

**URBAN CLIMATE FINANCE AT THE NEW DEVELOPMENT BANK:  
PORTFOLIO ANALYSIS AND TRENDS (2016–2024)**

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Eduardo Lemes Schlemm

Department for Knowledge and Communication Management

at University for Continuing Education Krems

Advisor: Dr. Łukasz Bryl (Poznań University of Economics and Business)

Advisor: Dr. Gabriela Viale Pereira (University for Continuing Education Krems)

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*Eduardo Lemes Schlemm*

## **DEDICATIONS**

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## ABSTRACT

Cities account for over 70 percent of global carbon dioxide emissions and face acute climate vulnerabilities, underscoring the urgent need for targeted urban climate finance. Multilateral Development Banks such as the New Development Bank play a key role in bridging the adaptation funding gap in emerging economies. This study presents a systematic quantitative analysis of the New Development Bank's urban climate portfolio from 2016 to 2024, using a descriptive research design composed of three analytical components: descriptive, comparative, and trend analyses. Data from 115 projects were collected from official Bank documents, harmonized to December 2024 USD using consumer price index adjustments, and manually coded using explicit classification criteria for borrower types, climate focus, and urban designation. Results show that the New Development Bank made substantial urban investments, with urban projects comprising 32.5 percent of its portfolio, or USD 14.6 billion, exceeding global municipal finance benchmarks but remaining insufficient to meet international urban resilience goals. Investment was heavily concentrated in Brazil, China, and India, with Brazil notably allocating more funding to urban than non-urban projects. However, subnational governments had minimal direct involvement, constrained by structural barriers to international finance. National governments and state-owned enterprises dominated borrowing through sovereign-backed loans, while the average urban project size of USD 280 million often exceeded the financial and administrative capacities of municipalities. Climate finance allocation revealed a significant imbalance, with a strong emphasis on mitigation and critical underfunding of adaptation, even though adaptation outcomes depend heavily on subnational implementation. Transparency limitations, particularly in projects involving financial intermediaries, further obscured the role of local actors. This research identifies systemic constraints within multilateral financing structures, links local governance capacity to adaptation effectiveness, and calls for improved tracking of subnational engagement. It recommends redesigning finance mechanisms to empower cities, scaling direct subnational lending, and prioritizing outcome-based evaluations to support transformative urban resilience.

**Keywords:** urban climate finance, urban adaptation, urban mitigation, sustainable urban development, multilateral development banks, development finance institutions.

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## ABBREVIATIONS

AFOLU	Agriculture, Forestry, and Other Land Use
COP	Conference of the Parties
DFI	Development Finance Institution
EMDEs	Emerging Markets and Developing Economies
FRLD	Fund for Responding to Loss and Damage
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNI	Gross National Income
MDB	Multilateral Development Bank
NbS	Nature-based Solutions
NCQG	New Collective Quantified Goal
NDB	New Development Bank
NDC	Nationally Determined Contribution
ODA	Official Development Assistance
PPP	Purchasing Power Parity
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change

## 1 INTRODUCTION

This chapter examines key challenges of urban climate finance amid accelerating climate impacts. It outlines the background of urban climate vulnerability, emphasizing cities' significance as major greenhouse gas (GHG) emitters and highly vulnerable spaces facing escalating risks. The discussion addresses the persistent adaptation finance gap and barriers cities face in mobilizing climate resources. Within this framework, Multilateral Development Banks (MDBs) are presented as pivotal actors catalysing investments and shaping effectiveness of climate finance. The chapter concludes by presenting the specific research focus on the New Development Bank (NDB), alongside the Problem Statement, Research Questions, and Objectives guiding this analysis.

### 1.1 Background

Cities are central to addressing the challenges of a changing climate, given their concentration of people, economic activity, and infrastructure. Urban climate action is a critical component of the global effort to address climate change (Fuhr et al., 2018). Their growing importance in climate discussions is closely linked to accelerating global urbanization trends. 55 percent of the world's population lived in urban areas in 2018, and this proportion is expected to reach 68 percent by 2050 (UNDESA, 2019). Cities are also significant contributors to GHG emissions (UN-Habitat, 2024). Cities are responsible for approximately 71 percent to 76 percent of CO<sub>2</sub> emissions linked to final energy use worldwide, and they consume between 67 percent and 76 percent of the world's total energy (Seto et al., 2014). As such, cities can not only reduce emissions but also adapt to climate impacts, and through effective policies, they hold great potential to drive transformative climate solutions (Betsill & Bulkeley, 2006).

At the same time, cities are highly vulnerable to the impacts of climate change (UN-Habitat, 2024). In 2018, nearly 1.6 billion people, 64 percent of those living in cities with over 300,000 inhabitants, were in areas highly exposed to at least one type of disaster, such as cyclones, floods, droughts, earthquakes, landslides, or volcanic eruptions (Gu, 2019). This vulnerability is projected to intensify significantly as global climate trends continue to worsen, with rising temperatures, sea levels, and extreme weather events amplifying existing urban risks (Gu, 2019). The planet has entered uncharted climatic territory, with multiple indicators demonstrating accelerating change. Temperature records show particularly alarming trends: the decade from 2015 to 2024 comprised the ten warmest years ever recorded, with 2024 setting a new high of 1.55°C (±0.13°C) above pre-industrial levels - surpassing 2023's previous record of 1.45°C (WMO, 2025). This sustained warming has been accompanied by a fivefold increase in extreme weather events since the 1970s (WMO, 2022).

In 2024, ocean heat content reached its highest level since measurements began 65 years ago, continuing an eight-year streak of broken records (WMO, 2025). The current rate of ocean warming in 2005-2024 has more than doubled compared to 1960-2005 levels (WMO, 2025). Estimates indicate that by 2050, over 800 million people in coastal cities will be at risk from at least 0.5 meters of sea-level rise and related flooding, while more than 1.6 billion urban residents will face extreme heat exceeding 35°C (UCCRN, 2018).

Air pollution is another major challenge for urban areas. In 2019, approximately 86 percent of urban residents, about 2.5 billion people, lived in areas where air pollution levels due to exposure to fine particulate matter exceeded the WHO's 2005 air quality guideline, contributing to 1.8 million premature deaths (Southerland et al., 2022). The estimated number of premature deaths worldwide that year, considering ambient (outdoor) air pollution in both urban and rural areas, was 4.2 million (WHO, 2024). More broadly, pollution as a whole was responsible for approximately 9 million premature deaths in 2019 (Fuller et al., 2022). In 2021, the World Health Organization introduced stricter air quality standards. 99 percent of the global urban population lives in areas that exceed these limits (WHO, 2024).

The accelerating pace of global climate change is not only an environmental crisis but also a growing economic threat. Climate modelling indicates that limiting global warming to 1.5°C could yield significant financial benefits. By avoiding widespread damage to infrastructure, ecosystems, and livelihoods, the savings could surpass the required climate investments by a factor of five by the end of the century (CPI, 2024). This projection highlights the strong economic rationale behind ambitious climate action and reinforces the urgency for large-scale, forward-looking investments. Framing climate finance as a preventive strategy rather than a reactive cost burden is increasingly supported by empirical data and policy analysis.

In contrast, the economic toll of inaction is already substantial and continues to rise. The annual global cost of repairing damage to critical infrastructure caused by natural and climate-related disasters is estimated at approximately USD 700 billion (Ding et al., 2021). This figure encompasses not only direct repair expenses but also broader economic, social, and health-related losses resulting from service disruptions and the erosion of new capital investments (Ding et al., 2021). Approximately 70 percent of these costs are attributed to climate-related hazards such as storms, floods, and extreme weather events, while the remainder results from geological risks like earthquakes and tsunamis (Ding et al., 2021). These numbers emphasize the high and growing cost of deferred climate action, reinforcing the case for timely, well-targeted investments in climate resilience.

In this regard, climate finance<sup>1</sup> plays a critical role in enabling the transition to a low-carbon, climate-resilient future, providing essential support for both mitigation<sup>2</sup> efforts to reduce GHG emissions and adaptation<sup>3</sup> measures to manage the impacts of climate change (UN-Habitat, 2024). Cities drive mitigation by improving energy efficiency in buildings, promoting renewable energy, transitioning to low-carbon public transportation, and encouraging compact, transit-oriented development to limit urban sprawl. Adaptation requires modifying urban systems via upgrading stormwater systems, implementing early warning systems, expanding green infrastructure, or enforcing resilient zoning (UN-Habitat, 2024).

The scale of needed investment is immense, with the Coalition for Disaster Resilient Infrastructure estimating annual requirements as high as USD 9.2 trillion to address infrastructure deficits, achieve the Sustainable Development Goals (SDGs), and meet net-zero targets by 2050 (CDRI, 2023). However, a severe and unevenly distributed financing gap persists. Globally, urban climate finance is heavily skewed, with USD 814 billion going to mitigation compared to only USD 10 billion for adaptation and USD 7 billion for dual benefits in 2021/2022 (CCFLA, 2024).

Crucially, only 3–5 per cent of total adaptation finance is explicitly designated for urban contexts (Richmond et al., 2021), creating major barriers in the places most at risk. This funding gap is particularly alarming given the world’s fastest-growing cities are expected to face extreme climate risks (UCCRN, 2018).

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<sup>1</sup> Climate finance refers to “financial resources and instruments that support action on climate change” (UNDP, 2023, p. 22, para. 1). It can come from “public or private, national or international, bilateral or multilateral” sources, using tools like “grants, green bonds, debt swaps, guarantees, and concessional loans” (UNDP, 2023, p. 22, para. 2).

<sup>2</sup> Climate change mitigation refers to “any action taken by governments, businesses, or people to reduce or prevent GHG emissions, or to enhance carbon sinks that remove these gases from the atmosphere” (UNDP, 2023, p. 55).

<sup>3</sup> Climate change adaptation refers to “actions that help reduce vulnerability to the current or expected impacts of climate change like weather extremes and natural disasters, sea-level rise, biodiversity loss, or food and water insecurity” (UNDP, 2023, p. 7).

Despite some progress, the pace and scale of action remain inadequate (UNEP, 2023; WRI, 2020). Local-level investment, in particular, remains insufficient, especially in rapidly urbanizing countries (Dodman et al., 2022). Alarming, even currently deployed and planned adaptations fall short of managing current climate risks for urban populations, and even maximal conceivable adaptation deployment would leave most current risks unresolved, underscoring the fundamental importance of mitigation (Dodman et al., 2022). The gap in urban climate adaptation is marked by significant inequality, with the poorest 20 percent experiencing a much wider gap compared to the wealthiest segment. This disparity is most pronounced in Asia, highlighting broader development imbalances that contribute to varying levels of vulnerability (Dodman et al., 2022).

Cities face profound, multi-faceted barriers accessing finance. Projects frequently present a dual challenge: too large for municipal budgets yet too small for major external donors (UN-Habitat, 2024). Subnational governments in developing countries struggle with unreliable intragovernmental transfers, creditworthiness issues, reliance on intergovernmental transfers, and limited own-source revenue systems (UN-Habitat, 2024). National legal and regulatory frameworks typically prevent cities from borrowing directly from international lenders (UN-Habitat, 2024), while lengthy and complex bureaucratic approval processes often result in significant delays in allocating budgets for climate action initiatives (Dodman et al., 2022).

Local governments face budget constraints and competing priorities, limiting funds for climate action (UN-Habitat, 2024), compounded by insufficient quantitative mechanisms to assess costs and funding schemes (Grafakos et al., 2020). Heavy reliance on loans accounted for nearly two-thirds of the USD 73.1 billion in public climate finance provided through bilateral and multilateral channels in 2021, totalling approximately USD 49.5 billion, which risks further indebting urban local governments in low-income contexts (OECD, 2024). This debt burden creates significant repayment pressures that may force increases in taxes or cuts to essential services like healthcare and education, inadvertently undermining efforts to build climate resilience (UN-Habitat, 2024).

These financial barriers worsen existing inequalities, as vulnerable communities are most affected by climate change but have limited access to funding for equitable solutions such as nature-based solutions (NbS), public transit, or energy-efficient housing (UN-Habitat, 2024). Despite this, evidence shows that inclusive access to resilient infrastructure not only enhances climate adaptation but also generates cascading social and economic benefits, reinforcing the urgent need for more equitable and sustainable financing models (Mahendra et al., 2021). Effectively addressing these fiscal constraints is essential to enabling cities to implement comprehensive and equitable climate strategies that prioritize social inclusion.

MDBs and Development Finance Institutions (DFIs) form a crucial part of the ecosystem bridging this gap. They offer concessional loans, help reduce risks to attract private investment, and strengthen city capacity by supporting the preparation of bankable projects and providing early-stage grants for technical studies to meet necessary standards (UN-Habitat, 2024).

Notably, Multilateral DFIs provided over half of the total tracked public urban adaptation funding, contributing USD 2 billion out of USD 5 billion in 2021 and 2022. They were also major contributors to dual-benefit finance, delivering USD 4 billion of the USD 7 billion invested in projects that address both climate mitigation and adaptation. Bilateral DFIs contributed an additional USD 1 billion (CCFLA, 2024). These dual-purpose investments were primarily directed toward cross-sectoral initiatives, which received USD 3 billion, as well as water and sanitation and transport, each receiving USD 1 billion (CCFLA, 2024). However, cities often access this finance indirectly via sovereign guarantees through national governments due to direct borrowing constraints (UN-Habitat, 2024), highlighting the complex intermediation role.

The NDB, established in 2014 by the BRICS alliance (NDB, 2014), was originally founded by Brazil, Russia, India, China, and South Africa. The alliance expanded in 2024 to include Egypt, Ethiopia, Iran, Saudi Arabia, and the United Arab Emirates, with Indonesia formally joining in January 2025 (Republic of South Africa, 2023). The BRICS economies collectively represent approximately 37.3 percent of global gross domestic product (GDP) when measured by purchasing power parity (PPP), and account for over half of the world's population (IMF, 2025), playing a crucial role in global efforts to reduce GHG emissions and protect biodiversity.

The NDB's mandate, established in its Articles of Agreement, centres on mobilizing resources for “infrastructure and sustainable development projects in BRICS and other emerging economies and developing countries” (NDB, 2014, p. 1, para. 7), “through loans, guarantees, equity participation and other financial instruments (NDB, 2014, p. 1, para. 8). Founded by Brazil, Russia, India, China, and South Africa with equal voting shares and an initial subscribed capital of USD 50 billion, the Bank operates within member states encompassing many of the world's fastest-growing and most climate-vulnerable cities facing extreme risk (NDB, 2014).

Understanding the NDB's specific contribution to urban climate finance, including the composition of its portfolio, financing structures, support for different urban borrower types, application of environmental and social safeguards, and the evolution of its focus over time, is therefore critical to assessing the global response to the urban climate challenge and identifying pathways to close the persistent financing gap, particularly for adaptation in rapidly urbanizing regions of the Global South.

## 1.2 Problem Statement

Cities are critical in the climate crisis, contributing over 70 percent of global CO<sub>2</sub> emissions while being highly vulnerable to climate impacts. MDBs such as the NDB play a crucial role in financing urban climate mitigation and adaptation infrastructure in emerging economies. Although the NDB commits to sustainable development and climate action, there is limited knowledge about its focus on urban climate finance. Key questions remain about the prominence of urban climate projects in the NDB's portfolio, financing structures, supported urban borrower types, application of environmental safeguards, and shifts in urban climate focus over time. This study addresses this gap through a systematic, quantitative assessment of the NDB's urban climate finance portfolio from 2016 to 2024, evaluating its alignment with the urgent need for increased urban climate investment.

## 1.3 Research Questions and Objectives

The purpose of this study is to provide a comprehensive analysis of the NDB urban climate finance portfolio from 2016 to 2024. Specifically, it aims to assess the scope, structure, and evolution of urban climate-focused projects and how these align with broader development and climate objectives.

To achieve this, the study first examines the composition of the urban project portfolio in relation to climate objectives and key project characteristics:

**RQ1:** What is the composition of the NDB's urban project portfolio from 2016 to 2024 in terms of climate focus, borrower types, sectors, and environmental and social safeguard categories?

Following this, the research compares how urban climate projects differ from other projects in terms of financing and institutional arrangements:

**RQ2:** How do financing amounts, loan structures, and borrower types differ between urban climate projects and other projects in the NDB portfolio?

Finally, the study analyses how urban climate financing and priorities have changed over time between 2016 and 2024:

**RQ3:** How has the focus and financing of urban climate projects evolved within the NDB portfolio over the period from 2016 to 2024?

## 2 LITERATURE REVIEW

This chapter is divided into three subchapters. The first, International Frameworks and Policies, examines how global agreements have increasingly recognized the role of cities in addressing climate change, while highlighting ongoing limitations in enabling effective and equitable local action. Frameworks such as the Paris Agreement and the New Urban Agenda are assessed in terms of their influence on urban climate governance and access to finance.

The second subchapter, Global Climate Finance, analyses the broader architecture of climate finance, where rising climate urgency is met with fragmented financial systems. It explores public and private financial flows and underscores challenges related to transparency, coordination, and the persistent imbalance between mitigation and adaptation funding.

The third subchapter, Urban Climate Finance, investigates the critical financing gap faced by cities. Despite their central role in climate mitigation and adaptation, cities receive only a small fraction of available climate finance. This section considers structural barriers that restrict access to funding, including rigid financial instruments, limited data, and centralized disbursement mechanisms. The role of MDBs is discussed and examined as important actors in urban climate finance, though they face significant institutional and operational limitations. This discussion provides the foundation for evaluating the NDB's approach to urban climate investment.

### 2.1 International Frameworks and Policies

Global agendas increasingly acknowledge the pivotal role of urban areas in advancing sustainable development and enhancing climate resilience<sup>4</sup> (UN-Habitat, 2024). These frameworks form a global enabling environment that influences national and local policies on urbanization and climate adaptation (Dodman et al., 2022). Table 1 presents how urban issues are represented within major sustainable international development policies and global agendas, highlighting both the progress achieved and the critical gaps that persist.

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<sup>4</sup> Climate resilience refers to “the capacity of a community or environment to anticipate and manage climate impacts, minimize their damage, and recover and transform as needed after the initial shock” (UNDP, 2023, p. 75).

