As part of the intergovernmental fiscal framework, TN was the first state in the country to set up the State Finance Commission to put in place a structured mechanism to share taxes and grants with urban local bodies (ULBs).

The TNUDF has supported over US$3.2 billion in urban investments while maintaining an outstanding track record of 100 percent loan repayments from the ULBs.

Urban infrastructure investments in TN must be scaled up significantly over the next 15 years in order to meet unmet demands in terms of urban services delivery gaps.

Coverage of the water supply networks in municipal corporations and municipalities is on average about 50 percent.

To address gaps in basic services in transport, water supply and sanitation (WSS), and other sectors, the ULBs will require a significant scale-up in capital investments, estimated at US$2.8 billion

7 Mohanty, Abinash, and Shreya Wadhawan.

To address this, in 2022, the Government of Tamil Nadu (GoTN) undertook a rate revision of property taxes for all the ULBs in the state.

Moreover, insufficient OSRs, coupled with weak technical capacities and high initial costs, make it difficult for smaller ULBs to tap into municipal bond issuance, which is another much-needed avenue for resource mobilization.[12][13]

(b Institutional capacity would benefit from improved ULB human resource management to address matters such as high vacancy rates in ULB staffing as well as additional skill sets that need to be brought in.

While progress has been made, including having computerized and double-entry accounting systems at the ULBs, they are facing other challenges in public financial management, that is, public investments are not subject to climate-related assessments at the ULB level, there is limited systematic citizen consultation on spending, and budget execution is insufficiently monitored and disclosed.

Many of the existing sewage treatment plants (STPs) are underutilized and suffer from poor operation and maintenance (O&M). Sewerage coverage in the 21 participating ULBs is only about 45 percent with an unutilized STP capacity of 160 MLD.

Women traditionally carry most of the burden for collecting water from standpipes, tankers, and handpumps and managing

[12] Data on service gaps and investment needs are from Next Generation of Urban Sector Interventions for ULBs in Tamil Nadu, June 2022.

[14] Notably, formally revised operating guidelines for septage management and established a memorandum of understanding and service-level agreement for shared facilities.

Further, with an unmetered, erratic rationing water supply regime, many ULBs face high costs and low flat tariffs, which constrain their ability to recover O&M costs and/or limit their capacity to further invest in extended coverage and services quality.

Concerted efforts are required at the city level to plan and coordinate interventions for addressing climate adaptation and mitigation.

Hence, there is an urgent need to strengthen the capacity of ULBs to incorporate climate change adaptation measures in urban planning, management, and service delivery, including dedicated water

[15] Daily water collection can take up to 200 million hours worldwide.

[17] WSS tariff is set by the ULBs, then approved by the State, without a specific methodology or target.

[23] Table 8 - State-Wide Stage of Ground Water Development; Niti Ayog Sector Report 9A Water Resources.

ULBs also have a large role to play in climate change mitigation by taking low-carbon pathways, such as improved energy efficiency and increased use of renewable energy in infrastructure investment and operation. The GoTN has begun initiatives to address climate change, including the formation of the Tamil Nadu Green Climate Company to implement key flagship missions. However, integrated planning at the city level to coordinate the climate investment needs of multiple sectors remains limited.

To address the fast-growing demand for urban services in a sustainable, climate-resilient, and resource-efficient manner, the GoTN, led by the Municipal Administration and Water Supply Department (MAWSD), has formulated Urban Vision 2031.

The proposed Tamil Nadu Climate Resilient Urban Development Program (TNCRUDP) (the Program), a Program-for-Results (PforR) operation with an Investment Project Financing (IPF) component focusing on Technical Assistance (TA), will support implementation of the WSS and Urban Governance pillars of Urban Vision 2031 in 21 participating ULBs where there is high climate vulnerability and there are substantial gaps in WSS services, OSR, and institutional capacity

The SCD identifies policies and actions to make cities more productive and livable, including reducing their environmental impacts and strengthening city finances and public sector management. The Program directly contributes to these areas as it supports making ULBs more livable and productive, by investing in urban governance, climate resilience, and WSS.

Climate change adaptation and mitigation benefits are expected in Results Area 2 (RA2) as well, which will increase access, modernize, and optimize WSS services, thereby reducing emissions and water stress and augmenting access to resilient services.

It also builds on the achievements and innovations from the Tamil Nadu Sustainable Urban Development Project (TNSUDP, P150395) and the Chennai City Partnership (P175221).

The World Bank is currently supporting the Chennai City Partnership Program that provides a model of urban reforms and service improvements cutting across sectoral boundaries.

The proposed operation has a strong focus on system-wide institutional reforms on urban management, including improving municipal finance by increasing OSRs and issuing municipal bonds, and mainstreaming climate-resilient actions at the investment and institutional levels.

Globally, the World Bank has a wide and diverse experience of supporting cities in strengthening their governance, financing, institutional, and service delivery systems, especially in Asia, Africa, and Latin America.

The PforR instrument will facilitate: (a) sharpening the focus on institutional strengthening, including scaling up the performance-based grant from three pilot ULBs under the TNSUDP and incentivizing innovative ways to access financing; (b) showcasing an integrated WSS framework to significantly improve coverage, quality, and efficiency of services; (c) incentivizing climate change to be mainstreamed as a cross-cutting theme in investments, service delivery, and institutions; (d) supporting the larger government program in optimizing their outcomes; and (e) using and strengthening existing government systems, building on the past and ongoing systems development and capacity-building efforts.

While an IPF modality with performance-based conditions could have supported larger and more complex investments, the PforR was considered appropriate given the need to incentivize reforms and improve and sustain service delivery and institutional changes.

The objectives of the program are aligned with Urban Vision 2031 and the Government of India (GoI) missions AMRUT and SBM, including (a) functional water tap connections to all households; (b) rejuvenation of water bodies and wells and recycling and reuse of treated used water; (c) rainwater harvesting; (d) scientific management of wastewater and having all used water, including fecal sludge, safely contained, transported, processed, and disposed; and (e) creation of green spaces.

The proposed Program will focus on two mutually reinforcing RAs: institutional strengthening on urban management and improvement in WSS service delivery and ensuring that climate resilience is considered in each area.

