CLIMATE FINANCE IN INDIA

PAPER 4

CATALYSING PRIVATE CLIMATE FINANCE READINESS FOR MAINSTREAMING ARTICLE 9 AT THE SUBNATIONAL LEVEL

CONTEXT OF INDIA

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ABOUT THIS PAPER SERIES

While there have been strides made in climate finance mobilisation and deployment, there are still several gaps and the quantum mobilised till date lags behind the requirements. In the face of the climate emergency, there is a need to immediately mobilise large amounts of climate finance, from across all sources, for developing countries. This collection of papers explores areas and approaches for facilitating the required finance mobilisation in India. Building on existing research and assessments, the papers in this report dive deep in the following four themes:

- The State of Climate Finance: Understanding Past and Future Trends
- Climate Finance Flows to Developing Countries: Untapped Opportunities
- Climate Finance in India
- Catalysing Private Climate Finance Readiness for Mainstreaming Article 9 at the Subnational Level: Context of India

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EXECUTIVE SUMMARY

India's ignition to climate transition is already underway and is driven by Nationally Determined Contributions (NDCs) target by 2030[1]. At the Conference of Parties (COP26) in 2021, India has announced bold climate ambitions that includes a reduction in carbon intensity of its economy by 45% over the 2005 levels by 2030, to cut projected carbon emissions by 1 billion tonnes between now and 2030, and sourcing 50 percent of energy requirements from renewables by 2030 to achieve a net zero country wide economy by 2030. Finance is the key to drive and accelerate the transition even further, and subnational governments are key actors in the implementation of national goals. Consequently, research findings indicate that India will need US$1.4 trillion in additional funding[2] for low emissions technologies to be on a sustainable path over the next 20 years – 70 percent higher than in a scenario based on current policy. Studies ascertain the weightage between mitigation and adaptation finance is 95:5 ratio.

In this paper, the author investigates the state of play of private investments that have flown into the country and delivered for sectoral climate responsive development at the subnational level. Furthermore, the author assesses divergent drivers and actors and institutions involved in climate finance by a decision matrix and builds a realistic evidence case of mitigation: adaptation in non-domestic private finance. The identification of challenges for private climate finance readiness across sub-sectors is a first climacteric step in the search for ways to overcome and cure this bias. Additionally, the author attempts to describe interrelations between emerging challenges which either effective institutional capacity building or policies must take into account to enable the conditions for mainstreaming article 6 in India for mobilizing readiness to equitable access to adaptation and mitigation projects at India's subnational level.

ABOUT THE AUTHOR

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1. LANDSCAPE OF GROWING CLIMATE IMPACTS AT THE SUBNATIONAL LEVEL IN INDIA

India is committed to growing its economy to $5 trillion by 2024-25, and a $10 trillion economy by 2032. With more unpredictable, intensified, extreme weather event occurrences, and rising sea levels, economic impacts start to become more noticeable, especially in more exposed regions such as India. The IPCC sixth assessment working group II report[3]estimates India to be at a highly vulnerable risk by 2050, predicting the region to witness a severe increase in heat frequency and a 40% increase in precipitation annually. This drives almost twelve of the Indian states and six southern cities prone to intense vulnerability to climate impact events including mega-cities such as Mumbai, Chennai and Kolkata. The witnessed effects include sea level rise, urban flooding, intense heat waves and related climate effects due to rise in temperature and coastal sea rise. India could lose up to 35% of GDP by mid-century in a severe scenario if no further climate mitigation actions are taken[4]. India ranks fifth on the list of countries most vulnerable to climate change out of 181 countries[5]. Out of 48 countries accounting for 90 percent of global GDP in 2019, India stood at 45th rank in a Climate Economics Index Rankings. This emphasizes the intricate vulnerability of economic growth due to climate change. According to global studies which map and rank top 20 coastal cities with highest flood damage losses by 2050, 13 are in South Asia including Mumbai and Chennai. Damages from rising sea levels in a single mega-city like Mumbai, India, is estimated to be worth $49-50 billion (₹4,900 - ₹5,000 crore) by 2050 and may climb by a factor of 2.9 by 2070.

The lockdowns during the COVID-19 pandemic had also impacted almost 9% of the state's economy and had a massive impact on jobs and employment with a declining unemployment trendline from 33.41 million in 2018 to 38.56 million, which is about 15 percent[6].

Other climatic and extreme weather threats—including Cyclone Amphan that hit the east coast, Cyclone Nisarga which made landfall on the west, and Cyclone Nivar that hit the south coastline—have resulted in loss and damages up to one billion. Presumably, the single event of Cyclone Amphan alone affected 13 million people which led to loss and damage costs over $13 billion to subnational governments[7]. Subnational and local governments had worked hard to evacuate communities during the floods and cyclone events given the pandemic. However, this has often become a massive seasonal challenge and financial burden for the governments.