**Table 1: Global policy frameworks shaping urbanization and climate adaptation**

<b>Agreement (date of agreement)</b>	<b>Scope of agreement</b>	<b>Relevance for cities, settlements and infrastructure</b>	<b>Relevance for addressing climate change risk</b>
Sendai Framework for Disaster Risk Reduction (March 2015)	Global framework to reduce disaster risks, emphasizing urbanization as a key factor.	Addresses urbanization as a major risk driver and promotes disaster risk management through national-local cooperation.	Focuses on systemic, compound, and cascading risks, including impacts from natural, technological, and biological hazards. Emphasizes governance, planning, and recovery.
Addis Ababa Action Agenda (July 2015)	Global framework from the Financing for Development Conference, focusing on adequate financing, particularly for subnational and local governments, to support sustainable development and climate mitigation.	Emphasizes the role of local governments and the need to strengthen their capacities but lacks specific mechanisms for financing local commitments.	Financing is crucial for risk reduction in cities, though institutional variability complicates a universal framework.
Transforming our world: the 2030 Agenda for Sustainable Development (September 2015)	Global agreement with 17 Sustainable Development Goals (SDGs), adopted by 193 governments.	SDG 11 focuses on making cities inclusive, safe, resilient, and sustainable, with other SDGs addressing basic services, equality, and governance. Limited focus on local and regional governments' roles.	SDG 13 calls for climate action in cities, and an integrated approach helps address underlying risk drivers.
The Paris Agreement (December 2015)	Global agreement under the UN Framework Convention on Climate Change.	Recognizes local and subnational governments, including cities, as key non-state actors.	Encourages cities to create specific agendas for climate action (mitigation and adaptation).
The World Humanitarian Summit (May 2016)	Summit with 180 member states, generating over 3,500 commitments, focusing on non-state actors in addressing climate change-related forced displacement.	Includes five core responsibilities relevant to urban areas, with commitments from NGOs and local authorities to address these in cities.	Climate change is expected to impact refugee and migrant flows, with many living in high-risk areas, but limited funding and poor data sharing hinder effectiveness.
The New Urban Agenda (October 2016)	Global agenda from the UN Conference on Housing and Sustainable Urban Development, focusing on national urban policies and adaptation plans to guide subnational governments.	Aims to provide global guidelines for sustainable urban development, with a focus on national policies. Limited recognition of urban governments and civil society as change drivers.	Defines roles for cities in contributing to low- carbon development, sustainability, and resilience, with an ongoing assessment of their contributions.

*Note.* This table is not extensive. Source: Adapted from Dodman et al. (2022, p. 920).

These international policy frameworks illustrate an evolving recognition of urban areas as key arenas for achieving sustainable development and building resilience to climate risks. The 2030 Agenda for Sustainable Development, through its SDGs, underscores the importance of achieving a more sustainable future that prioritizes well-being, equality, and justice, while 'leaving no one behind' (Dodman et al., 2022).

However, while some frameworks such as the Addis Ababa Action Agenda and the New Urban Agenda stress the importance of financial reform for sustainable development, they fall short of addressing how such reforms should be implemented at the local level to meet the SDGs (Mitlin et al., 2018). One reason is that few agencies have the knowledge or commitment to transform financial systems in ways that advance social justice, equity, and poverty reduction locally (Mitlin et al., 2018).

Global climate governance has traditionally centred on national governments (Hsu et al., 2020), especially within the framework of the United Nations Framework Convention on Climate Change (UNFCCC)<sup>5</sup> and its Conference of the Parties (COP). However, the Paris Agreement, a global pact negotiated at UNFCCC COP21, reflect a shift toward a more inclusive, bottom-up approach described as 'catalytic and facilitative', expanding the role of "non-Party stakeholders" such as cities, regions, businesses, investors, and civil society (Hale, 2016). These actors are now positioned as central drivers of climate action and integral to the UNFCCC process, actively contributing to policy development and overseeing the monitoring and implementation of Nationally Determined Contributions (NDCs)<sup>6</sup> to help ensure that global climate commitments are met (Bäckstrand et al., 2017).

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<sup>5</sup> The UNFCCC is the United Nations body responsible for coordinating the worldwide effort to address climate change. It has universal membership and serves as the foundational treaty for the 2015 Paris Agreement. The primary goal of the Paris Agreement is to limit the increase in global average temperature this century to nearly 1.5 degrees Celsius above pre-industrial levels (UNFCCC, 2015).

<sup>6</sup> The Paris Agreement requires participating nations to develop NDCs, which are five-year climate action plans submitted to the UNFCCC. These documents detail each country's proposed measures to mitigate GHG emissions and adapt to climate impacts, with the collective aim of meeting the agreement's temperature objectives (UNFCCC, 2015).

A 2022/2023 review of 194 NDCs revealed that 66 percent include either moderate (39 percent) or strong (27 percent) urban content, a significant rise from just 14 percent with strong content in 2016/2017 (UNDP et al., 2024). However, 34 percent still exhibit low or no urban focus, underscoring the need to expand and strengthen urban elements to boost climate ambition and implementation (UNDP et al., 2024). The same analysis found that 44 percent (86 NDCs) mentioned both urban mitigation and adaptation. Urban mitigation was most frequently linked to energy, transport, and waste, while urban adaptation focused on infrastructure and water sectors, with NbS<sup>7</sup>, participation, and gender as key cross-cutting themes (UNDP et al., 2024).

Cities and regions are also increasingly engaging in global climate governance through innovative reporting mechanisms. Among these, Voluntary Local Reviews enable municipal governments to systematically assess and communicate their progress in achieving the UN SDGs (UN-Habitat, 2024). A complementary framework, Voluntary Subnational Reviews, has been developed for regional governments to similarly track and report their sustainability advancements (UN-Habitat, 2024).

Though non-binding, these frameworks follow UN-recognized guidelines. The Voluntary Local Reviews model gained prominence in 2018 when New York City, responding to the US withdrawal from the Paris Agreement, submitted the first SDG-aligned local review, mirroring the VNRs that countries submit to the UN (UN-Habitat, 2024).

Beyond these reporting mechanisms, the UNFCCC has progressively deepened its institutional engagement with cities and subnational actors through a series of decisions across successive COPs, reflecting a recognition of the critical role cities play in driving climate action, as systematically outlined in Table 2.

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<sup>7</sup> Nature-based solutions refer to “actions to protect, conserve, restore, and sustainably use and manage ecosystems to support climate change adaptation and mitigation efforts, preserve biodiversity, and enable sustainable livelihoods. They are actions that prioritize the importance of ecosystems and biodiversity and are designed and implemented with the full engagement and consent of local communities and Indigenous Peoples, who hold generational knowledge on protecting nature” (UNDP, 2023, p. 61).

**Table 2: Summary of COP focus areas and milestones since the Paris Agreement**

<b>UNFCCC COP</b>	<b>Key UNFCCC Outcomes and milestones</b>	<b>Implications for urban contexts</b>
COP21 (2015, Paris)	The Paris Agreement recognizes all levels of government, including cities and subnational actors, as key Non-Party Stakeholders. Focus on limiting global warming below 2°C and striving for 1.5°C. Binding NDCs established, following agreement ratification in 2016.	Ambitious mitigation efforts to cut GHGs, climate-resilient urban development, and enhanced multi-level governance.
COP22 (2016, Marrakech)	The Marrakech Partnership for Global Climate Action (MPCGA) promotes collaboration across sectors, with "human settlements" as one thematic area.	Focus on partnerships and local leadership for urban climate action.
COP23 (2017, Bonn)	The Talanoa Dialogue fostered inclusive discussions to boost climate ambition and paved the way for the Global Stocktake.	Focus on community engagement, dialogue, and diverse input in urban climate planning.
COP24 (2018, Katowice)	Focused on finalizing the "rulebook" for the Paris Agreement, emphasizing transparency, accountability, and monitoring of climate actions.	Urgent need for robust urban data systems, climate action evaluation, and accountability in governance.
COP25 (2019, Madrid)	Urgency to enhance climate ambition, close the emissions gap, and meet the Agreement's goals. Need for more financing, technology sharing, and capacity building in developing countries.	Emphasis on accessible climate finance, sustainable urban development, gender, low-carbon infrastructure, and resilience in vulnerable cities.
COP26 (2021, Glasgow)	The Glasgow Climate Pact highlights "multi-level action" and the need to enhance ambition for mitigation and adaptation. It also establishes the Glasgow–Sharm el-Sheikh Adaptation Agenda for immediate adaptation solutions, especially for Non-Party Stakeholders.	The Cities Race to Zero and Race to Resilience campaigns, part of the Sharm el-Sheikh work programme, aim to showcase action and drive ambition tailored to each city's context.
COP27 (2022, Sharm el-Sheikh)	Establishment of the Fund for responding to Loss and Damage (FRLD). COP27 Presidency launched e Sustainable Urban Resilience for the Next Generation (SURGe) Initiative. The First Movers Coalition (FMC) was formed between the World Economic Forum and US Climate Envoy to decarbonize heavy-emitting sectors.	FRLD milestone for urban climate justice, though key issues remain. SURGe accelerates urban action through multi-level governance.
COP28 (2023, Dubai)	The First Global Stocktake showed Parties are off-track for the Paris Agreement goals. Targets for the Global Goal on Adaptation were set, and a historic agreement on L&D funding was reached. The closing agreement marks the start of a just transition away from fossil fuels.	The first Global Stocktake outcome highlights the key role of non-Party stakeholders, including cities and subnational authorities, and recognizes collaborative action.
COP29 (2024, Baku)	Advanced the operationalization of carbon markets. Focused on climate finance, with an agreed target of USD 300 billion per year from developed nations by 2035 (UNFCCC, 2025).	Focus on cities as key climate actors and urban-centric strategies for sustainable development and resilience.

*Note.* The COP29 analysis is based on official post-session documents published by the UNFCCC. Source: Adapted from UN-Habitat (2024, p. 46).

The recognition of cities' critical role in climate action began with their acknowledgment as non-Party stakeholders (COP21). It advanced through urban platforms like the Marrakech Partnership (COP22) and initiatives such as Cities Race to Zero (COP26) and SURGe (COP27). Climate finance remains a contested issue in UNFCCC negotiations, reflecting persistent systemic challenges.

The Paris Agreement emphasized that developed countries should lead in mobilizing climate finance through various sources and channels, aiming to exceed prior efforts (UNFCCC, 2015). In this sense, a new collective goal for climate finance was launched to build on the USD 100 billion annual target established in Copenhagen<sup>8</sup> (UNFCCC, 2010). The New Collective Quantified Goal (NCQG) was first proposed at COP26 in Glasgow, aiming to enhance the scale, scope, and quality of climate finance based on scientific evidence and the needs of developing countries (UNFCCC, 2016).

These discussions culminated in a final decision on NCQG at COP29 in Baku, where a target of at least USD 300 billion per year by 2035 for developing countries was established, alongside a broader goal to mobilize USD 1.3 trillion annually by 2035 from both public and private sources (Watson et al., 2025). While the new climate finance goal was agreed upon, it was a point of contention between developing countries, who stressed equity and public funding, and developed countries, who saw it as a mobilization target under the Paris Agreement (UNFCCC, 2024a).

The NCQG decision also stresses reducing barriers to climate finance, like high capital costs co-financing requirements and burdensome application processes. It urges multilateral funds to simplify access and disbursement, and bilateral providers to support multi-year, local programs, especially for adaptation (Watson et al., 2025). However, the agreement created neither a specific adaptation sub-target nor a new dedicated adaptation finance commitment. The NCQG text simply reiterates a generic “balance” between mitigation and adaptation finance and lacks any new quantitative adaptation goal (UNFCCC, 2025). This happened despite the first Global Stocktake at COP28 reaffirming the urgency of doubling adaptation finance and mandating a progress report from developed countries in 2024 (UNFCCC, 2023).

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<sup>8</sup> At the 2009 Copenhagen Climate Summit (COP15), developed countries committed to a collective goal of mobilizing USD 100 billion annually in climate finance by 2020 to support developing countries in their climate action efforts (UNFCCC, 2010).

This inaction effectively maintains the COP26 promise from the 2021 Glasgow Climate Pact as the current standard, where developed countries agreed to collectively at least double their adaptation finance to developing nations from 2019 levels by 2025 (UNFCCC, 2021). While this commitment represented an important step forward when adopted, its continued status as the most ambitious available target has drawn criticism from vulnerable nations and climate advocates, who emphasize the growing adaptation funding gap and urge substantially higher commitments to match escalating needs (Watson et al., 2025).

Despite these ongoing challenges in adaptation finance, other areas of climate funding have seen notable advancements. Particularly, momentum has grown around addressing the irreversible impacts of climate change, culminating in new mechanisms aimed at supporting the most vulnerable communities.

Significant progress has been achieved in certain areas of climate finance, particularly through the establishment of loss and damage funding mechanisms. At COP27, countries formally recognized loss and damage as the third pillar of climate finance, creating the Fund for Responding to Loss and Damage (FRLD). This fund was further negotiated and finalized at COP28, with COP29 confirming it as a financial intermediary fund hosted by the World Bank (V20, 2022). However, these advances in dedicated climate financing mechanisms contrast with ongoing concerns about the sufficiency of developed nations' broader financial commitments.

In this sense, Official Development Assistance (ODA) represents one of the longest-standing financial obligations for supporting global development. Established through a 1970 UN resolution (United Nations, 1971), this framework set a target for wealthy nations to contribute 0.7 percent of their Gross National Income (GNI)<sup>9</sup> to development aid. Though non-binding, this benchmark persists as a key measure of equitable contributions to global development, including climate and sustainability goals. However, compliance has been limited, with only Luxembourg, Norway, and Sweden consistently meeting the target while also increasing their climate finance contributions (CARE, 2023).

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<sup>9</sup> The 0.7 percent aid target was established by the UN General Assembly in 1970 with the adoption of Resolution 2626 (XXV), urging developed states to dedicate a percentage of their GNI to ODA (United Nations, 1971).

In addition, the relationship between ODA and the UNFCCC is guided by the principle of "additionality," as articulated in Article 4, paragraph 3 of the convention commitments (United Nations, 1992). This provision stipulates that developed countries must provide "new and additional" financial resources to support developing nations in meeting their climate commitments (United Nations, 1992). However, this principle has faced growing scrutiny. Recent analyses show that 93 percent of climate finance reported by high-income countries from 2011 to 2020 came from existing ODA budgets, raising concerns about whether climate funding is truly supplemental to traditional development aid (CARE, 2023).

Moreover, ODA reporting mechanisms predominantly track sectoral allocations rather than geographically targeted urban investments, making it difficult to determine what proportion of climate-related ODA directly benefits cities (UN-Habitat, 2024). The disbursements for urban projects are often managed by central government agencies rather than local urban governments, limiting cities' direct access to funds and their ability to tailor solutions to local contexts (UN-Habitat, 2024).

## **2.2 Global Climate Finance**

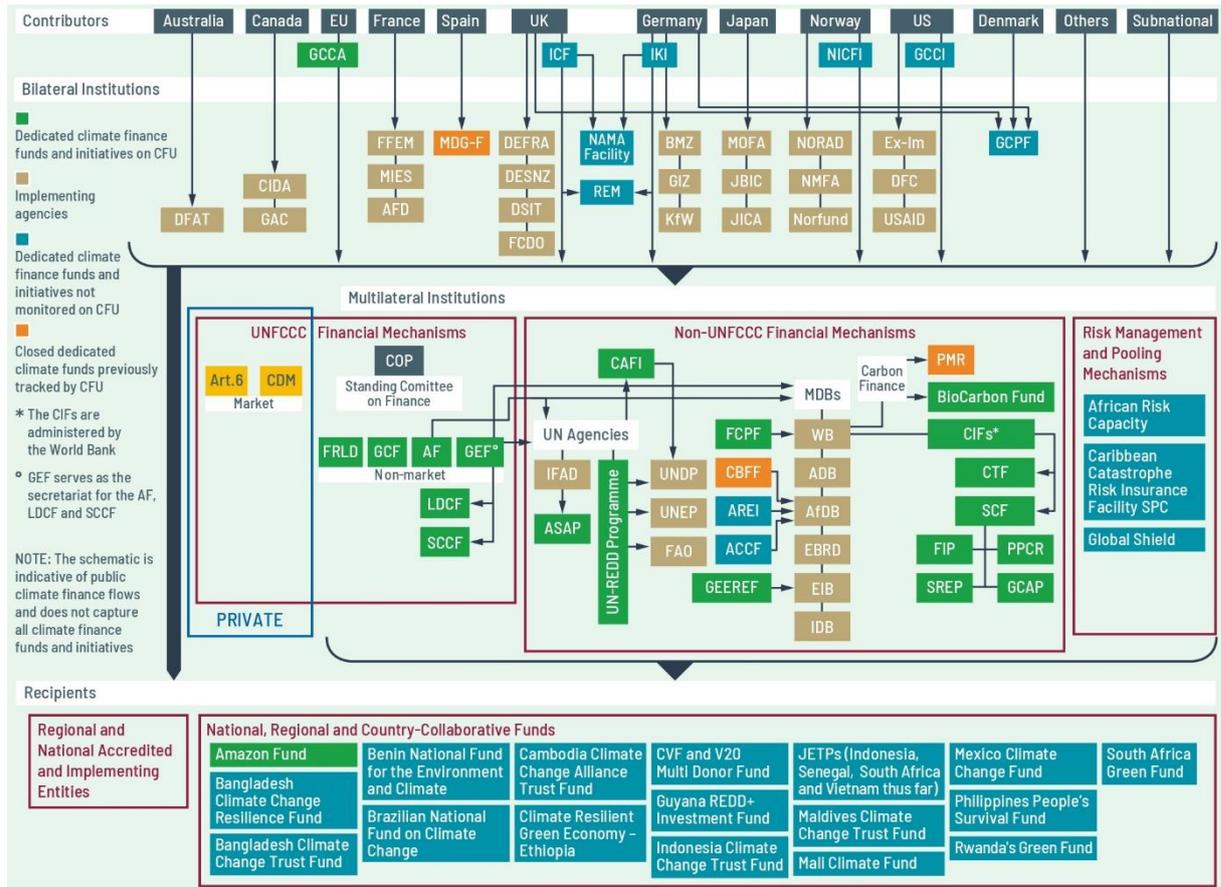
The global climate finance architecture constitutes a dynamic ecosystem of public and private funding flows, multilateral mechanisms, and regulatory frameworks essential for low-emission, climate-resilient development. Funding sources include UNFCCC-linked mechanisms, international financial institutions, bilateral agreements, and national and regional funds financed through international finance, domestic budgets, or private sector contributions (Watson et al., 2025).

However, despite its critical role, this architecture remains fragmented, characterized by inconsistent definitions, opaque tracking methodologies, and poor coordination among mechanisms. Recent efforts have focused on streamlining access and maintaining accountability, yet transparency challenges persist. While reporting practices for multilateral climate finance have improved, detailed and reliable data on bilateral initiatives and national funds remain limited due to inconsistent self-reporting and the absence of independent verification processes (Watson et al., 2025).

In response to these fragmentation and accountability concerns, multilateral climate funds have increasingly moved away from traditional donor-controlled governance models. They now offer developing countries greater voting power and board representation, aiming to enhance legitimacy and ownership. Additionally, many funds have introduced formal roles for civil society observers in decision-making processes, though the degree of actual influence these observers exert varies significantly across institutions (Watson et al., 2025).

To clarify all these financial flows, Figure 1 outlines the global climate finance architecture, focusing on public mechanisms. These climate finance instruments include grants<sup>10</sup>, concessional loans<sup>11</sup>, guarantees<sup>12</sup>, and private equity<sup>13</sup> investments, each with distinct governance structures and operational objectives (Watson et al., 2025).

**Figure 1: Global climate finance architecture**



Note. Appendix A provides a list of all referenced institutions, mechanisms, funds, and initiatives. Source: Watson et al. (2025, p. 4).

<sup>10</sup> Non-repayable financial transfers.

<sup>11</sup> Below-market-rate financing with extended repayment periods and grace periods.