The service delivery improvement RA will focus on improving access, quality, efficiency, and resilience of WSS services to rising climate risks, particularly extreme heat, droughts, and floods; enhancing energy efficiency in municipal assets; and expanding green cover to mitigate urban heat island effects.

The World Bank Program is proposed as US$809.62 million, covering 37 percent of the overall government program. The World Bank (IBRD) will finance US$279 million (or 34 percent) of the Program.

The World Bank operation includes an IPF-TA component for US$30 million, which is funded by US$20.25 million from IBRD and US$9.75 million from the GoTN.

The Program recognizes that universal, climate-resilient, and efficient service delivery faces constraints at two levels: (a) individual services are delivered with a focus on infrastructure construction, with a limited quality and sustainability orientation, and (b) the overall municipal administration system faces cross-cutting capacity, financing, and policy constraints, including weak orientation toward climate resilience.

[1] Budgeted revenue includes OSR (tax and non-tax), assigned revenue, and grants.

Similarly, enhancing the climate agenda that increases resilience of institutions, infrastructure, and beneficiaries against the rising threat of extreme temperatures, droughts and floods in the project area requires multisectoral climate assessment and action planning.

RA1 is transversal in nature, and the funds received by the ULBs on achieving the required institutional actions can support green- and climate-related investments based on their specific need, including WSS services under RA2. Investments and implementation of service reforms under RA2 will also contribute to achieving targets under RA1, such as increase in OSR through increased WSS revenues

RA1: Strengthening Urban Management, Institutional Framework and Climate Resilience

24. Under RA1, funding will be allocated to the ULBs based on their improved institutional performance. The following aspects are incentivized: (a) staffing and human resource management; (b) capital expenditure and asset management; (c) transparency and timeliness in budget management; (d) mobilization of OSR; (e) adoption and implementation of comprehensive CCAPs, including cross-sectoral CCAP and four WSS subplans on water security and emergency preparedness and response, citywide inclusive sanitation (CWIS), WSS business planning, and stormwater drainage; and (f) citizen engagement and user-centric service delivery. To create an enabling environment for the ULBs to achieve these institutional reforms, a set of actions will also be required at the state level to establish institutional frameworks to (a) strengthen public investment management; (b) improve planning and capacity with respect to local capital expenditure, and (c) prepare and publish an annual performance benchmark report on governance and service delivery at the ULBs.

RA1 also supports cities in accessing private capital.

The proceeds from this pooled financing were provided as loans to the ULBs for carrying out infrastructure projects. All bond service payments were promptly made during FY21/22, demonstrating a strong commitment to timely and responsible financial management (FM).

Under AMRUT 2.0, the GoI has linked grants to outcomes to track service delivery to some extent; for example, 40 percent of AMRUT grants for infrastructure is linked to the targeted number of WSS household connections achieved.

In 2019, a new regulation was issued to allow trusts registered for pooled finance, such as WSPF, to issue bonds.

An extensive reform agenda was stipulated, and grant support to states and cities were conditional on progress on service delivery, legislative, institutional, and financial sustainability reforms.

The reform for institutional and financial sustainability continues to remain as a separate window and is not linked to grants.

In contrast, RA2 pursues service delivery and financial and operational efficiency goals concurrently in an integrated manner.

RA2 concurrently strengthens the climate-resilience, service delivery, and operational and financial efficiency aspects of WSS infrastructure while also supporting energy efficiency and climate resilience at a broad municipal level.

These will be combined with on-the-ground service delivery improvements, such as water connections that are metered and billed water is delivered throughout the day, NRW management, and complete wastewater management systems (from household connections to treated effluents). These higher level of services and stronger operational/financing management also enhance the resilience of the services in climate emergencies occurring during droughts and floods in the project areas.

Moreover, PAP requires critical WSS-related actions that complement the Program WSS framework, such as tariff rationalization through WSS bylaws and water quality monitoring programs.

This framework also supports scaling up private finance for WSS infrastructure and services. Finally, RA2 also incentivizes improving energy efficiency in municipal assets and developing municipal parks using nature-based solutions, contributing to both climate mitigation and adaptation agendas.

This component will be financed through a US$20.25 million IBRD loan and US$9.75 million counterpart funding. The US$20.25 million IBRD loan for the IPF component includes US$10.125 million to be implemented by DMA and US$10.125 million to be implemented by TNUIFSL.

Moreover, the systematic capacity building to be supported by the IPF, coupled with enhancements in municipal systems promoted by the DLIs, will enable the ULBs to better manage their resources and services, including preparing bankable pipeline of projects that ultimately attract private financing over time.

This will also help address the institutional capacity needs of the ULBs to improve service delivery and efficiency.

The Program will support ULBs with IEC through PBCs and the IPF component, covering topics like safe water management, WSS user charges and climate resilience.

The Program will help reduce unchecked GHG emissions from individual cesspools and latrines by expanding household sewerage connections and increasing the amount of wastewater being treated in existing and newly constructed STPs in the project area that meet the effluent disposal standards.

The Program aims to leverage the private sector for improving the efficiency, quality, and sustainability of urban service delivery. In infrastructure-related sectors, including WSS, critical binding constraints to scaling up private finance are the lack of creditworthiness and financial capacity in the ULBs and the lack of institutional capacity to develop a viable project pipeline and implement in a timebound manner. The Program takes a comprehensive approach to scaling up private finance for urban infrastructure and services improvements in the

[5] Recent research shows that, in Chennai, time spent on water collection by unconnected households accounts for 22 percent of the coping costs of INR 658 per month.

[6] GHG account was carried out based on the Water Global practice standardized methodology, focusing on sanitation activities only since these are the largest portion of program-supported investments with relevance to GHG accounting.

and/or viability gap funding at the ULBs, which can provide enhanced revenue security for the private sector; (b) strengthening project structuring and contract management systems (for example, using PBCs for WSS services) in the ULBs for service delivery; and (c) building a solid pipeline of WSS investmen projects with sound technical and financial viability. In addition, the Program incentivizes the mobilization of private capital through the issuance of municipal bonds by TNUIFSL on behalf of the ULBs for infrastructure services.

These will pave the way for developing a scalable model in TN that can be adopted for all the ULBs to address the expanding urban investment gaps through private finance in addition to government grants in a sustainable manner.