The underlying cause of climate threats posed upon local governments are often undermined. It is worth mentioning that most cities falling in the highly vulnerable zone are cities with high greenhouse emissions resulting from various activities and city demand and consumption; including emissions due to the current energy basket, transportation mix, and emissions caused by lack of scientific or bi-remedial waste management. The data below highlights the analysis on emissions intensity in few of Indian cities as of 2019, excluding the years with Covid dip. The output numbers are derived from a GHG Inventorization exercise which had been conducted while preparing the city Climate Action Plans for few of the mentioned cities and according to a study review[8].

City	Projected population as of 2019	Total Emissions in MtCo2e	Per Capita Emissions in tCo2e (Including Manufacturing and Industrial)
Mumbai	1,28,28,821	23.42	1.8
Indore	23,27,906	3.633	1.6
Chennai	1,12,35,018	22.09	4.79
Bangalore	1,18,83,000	7.59	2.23
Kolkata	1,47,55,000	14.81	3.29

1.1 MITIGATION AND ADAPTATION POTENTIAL AT THE SUBNATIONAL LEVEL

Cities, being the best positioned to address the impacts of climate change and mainstream the goals and targets announced by India at the 26th Conference of Parties at Glasgow. [NR1] India has pledged to reach net-zero emissions by 2070 and unveiled near-term commitments to work toward that goal. This included installing 500GW of non-fossil fuel electricity capacity and generating 50% of India's energy capacity from renewable energy sources by 2030. India also announced its aim to reduce carbon intensity of its economy by 45% (over 2005 levels) by 2030, and to cut its projected carbon emissions by 1 billion tonnes between now and 2030.

These commitments go beyond India's current Nationally Determined Contribution (NDCs); they will put the country on a low-carbon development pathway and send strong signals to every sector about what the future holds.

Various cities in India have analysed the GHG mitigation potentials, positioning themselves to contribute to global and national climate change agenda through low emission interventions encompassed within and supplemented through intermediary facilitated strategies, policies, and plans (Table 1).

City	Mitigation potential (million tCO2e)	Base year	Estimated reduction by
Ahmedabad	40.7 Various initiatives and their mitigation potential include: • reduction of energy service demand primarily in the industrial sector (15.4 million-ton CO2), • low-carbon power (8.6 million-ton CO2), • fuel switching to gas (6.3 million-ton CO2), • energy efficiency improvements in the industrial sector (4.3 million-ton CO2), • the buildings sector (2.4 million-ton CO2) and • 3.7-million-ton CO2 reduction with increased energy efficiency along the transport sector	2005	2035
Kolkata	7.8 The mitigation potential share: • solid waste management (27%) • energy efficiency (26%), • renewable energy (25%), • transport (21%), and water (1%)	2014	2025
Mumbai	0.023 (Adding a three-way catalyst to all CNG buses and a diesel particulate filter to all diesel buses had a mitigation potential of 0.023 million tonnes)	2014	-
	0.06 (While a replacement of 100% electric and biodiesel buses provided a potential of 0.06 million tonnes.)	2014	-
Rajkot	0.43 (Transport sector contributed to 0.015 million tonnes)	2018	2023
Siliguri	0.15 (The transport sector's share of mitigation potential was 0.0021 million tonnes)	2016	2023
Coimbatore	1.7 (Transport sector accounts for 1.2% of the mitigation potential)	2016	2023

TABLE 1: CITY SPECIFIC MITIGATION POTENTIALS

On an aggregated national level, the combined mitigation potential of all urban missions was found to be 133 million tonnes of CO2e by 2021, and 270 million tonnes of CO2e by 2031. These missions include AMRUT, smart cities mission, and the Swachh Bharat Mission.

Sub-Sector	GHG Mitigation (million tonnes CO2 equivalent)	
	2021	2031
Integrated Water Management (Water Supply, Sewerage, Septage and Rainwater harvesting)	27.08	55.36
Energy Management (Rooftop Solar PV, Green Buildings & energy efficiency)	59.43	151.86
Green Spaces and Parks (with 15% increase)	41.80	45.00
Solid Waste Management	5.35	19.0