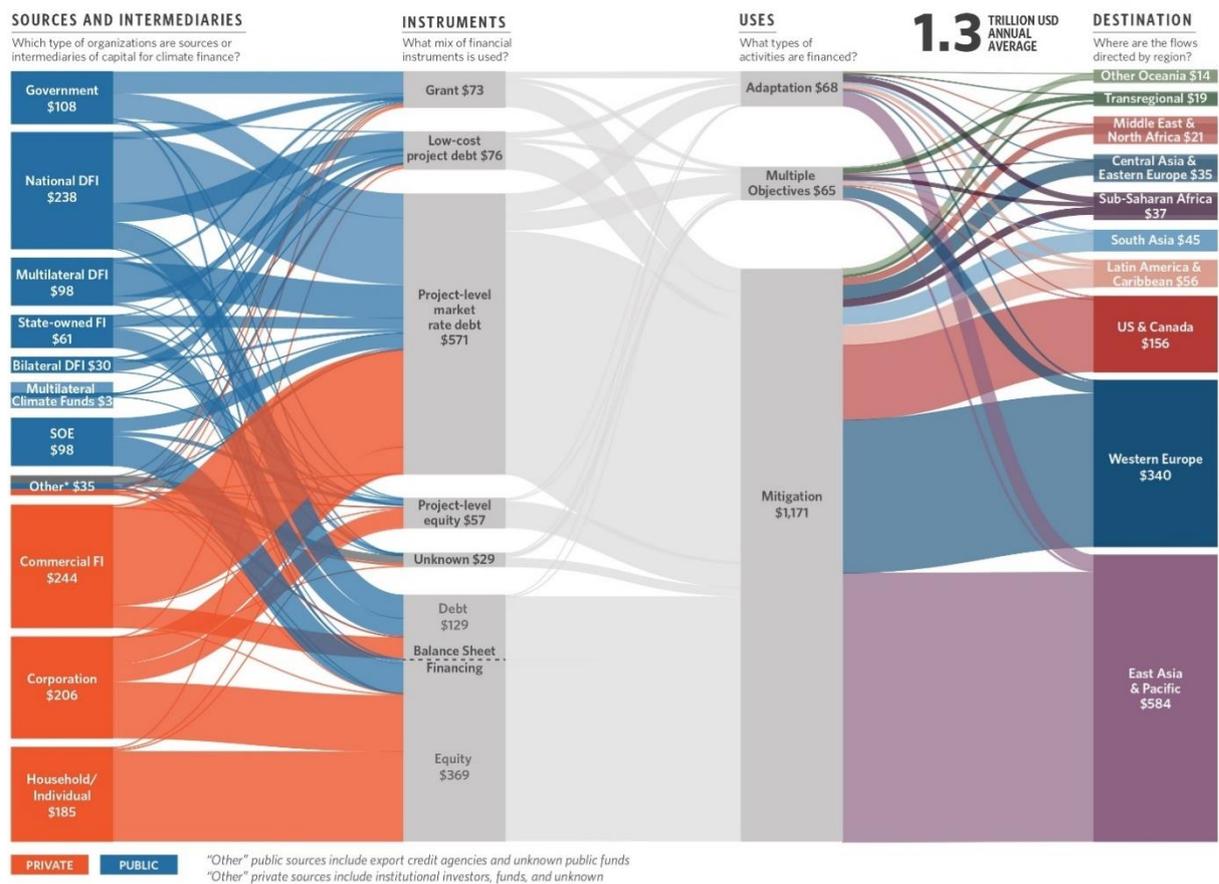
<sup>12</sup> Risk-sharing instruments where institutions assume partial liability for projects.

<sup>13</sup> Direct investments in climate ventures, generally pursuing commercial returns.

The current climate finance architecture offers recipient countries multiple funding channels, which can enhance access and potential complementarity but also create complexity. This fragmented system complicates monitoring, reporting, and verification efforts, while making coordination and equitable resource allocation more challenging (Watson et al., 2025). However, the fundamental challenge remains the scale of funding required.

While climate finance more than doubled from USD 674 billion in 2018 to USD 1.46 trillion in 2022, it must still increase fivefold to stay on track for the 1.5°C target, reaching an average of USD 7.4 trillion per year through 2030 (CPI, 2024). Overall, climate finance flows remain far below what is needed, with an estimated USD 6.7 to 10 trillion required annually until 2050 to limit warming and avoid the most severe impacts of climate change (CPI, 2024). The average between 2021 and 2022 was USD 1.3 trillion, as shown in Figure 2.

**Figure 2: Landscape of climate finance (2021/2022)**



*Note.* Global climate finance flows along their life cycle in 2022 and 2023. Values are averages of two years' data to smooth out fluctuations, in USD billions. Source: CPI (2024, p. 1).

Current climate finance accounts for just 1 percent of global GDP, while projections indicate that some emerging markets and developing economies (EMDEs) might need to allocate up to 6.5 percent of their GDP by 2030 (Songwe et al., 2022). Beyond the funding gap, there is also an imbalance between mitigation and adaptation finance. Achieving a better balance, as outlined in Articles 7 and 9 of the Paris Agreement, is critical to address the differing vulnerabilities and capacities of developed and developing countries (IPCC, 2023).

Climate mitigation finance reached USD 1.3 trillion in 2022, growing at a compound annual growth rate of 20 percent from USD 627 billion in 2018. Despite this rapid growth, mitigation finance still falls short of estimated needs, which are projected to average USD 7.2 trillion annually from 2024 to 2030 (CPI, 2024). Mitigation projects, which accounted for 90 percent of global climate finance, were primarily driven by investments in renewable energy (RE), low-carbon transport, and buildings and infrastructure, which together represented 94 percent of total mitigation finance from 2018 to 2022 (CPI, 2024).

Private finance played a major role, contributing 54 percent of total mitigation funding, with significant growth in sectors such as energy systems, buildings, and transport. Over half (57 percent) of mitigation investments were funded through market-rate loans, followed by equity instruments (32 percent), while concessional capital made up 9 percent (CPI, 2024). The increase in private financing, particularly for buildings, infrastructure, and transport, signals growing commercial viability in these sectors, though opportunities remain to further scale up mitigation finance. Outside of energy, buildings, and transport, investment in climate mitigation remains slow. Sectors like Agriculture, Forestry, and Other Land Use (AFOLU), industry, and water and wastewater have significant mitigation potential, yet their investment levels stayed limited between 2018 and 2022 (UNEP, 2024).

Adaptation finance remains even more constrained. Despite considerable efforts, adaptation continues to receive far less attention and resources than mitigation. Actions for climate adaptation are still fragmented, often focusing on incremental changes rather than transformative solutions (Berrang-Ford et al., 2021). In fact, adaptation finance has consistently represented just 20-25 percent of all concessional finance available (Global Center on Adaptation, 2022).

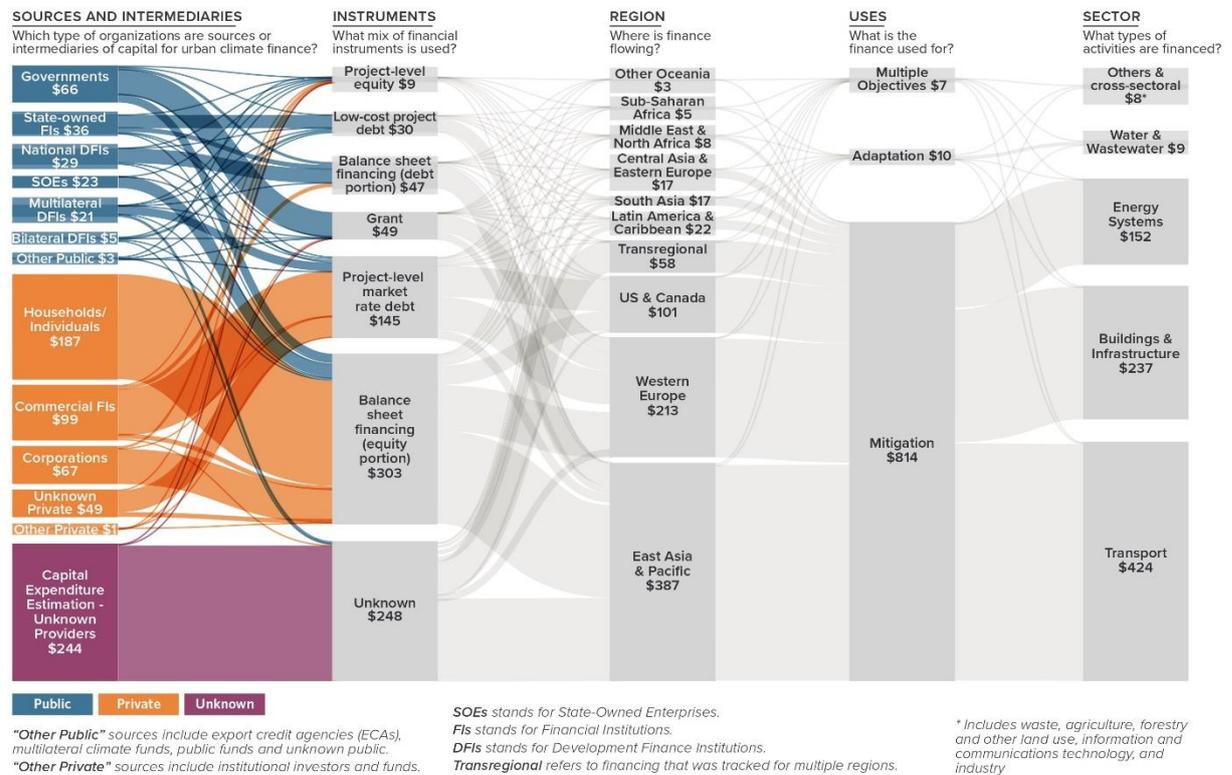
While adaptation finance more than doubled to USD 76 billion in 2022, it still falls short of the estimated needs for EMDEs, which are USD 212 billion per year from 2024 to 2030 and USD 239 billion annually from 2031 to 2050. In 2022, adaptation finance was only one-third of the required amount for EMDEs (CPI, 2024). Public funding remains dominant, providing 92 percent of adaptation flows, particularly in sectors such as water and wastewater with 88 percent, AFOLU with 87 percent, and cross-sectoral adaptation with 99 percent (CPI, 2024).

### 2.3 Urban Climate Finance

While climate finance flows predominantly target international and national government (CPI, 2021), cities represent a critical frontier for climate action and have become increasingly central to global climate governance (Bulkeley, 2021). Urban areas account for both significant global emissions and the highest concentrations of climate-vulnerable populations (UN-Habitat, 2024), while their complex systems require tailored financial solutions to drive sustainable, resilient, and equitable transitions (CPI, 2024).

Municipalities receive less than 20 percent of current climate finance and often struggle to secure investment, especially for small, community-led projects outside traditional financing mechanisms (UN-Habitat, 2024). Urban climate finance averaged USD 831 billion annually in 2021–2022, as shown by the landscape of urban climate finance in Figure 3. However, this amount falls far short of the estimated USD 4.5 to 5.4 trillion in annual investments required from 2015 to 2030 to meet the global demand for low-emission, climate-resilient urban infrastructure (CCFLA, 2015).

**Figure 3: Landscape of urban climate finance (2021/2022)**



**Note.** Global climate finance flows along their life cycle in 2022 and 2023. Values are averages of two years' data to smooth out fluctuations, in USD billions. Source: CCFLA (2024, p. X).

In 2021–2022, private actors provided 49 percent (USD 404 billion) of urban climate finance, tripling since 2017, with households contributing nearly half of that (USD 187 billion). Public finance accounted for 22 percent, more than doubling over the same period. National governments (36 percent) and DFIs (30 percent) led public contributions, with national DFIs investing more in urban projects than multilateral DFIs. Despite their larger overall portfolios (CPI, 2024), multilateral institutions remain underutilized in city-level finance. This underscores a key gap in leveraging global climate funds to support urban resilience.

However, the urban climate finance<sup>14</sup> remains insufficient and unequally distributed (CPI, 2024). Funding for adaptation lags significantly behind mitigation, with far fewer resources allocated and slower deployment. In 2021–2022, adaptation received just over USD 10 billion, only around 1 percent of the total USD 831 billion tracked for urban climate action. This disparity undermines the overall effectiveness of urban climate strategies, where adaptation is crucial (UN-Habitat, 2024).

In addition to that, low-income urban communities, especially those living in informal settlements, are among the most exposed to climate risks (UN-Habitat, 2024). More than one billion people currently live in slum conditions, and this number could rise to two billion by 2030 (UN-Habitat, 2022). These populations face both direct impacts such as floods, droughts, and heatwaves, and indirect effects like growing food and water insecurity (Cities Alliance, 2024).

Despite their vulnerability, the urban poor receive only a small portion of global climate finance (Cities Alliance, 2024). Marginalized groups including Indigenous Peoples, minorities, and informal workers continue to face disproportionate exposure to climate hazards with limited support (UN-Habitat, 2024). Achieving a just urban transition requires prioritizing these communities in climate policy and investment (Hughes & Hoffmann, 2020).

Current climate finance imbalances undermine the principles of the Paris Agreement by reinforcing systemic inequities and failing to meet the target of equal funding for adaptation and mitigation (UNFCCC, 2015). Table 3 presents a detailed overview of this imbalance across the uses and sectors.

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<sup>14</sup> Urban climate finance refers to “financial resources directed to activities aimed at limiting city-induced GHG emissions and to activities intended to address climate-related risks faced by cities” (CCFLA, 2024, p. 9).

**Table 3: Urban climate finance by use and sector (2021/2022)**

<b>Use/Sector</b>	<b>2019/2020</b>	<b>2021/2022</b>
<b>Adaptation</b>	<b>10.81</b>	<b>9.53</b>
Agriculture Forestry Other land uses and Fisheries	0.11	0.14
Buildings & Infrastructure	0.05	0.18
Energy Systems	0.15	0.11
Industry	0.00	0.00
Information and Communications Technology	0.00	0.00
Others & Cross-sectoral	2.54	1.98
Transport	1.78	0.59
Waste	0.01	0.01
Water & Wastewater	6.15	6.51
<b>Mitigation</b>	<b>521.95</b>	<b>814.24</b>
Agriculture Forestry Other land uses and Fisheries	0.06	0.05
Buildings & Infrastructure	186.53	236.87
Energy Systems	54.81	151.60
Industry	0.01	0.05
Information and Communications Technology	0.09	0.10
Others & Cross-sectoral	2.08	2.14
Transport	275.30	422.28
Unknown	0.02	-
Waste	1.95	0.47
Water & Wastewater	1.09	0.69
<b>Multiple Objectives</b>	<b>8.22</b>	<b>6.75</b>
Agriculture Forestry Other land uses and Fisheries	0.13	0.23
Buildings & Infrastructure	0.23	0.02
Energy Systems	0.17	0.65
Industry	0.05	0.01
Information and Communications Technology	0.15	0.00
Others & Cross-sectoral	3.16	2.71
Transport	1.89	1.34
Waste	0.10	0.14
Water & Wastewater	2.35	1.65
<b>Unknown</b>	<b>-</b>	<b>0.01</b>
Transport	-	0.01
Unknown	-	0.00
<b>Total</b>	<b>540.98</b>	<b>830.54</b>

Note. Values in USD billion. Source: Adapted from CCFLA (2024).

The data reveals that between 2019-2020 and 2021-2022, mitigation financing grew substantially while adaptation and dual-benefit investments experienced further decline from an already inadequate baseline. Moreover, current urban climate investments show a pronounced bias toward mitigation sectors, particularly energy, transport, and buildings.

For the transport sector, considering the weight of private actors in urban climate finance, it is important to note that households and individuals primarily invest in electric cars, totalling USD 128 billion, and other private vehicles that reduce GHG emissions, as shown in Table 4.

**Table 4: Transport sector urban climate finance by sub-sector (2021/2022)**

<b>Transport Sub-sector</b>	<b>2019/2020</b>	<b>2021/2022</b>
Buses	20.66	16.73
Non-motorised transport	15.30	21.35
Other/Unspecified	2.39	1.99
Policy & National Budget Support & Capacity Building	1.47	0.51
Private Vehicles	73.16	230.12
Railways	162.53	151.49
Transport-Oriented Urban Development and Infrastructure	3.07	1.68
Waterway	0.39	0.36
<b>Total</b>	<b>278.98</b>	<b>424.22</b>

*Note.* Values in USD billion. Source: Adapted from CCFLA (2024).

Private households and individuals also contribute significantly to the buildings sector, investing USD 36 billion in retrofits and new constructions (CCFLA, 2024). The total investment in building and infrastructure construction work amounted to around USD 97 billion, as shown in Table 5.

**Table 5: Buildings & Infrastructure urban climate finance by sub-sector (2021/2022)**

<b>Buildings &amp; Infrastructure Sub-sector</b>	<b>2019/2020</b>	<b>2021/2022</b>
Appliances & Lighting	50.31	58.01
Building & Infrastructure Construction Work	67.24	97.21
Hvac & Water Heaters	44.19	49.98
Other/Unspecified	24.78	31.86
Policy & National Budget Support & Capacity Building	0.29	0.00
<b>Total</b>	<b>186.81</b>	<b>237.06</b>

*Note.* Values in USD billion. Source: Adapted from CCFLA (2024).

In the energy systems sector, solar PV projects received 91 percent of urban renewable energy investment, totalling USD 139 billion. This includes grid connected, off grid, and commercial rooftop systems (CCFLA, 2024). Total investment in the energy system sub-sector averaged around USD 152 billion between 2021 and 2022, as shown in Table 6.

**Table 6: Energy System sector urban climate finance by sub-sector (2021/2022)**

<b>Energy Systems Sub-sector</b>	<b>2019/2020</b>	<b>2021/2022</b>
Fuel Production	0.25	2.79
Other/Unspecified	0.77	1.60
Policy & National Budget Support & Capacity Building	0.07	0.11
Power & Heat Generation	52.72	146.77
Power & Heat Transmission & Distribution	1.32	1.10
<b>Total</b>	<b>55.13</b>	<b>152.37</b>

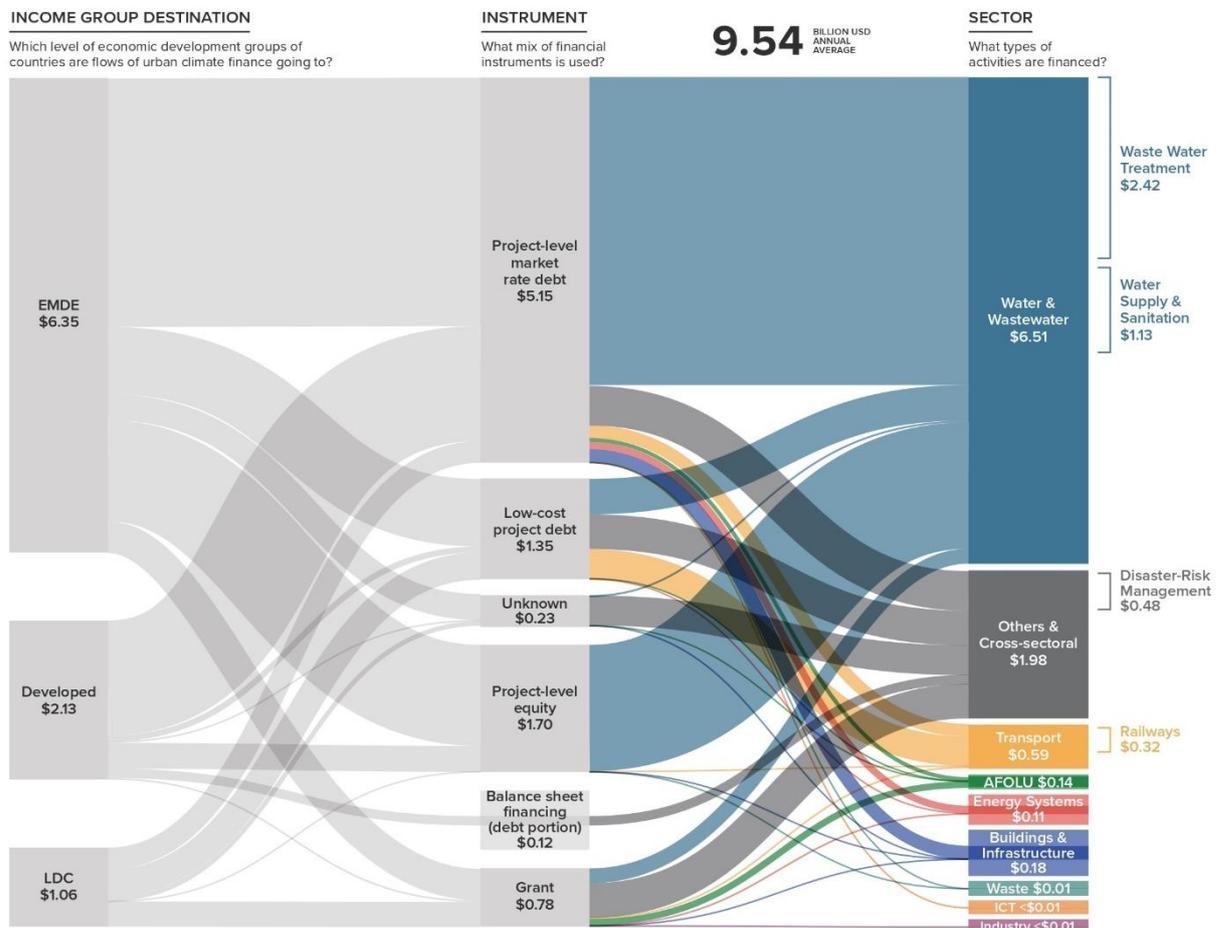
*Note.* Values in USD billion. Source: Adapted from CCFLA (2024).