The PDO of the Program is to strengthen urban management and improve access to efficient and climate resilient urban water and sanitation services in participating ULBs in Tamil Nadu.

Six out the eight DLIs are linked to ULB institutional reforms, urban governance, and climate measures, either transversal at the ULB level or WSS sector related. DLIs under RA1 are entirely focused on transversal ULB institutional reforms and measures, with funds to be received by the ULBs contingent on achieving the required institutional benchmarks, including climate, public investment management, and municipal finance-related actions.

RA2 also supports energy efficiency and development of green space at city level. Funds under DLI 6 and 7 will be used exclusively for WSS investments; ULB are also expected to use part of the funds received under DLIs 1, 3, 4 and 5 towards WSS investments. TNUIFSL will sign sub-loan/sub-grant agreements with each participating ULB that will detail out the funding being made available for WSS investments and obligations related to DLI 6 and 7.

Under DLI 1, the participating ULBs are expected to implement measures identified in the OSR improvement plan such as conducting GIS mapping to increase property assessments and improving e-governance and deploying field team to increase collections.

DLI 2: Increased access to financial markets.

Funds raised through these bonds will be allocated for investing in the urban water systems, including WSS and stormwater drainage The IPF TA component will support TNUIFS in the following activities: (a) pooling a set of interested ULBs and subprojects with sufficient creditworthiness to structure a transaction with support from financial advisors; (b) undertaking a credit rating through a rating agency; and (c) appointing a merchant banker to undertake issuance of the bond in capital markets, including ensuring SEBI regulatory

8 The total OSR of the participating ULBs was US$127.23 million in FY21-22.

9 Besides TA under the IPF component and utilizing the DLI-2 grant, WSPF is also expected to access the incentive funds for credit enhancement from Ministry of Housing and Urban Affairs that is available to the extent of INR 13 crores (US$1.57 million) for every municipal bond issue of INR 100 crores (US$12.04 million) up to a maximum of INR 26 crores (US$3.13 million).

These categories include renewable and sustainable energy, clean transportation, sustainable water management, climate change adaptation, energy efficiency, sustainable waste management, sustainable land use, biodiversity conservation, and any other category specified by the relevant regulatory authority. The utilization of funds raised through these securities must adhere to the conditions and guidelines set by SEBI.

By undertaking such an initiative, TNUIFSL can further enhance its financial capabilities and contribute significantly to the development and sustainability of urban infrastructure projects across TN.

DLI 3: Enhanced institutional capacity for climate resilience planning aims to mainstream climate actions in participating ULBs. The DLI will incentivize the ULBs to adopt and implement CCAPs, which will follow standardized guidelines to be issued by the DMA. Each CCAP includes one cross-sectoral action plan based on comprehensive risk assessment, GHG inventory and identification of adaptation and mitigation measures covering WSS, transport, energy/building, solid waste, and green space, supplemented by four WSS sub-plans.

Under DLI 3, the ULBs are expected to allocate 5 percent of their capital budget for subprojects identified in the CCAP and initiate implementation measures. The IPF component will support the participating ULBs to develop these plans through TA and capacity building.

DLIs 4 (Improved fundamental institutional capacity) and 5 (Strengthened institutional capacity to manage resources in a sustainable, participatory, and green manner).

DLI 4 supports ULBs to meet a set of Minimum Conditions (MCs) in HRM and budget, budget execution, accounting, and transparency.

DLI 6: Delivery of functional water and sewerage connections. This DLI provides incentives to install and operationalize functional water tap connections (FWTCs) and functional sewerage connections (FSCs) with service delivery parameters exceeding AMRUT 2.0 requirements and the current service levels in the state under a PBC framework. Under DLI 6, the ULBs will achieve one or more of the following: (a) improve citywide water supply covering 70 percent of the city with functional water connections at household level that deliver a minimum of three hours of supply every day, (b) establish 24x7 water supply in demonstration zones with metered connections to encourage water conservation and financial sustainability, and (c) provide sewerage connections at household level that are further connected to a functioning STP that meets effluent disposal standards. The ULBs are also required to ensure that their WSS subprojects incorporate rapid climate resilience guidelines developed by TNUIFSL (to mainly address floods and droughts) to improve the resilience of the infrastructure and the services. DLI 6 also require the ULBs to demonstrate steady physical and financial progress to secure cashflows.

DLI 7: Increased operational, climate and financial efficiency of WSS services. This DLI focusses on (a) performance orientation, NRW management, and optimization of use of existing assets, aiming to enable a shift from

[4] Climate in WSS business plans refers to actions to gradually reduce emissions (energy efficiency, trucks usage, and so on) and, in alignment with the water security plan and ERPP, to make WSS services more robust against droughts and floods.

[42] Such as upgrading of unsafely managed sanitation facilities (e.g., latrines and cesspools) to safely managed technologies including fecal sludge management, thus contributing to both climate resilience (due to reduced sewage contamination) and mitigation (due to reduced emissions).

Optimization of existing assets, both in terms of STPs and water supply systems (through NRW and professional network management), contributes to operational (water and energy use) and financial efficiency. A higher and more reliable WSS service delivery (through WSS household level connections) and additional volume of water (due to NRW reduction) to targeted communities will help them withstand climate-related shocks to water supply (such as droughts/water shortages and heat waves) and improve public health outcomes by improving availability of potable water, access to safely managed sanitation solutions (through sewerage) and increasing of wastewater treatment. Moreover, the DLI will provide mitigation benefits by optimizing energy, reducing NRW, and increasing treatment of wastewater in project areas.

DLI 8: improved city-level climate resilience. The ULBs will be provided with grants under this DLI for reduction in energy consumption in their main municipal assets (such as WSS and streetlighting) and development of green spaces/municipal parks as nature-based solutions to reduce the heat island effect and help the area in absorbing water during extreme precipitation, thus contributing to climate resilience and mitigation at the same time.

The IVA will review these technical reports along with other records and technical designs and conduct interviews with beneficiaries and on-site checks of physical interventions.

The DMA will be responsible for coordinating and overseeing the achievement of RA1 (except for DLI 2 that will be coordinated by TNUIFSL) and will pass on the funds to ULBs as grants, upon achievement of the DLIs. TNUIFSL will be responsible for RA2 (except for DLI 8 that will be coordinated by DMA) and will pass on the funds to ULBs as a mix of sub-loans and sub-grants.