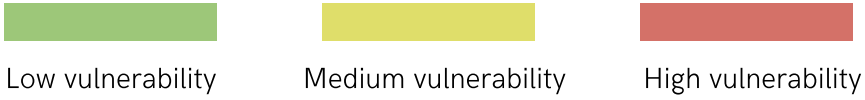
Under the National Action Plan for Climate Change, launched in 2008, and encompassing eight missions, one key mission was the National Mission for Green India, that estimates an annual incremental mitigation potential of 55 million tonnes CO2e in 2020. The National Mission on Enhanced Energy Efficiency[9] estimates an annual emissions reduction of 98.55 million tons CO2e from industries, with the Performance Achieve and Trade system anticipated to bring about a reduction of 605 million tonnes by 2030 through cost efficient energy efficiency improvements. In the energy sector, decarbonisation of the electricity grid by enhancing the contribution of renewable energy will play a pivotal role in mitigating carbon emissions. By 2032, the mitigation potential due to renewable energy in India is estimated to be 265.5 million tonnes of CO2e, with wind contributing to 83.6 million, biomass contributing to 82.1 million, hydro power contributing to 38 million, co-generation contributing to 19.4 million tonnes, waste-to-energy contributing to 10.5 million tonnes, and solar contributing to 31.9 million.

Coming to the adaptation potential, it is challenging and even cumbersome to measure the ballpark potentials and value numbers at the regional level due to uncertainties in projections and geographic changes in the impacts of climate change. Though few cities in India have measured their carbon sequestration potentials, the numbers are incomparable.

2. READINESS AND ECOSYSTEM OF PRIVATE FINANCE UTILIZATION FOR CLIMATE PROJECTS AT THE SUBNATIONAL LEVEL

For the purpose of readiness assessment and the ecosystem of private finance utilization, the table below maps the ecosystem of sectoral concentration of private finance investments and utilization for climate mitigation and adaptation projects in the last five years. There are five parameters selected for this analysis:

- Mapping the 14 hotspots or highest vulnerable cities and their states as per the IPCC assessment;
- States which rank the highest in GDP value and economic status in line with the national capita and which rank highest in size and per capita;
- Vulnerability ranking of the state as per DST report 19-20 and its SDG status in comparison to the national baseline;
- The urbanization potential, which is the number of smart cities as per the National Smart Cities mission, and the average climate score as per the MoHUA Climate Smart Cities Assessment Framework which is the only climate scoring index at the subnational level.



State	State Vulnerability score[10]	Scope of urbanization and climate vulnerability[11]	Overall average CSCAF scores of the state's smart cities	SDG Progress {Benchmark score 66)	Presence of climate finance frameworks for attracting investments	Sectoral concentration of private finance investments in last five years
Maharashtra 1st in GDP 12.43 crores ₹32.24 Trillion		13 smart cities (ex. Mumbai) 10 highly vulnerable districts	★ ★ ★	Front Runner -70	No climate finance framework institutionalized at state level.	$270 million from the Green Climate Fund for integrated watershed adaptation programmes. C40 cities and CIFF grants for Climate adaptation and mitigation action planning. AFD also assists projects related to credit Facility Agreement for Metro rail projects and few Smart City Projects focussing on transport and water
Tamil Nadu 2nd in GDP 7.88 Crores ₹20.91 Trillion		11 smart cities, two smart cities (Chennai, Tuticorin) in the high risk	★ ★	Front Runner -74	No climate finance framework institutionalized at state level.	ADB $100-million loan climate adaptation project - irrigation and drainage system[14] KfW, and Technical Assistance Programmes through GIZ for Energy and Sustainable Urban Infrastructure Development-Chennai Storm Water Management[15]

Gujarat 5th in GDP 6.48 Crores ₹18.79 Trillion		7 smart cities, one smart city (Bhavnagar) in the high risk	★ ★ ★	Aspirant - 46	Gujarat Climate Change Department has developed a Climate Change Budget framework.	International climate funds like the Green Climate Fund (GCF) and the ADB funds for wind power project[16]
West Bengal 6th in GDP 9.8 crores ₹14.44 Trillion		3 smart cities, one municipal corporation (Khidirpur) in the high risk	★ ★	Aspirant - 46	No climate finance or budget framework institutionalized at state level.	$105 million project to improve the inland water transport infrastructure[17] and $135 million to enhance the operational efficiency and reliability of electricity supply in few selected precincts in the state[18].
Karnataka 8th in GDP 6.84 Crores ₹18.03 trillion		9 smart cities, one smart city (Mangalore) in the high risk	★	Performer - 53	No climate finance or budget framework institutionalized at state level.	ADB funds Karnataka State Highways Improvement III Project, $150 million for water efficiency[19].
Madhya Pradesh		7 smart cities	★ ★ ★	Performer - 62	No climate finance or budget framework institutionalized at state level. Cities like Indore and Jabalpur are working on carbon credits for sequestration.	World Bank grants $440 million for RE project Rewa Ultra Mega Solar Power Project[20].