Overall, data on urban climate finance is still limited and often lacks quality. This is due to several challenges, including limited transparency from private actors, especially in the transport and buildings sectors, as well as the lack of standardized reporting, unclear definitions, and insufficient detail. These issues hinder the ability to effectively monitor and evaluate investments in urban climate action (CCFLA, 2024). Even with these limitations, the numbers clearly show that current financing levels are far from sufficient to meet the scale of mitigation required.

Transport, energy, and buildings represent the largest share of cities' mitigation investment needs. Until 2030, cities are projected to require USD 1.7 trillion annually for transport solutions such as electric vehicles and urban rail. Energy needs are estimated at USD 1.2 trillion per year, mainly for renewable power and heat generation. Buildings will require around USD 1 trillion annually for retrofits, new construction, and efficient technologies like HVAC systems, water heaters, and clean cooking appliances (CCFLA, 2024).

Looking at urban adaptation, cities are estimated to need USD 147 billion per year until 2030 for adaptation (CCFLA, 2024). However, there is a significant gap in financing to meet this estimate, considering that urban adaptation received an average of about USD 9.5 billion in 2021 and 2022, as shown in Figure 4.

**Figure 4: Urban adaptation finance flows (2021/2022)**



*Note.* Unknown < USD 0.01. Values are averages of two years' data to smooth out fluctuations, in USD billions. Source: CCFLA (2024, p. 20).

Water and wastewater activities received the largest share of urban adaptation finance, accounting for 68 percent of the total, reaching USD 7 billion. This highlights their importance in strengthening climate resilience. The sector is also drawing more private investment due to its commercial potential. In comparison, cross sectoral solutions such as disaster risk management and coastal protection received 21 percent of the funding, totalling USD 2 billion (CCFLA, 2024).

Moreover, urban adaptation finance was relatively balanced between public and private sources. Of the total, private actors contributed USD 4 billion, while public institutions provided USD 5 billion. Public funding was distributed across multiple sectors, with 43 percent directed toward disaster-risk management, coastal protection, and water infrastructure, and 13 percent allocated to transport systems (CCFLA, 2024).

Multilateral DFIs contributed over half of total public urban adaptation finance, amounting to USD 2 billion, although data challenges may affect these figures. Dual-benefit finance, combining climate mitigation and adaptation, averaged USD 7 billion in 2021 and 2022, with 88 percent from public actors, primarily multilateral DFIs with USD 4 billion (CCFLA, 2024).

In the context of a significant gap between existing and required funding and challenges in accessing finance, MDBs play a key role in supporting climate action, especially considering that they primarily finance projects in developing countries. MDBs are also crucial for adaptation and integrated climate efforts, as highlighted in Table 7. In 2021 and 2022, MDBs contributed USD 21 billion, accounting for 12 percent of total public urban climate finance (CCFLA, 2024).

**Table 7: MDBs contributions to public urban climate finance (2021/2022)**

Category	Public Climate Finance	MDBs contribution	MDBs Share (%)
Mitigation	172,607	14,724	8.50%
Adaptation	4,635	2,350	50.70%
Multiple Objectives	5,921	4,395	74.20%
<b>All uses</b>	<b>183,169</b>	<b>21,496</b>	<b>11.70%</b>

*Note.* Values in USD million. Source: Adapted from CCFLA (2024).

While the contributions of MDBs are vital in addressing the urban climate finance gap, the effectiveness of these efforts is often shaped by the evolving dynamics of global governance and financing structures. At the same time, cities encounter persistent difficulties in securing funds for local climate initiatives. Many of these projects are too costly to be covered by municipal budgets but still fall below the scale preferred by international donors. To overcome this, some cities have adopted strategies such as pooling multiple urban projects, allowing them to extend climate action beyond individual jurisdictions and strengthen their capacity to attract financing (UN-Habitat, 2024). However, global discussions on urban climate finance continue to focus primarily on measuring shortfalls in funding (Mitlin et al., 2018), often neglecting the deeper structural obstacles that prevent effective implementation. To address these challenges, especially in developing countries, there is a growing recognition of the need for more flexible and innovative models of collaboration.

### **3 THEORETICAL FRAMEWORK**

This chapter provides the theoretical foundation for analysing the roles in financing urban climate projects. Two interrelated concepts frame the study: hybrid multilateralism and multi-level governance. Together, they offer insight into how multilateral institutions like the NDB function within an evolving climate finance architecture that increasingly involves subnational actors, particularly cities.

#### **3.1 Hybrid Multilateralism**

Hybrid multilateralism represents a fundamental reconfiguration of global climate governance emerging from the 2015 Paris Agreement. Moving decisively beyond traditional state-centric models, this concept captures the dynamic interplay between formal international institutions and a diverse array of non-state and subnational actors. Bäckstrand et al. (2017) provide the seminal definition, characterizing hybrid multilateralism as an architecture that intentionally blends established state-led multilateral processes with the growing agency and participation of cities, regions, businesses, civil society organizations, and financial institutions. This integration creates a more flexible, distributed network where diverse actors actively co-constitute governance, moving far beyond mere consultation to roles in implementation, monitoring, and setting voluntary commitments, all formally acknowledged within frameworks like the Paris Agreement.

The operational structure of hybrid multilateralism manifests through distinct mechanisms. Bäckstrand et al. (2017) identify two core, interconnected dimensions. Firstly, it involves the strategic fusion of voluntary state pledges, as the NDCs, with a robust global transparency framework. This combination facilitates periodic review cycles and generates collective pressure for escalating climate ambition. Crucially, within this structure, non-state actors, including MDBs and cities, function as essential accountability agents, tracking government compliance and verifying progress, often through parallel mechanisms operating alongside formal UN channels.

Secondly, hybrid multilateralism fosters a deliberate synergy between multilateral treaty processes and burgeoning transnational initiatives. Here, international bodies, particularly the UNFCCC Secretariat, adopt an active role as orchestrators. They facilitate, legitimize, and showcase non-state actions, exemplified by platforms like the Global Climate Action Portal, an UNFCCC platform bringing together the commitments and actions of non-state actors (UNFCCC, 2024b).

Kuyper, Linnér, and Schroeder (2018) strongly reinforce this structural analysis, arguing that the Paris Agreement explicitly "cements an architecture of hybrid multilateralism." They emphasize how the Agreement integrates binding state NDCs with UN-led orchestration of non-state efforts, systematically weaving diverse actors into governance processes, such as monitoring state commitments and registering climate actions, that collectively pressure sovereign states to enhance their ambition.

This governance shift inherently elevates the role of cities, directly relevant to analysing the NDB's urban climate finance focus. Strachová (2021) positions urban actors as pivotal catalysts within hybrid multilateralism. Her analysis demonstrates that cities' accelerated engagement in transnational climate initiatives frequently emerges as a direct response to perceived or actual failures by central governments to meet international climate commitments. This dynamic empowers cities to leverage informal channels, including global city networks, direct knowledge exchange, and unilateral climate action commitments, to exert influence and implement solutions.

However, Strachová (2021) identifies a critical, unresolved tension: the potential misalignment between decentralized city-led action and national policy coherence. This active urban agency fundamentally reconfigures traditional international hierarchies, positioning cities not merely as passive implementers of national directives but as autonomous diplomatic actors. MDBs like the NDB, operating within this hybrid space, must navigate this complex landscape when financing urban climate infrastructure, often engaging directly with subnational entities whose priorities and capacities may diverge from those of their national governments.

Despite its transformative potential, hybrid multilateralism presents significant operational complexities and unresolved challenges. Dryzek (2017) examines into these complexities, identifying orchestration as a predominant mechanism within the hybrid model but exposing a core theoretical tension. While hybridity conceptually describes the convergence of top-down and bottom-up governance, a narrow focus on orchestration risks obscuring the full spectrum of non-state roles.

This framework demonstrates that actors like the MDBs and cities exercise multifaceted agency within hybrid multilateral governance. Beyond serving as intermediaries for international bodies, they operate as independent advocates shaping climate agendas, financiers structuring capital flows, knowledge producers generating technical standards and best practices, and direct implementers delivering infrastructure projects.

However, Dryzek (2017) highlights critical unresolved debates about hybrid multilateralism's real-world effectiveness and democratic legitimacy. While the model creates space for diverse actors to participate, questions remain about whether it drives meaningful climate action or simply adds complexity without improving outcomes. Additionally, as non-state actors gain influence, concerns arise about accountability, since many are not democratically elected. According to Dryzek (2017), hybrid governance does not replace traditional systems but instead overlaps with them, creating both opportunities and tensions.

Adding a critical legal perspective, Owino (2023) defines hybrid multilateralism by the complementary actions of non-state actors but cautions that its potential to drive emissions reductions and mobilize finance is counterbalanced by systemic implementation challenges. These include the often-fragmented proliferation of initiatives, persistent participation biases favouring developed economies, methodological hurdles in robustly tracking impacts and attributing outcomes, and inherent governance fragility in the face of disruptions. These critiques highlight the complex operational environment within which the NDB must function and the potential hurdles its urban climate finance portfolio might encounter.

Hybrid multilateralism is not limited to the context of UNFCCC negotiations or formal climate diplomacy. It also encompasses the active participation, influence, and co-governance roles of a wide range of actors across various arenas of international cooperation, including development banks and international financial institutions. Understanding hybrid multilateralism in this broader sense, as a governance architecture that facilitates and structures the engagement of both state and non-state actors through formal and informal mechanisms, is essential for analysing how climate action is financed and implemented.

### **3.2 Multi-level Governance**

Multi-level governance (MLG) offers a critical theoretical lens for analysing the spatial and institutional distribution of authority in climate policy. The concept emerged in the early 1990s in response to changes in European Union (EU) policy-making that challenged traditional state-centric models of authority. Initially observed in the context of EU structural policy, the term was coined and popularized by Gary Marks (1993) and later developed in collaboration with Liesbet Hooghe (Marks et al., 1996).

Hooghe and Marks (1996) argued that a new conceptual framework was needed to understand the evolving complexity of governance within the EU. This led to their influential 2001 book *Multi-Level Governance and European Integration* (Hooghe & Marks, 2001), which formally introduced MLG as a way to conceptualize the dispersion of authority across multiple levels of government, including supranational, national, and subnational institutions.

In its foundational articulation, MLG described a system where decision-making is shared among various overlapping jurisdictions, with authority no longer residing solely in the hands of nation-states. The approach challenged traditional hierarchical models by emphasizing how governance now occurred both vertically, across levels of government, and horizontally, among a range of actors including non-state stakeholders (Marks, 1993).

Over time, MLG evolved from a primarily European framework to a broader analytical tool used to understand governance in complex political systems worldwide. Hooghe and Marks (2003) refined MLG by distinguishing two coexisting types. Type I MLG comprises general-purpose jurisdictions, such as cities or states, characterized by non-intersecting memberships and durable, community based. Type II MLG encompasses task-specific entities, like climate agencies, featuring intersecting memberships and flexible, functional boundaries (Liesbet & Marks, 2003). These types operate complementarily, with Type II structures often emerging within Type I systems to address transnational challenges.

As the theoretical framework matured, its analytical application expanded significantly beyond European integration studies to address complex transnational policy challenges. Climate change emerged as a quintessential domain for MLG analysis due to its inherently cross-scalar nature, demanding coordination across geographical and institutional boundaries. Betsill and Bulkeley (2006) demonstrated compellingly that effective climate governance necessitates polycentric interactions spanning global regimes such as the UNFCCC, national policy frameworks, and subnational initiatives. Their empirical research underscored that cities and regional governments function not merely as passive implementers of higher-level directives but as active co-constructors of climate agendas, operating in dynamic concert with actors situated both above and across governance levels. Piattoni (2009) further expanded the theoretical foundations, characterising MLG as a dynamic system that systematically disrupts conventional boundaries separating public and private spheres, domestic and international domains, and central versus peripheral loci of influence.

MLG involves various actors with different authorities and skills. In climate adaptation and mitigation, decision-making is spread upward to international bodies, downward to local governments, and outward to non-state actors (UN-Habitat, 2024). The vertical aspect highlights that national governments need to collaborate closely with regional and local authorities, who play a crucial role in implementing climate policies (UN-Habitat, 2024). Cities are embedded within national political systems, which influence their capacity to respond to climate change (UN-Habitat, 2024). As Reckien et al. (2018) note, cities act as a interface between local actions and broader climate commitments at national and international levels.

In the context of urban climate governance, MLG has become particularly salient. As cities around the world take on increasingly ambitious climate action plans, their efforts must often be coordinated with national governments, international donors, and transnational city networks like C40 and ICLEI. These initiatives highlight the vertical dimension of MLG, where policy coherence and resource allocation require alignment across different levels of government (UN-Habitat, 2024). At the same time, cities frequently engage in horizontal learning and cooperation, sharing best practices and forming alliances that bypass or complement national-level coordination. Scholars argue that this dual engagement demonstrates the practical relevance of MLG in understanding how urban climate action is embedded in, and shaped by, multiscale governance structures.

Urban climate finance governance fundamentally requires the integrative analytical lens provided by MLG theory. This framework reveals how interdependent actors operating across distinct jurisdictional levels collectively shape financing outcomes. These actors span local, national, and transnational scales. Their interdependence becomes particularly evident when cities must access capital through both domestic fiscal channels and international financial institutions. Effectively governing climate finance necessitates continuous negotiation among three critical tiers. Sovereign states establish policy priorities and regulatory frameworks. Local authorities implement context specific projects on the ground. Global financiers allocate capital and technical resources to enable these initiatives.

Moreover, MLG provides essential clarity for understanding the vertical coordination indispensable to urban climate action. Cities pursuing climate initiatives must systematically align municipal plans with multiple overlapping dimensions. These include national development policies and international funding mechanisms. Concurrently, horizontal collaboration across diverse stakeholders directly influences project outcomes. This collaboration spans public institutions, private entities, and civil society groups. It shapes the design, execution, and monitoring of financed projects. This dynamic interplay between vertical alignment and horizontal cooperation creates a multi-scalar governance architecture.

## 4 METHODOLOGY

This chapter examines the methodological framework used to analyse the NDB urban climate finance portfolio from 2016 to 2024. It outlines a quantitative descriptive research design, structured around three integrated analytical components: descriptive, comparative, and trend analyses. The discussion details a rigorous data collection process, including project sampling, currency harmonization, and the manual coding of key variables based on transparent operational definitions. Within this framework, the chapter concludes by explaining the data analysis strategy.

### 4.1 Research Design and Approach

This study employs a quantitative descriptive design to systematically analyse the NDB project portfolio from 2016 to 2024. The approach is structured around three integrated analytical pillars. First, the descriptive analysis characterizes the distribution of projects across borrower and entity types, climate focus, sectors, and environmental safeguard categories. This pillar aligns with Neuman's (2011) framework for descriptive research, which emphasizes creating a detailed, accurate picture of phenomena, classifying types through categorical systems, and reporting on the background or context of institutional operations. Second, the comparative analysis examines variations between urban climate projects and non-climate projects, specifically contrasting financing amounts, geographic allocation, and sovereign versus non-sovereign loan structures. Third, the trend analysis tracks thematic shifts in urban climate financing priorities over the eight-year period, including changes in sectoral focus, borrower and entity engagement, and safeguard application.

The research design leverages structured numerical data to identify strategic patterns in the NDB's operational approach toward urban climate finance. This methodology directly serves the study's overarching goal of evaluating the bank's adherence to sustainable development mandates, particularly its commitment to scaling urban climate investment in emerging economies. The three analytical pillars correspond directly to the research questions: descriptive analysis addresses Research Question 1 regarding portfolio composition; comparative analysis examines Research Question 2 concerning financing and structural differences; and trend analysis responds to Research Question 3 on temporal evolution. Methodologically, this approach draws on established frameworks for Urban Climate Finance Landscape assessments, such as those by the Cities Climate Finance Leadership Alliance (CCFLA, 2024), including the adoption of analogous project classification categories and analytical lenses to ensure comparability.

## 4.2 Data Collection Methods

The dataset for this study comes solely from the NDB's publicly available project documents. To address the varying formats and levels of detail, a structured, multi-stage cleaning and refinement process was applied, as shown in Table 8.

**Table 8: Phases of data collection and processing**

Phase	Procedure	Output
Initial Retrieval	Downloaded 139 project PDFs from NDB's Projects Page.	Raw project database (139 entries)
Exclusion Criteria	Removed 22 projects: 2 outside 2016–2024 date range and 17 with incomplete/missing data.	Final sample (115 projects)
Data Structuring	Extracted data into columns: Project Name, Country, Type, Area of Operation, Financing Approval Date, Total Project Cost, Currency, Value in millions, Recipient, Fund Manager, Borrower, Project Entities, Project Context, Project Description, Project Objective, Implementation Arrangements, Environmental and Social Information.	Structured spreadsheet
Currency Harmonization	Converted non-USD costs (CNY, EUR, RMB) to USD using daily exchange rates. Adjusted all values to December 2024 USD using the US Consumer Price Index.	Standardized financial metrics
Classification	Applied manual coding rules using project documentation.	Categorical variables for analysis

*Note.* This table was produced by the author.