Within such funding envelope, the basis for loan-grant mix from TNUIFSL applicable for DLIs 6 and 7 is presented in the financial analysis section.

The detailed performance criteria, annual assessment process and budget cycle are presented in

[4] 3 The mix of grants and loans is as per the financial evaluation and agreement between TNUIFSL and ULBs.

DMA and TNUIFSL will also be responsible for implementing the IPF TA component.

The main agencies responsible for collating and coordinating information collection and monitoring would be the DMA and TNUIFSL.

In the final year of the Program, DMA and TNUIFSL, in coordination with the World Bank, will reconcile the audited Program expenditures with the amounts disbursed by the World Bank on the achievement of DLI targets.

Organizational capacity building for the sustainability of the urban management reforms, WSS services and climate resilience is an integral part of the Program in both RA1 and RA2. The IPF component will fund a set of TA and capacity-building activities that address the constraints of participating ULBs in key Program-related areas, such as monitoring and verification of results, urban management, climate resilience, and WSS service delivery. TA will support the DMA and TNUIFSL to develop guidelines for ULBs and share best practices related to CCAPs, energy audits, WSS PB and the development of green municipal bonds. It will support the ULBs to develop CCAPs, conduct energy audits and GIS mapping, and carry out WSS communication campaigns.

The Program design is also informed by learnings from the recently completed TNSUDP and the ongoing Chennai City Partnership and similar urban and water sector programs supported by the World Bank globally including in Morocco, Ethiopia, and Albania. Sector-specific activities are informed by strategic policy-level dialogue and TA activities in TN, including those funded by the TNSUDP on ULB capacity and financial needs assessment and public financial management.

Guidelines for climate-resilient measures in WSS projects have been developed and incorporated in the designs of WSS investments to be supported by the Program. Moreover, the package of WSS interventions has been carefully designed to ensure that infrastructure is provided, operated, and maintained efficiently by coupling them with institutional sector measures, operational and financial incentives, and a performance-based contracting model.

For the WSS infrastructure assets financed under the Program, energy consumption from pumping stations, motors, and treatment plants are the potential sources of GHG emissions.

The Program will incentivize the adoption of robust CCAP by each ULB, which includes preparation of CWIS plans to improve sanitation facilities and city-wide safe disposal of sewage, leading to a progressive (medium-to-long term) reduction of GHG emissions.

The ULBs are incentivized to carry out energy audits to closely monitor their energy consumption and achieve systematic improvement in energy efficiency for their municipal assets. The Program will also ensure progressive reduction in emissions through incentivizing the optimization of existing assets and efficient operation of WSS assets. The proposed wastewater management subprojects would lead to an increase in sewerage connections and treatment of wastewater, directly leading to a net reduction in lifetime emissions of 6,786,713 tCO2-eq.

RA1 prioritizes the adoption of CCAPs for the ULBs based on assessment of climat vulnerability and GHG inventories, and implementation of adaptation and mitigation measures including identifying alternative water sources to ensure water security, promoting city-wide access to improved sanitation (including adequate treatment), and ensuring WSS infrastructure are resilient to flooding and other disasters. RA2 incentivizes the ULBs to mainstream climate resilience aspects in investment design, planning, and operation of WSS services. A climate risk screening checklist and resilience design guideline have been developed by TNUIFSL outlining climate risk aspects and resilience measures pertaining to WSS systems, and the ULBs are required to incorporate these measures in the design of their WSS projects. This will help preempt and prevent potential impacts to WSS systems from climate-exacerbated floods and droughts, for example, restricting potential contamination of raw water in service reservoirs due to flooding, reducing disruption in road connectivity, and ensuring access to pump houses during flooding.

For each type of risk, the guideline recommends specific measures for the design and O&M stages. Overall, core Program activities such as improvement in WSS coverage, performance standards, and an overall effective institutional framework will enhance operational efficiency and sustainability of services, thus helping enhance resilience to droughts, floods, and extreme temperatures. In addition, the ULBs are encouraged to prepare and implement the water security and emergency plan for WSS as part of their CCAPs to ensure operational resilience through service continuity and minimal disruption due to climate-exacerbated droughts, extreme heat, and floods.

The IPF component will also include training and capacity building for the ULBs in the management of WSS services during climate emergencies.

The identified expenditure items will provide financing to the ULBs for undertaking project specific investments and ULB-level reforms and institutional development activities, which are critical to improving the service levels and overall performance of the ULBs.

The GoTN will receive GoI funds as a part of the AMRUT 2.0 and SBM 2.0 programs as per the GoI guidelines; these are expected to be 7.2 percent of the Program.

The Program is well justified based on the economic benefits that will come from improved urban governance, climate resilience, and WSS service delivery.

The results show that there will an economic net present value (NPV) of US$166.1 million and an economic internal rate of return (IRR) of 18.1 percent at a discounted rate of 12 percent.

(b Significant economic and social benefits, which could not be quantified, are also expected from implementing the series of policy and institutional reforms supported under RA1 and energy efficiency measures and green space development under RA2. For example, measures for increased OSR supported by the PforR will result in an estimated revenue increase of US$4.45 million in NPV terms.

Financial feasibility is assessed based on three parameters: (a) the ULB has no operating deficit in any year, after considering additional operating costs, ULB counterpart funding, and debt servicing obligations; (b) not more than 30 percent of the annual revenue is deployed for debt service; and (c) the average debt service coverage ratio is not less than 1.25.

An Integrated Fiduciary Systems Assessment (IFSA) of the key IAs has been carried out in accordance with the World Bank Policy and Directive for PforR financing.

TNUIFSL is a Public Limited Company registered under the provisions of the Companies Act, 2013, with shareholding from the GoTN.

A Government Order (GO) will be issued by the GoTN within four months of effectiveness to operationalize the overall Program.

TNUIFSL will have acces to the budget and the amounts will be transferred to the bank account of the company. The ULBs will receive the funds in two Program-specific bank accounts maintained for each RA for ease of accounting and reporting.

The Tamil Nadu Water Supply and Drainage (TWAD) Board is providing tendering and supervision support to a few ULBs to implement their sub-projects and contractual payment will be processed by the respective ULBs.