Odisha 16th in GDP		3 smart cities, one smart city (Paradip) in the high risk	★	Performer -61	Climate budget and state climate financing framework institutionalized[21] called The State Action Plan Financing Framework (SAPFIN), and reporting framework across key sectors and has also got the clearance for the country's first Project with GCF Financing.	USD 2.2 billion Green Climate Fund for Ground Water Recharge and Solar Micro Irrigation[22]
Kerala 9th in GDP 3.58 crores ₹3.58 Trillion		2 smart cities, one smart city (Kochi) in the high risk	★ ★	Front Runner -75	No climate finance or budget framework institutionalized at state level [23].	World Bank funds $125 million program[24] for resilience to natural disasters, climate change impacts in 2021 and US$ 250 million for the Resilient Kerala Program in 2019[25].

An assessment of the above findings clearly indicate that the state of Odisha and Gujarat have been outliers and outperformers with the institutionalization of state financing frameworks for tracking financial investments. Despite this, other states like Tamil Nadu and West Bengal have also witnessed disaggregated funding opportunities and attracted private investments from major private non-domestic banks like KfW, ADB, World Bank and funders like GCF for adaptation as well as mitigation projects. Feasibility studies, DPRs and a bankable pipeline for investments have favoured this finance readiness, thus indicating strong evidence for disapproving the bias for mitigation in private lending at subnational level in India, and reasoning an underlying potential and acceptance from private investors and banks for feasible large scale adaptation projects.

2.1 THE GOVERNANCE ARCHITECTURE FOR DELIVERY OF FINANCIAL FLOWS FROM NATIONAL TO SUBNATIONAL LEVEL

Considering the top-down nature of climate governance structure in India, states are dependent on the federal government for financial assistance in terms of grants and budgetary allocations to implement their State Climate Change Action Plans (SAPCCs). Historically, institutions for tackling climate change have been set up by states in response to certain central schemes. The implementation of environmental and climate policy and programs are subject to the distinct political and economic interests of the individual governments at the subnational level. There are limited capacities to access alternate finance streams like bilateral and multilateral funds, etc. may be warranted. There is a severe fragmentation of governance in the climate eco system. Climate portfolio is only a complementary subject to the local governments, which mobilize funds for integrating climate responsiveness in projects through some line of funding availability or green bonds issued at its own interest. The investments flow from the central government to the subnational state governments through schemes and programmes.

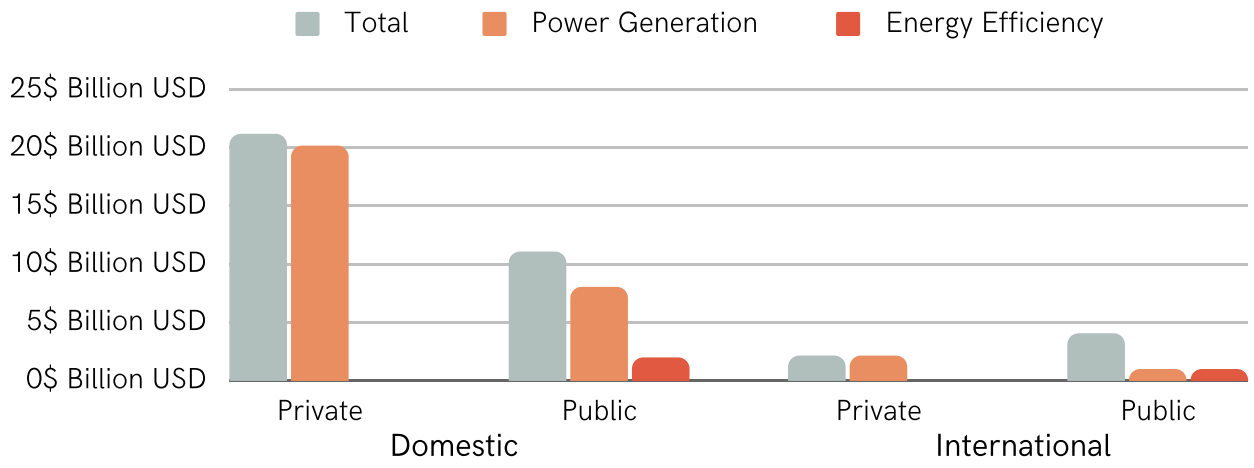
Central Government	State Government	City
1. Ministry of Urban Development 2. Ministry of Environment, Forest and Climate Change 3. Ministry of Housing and Urban Affairs 4. Ministry of Science and Technology 5. Central Pollution Control Board 6. Forest Survey of India 7. National Ganga River Basin Authority 8. National Green Tribunal 9. National Bio-diversity Authority 10. National Green Corps 11. Ministry of Power etc.	1. State Pollution Control Board 2. State Department for Environment and Forest 3. State Bio-diversity Board 4. State Zoo Authority 5. State Environment Protection Council 6. State Energy Department 7. State Housing Department 8. State Urban Development Department	1. City governments 2. Development authorities 3. Transport Corporations

To achieve bold national commitments, it is prudent to enhance readiness to the Subnational governments. As States and regional governments are central to achieving climate action goals set at the federal level, access to finance becomes necessary for them to implement the greater leadership challenges in fighting climate change.