The currency harmonization followed a dual-step normalization process to ensure comparability. First, non-USD project costs were converted to USD using daily exchange rates (Exchange-Rates.org, 2025). Second, all nominal amounts were adjusted to real December 2024 USD values using the U.S. Consumer Price Index (BLS, 2025). This mirrors Steffen & Schmidt's (2018) methodology, which similarly converted local currencies to USD and deflated nominal amounts to real USD values using the United States Consumer Price Index. Using December 2024 as the constant-price baseline aligns with their practice of selecting the end of the analysis period to standardize purchasing power. This deflation process is critical for ensuring valid cross-temporal portfolio comparisons.

Table 9 presents the operational definitions and coding criteria used to classify key variables in the dataset. Each variable was coded based on explicit information found in project documentation, using consistent rules to ensure transparency and replicability.

**Table 9: Operational definitions for classification**

<b>Variable</b>	<b>Categories</b>	<b>Operational Definition &amp; Coding Basis</b>
<b>Borrower Type</b>	National Government, Private Sector, State-Owned Enterprise, Subnational Government	Based on the legal identity of the borrower.
<b>Project Entities</b>	National Government, Private Sector, State-Owned Enterprise, Subnational Government (multiple entities allowed per project)	Based on the legal identity of the project entities involved.
<b>Climate Focus</b>	Mitigation	Project qualifies if the description and/or objectives cite activities that reduce GHG emissions or enhance carbon sinks.
	Adaptation	Project qualifies if the description and/or objectives cite actions that reduce vulnerability to current or expected climate change impacts.
	Multiple Objectives	Project meets both Mitigation and Adaptation criteria for distinct components.
	Not Climate-Focused	Project does not meet the criteria for Mitigation, Adaptation, or Multiple Objectives.
<b>Urban Classification</b>	Urban	Project qualifies if the description and objectives indicate it serves areas within city boundaries or exclusively urban populations.
	Non-Urban	Project does not meet the Urban criteria.
<b>Environmental and Social Information</b>	Category A	Explicitly labelled as Category A: Projects with significant, irreversible, diverse, or unprecedented adverse environmental and social impacts.
	Category B	Explicitly labelled as Category B: Projects with less severe, site-specific, and typically reversible impacts.
	Category C	Explicitly labelled as Category C: Projects likely to have minimal or no adverse environmental impacts.
	Category FI	Explicitly labelled as Category FI: Projects involving financial intermediaries.

*Note.* This table was produced by the author. The operational definitions and coding criteria are based on the author's analysis of publicly available project information.

According to the *New Development Bank Environment and Social Framework* (NDB, 2016), projects are classified into four categories: A, B, C, and FI, based on an initial screening of potential environmental and social impacts. Category A includes projects that may cause severe, irreversible, or widespread adverse impacts. Category B covers projects with moderate impacts that are generally site-specific, reversible, and easier to mitigate. Category C applies to projects expected to have minimal or no adverse impacts. Category FI refers to projects involving financial intermediaries. For Category A and B projects, the bank requires environmental and social impact assessments tailored to the project's level of risk. Category A assessments are comprehensive and include environmental impact assessments, environmental management plans, resettlement plans, and indigenous peoples plans. For Category B, documentation is determined case by case. Category C projects require only a basic review of environmental and social considerations. In FI projects, financial intermediaries must establish environmental and social management systems, and any sub-projects with significant impacts must undergo full assessments. The bank may revise project categories during processing, considers member-country standards, and requires all mitigation plans to align with its Environmental and Social Framework. It also conducts due diligence to assess an intermediary's capacity to manage environmental and social risks.

### **4.3 Data Analysis Strategy**

Following the structured coding process guided by the established operational definitions, the data were systematically organized in a spreadsheet for subsequent quantitative analysis. The primary analytical techniques employed were descriptive statistics. Frequencies and proportions were calculated for the key categorical variables. Cross tabulations were performed to examine potential associations between project characteristics.

To track changes over the period from 2016 to 2024, shifts in key dimensions such as sectoral focus, borrower and entity type engagement, and safeguard application were quantified and assessed. Sankey diagrams were generated to visually represent the flow and allocation of financing across interconnected categories, considering project country by urban classification, and the involvement of subnational government entities of urban projects. This visualization complemented the numerical assessment of temporal patterns.

For relevant variables a suite of descriptive statistics was calculated. These included the total value, the average, the median, the minimum value, the maximum value, and the number of projects. This combination of frequency distributions, cross tabulations, temporal assessments, visualizations, and descriptive statistics enabled the systematic identification of patterns and variations within the dataset.

## 5 RESULTS

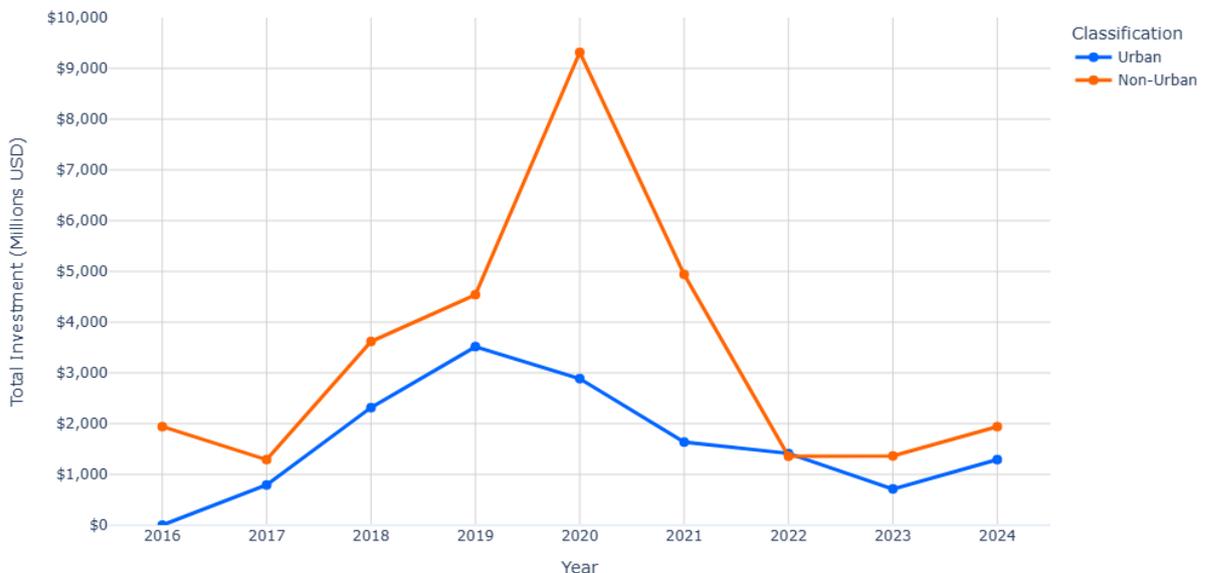
This chapter presents the analysis of the NDB's urban climate finance from 2016 to 2024. It covers a descriptive overview of project classifications and financing trends, compares urban and non-urban project patterns, and examines subnational government involvement in urban projects. These insights reveal the NDB's evolving role in supporting urban climate action.

### 5.1 Descriptive Overview of the NDB Projects

The NDB's project portfolio from 2016 to 2024 amounts to approximately USD 45 billion, expressed in constant prices as of December 2024. Of this total, 32.5 percent, or USD 14.5 billion, is allocated to urban projects, while the remaining 67.5 percent, equivalent to USD 30.3 billion, corresponds to non-urban projects.

As shown in Figure 5, the investment trajectories for urban and non-urban projects follow a broadly similar trend. In 2024, for example, urban projects account for 40 percent of total investments for the year, while non-urban projects account for 60 percent. This general pattern is consistent across most years, except for 2020 and 2021, during which the NDB prioritized Covid-19-related projects. Additionally, no urban-related projects were recorded in 2016.

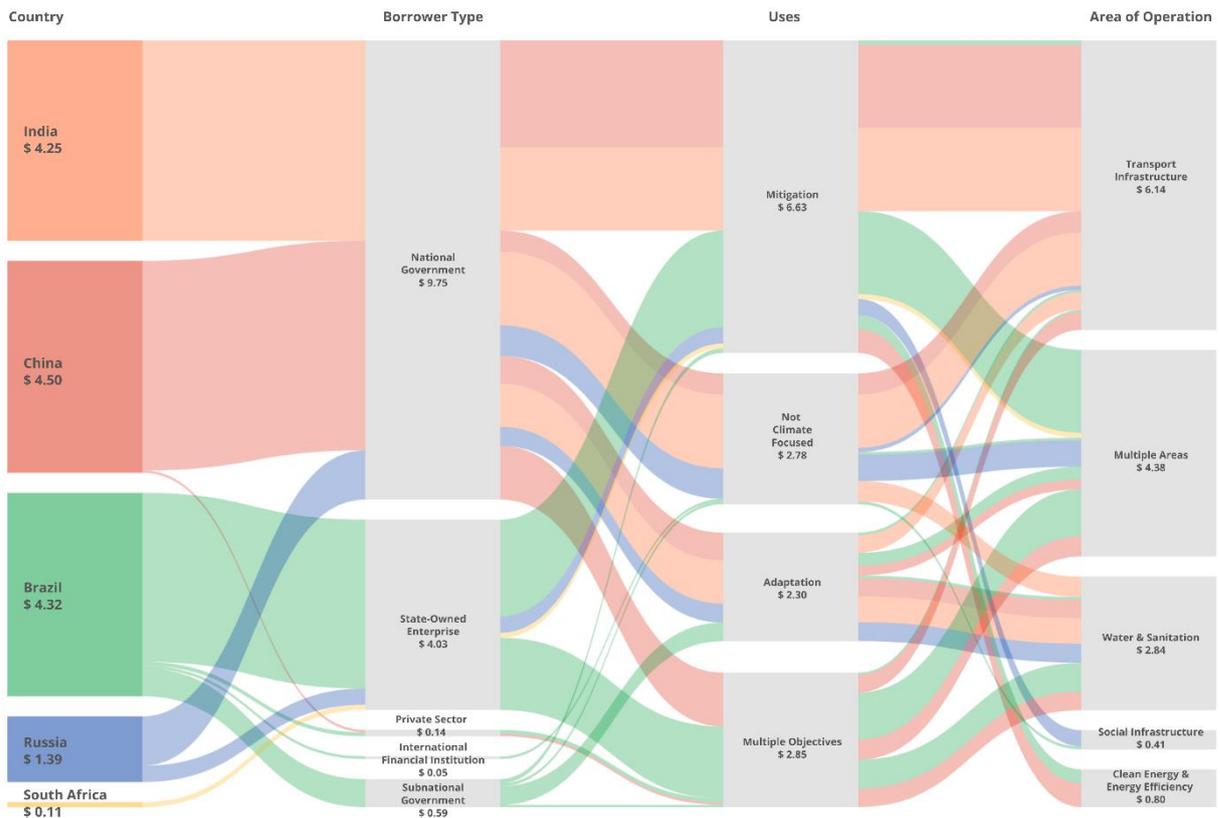
**Figure 5: Urban classification of NDB projects aggregated by year (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

As shown in Figure 6, urban projects financed by the NDB during the analysed period were predominantly concentrated in China, Brazil, and India, each accounting for approximately 30 percent of the total volume. In constant prices, China received around USD 4.5 billion, Brazil USD 4.3 billion, and India USD 4.2 billion. Russia represented 9.6 percent of the total volume, while South Africa accounted for only 0.7 percent.

**Figure 6: Urban NDB finance flows (2016–2024)**



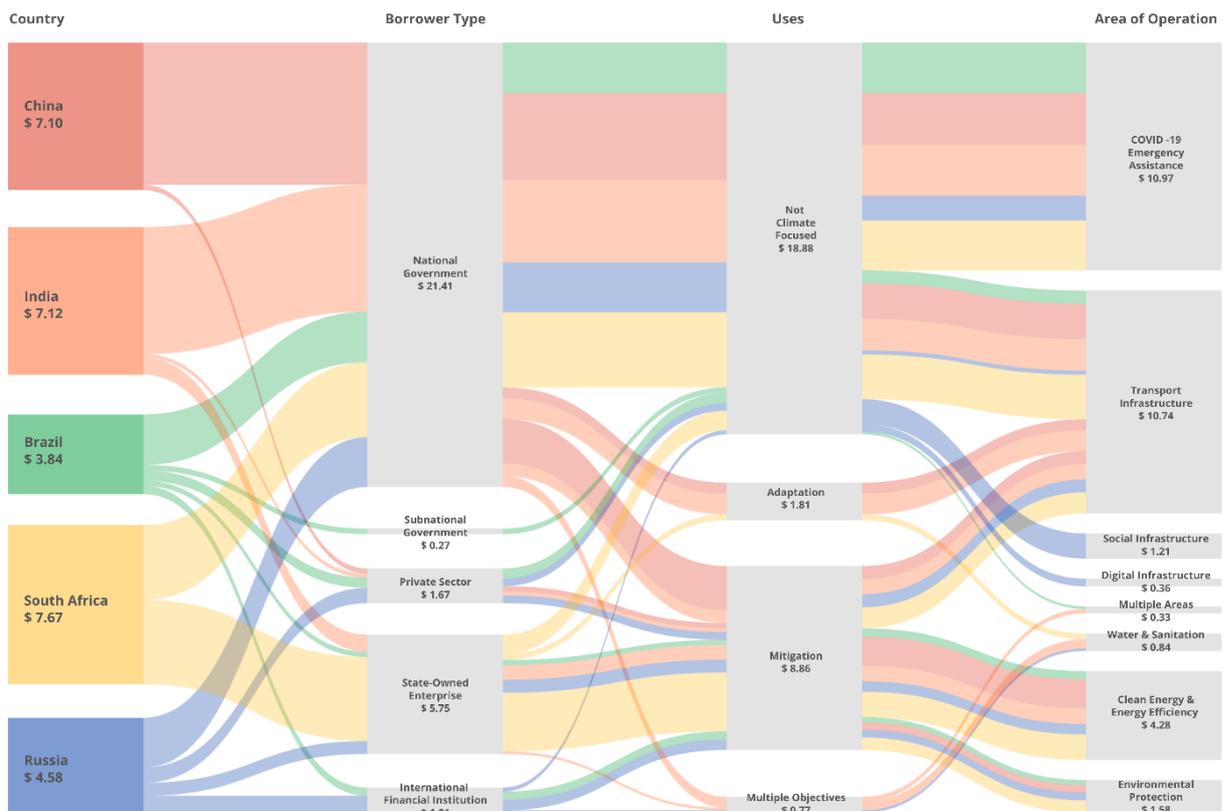
*Note.* Values in constant December 2024 USD (billions). Source: Author’s calculations using data from the New Development Bank (2025).

An analysis of borrower types reveals that national governments were responsible for 66.9 percent of borrowing, primarily for projects in India, China, and Russia. State-owned enterprises accounted for 27.7 percent, largely in Brazil, Russia, and South Africa. Brazil was the only country with urban projects financed through subnational governments, which constituted 4.1 percent of the total urban project finance flow. Borrowing by the private sector and international financial institutions was limited, comprising just 0.9 percent and 0.4 percent of the total, respectively.

In terms of project uses and areas of operation, mitigation projects accounted for 45.5 percent of the total, totalling approximately USD 6.63 billion in constant prices. These funds were directed primarily toward transport infrastructure, multiple sectors, climate energy and energy efficiency, and social infrastructure. Adaptation projects represented 15.8 percent of the total, amounting to roughly USD 2.3 billion, with most resources focused on water and sanitation initiatives. The areas of operation with the highest financial volumes were transport infrastructure at USD 6.14 billion, followed by multiple sectors at USD 4.38 billion, and water and sanitation at USD 2.84 billion, all in constant prices.

When analysing non-urban projects, Figure 7 shows that South Africa receives the largest share of financing, with around USD 7.67 billion, representing approximately 25 percent of the total. China accounts for 23.4 percent, India for 23.5 percent, and Brazil for 12.7 percent of non-urban NDB project financing. In terms of financing type, most non-urban projects, 92.7 percent, were funded through sovereign loans, while the remaining 7.3 percent used non-sovereign loans.

**Figure 7: Non-urban NDB finance flows (2016–2024)**



*Note.* Values in constant December 2024 USD (billions). Source: Author’s calculations using data from the New Development Bank (2025).

As with urban projects, the main borrower types in non-urban projects are national governments and state-owned enterprises, which account for 70.6 percent and 19.0 percent of the total volume, respectively. However, in the case of non-urban projects, the private sector ranks third with 5.5 percent, followed by international financial institutions with 4.0 percent. Subnational governments, represented solely by Brazil, account for only 0.9 percent of the total non-urban project financing.

In terms of project classification and area of operation, 62.3 percent of the financing, or around USD 18.88 billion, is directed toward projects not explicitly climate focused. Of this amount, around USD 10.97 billion was allocated to COVID-19 emergency assistance. Mitigation projects represent 29.2 percent of the total, corresponding to around USD 8.86 billion. Adaptation accounts for around USD 1.81 billion, or 6.0 percent, and projects with multiple climate-related objectives total around USD 770 million, or 2.5 percent.

Beyond COVID-19 emergency assistance, the main areas of operation in non-urban projects include transport infrastructure with USD 10.74 billion and clean energy and energy efficiency with approximately USD 4.28 billion, all expressed in constant prices.

Regarding the financial instruments used, non-urban projects are predominantly financed through non-sovereign loans, which account for 84.5 percent of the total, in contrast to 15.5 percent from sovereign loans.

## 5.2 Comparative Patterns in the NDB Projects

When examining the distribution of projects over time, analysing them from various perspectives such as country of implementation, borrower type, project use, and area of operation helps to better understand the NDB's financial flows. In this context, Table 10 shows that the 63 non-urban projects received significantly higher total and average funding than the 52 urban projects, despite both having a similar range of minimum and maximum project sizes.

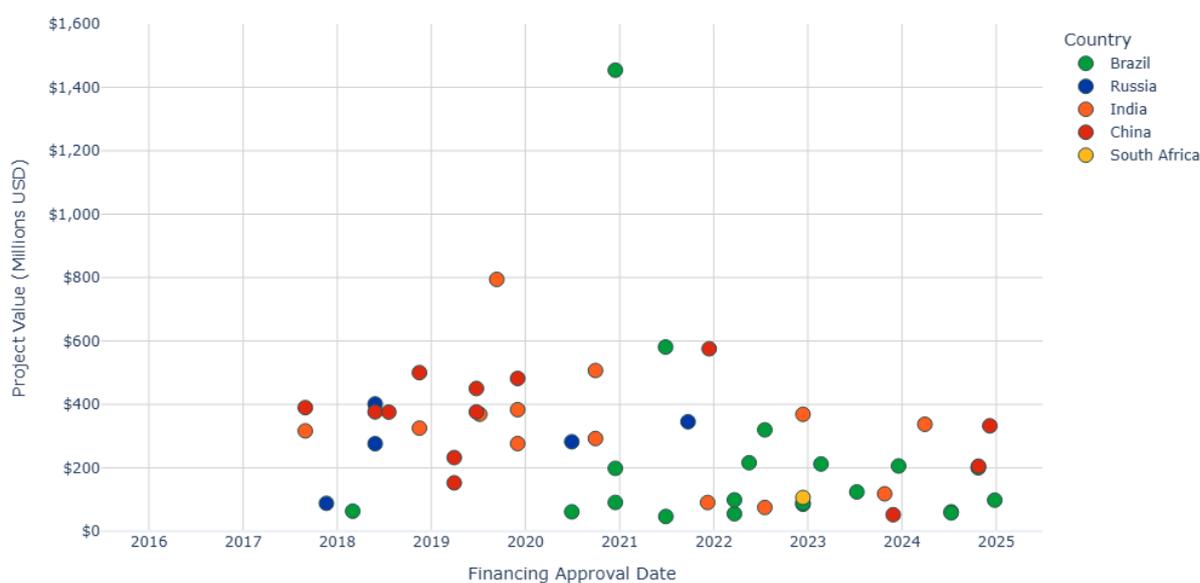
**Table 10: NDB projects statistics by urban classification (2016–2024)**

Classification	Total	Share (%)	Average	Median	Min	Max	Projects
Urban	14,567.90	32.46%	280.15	254.07	46.46	1,453.99	52
Non-Urban	30,311.17	67.54%	481.13	374.05	45.34	1,296.07	63
Total	44,879.07	100.00%	390.25	332.3	45.34	1,453.99	115

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

As shown in Figure 8 and Table 11, with values in constant prices, Brazil has the highest number of urban projects between 2020 and the end of the analysis period in 2024, with one big project of USD 1.4 billion in 2018. India and China each have 13 projects between mid-2017 and 2024, averaging USD 346 million and USD 327 million respectively. Russia recorded five projects between 2017 and 2022, while South Africa has one small project of USD 106 million approved in late 2022.