To enhance the efficacy of the existing procurement and contract management system, IFSA proposes that MAWSD to develop detailed procurement guidance as an annex to the POM, develop and adopt the Standard Tender Documents (STDs) for the Program, deploy adequate staff to manage the procurement and contract management at all levels, provide need-based refresher trainings, and include the review of the procurement cycle as part of the Program internal audit.

The IAs started managing the PP through STEP after the World Bank agreed to the initial PP, which describes the agreed procurement arrangements for the TA.

FM arrangements for the IPF component. Fund flow and accounting will be as outlined for PforR. Interim unaudited financial reports (IUFRs) will be submitted to the World Bank by the IAs within 45 days from the end of each quarter based on which the World Bank will disburse from the loan allocation.

The Program will improve urban services and infrastructure in 21 ULBs in TN and is expected to lead to significant environmental benefits.

Environmental risks of the Program can be managed/mitigated by (a) screening to avoid sensitive receptors; (b) assessment of direct/indirect and cumulative pollution/safety risks, including those due to linked activities; (c) implementation of the environmental and social management plans (ESMPs) as per the Environmental Guidance and Social Guidance outlined in the POM; and (d) strengthening of the institutional supervision and monitoring mechanisms. The Program has embedded critical environmental aspects in the design such as requirements for efficient management of STPs. The PAP includes strengthening the capacities on environmental aspects, developing, and following Environmental Guidance, and strengthening the capacities for ensuring adherence to laws on prevention of manual scavenging in polluted sewers and supplementary environmental management actions such as establishing a water quality and wastewater surveillance program.

All activities related to the subprojects under the Program have been screened to exclude those with land acquisition, resettlement, rehabilitation, and adverse long-term livelihood impacts on people.

In addition, some Program interventions such as metering and roll out of volumetric billing for WSS services, will need to be explained to consumers and other stakeholders, and any concerns addressed proactively; this will require the design and implementation of a robust strategic communications plan during the Program period, as included in the IPF component.

The ESSA has assessed the adequacy of the national- and state-level policy, legal, and regulatory frameworks relevant for the Program and the capacities of the IAs to manage the Program environmental and social risks and has recommended appropriate measures to fill the gaps through the PAP (see annex 6). Any high-risk activity, which may directly or indirectly result in significant and irreversible risks to the environment, biodiversity, and people will not be eligible for funding under the Program.

The IPF component will support only TA and capacity-building activities including preparation of investment subprojects. The World Bank Environmental and Social Framework will be applicable for the IPF component and Environmental and Social Standards (ESS) 1, 2, 3, and 10 are releva During the operation, the environmental and social risks related to TA activities will be screened by IAs.

The World Bank, through its implementation support, will monitor the Environmental and Social Commitment Plan and ensure that the applicable ESS are satisfactorily addressed.

This is particularly the case in terms of delivering water for a certain number of hours per day, achieving cost recovery improvements, and systematically tracking NRW and effluent standards. Availability of water resources may also jeopardize the meeting of service delivery standards.

Environmental and social risk of the Program is Substantial due to potential environmental risks during construction and O&M, and gaps in regulations and standards at the state level related to disposal of treated sewage.

DLI 2	Increased access to financial market
Description	ULBs in Tamil Nadu, with the support of TNUIFSL, have issued municipal bonds aggregating US$30 million, for urban water systems.
	The ULBs allocate at least 5% of capital budget to support implementation of the projects identified in the CCAP, and get the budget approved by the respective municipal council.

DLI 6	Delivery of functional water and sewerage connections
DLI 6.1	ULBs implementation of WSS investments incorporating climate resilience guidelines
Description	Participating ULBs have implemented WSS investments incorporating climate resilience guidelines developed by TNUIFSL.

Functional STP implies that at least 90% of wastewater effluent samples in three calendar months before the evaluation period comply with TNPCB effluent discharge standards (see POM) and compliance reports are available for verification.

The contract will include an O&M period of at least 5 years starting from the commencement of supply to at least 80% of the targeted connections and will include social engagement activities, including training women on water conservation techniques (see POM for details).

Existing STPs that already have ongoing contracts for STP management may be excluded from the proposed PBCs (yet the required standards of STP functionality as per DLRs 7.3 apply).

Formula	$90,000 per million Dollars of committed funds from TNUDF for every Participating ULB that has signed a PBC.

Formula

$45 per connection for water supply projects achieving NRW of 20% or below.

The IVA will verify that devices for flow measurement of water input into the system as well as revenue water are reliable and functioning and have been calibrated within last 6 months before the baseline by an authorized agency.

However, increase in volume of wastewater treated in these STPs can come from both Program and non-Program areas. The volume of wastewater received and treated during the Program period will be measured using the same flow measurement method at the inlet and outlet of STPs for a full financial year. Treated effluents should comply with standards (see POM).

Formula

$68,40(per MLD of additional sewage treated in eligible existing STPs (as set forth in POM).

Volume of wastewater received and treated at STPs will be based on reliable and functioning devices that have been calibrated within the last 6 months before the baseline by an authorized agency.

The IVA will carry out a field survey to confirm functioning flow measurement devices for bulk water, including a sample of DMA sensors, wastewater flow at inlet and outlet of STPs, and installation of energy efficiency certified equipment for new STPs.

Formula	US$150 per 1,000 kWh (up to a total of 60,313,546 kWh) of energy savings.
	The IVA will review and verify the electricity bills as required.
Formula	US$8,030 per 1,000 m. 2 area (up to a total of 608,000 m. 2) of green space developed over baseline set forth in POM.

SBM 2.0, which started in 2022, focuses on sustainable solid waste management, sustainable sanitation, and used water management. AMRUT 2.0, which started in 2021, emphasizes reforms to enhance access to household WSS piped connections, water security, and enhancing water efficiency.

Urban Vision 2031 aims to achieve universal basic infrastructure and services in all ULBs with the key priorities: (a) improving accessibility and quality of urban services, especially in smaller ULBs; (b) ensuring that infrastructure design and urban development are climate resilient and low-carbon in line with climate change projections; and (c) strengthening the institutional capacity of ULBs to better plan, deliver, and manage urban services and their public assets in a financially sustainable manner.