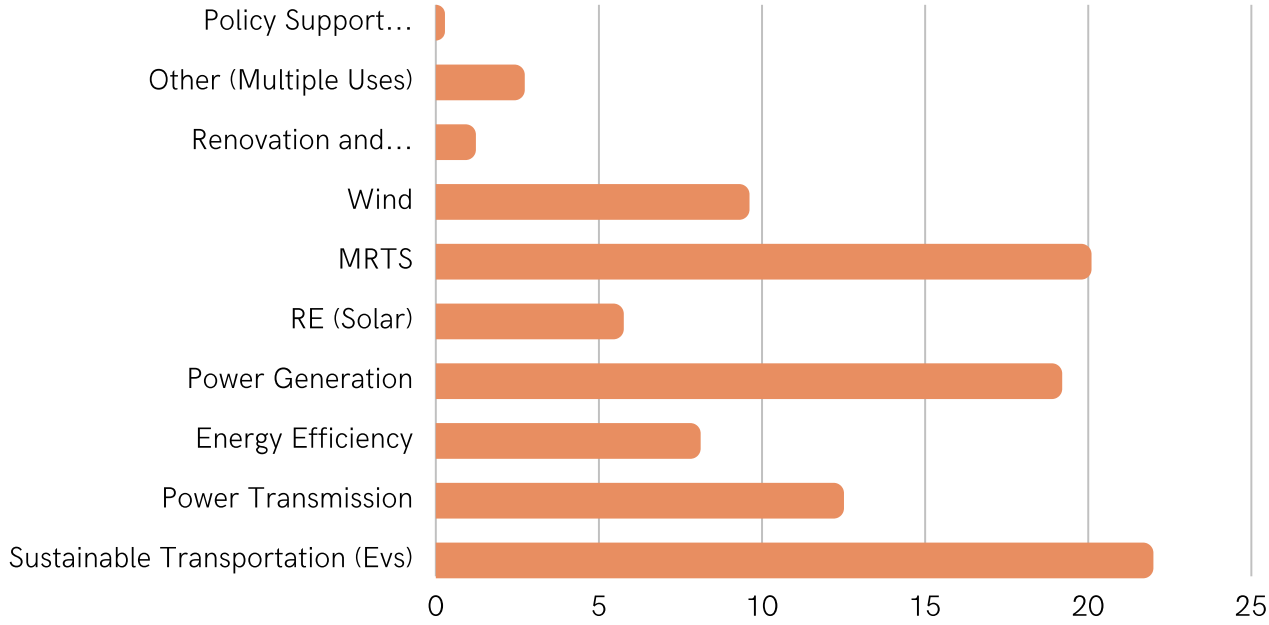
3. TRACKING PRIVATE FINANCIAL FLOWS FOR MITIGATION VS ADAPTATION

The paper considers only tracked Private climate finance viz. local and foreign currency loans, private equity, venture capital, partial risk guarantees, green bonds, Clean Development Mechanism (CDM), and other international funds flowing in from multilateral development banks and bilateral financial institutions in the form of grants, loans and concessional loans.

As per initial findings from the study research, a major gap that has emerged is that data on tracked investments is available till FY2018. Also, information about utilization of NCEEF funds by IREDA for RE sector and extent of Priority Sector Lending reaching RE sector is lacking. Given the lack of data availability for 2019 and onwards, the paper considers only tracked public and private financial flows until 2018. As of FY17, the financial flow of green finance in India was summed to a total of USD 17 billion and USD 21 billion for FY 2018[26]. The average stands at USD 19 billion per annum, while the total tracked green finance for the years 2016-2018 amounts to INR 248 thousand crores (USD 38 billion). During the years 2016-2017 and 2017-2018, the total contribution by domestic private sector has been US$21.32 billion raised mostly through debt and equity instruments, while domestic public contribution amounts to US$10.9 billion. The international public finance, from bilateral and multilateral financial institutions through FDIs, contributed 18 percent to renewable power generation and 26 percent in which majority of the funds were directed to clean energy, efficiency and power transmission sectors in FY17 and FY18. The graph below shows the breakdown of the financial sources.