**Figure 8: Recipient countries in urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

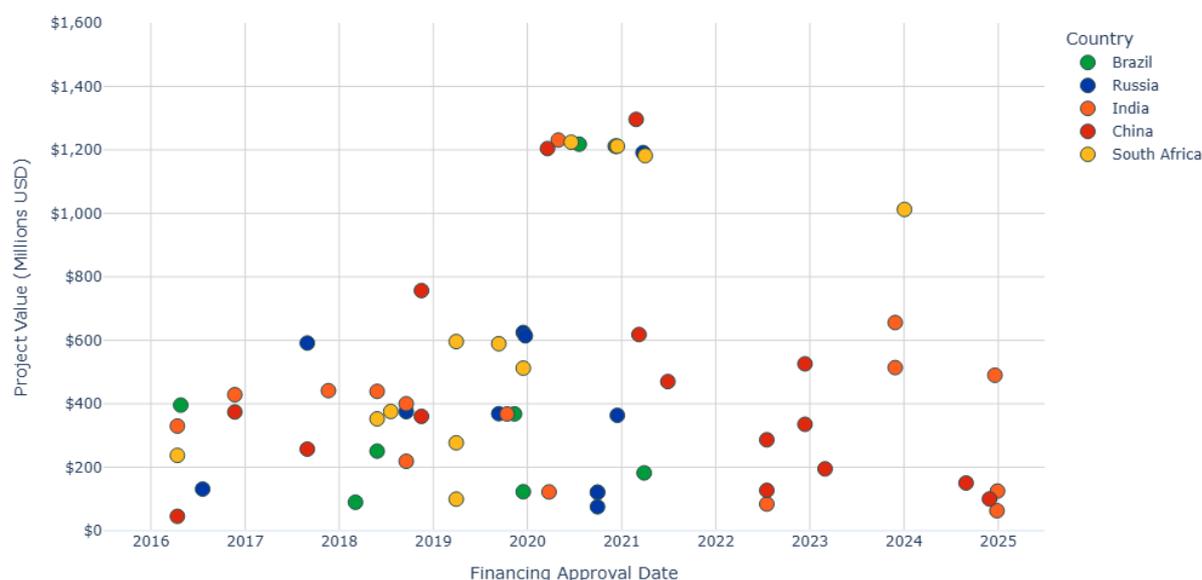
**Table 11: Recipient countries statistics in urban NDB projects (2016–2024)**

Country	Total	Share (%)	Average	Median	Min	Max	Projects
China	4,499.21	30.89%	346.09	376.22	51.93	575.29	13
Brazil	4,316.88	29.63%	215.84	98.39	46.46	1,453.99	20
India	4,252.61	29.19%	327.12	325.06	74.85	794.06	13
South Africa	106.34	0.73%	106.34	106.34	106.34	106.34	1
Russia	1,392.86	9.56 %	278.57	282.26	88.03	401.42	5

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

In contrast, non-urban projects tend to be larger on average, with values in constant prices. South Africa had the highest total, with USD 7,670 million across 12 projects and the largest average size at USD 639 million. India and China followed with around USD 7,100 million each over 16 projects throughout the period. Brazil's projects were concentrated between 2016 and mid-2021, while Russia's ended in 2022. Both had fewer projects and lower total financing.

**Figure 9: Recipient country for non-urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

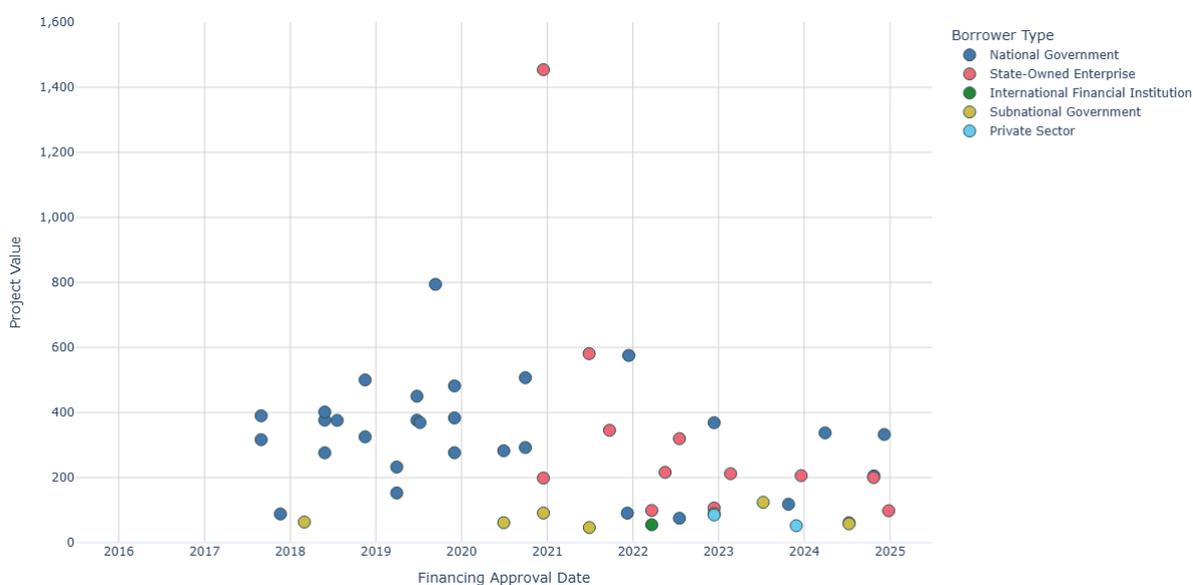
**Table 12: Recipient countries statistics in non-urban NDB projects (2016–2024)**

Country	Total	Share (%)	Average	Median	Min	Max	Projects
South Africa	7,669.52	25.30%	639.13	550.76	99.55	1,224.24	12
India	7,122.50	23.50%	445.16	414.31	63.00	1,230.96	16
China	7,101.88	23.43%	443.87	347.83	45.34	1,296.07	16
Russia	4,577.89	15.10%	416.17	368.76	75.47	1,191.52	11
Brazil	3,839.37	12.67%	479.92	309.50	89.79	1,218.08	8

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

Looking at the urban projects data by borrower type, as shown in Figure 10 and Table 13, expressed in constant prices, national governments were the largest borrowers, receiving around USD 9.7 billion across 29 projects with an average size of USD 336 million. State-owned enterprises followed with around USD 4 billion over 12 projects; however, their financing approvals only began in late 2021. Subnational governments, the private sector, and international financial institutions accounted for smaller totals and fewer projects.

**Figure 10: Borrower type in urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

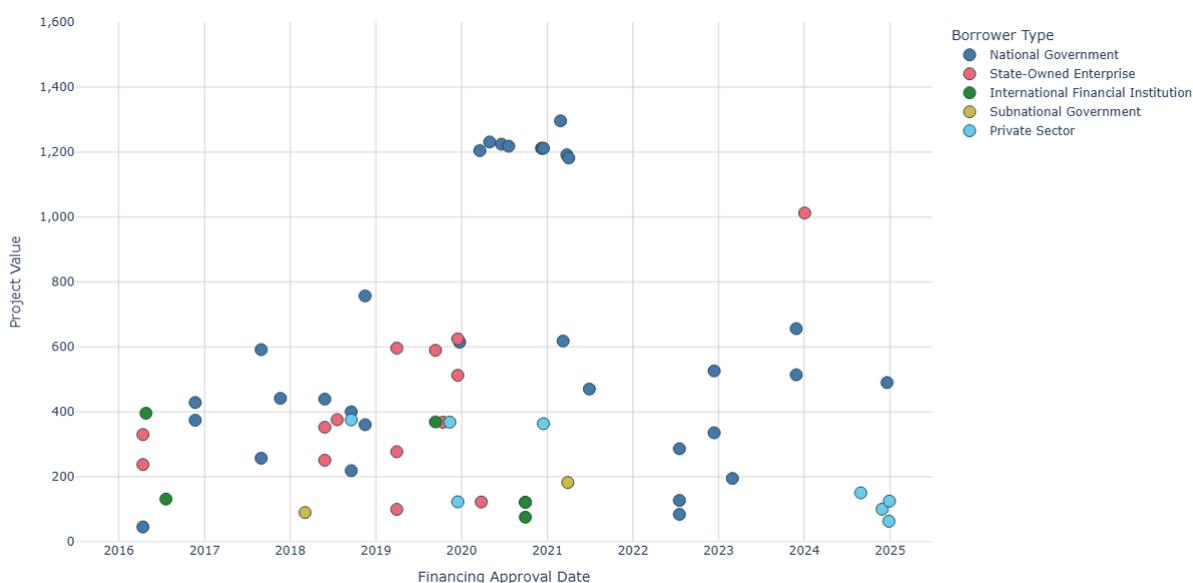
**Table 13: Borrower type statistics in urban NDB projects (2016–2024)**

Borrower Type	Total	Share (%)	Average	Median	Min	Max	Projects
National Government	9,747.59	66.91%	336.12	337.3	74.85	794.06	29
State-Owned Enterprise	4,034.47	27.70%	336.21	208.85	97.99	1,453.99	12
Subnational Government	593.95	4.08%	74.24	62.22	46.46	123.89	8
Private Sector	137.00	0.94%	68.50	68.5	51.93	85.07	2
International Financial Institution	54.89	0.37%	54.89	54.89	54.89	54.89	1

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

For non-urban projects by borrower type, as shown in Figure 11 and Table 14, and expressed in constant prices, national governments led with around USD 21.4 billion across 33 projects. State-owned enterprises followed with USD 5.7 billion over 14 projects, most approved before 2021. The private sector funded 8 projects totalling USD 1.7 billion, international financial institutions financed 6 with USD 1.2 billion, and subnational governments had the smallest total, at USD 272 million across 2 projects.

**Figure 11: Borrower type in non-urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

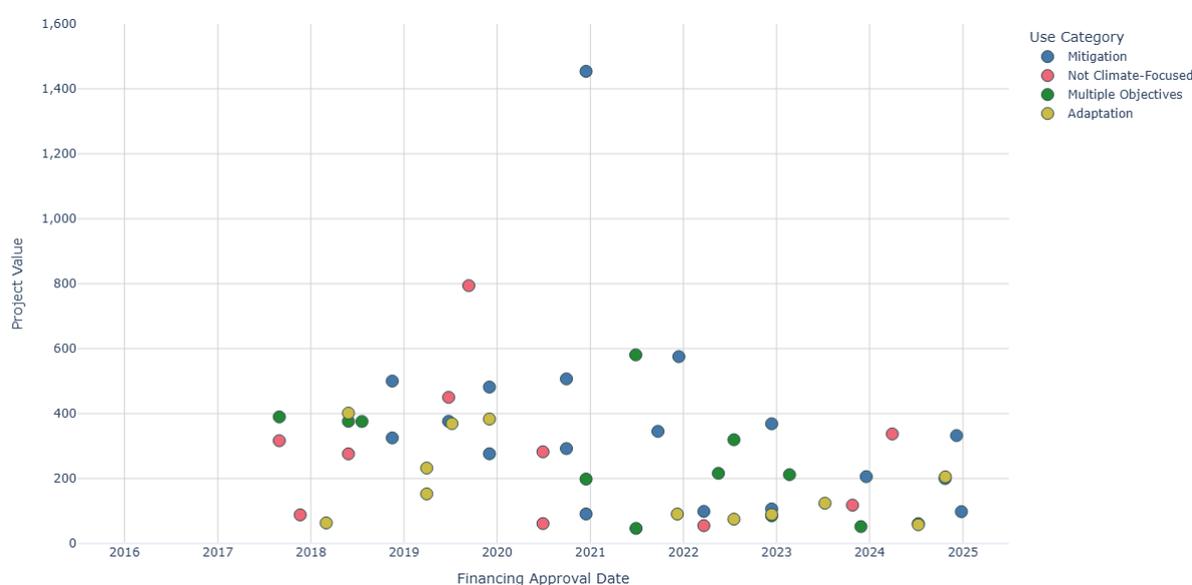
**Table 14: Borrower type statistics in non-urban NDB projects (2016–2024)**

Borrower Type	Total	Share (%)	Average	Median	Min	Max	Projects
National Government	21,410.34	68.18%	648.80	513.93	45.34	1,296.07	33
State-Owned Enterprise	5,747.19	18.30%	410.51	360.17	99.55	1,012.25	14
Private Sector	1,667.91	5.31%	208.49	137.69	63.00	375.07	8
International Financial Institution	1,213.63	3.86%	202.27	126.21	75.47	395.72	6
Subnational Government	272.09	0.87%	136.05	136.05	89.79	182.30	2

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

The uses category for urban projects, represented in Figure 12 and Table 15, with values expressed in constant prices, shows that mitigation projects accounted for the largest total financing, with approximately USD 6.63 billion across 18 projects, averaging around USD 369 million each. This includes one large project of USD 1,454 million at the end of 2020, which is significantly higher than the average. Projects with multiple objectives followed, totalling about USD 2.85 billion over 11 projects. Non-climate-focused projects amounted to roughly USD 2.78 billion across 10 projects, while adaptation projects totalled approximately USD 2.3 billion over 13 projects. All uses include projects from 2017 to 2024.

**Figure 12: Uses in urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

**Table 15: Uses statistics in urban NDB projects (2016–2024)**

Uses	Total	Share (%)	Average	Median	Min	Max	Projects
Mitigation	6,633.56	45.53%	368.53	328.68	90.87	1,453.99	18
Multiple Objectives	2,851.80	19.58%	259.25	215.95	46.46	580.81	11
Not Climate-Focused	2,778.21	19.07%	277.82	279.12	54.89	794.06	10
Adaptation	2,304.33	15.82%	177.26	123.89	57.80	401.42	13

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

For non-urban projects by use, as shown in Figure 13 and Table 16, with values expressed in constant prices, non-climate-focused projects accounted for the largest share of total financing, with approximately USD 18.88 billion across 29 projects and an average of around USD 651 million each. Mitigation projects followed, with about USD 8.86 billion over 26 projects, averaging USD 341 million. Adaptation projects totalled approximately USD 1.81 billion across 4 projects implemented in 2019, 2022, 2023, and 2024, with a higher average of USD 452 million. Projects with multiple objectives represented roughly USD 769 million across 4 projects in 2017, 2020, and 2022.

**Figure 13: Uses in non-urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

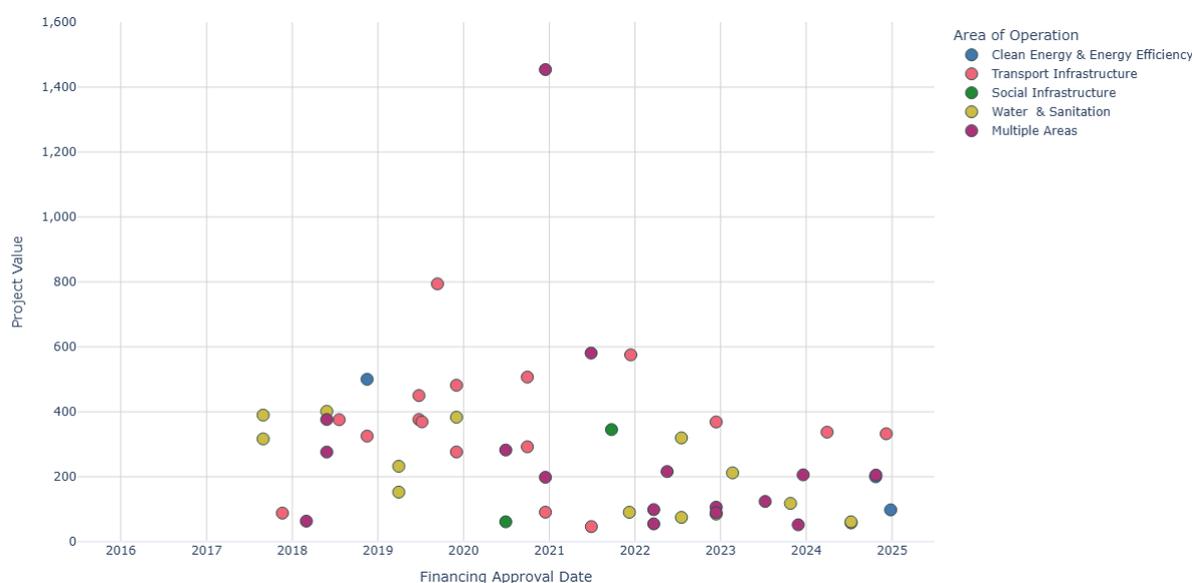
**Table 16: Uses statistics in non-urban NDB projects (2016–2024)**

Uses	Total	Share (%)	Average	Median	Min	Max	Projects
Not Climate-Focused	18,876.19	62.28%	650.90	589.22	75.47	1,296.07	29
Mitigation	8,859.08	29.22%	340.73	364.11	45.34	1,012.25	26
Adaptation	1806.74	5.96%	451.69	501.96	277.00	525.82	4
Multiple Objectives	769.15	2.54%	192.29	121.76	84.21	441.42	4

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

In urban NDB projects, with values expressed in constant prices, transport infrastructure had the largest total financing, about USD 6.14 billion across 18 projects, averaging USD 341 million each. Projects covering multiple areas followed, totalling around USD 4.38 billion over 16 projects. Water and sanitation projects amounted to USD 2.84 billion across 13 projects. Clean energy and energy efficiency accounted for USD 798 million over 3 projects in 2018 and 2024, while social infrastructure received USD 406 million across 2 projects in 2020 and 2021.