Regarding climate change, as part of the NAPCC, the TNSAPCC 2.0 contains strategies for the ULB to prepare CCAPs that require cities to audit their water resources and increase forest cover.

The Program has its RAs structured to support cross-cutting ULB-level and specific service-level improvements in parallel, to overcome overall municipal administration systems capacity and policy constraints, including weak orientation toward climate resilience, and the limited coverage, quality, and operational, and financial efficiency of specific urban services.

Urban services are supported under RA2, focusing largely on WSS services, together with energy efficiency and green space investments.

Funds received by ULBs under RA1 can be used to implement WSS-related reforms (such as cost recovery) and investments and toward O&M of these services.

Investments and implementation of service reforms under RA2 will also contribute to achieving DLIs under RA1, such as increase in OSRs through increased WSS revenues

Both RAs will incentivize the ULBs to strengthen the FM systems and expand its resource base in an incremental manner that will lead to overall creditworthiness improvement.

RA1 systematically incentivizes the ULBs to address key urban governance challenges that hinder the performance of ULBs, using an institutional PAF (see table 3.1 below) and associated performance-based grants supported by DLIs 4 and 5.

Upon successful achievement of the MCs, the ULBs will be eligible to be assessed under DLI 5 for up the institutional performance-based grant allocated for the respective year.

In addition, RA1 supports two critical areas of urban governance: strengthening ULB municipal finance and climate resilience. RA1 incentivizes ULBs to augment their OSR (DLI 1) and issue municipal bonds (DLI 2), to meet their recurrent expenditures and reduce their dependence on fiscal transfers. To address climate change, RA1 also aims to enhance ULB capacities for climate resilience through adoption and initiating implementation of comprehensive CCAPs, which includes aspects of water security and emergency preparedness and response, CWIS, WSS business planning, and stormwater drainage (DLI 3).

Service delivery goals will include the targets of AMRUT 2.0 (household tap or sewerage connection) as a minimum but go beyond specifying quality and service standards

DLI 6 supports expanding access to FWTCs and sewerage connections, with service delivery parameters exceeding AMRUT 2.0 requirements and current service levels in the state.

WSS systems under the Program are being designed according to specific climate-resilience requirements (including water security aspects) developed for this Program.

Moreover, DLI 7 will also incentivize higher O&M cost recovery, fostering higher financial and operational efficiencies combined and creating the basis for sustained WSS service delivery at the city level, extending beyond the areas in which assets are being created.

DLIs in RA2 are supplemented by requirements in the PAP in terms of approval of WSS tariffs bylaws that allow water volumetric and sewerage charges and systematic water quality monitoring. Important institutional tools to support efficiency and sustainability of WSS services are included in RA1, through the development of plans on water security and emergency, WSS business plan, CWIS, and stormwater drainage, as part of CCAPs.

The Program takes a comprehensive approach to scaling up private finance for WSS infrastructure and services improvements in participating ULBs by (a) addressing fundamental institutional capacity and creditworthiness related constraints in ULBs, (b) building a solid pipeline of WSS investments projects with sound technical and financial viability, and (c) supporting pilot municipal bond transactions to provide impetus to TNUIFSL to resume its municipal bond program (under RA1 These will pave the way for developing a scalable model in TN that can be adopted for all the ULBs to address the expanding WSS investment gaps through private finance in addition to government grants in a sustainable manner.

India has significantly increased the use of PBC in construction and O&M of WSS services in recent years.

There are already successful cases, such as Hubli, Malviya Nagar, Delhi, Nagpur, Kolkata, and Pune, where th service levels have significantly improved through PBC incentives, especially in terms of increased water supply hours, wastewater collection and treatment, and the associated customer services including billing and collection. In TN, there are ongoing PBCs in desalination and sewage treatment and wastewater reuse initiatives in Chennai and a water service improvement contract in Madurai. The Chennai Metropolitan Water Supply and Sewerage Board is designing and procuring a PBC for water system improvement in two zones of the core Chennai city area.

By using PBCs, the ULBs will migrate from an asset construction approach to performance-oriented approach. Further, the use of PBCs will also bring in contractor capacity into WSS O&M operations, thus bridging institutional capacity gaps of the ULBs.

RA2 also aims to enhance the ULB capacities for climate resilience through specific targets on reducing energy consumption in key municipal assets (such as WSS, streetlighting, public buildings, and so on) and increasing green cover through expansion of municipal parks using nature-based solutions (DLI 8).

In terms of resilience, RA1 prioritizes the adoption of CCAP for each ULB, which includes climate risk vulnerability assessment, GHG inventories, adaptation and mitigation measures based on their vulnerabilities, and identifying alternative water sources to ensure water security. RA2 incentivizes the ULBs to mainstream climate resilience aspects in investment design and O&M of proposed WSS infrastructure, including adopting a detailed climate risk screening checklist and incorporating resilient measures in the design of their WSS projects Ensuring water security is a critical element to enable higher levels of water supply service to be delivered. The operation includes TA for preparation of comprehensive, long-term water security planning as part of the CCAP The Program incentivizes the development and approval of the water security and emergency plan for WSS services, which are intended to better prepare the service providers to maintain WSS services in case of a climate-related emergency. Moreover, the provision of household level water and sewerage connections, supplemented by Program efforts in CWIS to move towards a universal access to safely managed sanitation, supports the climate adaptation agenda to reduce waterborne diseases and other health issues in the events of floods or droughts. In terms of mitigation, the Program will incentivize the ULBs to carry out energy audits to closely monitor their energy consumption and achieve systematic improvement in energy efficiency for their municipal assets.

Activities on metering and NRW incentivize efficient water use, and efficient wastewater treatment and disposal, all of which contribute to both climate mitigation and adaptation aspects.

TNUFSIL, in coordination with the respective ULBs, has prepared DPRs for five sewerage systems (Salem, Thiruvannamalai, Pudukottai, Kancheepuram, and Thoothukudi) and for one water system at Kancheepuram. This initial batch of subprojects correspond to about 30 percent of DLI 6 amount that directly goes to fund physical investments. The procurement packages for this initial set of subprojects are planned to be ready for contract award by end October 2023 as required by the Department of Economic Affairs, Ministry of Finance. In addition, a draft ToR for the IVA has been prepared and is expected to be ready for contract award by end October 2023.

