Additional Financing Report

PUBLIC

Project Number: 49107-013
November 2022

Administration of Grant
India: Integrated Urban Flood Management for the Chennai–Kosasthalaiyar Basin Project—Additional Financing

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 10 October 2022)

Currency unit	–	Indian Rupee/s (₹)
₹1.00	=	$0.012
$1.00	=	₹82.84

ABBREVIATIONS

ADB	–	Asian Development Bank
COVID-19	–	coronavirus disease
DDR	–	due diligence report
GCC	–	Greater Chennai Corporation
GEF	–	Global Environment Facility
IPC	–	infection, prevention and control
JFPR	–	Japan Fund for Prosperous and Resilient Asia and the Pacific
WASH	–	water, sanitation and hygiene

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. "FY" before a calendar year denotes the year in which the fiscal year ends, e.g., FY2022 ends on 31 March 2022.

(ii) In this report, "$" refers to United States dollars.

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PROJECT AT A GLANCE

1. Basic Data

Project Number: 49107-013

Project Name	Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin Project - Additional Financing	**Department/Division**	SARD/SAUW
Country	India	**Executing Agency**	Municipal Administration and Water Supply Dep't
Recipient	India		
Country Economic Indicators	https://www.adb.org/Documents/LinkedDocs/?id=49107-013-CEI		
Portfolio at a Glance	https://www.adb.org/Documents/LinkedDocs/?id=49107-013-PortAtaGlance		

2. Sector

Subsector(s)	ADB Financing ($ million)
Total	**0.000**

3. Operational Priorities

- ✓ OP1: Addressing remaining poverty and reducing inequalities
- ✓ OP2: Accelerating progress in gender equality
- ✓ OP3: Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ OP4: Making cities more livable
- ✓ OP6: Strengthening governance and institutional capacity

Climate Change Information

GHG reductions (tons per annum)	0
Climate Change impact on the Project	Medium

ADB Financing

Adaptation ($ million)	0.000
Mitigation ($ million)	0.000

Cofinancing

Adaptation ($ million)	0.060
Mitigation ($ million)	0.000

Sustainable Development Goals

SDG 1.5
SDG 5.5
SDG 11.5
SDG 13.a

Gender Equity and Mainstreaming

Effective gender mainstreaming (EGM) ✓

Poverty Targeting

General Intervention on Poverty ✓

4. Risk Categorization: Low

5. Safeguard Categorization

Environment: C **Involuntary Resettlement:** C **Indigenous Peoples:** C

6. Financing

Modality and Sources	Amount ($ million)
ADB	**0.000**
None	0.000
Cofinancing	**2.000**
Japan Fund for Prosperous and Resilient Asia and the Pacific - Project grant (Full ADB Administration)	2.000
Counterpart	**0.280**
Government	0.280
Total	**2.280**

Currency of Financing: US Dollar

I. BACKGROUND

1. The Asian Development Bank (ADB) approved on 23 September 2021 a loan of $251 million to the Government of India for the Integrated Urban Flood Management for the Chennai–Kosasthalaiyar Basin Project, from ADB's ordinary capital resources.[1] Loan and project agreements were signed on 26 October 2021. The loan became effective on 7 January 2022 and will close on 31 December 2027. ADB approved on 3 June 2022 the administration of a grant of $6.88 million to the Government of India for additional financing provided by the Global Environment Facility (GEF).[2] The executing agency is the Municipal Administration and Water Supply Department of the Government of Tamil Nadu. The implementing agency is the Greater Chennai Corporation (GCC).

2. The ongoing project will strengthen climate and disaster resilience in the Chennai–Kosasthalaiyar River basin. It will reduce the exposure of 1.9 million people to seasonal flooding by (i) improving climate-resilient urban flood protection infrastructure (output 1), (ii) enhancing urban flood preparedness of the GCC (output 2), and (iii) establishing measures for sustaining the operation and maintenance of the stormwater drainage system in the GCC (output 3).

3. The GCC has awarded all civil works packages and one consulting service contract under the loan, together amounting to $231.5 million or 92.2% of the loan amount. Physical progress is 37.1% on disbursement of $47.1 million, or 18.8% of the loan amount. A civil works package financed by the GEF has been floated for tender. The ongoing project complies with the safeguard requirements and covenants of the loan and grant agreements. The project is performing well and is on track to deliver expected outputs with appropriate project risk management.