**Figure 14: Area of operation statistics in urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

**Table 17: Area of operation statistics in urban NDB projects (2016–2024)**

Area of Operation	Total	Share (%)	Average	Median	Min	Max	Projects
Transport Infrastructure	6,143.93	42.18%	341.33	352.99	46.46	794.06	18
Multiple Areas	4,382.88	30.08%	273.93	201.69	51.93	1,453.99	16
Water & Sanitation	2,836.75	19.47%	218.21	211.91	61.16	401.42	13
Clean Energy & Energy Efficiency	797.96	5.48%	265.99	199.89	97.99	500.09	3
Social Infrastructure	406.37	2.79%	203.19	203.19	61.21	345.16	2

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

In non-urban NDB projects from 2016 to 2024, the range of areas of operation was broader than in urban projects, as shown in Figure 15 and Table 18, with values expressed in constant prices. The largest share of financing went to COVID-19 emergency assistance, with approximately USD 10.97 billion allocated in 2020 and 2021. All nine projects in this category were similar in size, each close to USD 1.2 billion, and notably larger than the average project in other areas. Transport infrastructure followed with around USD 10.74 billion across 26 projects, distributed throughout the entire period. This category includes one project approved at the end of 2023 that exceeds USD 1 billion, significantly above the average of USD 413 million. Clean energy and energy efficiency received approximately USD 4.28 billion across 14 projects, with 13 approved before 2022. Environmental protection totalled about USD 1.58 billion across 5 projects, mostly before 2020. Social infrastructure received USD 1.21 billion through 2 projects in 2017 and 2019. Water and sanitation totalled USD 840 million across 3 projects in 2017, 2019, and 2020. Digital infrastructure had one project of USD 364 million in 2020, while projects covering multiple areas received USD 329 million across 3 projects between 2019 and 2023.

**Figure 15: Area of operation in non-urban NDB projects (2016–2024)**



*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

**Table 18: Area of operation statistics in non-urban NDB projects (2016–2024)**

Area of Operation	Total	Share (%)	Average	Median	Min	Max	Projects
COVID -19 Emergency Assistance	10,970.25	33.32%	1,218.92	1,211.66	1,181.8	1,296.07	9
Transport Infrastructure	10,744.99	32.63%	413.27	384.09	75.47	1,211.66	26
Clean Energy & Energy Efficiency	4,279.05	12.99%	305.65	364.11	45.34	618.05	14
Environmental Protection	1,579.03	4.79%	315.81	257.09	100.04	595.94	5
Social Infrastructure	1,205.39	3.66%	602.7	602.7	591.31	614.08	2
Water & Sanitation	839.67	2.55%	279.89	277	121.26	441.42	3
Digital Infrastructure	363.50	1.10%	363.5	363.5	363.50	363.50	1
Multiple Areas	329.30	1.00%	109.77	122.27	84.21	122.82	3

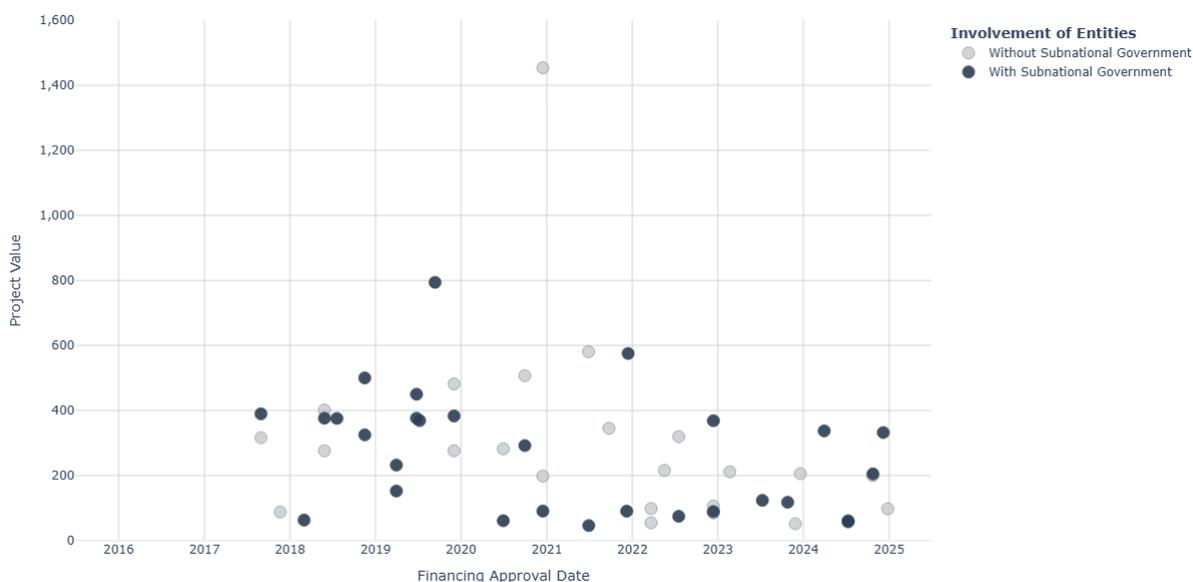
*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

### 5.3 Subnational Government Involvement in Urban NDB Projects

This section examines subnational government involvement in urban NDB projects from 2016 to 2024. The analysis compares projects with and without subnational government participation, noting that each project can involve multiple entities.

Non-urban projects show broad participation from various entities, including national governments, subnational governments, state-owned enterprises, private sector actors, and international financial institutions. In urban projects, involvement typically centers on subnational governments and state-owned enterprises, with a few projects involving both entity types. Some urban projects also include private sector entities and international financial institutions, although these are less common.

As shown in Figure 16 and Table 19, projects involving subnational governments had slightly higher total financing in constant price, approximately USD 7.7 billion across 29 projects, compared to about USD 6.9 billion for 23 projects without such involvement. Average project sizes were generally similar in both groups, with two exceptions. One project without subnational involvement reached USD 1,453 million, while a project with subnational participation totalled USD 794 million.

**Figure 16: Subnational involvement in urban NDB projects (2016–2024)**

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (2025).

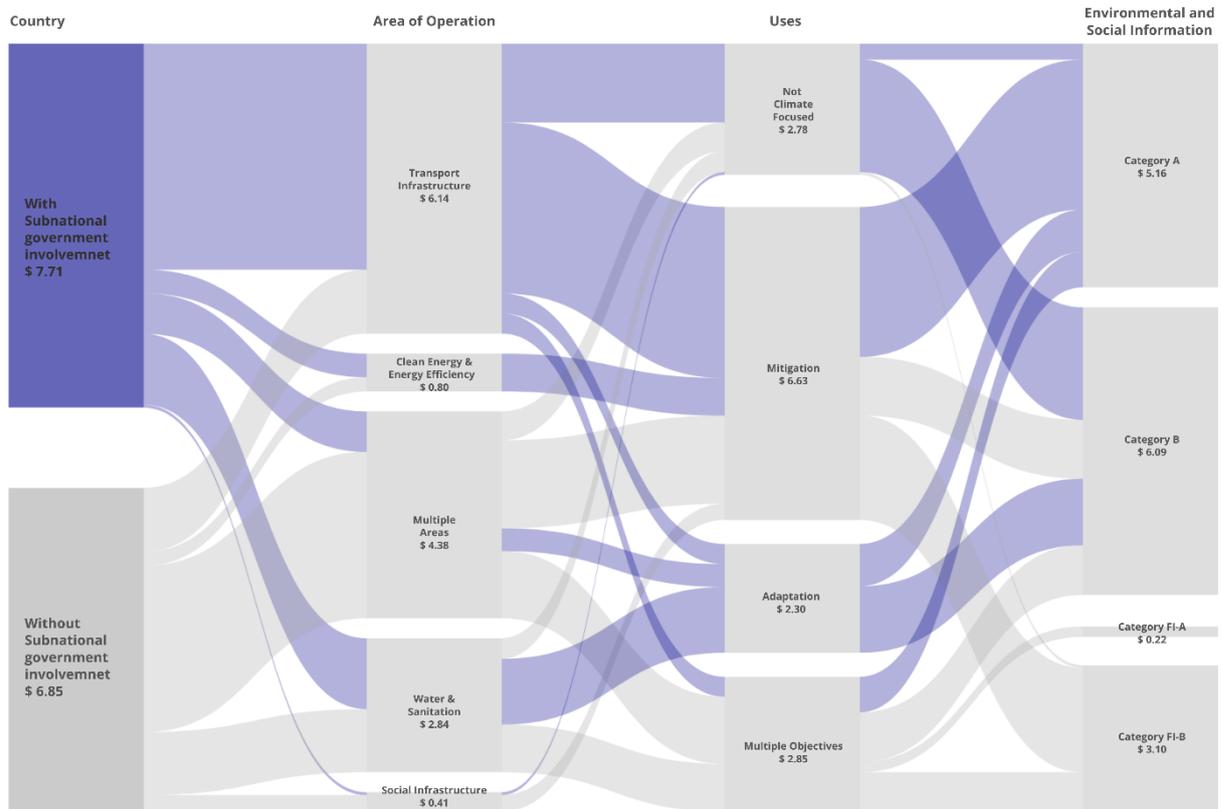
**Table 19: Subnational involvement statistics in urban NDB projects (2016–2024)**

Subnational Involvement	Total	Share (%)	Average	Median	Min	Max	Projects
With Subnational Government	7,712.48	52.94%	265.95	292.23	46.46	794.06	29
Without Subnational Government	6,855.42	47.06%	298.06	215.95	51.93	1,453.99	23

*Note.* Values in constant December 2024 USD (millions). Source: Author's calculations using data from the New Development Bank (NDB, 2025).

Figure 17 presents urban NDB finance flows with subnational government involvement from 2016 to 2024, in constant December 2024 prices. Transport Infrastructure, Clean Energy and Energy Efficiency, and Water and Sanitation projects receive funding from both types: with and without subnational involvement, though mostly from those with involvement. Multiple areas and Social Infrastructure projects also have funding from both, but primarily from projects without subnational participation. For project uses, mitigation and non-climate-focused projects are mainly funded by those involving subnational governments, while multiple objectives projects receive most funding from projects without subnational involvement. Adaptation projects are fully financed by projects that include subnational government participation.

**Figure 17: Urban NDB finance flows: subnational government involvement (2016–2024)**



*Note.* Values in constant December 2024 USD (billions). Source: Author's calculations using data from the New Development Bank (2025).

Regarding Environmental and Social Information, all Category A projects involve subnational government participation, while Category B projects are more balanced but mostly without subnational government involvement. Projects in Categories FI-A and FI-B, which include financial intermediaries, report no direct subnational government participation. However, since the data does not clarify whether these intermediaries collaborate with local governments, it is possible that over 20 percent of the total urban NDB investment volume indirectly involves subnational governments through such partnerships.

## 6 DISCUSSION

Cities are on the front lines of the climate crisis, facing high risks but also offering major opportunities for climate action. However, the structure of the global financial system remains inadequately responsive to the specific needs of urban areas, thereby constraining the capacity of cities to contribute effectively to climate transition efforts. In this context, this study analyses the NDB's portfolio to provide a valuable perspective on how multilateral institutions balance their goals, funding approaches, and the challenges of urban governance.

The distribution of projects from 2016 to 2024 reveals distinct operational patterns and strategic priorities in the NDB's portfolio. With 52 urban and 63 non-urban projects approved, the Bank demonstrates strong commitment to both areas, though non-urban initiatives slightly outnumber urban ones. During this period, the NDB allocated approximately USD 14.6 billion to urban projects, representing 32.5 percent of its total USD 45 billion portfolio. This reflects a clear focus on urban development and surpasses the global average, where municipal governments typically access under 20 percent of climate finance (UN-Habitat, 2024).

However, this investment remains far below the estimated USD 4.5 to 5.4 trillion in annual funding needed for climate-resilient urban infrastructure worldwide (CCFLA, 2015). This financing gap persists despite the NDB serving the BRICS alliance economies, which collectively represent 37.3 percent of global GDP measured by PPP and over half the world's population (IMF, 2025).

Operational timelines further contextualize this allocation. Urban projects were approved just after mid-2017, indicating an initial institutional decision to establish broader operations. Since then, the volume of urban investment has grown, reflecting the increasing strategic importance of cities within the Bank's agenda. Still, non-urban projects continue to dominate, comprising 67.5 percent of the total portfolio. Investment trends for both categories have generally followed similar proportions over time, with urban projects reaching 40 percent of annual investments in 2024. The main exception occurred during the COVID-19 pandemic in 2020 and 2021, when the Bank prioritized large-scale emergency assistance.

Brazil emerges as the most active recipient in urban development, with the highest project count of 20, including a major USD 1.45 billion undertaking in 2018. India and China each secured 13 urban projects at similar average values. This contrasts with Russia's limited urban engagement through five projects and South Africa's minimal presence with a single USD 106 million project. Non-urban projects show different geographical dynamics, with South Africa leading both total financing, at USD 7.7 billion, and average project size, at USD 639 million, despite having fewer projects than India or China, each with 16 projects.

Geographically, the urban portfolio reveals a pronounced concentration: China received USD 4.5 billion, Brazil USD 4.3 billion, and India USD 4.3 billion. These three countries collectively account for nearly 90 percent of total urban financing, while Russia received USD 1.4 billion, and South Africa's allocation represented just 0.7 percent. Brazil stands out as the only country where urban investments exceeded non-urban allocations. New project approvals in Russia ceased after 2022, consistent with the Bank's public statement that it placed new Russian transactions on hold following international sanctions (NDB, 2022).

Comparing urban and non-urban projects reveals distinct patterns in financing structures and borrower engagement. National governments dominated both portfolios, accounting for 66.91 percent of urban NDB financing totalling approximately USD 9.7 billion, and 68.18 percent of non-urban financing totalling USD 21.4 billion. State-owned enterprises represented the second-largest share but diverged significantly: they contributed 27.70 percent in urban projects totalling USD 4.0 billion, compared to 18.30 percent in non-urban projects totalling USD 5.7 billion.

Comparing urban and non-urban projects reveals distinct patterns in financing structures and borrower engagement. National governments dominated both portfolios, accounting for 66.91 percent of urban NDB financing, totalling approximately USD 9.7 billion, and 68.18 percent of non-urban financing, totalling USD 21.4 billion. State-owned enterprises represented the second-largest share but diverged significantly: they contributed 27.70 percent in urban projects, totalling USD 4.0 billion, compared to 18.30 percent in non-urban projects, totalling USD 5.7 billion.

Subnational governments played only a marginal role, participating in just 4 percent of urban projects and not at all in non-urban ones. This occurred exclusively in Brazil, likely due to national policies that permit municipal borrowing. This pattern is consistent with findings that, in most countries, legal and regulatory frameworks restrict cities from accessing international finance directly (UN-Habitat, 2024), and complex bureaucratic procedures often delay budget approvals for climate initiatives (Dodman et al., 2022).

Private sector involvement was limited overall but significantly higher in non-urban projects, accounting for over 5 percent of their financing compared to less than 1 percent in urban initiatives. This disparity, along with the greater presence of other international financial institutions in non-urban lending, points to a preference for centralized, large-scale investments. Together, these findings suggest that current climate finance mechanisms remain poorly aligned with the needs and capacities of urban areas, raising important concerns about accessibility, flexibility, and equity in the global climate finance architecture.

It is also important to note that most non-urban projects, specifically 92.7 percent, were financed through sovereign loans, while only 7.3 percent used non-sovereign instruments. This distinction is significant because sovereign loans are typically negotiated and guaranteed by national governments, which often limits direct access for cities and local authorities. As a result, urban projects must compete within national priorities, which may not always reflect local needs or timelines. The limited use of non-sovereign instruments highlights a broader structural barrier for cities seeking more autonomous access to international finance.

Within urban projects, the largest share of climate financing, about 45.53 percent or USD 6.63 billion, supported mitigation efforts in transport, energy, multisector, and social infrastructure. Adaptation, mainly in water and sanitation, received 15.82 percent or USD 2.30 billion. Projects addressing both mitigation and adaptation objectives accounted for 19.58 percent, while those not focused on climate represented 19.07 percent or USD 2.78 billion.

In the non-urban portfolio, 62.28 percent of financing, equivalent to USD 18.88 billion, went to projects not explicitly focused on climate. Of this amount, USD 10.97 billion supported emergency assistance during the COVID-19 pandemic. Mitigation projects accounted for 29.22 percent, or USD 8.86 billion; adaptation for 5.96 percent, or USD 1.81 billion; and projects with multiple climate objectives totalled 2.54 percent, or approximately USD 770 million.

These patterns reflect the broader global trend where urban climate finance remains insufficient and unevenly distributed (CPI, 2024). They also highlight the pronounced bias of current urban climate investments toward mitigation sectors (CCFLA, 2024). This imbalance weakens the effectiveness of urban climate strategies, especially in adaptation, which is essential for resilience. Furthermore, current financing gaps challenge the principles of the Paris Agreement by reinforcing inequalities and failing to meet the goal of balanced funding between mitigation and adaptation (UNFCCC, 2015). Nevertheless, the NDB's contribution to urban climate finance, particularly its balance between mitigation and adaptation, shows progress compared to other MDBs. Together, these banks allocated USD 14.72 billion to mitigation, USD 2.35 billion to adaptation, and USD 4.4 billion to projects with combined objectives in 2021 and 2022 (CCFLA, 2024).

Overall, NDB operations reflect broader patterns in development finance, where MDBs and DFIs address financing gaps by offering concessional loans, de-risking investments to attract private capital, and supporting cities through project preparation and early-stage technical grants (UN-Habitat, 2024). However, the average urban NDB project size of USD 280 million illustrates a structural challenge. Projects are often too large for municipal budgets but too small to attract major external financiers. This mismatch limits access for cities, despite their central role in climate action (UN-Habitat, 2024).

This study showed that subnational governments played a central role in urban climate finance within NDB projects, participating in over half of all urban initiatives. These projects with subnational involvement accounted for 52.94 percent of urban financing, equivalent to USD 7.7 billion across 29 projects. Projects without subnational participation made up 47.06 percent of funding, totalling USD 6.9 billion over 23 projects. This near parity in overall financing, alongside differences in maximum project sizes, suggests that subnational involvement does not inherently limit funding volume but may influence project risk profiles or implementation approaches.

Critical patterns also emerged in the sectoral allocation of projects involving subnational governments. Adaptation initiatives, particularly in water and sanitation, were exclusively financed through projects with subnational participation. In contrast, multi-objective climate projects drew most of their funding from projects without subnational involvement. Mitigation and non-climate-focused investments were more evenly distributed between projects with and without subnational government participation. This specialization highlights the essential role subnational entities play as conduits for locally grounded climate resilience, especially for adaptation, while national actors dominate complex cross-sectoral interventions.

Environmental and social safeguard requirements further revealed distinctive involvement patterns. All high-risk Category A projects had subnational government participation. This may indicate that these projects demand localized oversight for complex mitigation measures such as resettlement or ecosystem protection, aligning with subnational governments' jurisdictional responsibilities and community-level accountability. In contrast, Category B projects demonstrate balanced participation, suggesting their moderate, site-specific impacts may be managed effectively by either national or subnational entities, depending on contextual factors such as regulatory frameworks or institutional capacity.

Notably, financial intermediary projects reported no direct subnational involvement despite channelling over 20 percent of urban NDB funds. This absence in formal reporting obscures potential indirect collaborations, implying significant unquantified subnational engagement may exist through intermediary partnerships. These tracking gaps risk systematically underestimating local governments' true role in urban climate finance ecosystems and highlight a critical transparency barrier.

Building on this finding, the analysis reveals the NDB demonstrates significant, though highly varied, engagement with subnational governments. Brazil's pioneering model, where cities functioned as direct borrowers, proves subnational entities can effectively channel climate finance when regulatory barriers are lifted.