The identified expenditure items will provide financing to the ULBs for undertaking project-specific investments, ULB-level reforms, and institutional development activities that are critical to improving the service levels and overall performance of the ULBs.

The state has steadily increased its budget allocation for urban infrastructure investment.

[5]1 The FY22/23 approved budget for water supply, sanitation, housing, and urban development has increased by 18 percent from the FY21/22 budget estimate and by 95 percent from the actual budget for FY20/21. In terms of the sources of funds, the larger share of the total expenditure in the water and urban development sectors in TN is contributed by the state government.

The capacity of the state to absorb the allocated funds is shown by the budget execution rate.

The aggregate of DLI grants to ULBs on average will account for about 17 percent of their annual capital budgets. In addition, the total Program capital expenditures on WSS investments will account for about 49 percent on average of their annual capital budgets.

Therefore, the benefits estimated through the economic analysis are deemed considerably lower than what the actual stream of benefits from the Program would be.

Economic benefits and cost. The benefits and costs included in the analysis are the following:

(a) Direct financial benefits. These are measured by incremental cash revenue receipts that are expected from improved physical and commercial loss, metering, billing, tariff restructuring, and adding more water and sewerage connections.

Incremental costs include capital costs and O&M costs, including manpower, power, chemicals, and maintenance. The financial costs were adjusted to exclude applicable tax and apply an estimated standard conversion factor of 0.98 to use the domestic price numeraire.

This benefit would make up 21.2 percent of the total benefits.

This benefit would constitute 52.2 percent of the total benefits.

It is calculated based on the opportunity cost of collecting water, measured by the minimum wage. This would constitute 0.02 percent of the total benefits.

These are driven by wastewater management subprojects and were calculated using the lower-bound shadow price of carbon (US$50 per ton of CO_2e in 2023, rising to US$100 per ton of CO_2e by 2055).

The economic net benefits for WSS investments related DLIs are US$166.1 million in the base case at a 12 percent discount rate. The base case was stress tested for capital cost overrun, increase in O&M costs, reduced expected benefits, and delayed implementation (table 3.2). The results show that there will be net economic benefit under potential high-risk scenarios.

Implication for supervision to ensure economic viability. The sensitivity analysis shows that the economic performance of DLIs 6 and 7 depends on, in order of significance, realizing economic benefits to the beneficiaries, preventing capital costs overrun, preventing implementation delay, and controlling the O&M costs.

The economic assessment of the energy efficiency DLR proposed under DLI 8 shows that there will be an economic NPV of US$8.8 million and an economic IRR of 25 percent at a discounted rate of 12 percent. This was based on the aggregate end target set for the participating ULBs and the corresponding monetary savings. The assumed cost for implementing these energy efficiency interventions is INR 2.91/kWh, which is based on the CCAP for Coimbatore.[52] In terms of benefits, the reference tariff has been assumed as per Tamil Nadu Generation and Distribution Corporation Limited guidelines.

[52] This is the only reference on costs for energy efficiency interventions available for Tamil Nadu cities.

In addition, RA1 supports institutional reforms to improve climate change planning, financial sustainability, transparency, accountability, governance, and institutional performance for service delivery, and RA2 supports development of parks using nature-based solutions. This is expected to bring the following benefits:

(a) Mobilizing OSR and issuance of municipal bonds help the ULBs keep up with rising expenditures and improve their fiscal sustainability and access to finance. Measures for increased OSR supported by the PforR will result in an estimated increase of OSR of US$4.5 million in NPV terms. Over time, enhanced OSR and fiscal management could allow the ULBs to mobilize more resources by accessing more and better term financing and unlock development opportunities.

(c) Significant economic and social benefits are expected from other policy and institutional reforms supported by the PforR.

To mitigate these risks and strengthen the sustainability of investments and services, the following activities will be supported by DLIs and by the IPF component to support the strengthening of relevant state and ULB institutions.

Communication activities including demand management, which all contribute to a rational water use.

The implementation of volumetric tariff for billing purposes has also been defied due to lack of suitable metering infrastructure as well as other social challenges.

Metering and volumetric billing will target areas where service delivery will be substantially improved.

The IFSA identified key fiduciary risks that may affect the PDO and recommended system improvement and mitigation measures that will be implemented during the life of the Program as part of the PAP.

In case of capital investments, the GoI is funding some of the schemes through AMRUT 2.0 and SBM 2.0 and these schemes are identified, and funding is demarcated.

The overall funding provided by the World Bank will be US$279 million.

Most of these activities using the life cycle costing (capital and O&M expenditure), service-level KPIs, and energy saving initiatives

The Program will fund less than one percent of the state budget every year over the next six years, thus not affecting the state finances.

The GoTN is expected to move into a revenue surplus position from FY25/26 as per the MTFP.

The state overall liabilities including off-budget borrowings were above the allowed limit of 28 percent of GSDP in the last two years and is expected to taper down.

Also, capital expenditures on an average amount to US$605 million per year, which is much larger than the Program funds, and hence the absorptive capacity for the Program is not an issue. The Program would not affect the capacity of the IAs as, on average, the DMA handles funds and projects of US$1.60 billion and the total assets of TNUIFSL as of March 2022 was US$486 million, with a net worth US$36.5 million.

For the DMA, a separate Program budget head would be created, to provide funds for transfers to the ULBs on successful completion of DLIs and for meeting its expenditure.

All payments will be done from the bank account, including transfers to the ULBs.

In case of subprojects where AMRUT/SBM funds are used, part payment will be done from the respective scheme bank accounts and balance from the Program bank account.

The ULBs have computerized accounting software as part of the Urban Tree e-governance system and accounts are generated from the software.

Based on the delegate financial powers, the key procurements will be undertaken at the state level, and contracts will be managed at various implementation levels (state/ULBs).

The web-based management information system (MIS) platform tracks each procurement activity's physical and financial progress. This system requires upgradation to integrate additional procurement metrics to aid procurement planning, include procurement KPIs to cover the procurement and contract management stages, and embed seamlessly within the overall public financial management cycle.