The renewable energy sector and sustainable transport subsector particularly for electric vehicles has received more than almost 60% of the investment, while investment in clean energy reached US$11.1 billion which is 8% increase in 2018[27].



According to the numbers above, only 1% of the total financial flows was directed for policy research or other R&D innovation and support. By taking a closer look at Graph 2, we can analyse that the power generation sector accelerates ahead of other mitigation-related sectors, the total investments still have a lot of catching up to do to achieve India's clean energy targets. Funding is also much higher by loan disbursement to fossil fuel-based projects like power generation and transmission than in renewable energy projects due to investor confidence.

3.1 THE GOVERNANCE ARCHITECTURE FOR DELIVERY OF FINANCIAL FLOWS FROM NATIONAL TO SUBNATIONAL LEVEL

Along the mitigation angle, studies indicate that if India continues the same progress in sectoral mitigation areas, example for accelerating the EV market in the mobility sector, it would require an investment of over USD 180 billion in vehicle manufacturing and charging infra. Given the current 156.83 GW[28] of non-fossil fuel based installed capacity, India has announced an ambitious target of renewable capacity of 450 GW by 2030[29] , that would need an investment of USD 500 billion till 2030[30]. Also, the total financial requirement for achieving the 450 GW RE target is USD 500 billion till 2030 out of which only USD 34 billion was realized during FY17 and FY18.

On the adaptation front, A UNFCCC standing committee report (2018) highlights that the total climate specific finance flows from Annex II Parties in India by 2016 amounted to USD 38 billion. This is 40 percent less than the USD 100 billion target of climate finance. A sum of USD 30 billion in 2015 and USD 34 billion in 2016 were reported as climate-specific finance channelled through bilateral, region and other multilateral channels. Adaptation activities had received almost 29 percent of the bilateral fund flows and 25 percent multilateral fund flows respectively during 2015-16. Nine percent of adaptation finance flowing through multilateral development banks (MDBs) was grant based. Despite the finance flow, India's NDC preliminary estimates indicate a need for USD 206 billion by 2030 for implementing adaptation actions in key areas like agriculture, forestry, fisheries,

infrastructure, water resources and ecosystems. Apart from this, there might be additional investments required for activities related to resilience and disaster risk management.

This calls for enabling an ecosystem for driving in more private investments equitably into all sectoral projects to foster low-carbon and resilient infrastructure in the country.

3.2 DATA, POLICY AND INSTITUTIONAL CHALLENGES FOR ATTRACTING PRIVATE FINANCE INVESTMENTS AND ECOSYSTEM OF PRIVATE FINANCE UTILIZATION FOR CLIMATE PROJECTS AT SUBNATIONAL LEVEL

Challenges related to data availability, credibility and transparency:

- Tracking private climate finance is very complex both at national and subnational level in India. Gaps related to definition of private climate finance and its bifurcation and gap on limited common capital and transaction are also reasons that deter private sector investments.
- Issues with data confidentiality and accessibility, huge data gaps in specific sectors, and the lack of precise and agreed-upon definitions of private and public climate funding have all been cited as limitations.
- The data on tracked investments is available till FY2018 which has emerged as a major data gap. Also, information about utilization of NCEEF funds by IREDA and extent of Priority Sector Lending reaching RE sector is lacking. Lack of data availability for 2019 and onwards, and data on tracked public and private financial flows is available only until 2018.
- The research was more challenging because some of the data sets available lacked a date range for the investment. Lack of data reduces the clarity of municipal tender rules and leads to private-sector miscalculations.
- Insufficient reporting of private sector investment in urban adaptation finance due to a lack of transparency standards, lack of disclosure requirements and definitions are also few reported hurdles.

Challenges related to policy:

- Despite the fact that the Government of India (GoI) has demonstrated regulatory procedures and economic incentives for involving the private sector, real deployment has been slow.
- The formal absence of climate budgeting prevents exact reporting on climate action, in turn making it difficult to track private expenditure.
- The key institutional and policy hurdles are a lack of policy clarity and involvement with the corporate sector on climate change policy framework.
- It has been difficult for external private debt finance to flow to India, since external funders are required to adhere to complicated remittance laws, and the External Commercial Borrowings (ECB) guidelines are frequently highly rigorous.
- Broader macroeconomic policies, such as power market structure, fuel subsidies, central bank rules, and international financial regulations, influence private sector investment decisions. These policy and institutional gaps make it challenging to secure private funding for initiatives. As a result, the RE sector has seen significant private investment, while government incentives to attract private investment in other climate-related industries have been restricted.