II. ADDITIONAL FINANCING

A. Rationale

4. **The poor in Chennai vulnerable to pandemic and climate disasters.** Chennai is hard hit by the coronavirus disease (COVID-19), with confirmed cases exceeding 791,000 as of 9 October 2022.[3] The number of new cases has declined since January 2022 as the GCC has effectively managed the disease with testing, isolation, and treatment through its urban primary healthcare system. However, the major challenge in fighting the pandemic has been high disease transmission among the poor in densely populated pockets that lack adequate water, sanitation, and hygiene (WASH) services and associated infection prevention and control (IPC). Slum areas occupying 1%–2% of the administrative zone accounted for 15%–20% of its cases.

5. Chennai is low and flat, with its average elevation only 6.7 meters above sea level. The city is increasingly exposed to water-related climate challenges such as cyclones, storm surges, and slow drainage during the wet monsoon. About 63% of the Chennai–Kosasthalaiyar basin is flood-prone, with densely populated low-income communities highly vulnerable to extreme floods.

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[1] ADB. 2021. *Report and Recommendation of the President to the Board of Directors: Proposed Integrated Urban Flood Management for the Chennai–Kosasthalaiyar Basin Project.* Manila.

[2] The GEF grant will enhance flood retention in the Kadapakkam Lake through ecosystem restoration. It will demonstrate nature-based solutions for climate change adaptation through rejuvenation of the water body, promoting integrated flood risk management to strengthen disaster resilience, mitigate environmental degradation, and enhance biodiversity.

[3] State Control Room, Directorate of Public Health and Preventive Medicine Health and Family Welfare Department, Government of Tamil Nadu. 2022. *Media Bulleting on 9 October 2022—Daily Report on Public Health Measures Taken for COVID-19*.

The project area includes 395 slums.[4] Many of the urban poor live in substandard housing located alongside watercourses and in other low-lying areas, which are vulnerable to the dual risks of flooding and pandemic.[5] Enteric infections are also likely to increase due to climate change.

6. **Strengthened resilience through water sanitation and hygiene enhanced services.** COVID-19 is transmitted mainly through the respiration and inhalation of droplets, either directly from person to person or indirectly via surfaces.[6] WASH and physical distancing are thus central to containing COVID-19, constituting the first line of defense against loss of life and overburdened healthcare systems.[7] Handwashing is also effective against waterborne diseases. It requires, however, appropriate behavior change, washing facilities, and hygiene products.

7. Meanwhile, GCC's capacity to respond to future epidemics falls short. In the proposed project area, 65 government-run schools are the rescue centers during floods, and 17 urban primary health centers mitigate the patient load on central care centers. These facilities need a reliable water supply with adequate storage, enhanced plumbing, and renovated toilets for improved sanitation and hygiene. Communities need to enhance preparedness and response capacity to future epidemics. This can be achieved by enhancing hygiene awareness, improving surveillance systems for IPC, and establishing robust community response plans to manage the co-occurrence of epidemics and floods.

B. Project Description

8. The overall project impact and outcome remain unchanged.[8] The additional financing will be used to expand the scope of the project, particularly to improve IPC for COVID-19 and other communicable diseases through interventions to enhance WASH in low-income flood-prone urban areas of the Chennai–Kosasthalaiyar basin. It will strengthen the integrated risk management of epidemics and disasters. Under output 2, the additional financing supports the efforts of the GCC to (i) strengthen WASH services, products, and training with behavior interventions in 65 schools; (ii) enhance COVID-19 IPC and WASH measures in 17 urban primary health centers; (iii) improve the surveillance system for COVID-19 and other communicable diseases; and (iv) enhance preparedness in low-income flood-prone urban communities and their responses to future pandemics and flooding.[9] The additional financing will benefit 12,000 students (more than 95% living below the poverty line), teachers, other school staff, and, in urban primary health centers, medical and support staff, and 1,900 patients per day.

9. The proposed components meet the eligibility criteria for additional financing as they are technically feasible, economically viable, financially sound (paras. 14 and 15) and accorded high priority by the government, and consistent with the overall project objective and ADB's country partnership strategy for India, 2018–2022. The additional financing covers the activities for (i) enhanced WASH interventions in schools to improve hand hygiene, environmental hygiene, waste management, gender-sensitive and inclusive sanitation management, personal sanitation

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[4] Government of Tamil Nadu, Housing and Urban Development Department. 2016. *Tamil Nadu Slum Clearance Board Slum Survey 2015–2016.* Chennai.