MAWSD has prepared an Engineering Manual (2000) for the ULBs as a day-to-day reference, particularly for works and attached a procurement document for measurement/item rate contract. Also, the IAs are required to develop and adopt the STDs for Design, Build and Operate (DBO) and PBC for use under the Program.

The procurement entities use open tendering as the preferred procurement method and widely utilize two envelopes (technical and financial).

The ULBs obtain advisory support from the TWAD Board and Chennai Metro Water Corporation for high-value contracts.

The ULBs and IAs are not maintaining the payment period.

The assessment sampled five high-value contracts from the TNSUDP The average cost estimate was INR 182.70 crore (US$22.28 million), and these contracts were awarded at a 17 percent average over the cost estimate.

Based on the lessons learned from implementation of the TNSUDP, the Program needs overall strengthening of the contract management function with adequate staff deployed and trained.

Internal controls are being practiced and are included in the financial rules supplemented by defined delegation of financial powers.

The existing audit arrangements will be used for the DMA and TNUIFSL.

Fiduciary staffing and capacity of the OMU need to be strengthened through appropriate and timely appointments and regular fiduciary training provided.

A centralized fiduciary complaint handling mechanism preferably with a web interface with clearly defined rules, roles and responsibilities, authorities, and definite timelines to resolve/process the complaints/queries is to be developed to receive and address fiduciary complaints.

These integrate additional procurement metrics with the existing web-based MIS, utilize the procurement KPIs for monitoring, and disclose it along with the contract award details.

Financial Management for IPF Component

23. For DMA, a budget head for TA component will be created based on which expenditure will be incurred.

For approved TA activities, expenditure will be incurred by TNUIFSL and all payments are made to the vendors using the project bank account.

Audit of the expenditure under the IPF component at TNUIFSL will be done by the CA firm and a separate report will be shared with the Bank within nine months from close of the quarter.

The initial PP also prescribes National Competition Procurement (NCP) conditions agreed with GoI, the use of Government e-Marketplace (GeM) instead of RFQ for all activities with cost estimates less than or equal to US$ 100,000 equivalent, shortlisting with national consultants is up to US$2 million, and up to this threshold, the Direct RFP for the selection of consultancies is permitted (India-specific provision).

TA for the TNCRUDP will include retroactive financing for an activity procured in the TNSUDP.

Contract management of this activity will be done under the TNCRUDP STEP portal.

Consultations were held with state-level agencies, district-level officials, public representatives, officials, and engineers of ULB and other agencies involved in service delivery and regulatory aspects, and the communities.

The ESSA assessed program system consistency with the six core principles of PforR Guidance: environmental management (Core Principle 1), avoiding risks and managing natural Habitats and heritage (Core Principle 2), public and worker safety (Core Principle 3), land acquisition (Core Principle 4), indigenous peoples and vulnerable groups (Core Principle 5), and social conflict (Core Principle 6) The assessment revealed the need to strengthen systems and capacities for effective environmental and social management under the Program.

Assessment and management of environmental risks and impacts. The national/state systems or regulations are not in place to screen, avoid, assess, mitigate, or manage environmental risks and impacts of the type of activities envisaged (STPs, water treatment plants [WTPs], greening the public spaces, and interventions to ensure energy efficiency in public assets) Hence, it is recommended that to manage the environmental risks associated with the proposed Program, TNUIFSL, DMA, and ULBs shall prepare and follow systems to assess, manage, and mitigate environmental risks and impacts of all Program activities.

(a) Disposal of Treated Sewage: At the national level, the disposal standards for treated sewag prescribed by the Ministry of Environment, Forest, and Climate Change (MoEFCC) and National Green Tribunal (NGT) (more stringent) are different.

The Program shall ensure that (i) the disposal of treated sewage follows the Consent Conditions of TNPCB, which require upgrades to the designs to meet the NGT standards if the TNPCB agrees to follow them and (ii) the ULBs are encouraged to maximize reuse of treated wastewater as per existing policies. (b) Disposal of sludge: the standards for the disposal of sludge from WTP/STPs in India are yet to be prescribed by the MoEFCC, or Consent Conditions of the TNPCB

Design and review should follow the Environmental Guidelines, with required clauses in bid documents, construction supervision, monitoring and reporting on pollution and occupational health and safety, enforcement of regulations, and monitoring and reporting are hence important in all program activities. This shall be verified by Independent Environmental Audit during their verification process.

While the Land Acquisition Act 2013 provides rehabilitation and resettlement assistance to non-titleholders and compensation for temporary economic and/or livelihood losses on account of project activities, a similar legal provision does not exist in TN.

TNUIFSL has qualified and experienced environmental and social specialists (one each) in managing environmental and social risks on World Bank- and other international financial institution-funded projects. Over the last several years, TNUIFSI has systematized the use of Environmental and Social Management Framework at the project level and Environmental Impact Assessment/Environmental Management Plans at subproject levels through the World Bank-funded TNUDP III and TNSUDP

The DMA shall strengthen capacities at the state and regional levels, and ULBs shall specifically have dedicated capacities to manage the environmental risks relevant to the Program. Adequate capacity building on pollution and health and safety management and monitoring shall be ensured as part of the Program and TA.

Such risks shall be screened, assessed, and managed, by following specific design/environmental guidelines and monitoring. In addition, there may be moderate impacts associated with the laying of networks, water quality (existing pollution, or that contributed by other nearby/upstream activities), availability issues, and environmental health and safety issues of all other program activities. Environmental risks of the Program can be managed/mitigated through (a) careful screening to avoid sensitive receptors and direct and indirect pollution/safety risks; (b) designs based on standards and guidelines, with implementation guided by ESMPs, regulations presented in the environmental guidance manual; and (c) strengthening of the capacities, institutional supervision, awareness, and monitoring mechanisms.

The Program would involve construction of overhead tanks and STPs and laying of underground sewerage services and piped water supply. In congested urban areas where these activities would be undertaken, implementation of these may lead to the risk of temporary adverse economic/livelihoods impacts particularly for street vendors, roadside service providers, and so on as well as loss of/damage to structures and existence of non-titleholders occupying government lands.

The Program does not provide for household water supply connections in these areas.

In addition, actions were proposed in the PAP for strengthening the environmental and social systems such as adding procedural steps on environmental and social screening, ESMP preparation, environmental and social monitoring, and conduction of audits.