- Furthermore, there is no comprehensive financial tracking structure in place to track climate-related spending. The union government needs to direct a route for financial flows and handhold accountability and transparency for climate related financing to its subnational governments.
- The public sector lacks confidence in the private sector to make investments in some sectors. As a result, because there is a lack of initiative to combine public and private sector finances, leveraging does not occur to the extent that it should. For instance, the electric ferry and vessel industry has a lot of scope but is at a very nascent stage of development. There are limited policies for accessing financial and technical support for promoting and product development by the private sector.
- Uncertain national and regional regulations, as well as low-cost power rates for conventional energy, are two major roadblocks to EE adoption.

Challenges on Institutional Capacities:

- There are limited opportunities to connect with the private sector, with the main behavioural hurdles being noncompliance to environmental and social safeguards.
- At a national level, there is no systematic tracking of climate finance through a measuring, reporting, and verification (MRV) system, which is a process being adopted by other countries.
- Subnational and local governments are not empowered on funds, functions or functionaries, due to the fundamentals of sound decentralized structure. The SAPCCs aren't backed up by a coherent climate finance strategy. On an average, only 9 out of the 18 functions under the seventh fourth constitution amendment act has been effectively devolved. Cities have a limited say in borrowing or investing money or even finalizing their budgets. This has resulted in city governments becoming glorified service providers far from 'institutions of self-government'.
- State-owned distribution businesses fail to pay power producers on time, jeopardising their credit. Due to the significant risk of return on these investments, banks are hesitant to lend to power generation companies. Amendment of the draft Electricity Act for enforcing penalties to avoid curtailment of RPO would facilitate long-term growth trajectory of RPOs for solar, as well as non-solar based generation and to substantially improve compliance.
- In the private sector, there is a lack of understanding of climate concerns. The business sector's participation in climate change has been confined to greenhouse gas (GHG) accounting, with no use of effective and robust climate risk screening techniques. Project officers appraising the project do not have the requisite knowledge of low carbon sectors.
- Bankable projects are being developed in greater numbers, although primarily in the renewable energy industry. Given the oversubscription of the SECI tenders, it is clear that the availably of funds is not the problem. The finances are available, but not enough projects are being signed/commissioned. The big challenge for institutions like IFC and World Bank remains in helping to structure the financing in such a way to make RE + storage attractive to DISCOMs. However, as against an annual requirement of $31 billion in RE investments from 2018 to 2030, annual investment flows into the RE sector in India have averaged $10 billion from 2013 to 2017. The financing requirements are debt-heavy, and traditional sources of debt capital, banks and NBFCs, may not be able to supply funds at the required scale.

- Due to reporting requirements imposed by Development Finance Institutions (DFIs) and technological incompatibilities, distributed generation technologies have not attracted private investments.
- In the EE industry, building a robust pipeline of bankable projects remains a major difficulty. Several obstacles have hampered the process, including high transaction costs, limited project sizes, and a lack of EE awareness among finance institutions, among others.
- Lack of understanding of EE technology among financial institutions, as well as a scarcity of bankable projects. EE finance is frequently not tracked as a distinct project by financial institutions. Due to a lack of market experience and the social and environmental effects connected with these projects, FIs lack expertise of technology and business models, even for mature waste to energy technologies, such as in the waste management sector.
- Catering to the small scale of projects and the distributed nature of technologies, financing energy efficiency initiatives is riskier. Indian financial institutions (such as TCCL and ILFS) currently lack the capacity to handle the project sizes generated by the Energy Service Company (ESCO) industry.
- Liquidity crisis in banks does not turn out to be a realistic issue, but banks are wary about branching out and giving long-term debt (due to the high risk). This is due to a lack of participation from the private sector in the development of adaptation and mitigation strategies (e.g., Partial Risk Guarantee Funds, Venture Capital Fund for Energy Efficiency etc.), which has resulted in implementation challenges.

4. ENABLING CONDITIONS FOR MAINSTREAMING ARTICLE 6 IN INDIA AND MOBILIZING READINESS TO EQUITABLE ACCESS TO PRIVATE CLIMATE FINANCE AT SUBNATIONAL LEVEL

According to Article 9 of the Paris Agreement[31], rich country parties must offer financial resources to developing country parties in order to assist them with mitigation and adaptation. Correspondingly, scaling financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies as well as priorities and needs of developing country parties, particularly those that are vulnerable to the negative effects of climate change and have significant capacity constraints. This was also highlighted in the COP 26 negotiations in 2021 and the Working pact[32].