Given this demonstrated capacity and to better align with hybrid multilateralism's emphasis on multi-level governance, the NDB could strategically expand this direct engagement approach. This expansion could include formalizing partnerships with transnational city networks, broadening lending opportunities to include creditworthy states and provinces, and establishing co-design mechanisms for urban adaptation facilities. These steps would help ensure that local governments' perspectives are meaningfully incorporated into the Bank's strategic planning.

While these recommendations offer pathways forward, this study acknowledges inherent methodological limitations that should be considered. Despite the implementation of multi-tiered validation protocols, subjective judgments in classifying climate action objectives and defining urban project boundaries may remain. Such classification challenges are common in climate finance research but were actively addressed through cross-referenced coding frameworks and sensitivity analysis. A more significant limitation arose in evaluating projects involving financial intermediaries. Limited disclosure of subproject implementation details hindered detailed assessment of subnational government roles within these channels, which direct a significant portion (over twenty percent) of urban NDB financing. This lack of transparency prevented definitive conclusions regarding indirect municipal involvement through intermediary partnerships.

## 7 CONCLUSION

This study demonstrates that the NDB has made a significant commitment to urban development, with urban projects comprising 32.5 percent of its total portfolio from 2016 to 2024, equivalent to USD 14.6 billion. This surpasses the global average for municipal access to climate finance yet remains far below the scale needed to meet global urban climate resilience goals. Investment is heavily concentrated in Brazil, China, and India, with Brazil uniquely allocating more to urban than non-urban projects.

Despite this investment, subnational governments had only a limited direct role in project implementation. This limited participation appears to reflect structural barriers that restrict the ability of local governments to access international finance. Brazil is a notable exception, where national frameworks likely enabled cities to act as direct borrowers.

The analysis also shows that national governments and state-owned enterprises dominated the portfolio, accounting for most of the urban lending. The Bank's strong reliance on sovereign-backed loans further concentrated control at the national level, limiting opportunities for cities and provinces to participate directly. In addition, the average size of urban projects, approximately USD 280 million, exceeds the financial capacity of most municipalities but is often too small to attract major private capital. This reveals a structural mismatch between project design and the financial capacities of subnational actors.

The allocation of climate finance within the urban portfolio reflects a clear imbalance. Mitigation activities received the largest share of funding, while adaptation was significantly underfunded. Importantly, all adaptation projects required the participation of subnational governments, showing that local actors are essential for advancing urban climate resilience. Subnational governments were also central to the implementation of high-risk projects, yet their involvement remains poorly documented, particularly in financial intermediary projects. This lack of transparency makes it difficult to fully assess the role of local governments across the portfolio.

This research makes several contributions. It provides the first systematic assessment of the NDB's urban climate portfolio and highlights key limitations in current multilateral financing structures, including their inaccessibility to local actors. It empirically links local governance to adaptation outcomes. The findings also expose a major transparency gap in reporting subnational involvement, calling for improved tracking practices. Overall, the study situates the NDB's urban strategy within broader climate finance trends, identifying both promising innovations and persistent institutional constraints.

Future research should aim to address these gaps while expanding this line of inquiry. First, empirical evaluation of project outcomes, particularly adaptation initiatives which have historically been underfunded, is necessary to determine whether current financing models lead to tangible climate resilience or simply deploy capital without producing transformative impact. Second, applying this analytical framework to other MDBs would help clarify whether observed patterns are specific to the NDB or reflect broader systemic barriers within climate finance structures. Comparative analysis could reveal replicable innovations in subnational engagement and highlight widespread structural challenges. Third, further investigation into scalable direct lending models for cities and provinces should be prioritized. Brazil's example of subnational entities serving as primary borrowers provides a critical foundation for such research. It is important to understand the institutional, legal, and policy conditions that enabled this model in Brazil but not in other member countries. These insights could inform the redesign of multilateral lending practices to better align with the principles of hybrid multilateralism and to improve the accessibility of climate finance for subnational governments.

To conclude, prioritizing these research areas and reforming financing models is essential for achieving meaningful progress. Furthermore, by redesigning financing mechanisms to empower subnational governments who are at the forefront of climate action, multilateral banks such as the NDB can unlock transformative urban climate resilience and significantly enhance their impact.

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## APPENDIX A: CLIMATE FINANCE INSTITUTIONS AND INITIATIVES

This appendix presents tables detailing the global climate finance architecture, including implementing agencies and institutions, multilateral and bilateral funds, and key initiatives.

**Table A1: Implementing agencies and institutions**

Abbreviation	Implementing Agency/Institution
AfDB	African Development Bank
AFD	Agence Française de Développement (French development agency)
ADB	Asian Development Bank
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (Federal ministry of economic cooperation and development, Germany)
CIDA	Canadian International Development Agency
DESNZ	Department for Energy Security and Net Zero (UK)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DFAT	Department of Foreign Affairs and Trade (Australia)
DFC	United States International Development Finance Corporation
DSIT	Department for Science, Innovation and Technology (UK)
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
Ex-Im	Export-Import Bank of the United States
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign, Commonwealth and Development Office (UK)
FFEM	Fonds Français pour l'Environnement Mondial (French global environment facility)
GAC	Global Affairs Canada
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (German technical cooperation)

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IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
JBIC	Japan Bank of International Cooperation
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau (German development bank)
MIES	Mission Interministérielle de l'Effet de Serre (inter-ministerial taskforce on climate change, France)
MOFA	Ministry of Foreign Affairs (Japan)
NMFA	Norwegian Ministry of Foreign Affairs
Norfund	Norwegian Investment Fund for developing countries
NORAD	Norwegian Agency for Development Cooperation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WB	World Bank

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*Note.* The list does not capture all initiatives. Source: Watson et al. (2025, p. 4).

**Table A2: Multilateral funds and initiatives**

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<b>Abbreviation</b>	<b>Multilateral Funds and Initiatives</b>
AAAF	Africa Adaptation Acceleration Program
ACT	Accelerating Coal Transition program (implemented through WB, ADB, AfDB, EBRD and IDB)
AF	Adaptation Fund (GEF acts as secretariat and WB as trustee)
ACCF	Africa Climate Change Fund
AREI	African Renewable Energy Initiative

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Art.6	Article 6 market and non-market approaches (implemented under the Paris Agreement)
ASAP	Adaptation for Smallholder Agriculture Programme
CAFI	Central African Forest Initiative
CBFF	Congo Basin Forest Fund (hosted by AfDB)
CDM	Clean Development Mechanism (implemented under the Kyoto Protocol)
CIF	Climate Investment Funds (implemented through WB, ADB, AfDB, EBRD and IDB)
CTF	Clean Technology Fund (implemented through WB, ADB, AfDB, EBRD and IDB)
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program (implemented through WB, ADB, AfDB, EBRD and IDB)
FRLD	Fund for responding to Loss and Damage
GCAP	Global Climate Action Programs (implemented through WB, ADB, AfDB, EBRD and IDB)
GCCA	Global Climate Change Alliance
GCF	Green Climate Fund
GEF	Global Environment Facility
GEEREF	Global Energy Efficiency and Renewable Energy Fund (hosted by EIB)
LDCF	Least Developed Countries Fund (hosted by the GEF)
PMR	Partnership for Market Readiness
PPCR	Pilot Program for Climate Resilience (implemented through WB, ADB, AfDB, EBRD and IDB)
SCCF	Special Climate Change Fund (hosted by the GEF)
SCF	Strategic Climate Fund (implemented through WB, ADB, AfDB, EBRD and IDB)
SREP	Scaling Up Renewable Energy Program in Low Income Countries (implemented through WB, ADB, AfDB, EBRD and IDB)
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation

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*Note.* The list does not capture all initiatives. Source: Watson et al (2025, p. 4).

**Table A3: Bilateral funds and initiatives**

<b>Abbreviation</b>	<b>Bilateral Funds and Initiatives</b>
GCCI	Global Climate Change Initiative (US)
GCPF	Global Climate Partnership Fund (Germany, UK and Denmark)
ICF	International Climate Finance (UK)
IKI	Internationale Klimaschutzinitiative (international climate initiative, Germany)
MDG-F	MDG Achievement Fund (implemented by UNDP)
NAMA Facility	Nationally Appropriate Mitigation Action Facility (UK, Germany, Denmark and the EC)
NICFI	Norway's International Climate Forest Initiative
REM	REDD+ Early Movers (Germany and UK)

*Note.* The list does not capture all initiatives. Source: Watson et al. (2025, p. 4).

## APPENDIX B: LIST OF ANALYZED PROJECTS

This appendix presents a table summarizing the projects analysed from 2016 to 2024, including project names, countries, and financing approval dates.

**Table B1: NDB projects selected for analysis (2016–2024)**

<b>Project Name</b>	<b>Country</b>	<b>Financing Approval Date</b>
Lingang Distributed Solar Power Project	The People's Republic of China	13/04/2016
Project Finance Facility for Eskom	The Republic of South Africa	13/04/2016
Canara Renewable Energy Financing Scheme Project	The Republic of India	13/04/2016
Financing of Renewable Energy Projects and Associated Transmission Project	The Federative Republic of Brazil	26/04/2016
Beliy Porog Hydro Powerplant Project	The Russian Federation	20/07/2016
Putian Pinghai Bay Offshore Wind Power Project	The People's Republic of China	22/11/2016
Madhya Pradesh Major District Roads Project	The Republic of India	22/11/2016
Hunan Ecological Development Project	The People's Republic of China	30/08/2017
Jiangxi Industrial Low Carbon Restructuring and Green Development Pilot Project	The People's Republic of China	30/08/2017
Madhya Pradesh Multi Village Water Supply Project	The Republic of India	30/08/2017
Judicial System Support Project	The Russian Federation	30/08/2017
Rajasthan Water Sector Restructuring Project for the Desert Areas	The Republic of India	20/11/2017
Ufa Eastern Exit Project	The Russian Federation	20/11/2017
Pará Sustainable Municipalities Project	The Federative Republic of Brazil	02/03/2018
Maranhão Road Corridor – South North Integration Project	The Federative Republic of Brazil	05/03/2018

Chongqing Small Cities Sustainable Development Project	The People's Republic of China	28/05/2018
Durban Container Terminal Berth Reconstruction Project	The Republic of South Africa	28/05/2018
The Small Historic Cities Development Project	The Russian Federation	28/05/2018
Development of Water Supply and Sanitation Systems Project	The Russian Federation	28/05/2018
Bihar Rural Roads Project	The Republic of India	28/05/2018
Environmental Protection Project for Petrobras	The Federative Republic of Brazil	28/05/2018
Luoyang Metro Project	The People's Republic of China	20/07/2018
Greenhouse Gas Emissions Reduction and Energy Sector Development Project	The Republic of South Africa	20/07/2018
Sustainable Infrastructure in relation to "ZapSibNefteKhim" Petrochemical Facility Project	The Russian Federation	18/09/2018
Madhya Pradesh Bridges Project	The Republic of India	18/09/2018
Madhya Pradesh Major District Roads II Project	The Republic of India	18/09/2018
Hohhot New Airport Project	The People's Republic of China	16/11/2018
Jiangxi Natural Gas Transmission System Development Project	The People's Republic of China	16/11/2018
Mumbai Metro Rail (Line 2&7) Project	The Republic of India	16/11/2018
Guangdong Yudean Yangjiang Shapa Offshore Wind Power Project	The People's Republic of China	16/11/2018
Lesotho Highlands Water Transfer Project Phase II	The Republic of South Africa	31/03/2019
Guangxi Chongzuo Urban Water System Ecological Restoration Project	The People's Republic of China	31/03/2019
Environmental Protection Project for Medupi Thermal Power Plant	The Republic of South Africa	31/03/2019

Zhejiang Green Urban Project - Shengzhou Urban and Rural Integrated Water Supply and Sanitation Project (Phase II)	The People's Republic of China	31/03/2019
IDC Renewable Energy Sector Development Project	The Republic of South Africa	31/03/2019
Ningxia Yinchuan Integrated Green Transport Development Project	The People's Republic of China	25/06/2019
Lanzhou New Area Regional Hub Multimodal Logistics and Transport Infrastructure Demonstration Project	The People's Republic of China	25/06/2019
Assam Bridge Project	The Republic of India	08/07/2019
Andhra Pradesh Road Sector	The Republic of India	12/09/2019
South African National Toll Roads Strengthening and Improvement Program	The Republic of South Africa	12/09/2019
Development of Renewable Energy Sector in Russia Project	The Russian Federation	12/09/2019
REC Renewable Energy Sector Development Project	The Republic of India	14/10/2019
North Region Transportation Infrastructure Improvement Project	The Federative Republic of Brazil	12/11/2019
Indore Metro Rail Project	The Republic of India	02/12/2019
Manipur Water Supply Project	The Republic of India	02/12/2019
Hubei Huangshi Modern Tram Project	The People's Republic of China	02/12/2019
Locomotive Fleet Renewal Program	The Russian Federation	16/12/2019
Battery Energy Storage Project	The Republic of South Africa	16/12/2019
Patria Infrastructure Fund IV	The Federative Republic of Brazil	16/12/2019
Program of Development of Educational Infrastructure for Highly Skilled Workforce	The Russian Federation	24/12/2019
Emergency Program for Supporting China's Response to COVID -19	The People's Republic of China	19/03/2020
National Investment and Infrastructure Fund: Fund of Funds - I	The Republic of India	25/03/2020

Emergency Program for Supporting India's Response to COVID -19	The Republic of India	30/04/2020
Emergency Program for Supporting South Africa's Response to COVID -19	The Republic of South Africa	19/06/2020
Teresina Educational Infrastructure Program	The Federative Republic of Brazil	29/06/2020
Small Historic Cities Development Project Phase II	The Russian Federation	29/06/2020
Emergency Program for Supporting Brazil's Response to COVID -19	The Federative Republic of Brazil	20/07/2020
Mumbai Metro Rail II (Line 6) Project	The Republic of India	29/09/2020
Delhi - Ghaziabad - Meerut Regional Rapid Transit System Project	The Republic of India	29/09/2020
Russian Maritime Sector Support Program	The Russian Federation	29/09/2020
Toll Roads Program in Russia	The Russian Federation	29/09/2020
Water Supply and Sanitation Program in Russia	The Russian Federation	29/09/2020
Emergency Program for Supporting Brazil's Economic Recovery from COVID -19	The Federative Republic of Brazil	07/12/2020
Emergency Program for Supporting India's Economic Recovery from COVID -19	The Republic of India	11/12/2020
Curitiba's Bus Rapid Transit Rideability Improvement Project	The Federative Republic of Brazil	15/12/2020
National Non -Toll Roads Management Program	The Republic of South Africa	15/12/2020
Cellular Network and Cloud Services Expansion Project	The Russian Federation	15/12/2020
BRDE Urban, Rural and Social Infrastructure Program to achieve the SDGs	The Federative Republic of Brazil	15/12/2020
BNDES - NDB Sustainable Infrastructure Project	The Federative Republic of Brazil	15/12/2020
Emergency Program for Supporting China's Economic Recovery from COVID -19	The People's Republic of China	26/02/2021

Beijing Gas Tianjin Nangang LNG Emergency Reserve Project	The People's Republic of China	09/03/2021
Emergency Program for Supporting Russia's Response to COVID -19	The Russian Federation	25/03/2021
PARÁ II Project – Transport Infrastructure for Regional Development	The Federative Republic of Brazil	29/03/2021
Emergency Program for Supporting South Africa's Economic Recovery from COVID -19	The Republic of South Africa	02/04/2021
BNDES Clima Project – Sustainable Financing to Support Global Climate Change Mitigation and Adaptation in Brazil	The Federative Republic of Brazil	28/06/2021
Anhui Province Roads Development Project	The People's Republic of China	29/06/2021
Sorocaba Mobility and Urban Development Project	The Federative Republic of Brazil	29/06/2021
Affordable Housing Program	The Russian Federation	23/09/2021
Himachal Pradesh Rural Water Supply Project	The Republic of India	08/12/2021
Qingdao Metro Line Six (Phase I) Project	The People's Republic of China	14/12/2021
FONPLATA Sustainable Infrastructure Project	The Federative Republic of Brazil	22/03/2022
Desenvolve SP Sustainable Infrastructure Project	The Federative Republic of Brazil	22/03/2022
Banco do Brasil Sustainable Finance Project	The Federative Republic of Brazil	18/05/2022
Lanzhou Zhongchuan International Airport Phase III Expansion Project	The People's Republic of China	18/07/2022
Xi'an Xianyang International Airport Phase III Expansion Project	The People's Republic of China	18/07/2022
Meghalaya Ecotourism Infrastructure Development Project	The Republic of India	18/07/2022
Lamphepat Waterbody Rejuvenation Project	The Republic of India	18/07/2022
SABESP Investment Program	The Federative Republic of Brazil	18/07/2022
Guangxi Trunk Road Network Improvement Program	The People's Republic of China	13/12/2022

Corridor 4 of Phase II of Chennai Metro Rail Project	The Republic of India	13/12/2022
Anhui Tongling G3 Road -Rail Bridge Project	The People's Republic of China	13/12/2022
Urban and Sustainable Infrastructure Program – Aracaju City of the Future	The Federative Republic of Brazil	13/12/2022
Water and Wastewater Services Expansion Project in Manaus	The Federative Republic of Brazil	13/12/2022
DBSA Sustainable Infrastructure Project	The Republic of South Africa	13/12/2022
Pernambuco Water and Sanitation Efficiency and Expansion Project	The Federative Republic of Brazil	21/02/2023
Guizhou Qianxinan Rural Roads Improvement Program	The People's Republic of China	01/03/2023
Aparecida de Goiânia 100 Years' Infrastructure Program	The Federative Republic of Brazil	10/07/2023
Integrated Sewerage System for City of Imphal (Phase II) Project	The Republic of India	26/10/2023
Gujarat Rural Road Program	The Republic of India	28/11/2023
Bihar Rural Roads Project (Phase 2)	The Republic of India	28/11/2023
Bank of Huzhou Sustainable Infrastructure Project	The People's Republic of China	28/11/2023
BDMG Infrastructure and Sustainable Development Project	The Federative Republic of Brazil	19/12/2023
South Africa Freight Rail Sector Improvement Program	The Republic of South Africa	03/01/2024
Assam Bridge -II Project	The Republic of India	30/03/2024
Serra Urban Mobility Improvement Project	The Federative Republic of Brazil	10/07/2024
Paraiba Water Supply Infrastructure Project	The Federative Republic of Brazil	10/07/2024
BoCom Financial Leasing LNG Transportation Project	The People's Republic of China	29/08/2024
Electricity Distribution Infrastructure Modernization Project	The Federative Republic of Brazil	23/10/2024

Liaoning Industry Upgradation, Infrastructure and Environmentally Sustainable Development Project	The People's Republic of China	24/10/2024
Haitong Leasing Environmental Protection Project	The People's Republic of China	28/11/2024
The Middle Reaches of The Yangtze River (Wuhan) Smart Logistics Hub Project	The People's Republic of China	07/12/2024
Madhya Pradesh State Highways Improvement Project	The Republic of India	19/12/2024
Brasilia Capital of Solar Lighting Project	The Federative Republic of Brazil	26/12/2024
SAEL 300MW Renewable Energy Project	The Republic of India	27/12/2024
Shriram Finance Sustainable Transport Project	The Republic of India	29/12/2024

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*Note.* Data extracted from the New Development Bank's All Projects webpage (NDB, 2025).