Given India's developing low-carbon environment industry and the growing number of environmental/green funds, private investment will surge in the future. India is also taking steps to become a more active recipient of global climate funds from the Adaptation Fund and the Green Climate Fund (GCF). But it should be noted that private adaptation interventions are often complemented by public adaptation activities. To enable the ecosystem for mainstreaming article 6 and mobilizing private finance readiness in India, it might be important for a policy roadmap with a holistic approach of policy, institutional and leverage of financial instruments as recommended below.

- Regulatory frameworks: Devise an 'investment-grade' low carbon policy and regulatory frameworks to leverage private funds. Promoting a directed policy environment, removing sector specific technical barriers in all adaptation and mitigation projects, not only RE and transport.

- ESG and ESS as pillars: For all development projects, organise robust corporate social governance standards and adherence to environmental and social safeguard (ESS) measures.
- Fiscal instruments to attract financing: Opening new finance avenues in the form of masala bonds, green bonds, Green Mortgages, crowdfunding etc. like the cities of Indore, Ghaziabad[33] etc. for undertaking infrastructure projects to mitigate and adapt to emissions. This can help attract private financers at the subnational level.
- Public private coalition: Laying an ecosystem to implement large public private programmes similar to City Investments to Innovate, Integrate and Sustain (CITIIS[34]) with a coalition of international private investor banks and national and regional governments can help scale private investment and mainstream action at local level with increased efficiency and performance tracked by monitoring mechanisms. This reduces the trust deficit of investors to lay hands on new areas of adaptation investments.
- SBTs for GHG tracking and prioritization: Fostering climate readiness by science-based targets (SBT) at the local level by developing a city level greenhouse gas inventory and tracking emissions trajectory every five years through an MRV cell. This can help track and prioritize the funding for specific sectoral investments.
- Climate Finance Task Force for implementing green finance framework: NITI Aayog is in the draft stages of putting together a national green finance framework for India to mainstream private finance into cleaner modes from asset, operations and implementation angle. It may be efficient to create a finance task force at regional subnational level backed by a policy structure to accommodate a more central coordinating role between various commercial and public financial institutions, as well as to implement India's green finance framework.
- Leverage Performance Based Financing: Open to new funding mechanisms like Results based financing (RBF) and Performance based financing (PBF) and developing performance measurement and verification tools, tailored for specific adaptation and mitigation projects.
- Aspect of Inclusion in Climate Finance: Greater acknowledgment and incorporation of ESS/Social Environment Management Standards (SEMS) and gender-based financing (GBF) into investment decisions may aid Indian financial institutions (FIs) and project developers in obtaining international climate money.
- Central repository for climate aligned urban investments: The TCFD or the CDP-ICLEI Unified Reporting System should be used to encourage private financial institutions and companies to disclose standardized data on their climate-aligned urban investments to a common repository.
- Affluent methods for tracking and estimating investments in specific sectors: Deep dive into specific sectoral areas like retrofitting to green buildings and other such urban sectors to estimate investments is the key to tap investments into other urban climate mitigation activities. To continue to fill gaps in obtaining urban private climate finance, these systems can be extended and built for additional crucial sectors, such as waste/water management. Given the increasing environmental dangers that cities confront, more research and tools are needed to evaluate the adaptation and resilience investment needs and gaps.
- Ecosystem for bankable projects: Private financers indicate an irregular pipeline of bankable projects ready for implementation. Hence, it is recommended to develop a sectoral list of bankable projects by each in line departments, backed by the GHG

- Inventorization emission trends, to equitable distribution of private financing into both mitigation and adaptation projects.
- NAMA finance to boost private investment: To achieve low-carbon and climate-resilient growth, India must emphasize large-scale sector programmes. This investment can be aided by "Program Nationally Appropriate Mitigation Actions (NAMAs), which combine government incentives and financial instruments to remove barriers and hazards, stimulate private investment, and boost private investor profitability.
- Credit enhancement for mainstreaming Article 6 of COP 26: Enhance Market and non-market approaches like carbon credits and develop a subnational avenue for carbon trading and carbon markets. Credit enhancement is one way to make issuances to specific projects attractive to investors. This will help mainstream and implement article 6[35] which was agreed by nations at the COP 26 Glassgow Summit.

5. CONCLUSION

Before the dust settles on lofty long-term goals, India must run the "breathless marathon" of empowering its subnational in a slow-stride to reach net-zero in the short-medium term. Such institutional and policy shifts at the national and subnational levels will open doors and improve the country's readiness to attract private capital and achieve its targets. This will help India unburden the heavy bag of uncertainty and criticism raised upon its bold commitments, and propel the country towards achieving its NDCs and COP26 commitments.

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