[5] Several vulnerable pockets are in Tiruvotriyur, Madhavaram, and Ambattur, areas recently added to Chennai that suffered severe flooding in 2015 and COVID-19 infection.

[6] G. Howard et al. 2020. COVID-19: Urgent Actions, Critical Reflections and Future Relevance of "WaSH": Lessons for the Current and Future Pandemics. *Journal of Water and Health*. 18 (5). Pp. 613–630.

[7] Sanitation and Water for All. World Leaders' Call to Action on COVID-19. Heads of state and government and leaders of United Nations agencies, international financial institutions, civil society, private firms, and research and learning institutions issued a joint statement to prioritize water supply, sanitation, and hygiene in response to COVID-19.

[8] The project impact is Chennai City made a safe place to live and less vulnerable to disaster. The project outcome is strengthened climate and disaster resilience in the Chennai–Kosasthalaiyar River basin.

[9] Output 2 of the overall project is revised to enhancing urban flood and pandemic preparedness of the GCC.

habits, behavioral change to minimize disease transmission risk, and toilet disinfection; (ii) COVID-19 IPC and WASH measures in urban primary health centers, including improvement of IPC plans and associated staff training; (iii) surveillance system improvement through the establishment of mobile (a) medical and diagnostic units to conduct scheduled camps for spot sampling infectious disease and (b) water quality labs to strengthen water quality surveillance and wastewater epidemiology for waterborne diseases; and (iv) the development in targeted flood-prone low-income urban communities of a gender-responsive and integrated response plan for epidemics and flood disasters and the establishment of a simple system to monitor the functionality of WASH and IPC services. More details are in the project administration manual.[10]

C. Value Added by ADB

10. With ADB support, this additional financing will enhance the integrated management of epidemic and other disaster risks in low-income flood-prone urban areas. Proposed disease surveillance will provide a real-time picture of geographic and demographic trends in the local transmission of COVID-19 and other communicable diseases, generating information that will warn local governments in a timely way and enable them to act quickly to prevent the spread of disease.[11] Integrated response plans will help the city institutionalize processes and mechanisms to prepare for future epidemics and floods in vulnerable communities. These interventions will improve resilience to future crisis and strengthen the long-term sustainability of the city's coping capacity. This aligns with a proposal from a panel of senior leaders and experts on water issues and disasters for stronger and more integrated management of health and water-related disaster risk after COVID-19.[12] Good practices will be disseminated through knowledge products to provide a model for scaling up in other cities across the region.

D. Summary Cost Estimates and Financing Plan

11. The overall project is estimated to cost $482.29 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual.

Table 1: Summary Cost Estimates
($ million)

Item		Current Amount[a]	Additional Financing[b]	Total
A.	**Base Cost[c]**			
	1. Climate-resilient urban flood protection infrastructure improved in the Chennai–Kosasthalaiyar River basin	403.42	-	403.42
	2. Urban flood and pandemic preparedness of the Greater Chennai Corporation and project communities enhanced	10.07	2.05	12.11
	3. Measures for sustaining operation and maintenance of stormwater drainage system established in the Greater Chennai Corporation	7.13	-	7.13
	Subtotal (A)	**420.62**	**2.05**	**422.66**
B.	**Contingencies[d]**	**48.74**	**0.23**	**48.97**
C.	**Financing Charges during Implementation[e]**	**10.66**	-	**10.66**

[10] Project administration manual (Accessible from the list of linked documents in Appendix 2).

[11] World Health Organization. Status of Environmental Surveillance for SARS-CoV-2 Virus. *Scientific Brief*. 5 August. Studies have shown correlation between wastewater concentrations of RNA from severe acute respiratory syndrome coronavirus 2, the strain of coronavirus that causes COVID-19, and reports of COVID-19 clinical cases, suggesting that RNA concentrations can provide advance notice of COVID-19 spread 4–7 days ahead of data on confirmed cases.

[12] High-level Experts and Leaders Panel on Water and Disasters (HELP). A panel of senior leaders and experts on water issues and disasters called for measures to keep disaster-affected areas from becoming pandemic epicenters, and formulated principles to address water-related disaster risk reduction under the COVID-19 pandemic.

Item	Current Amount[a]	Additional Financing[b]	Total
Total Cost (A+B+C)	**480.01**	**2.28**	**482.29**

Note: Numbers may not sum precisely because of rounding.
[a] Refers to the original amount, including the loan, GEF grant, and the associated government contributions.
[b] Includes taxes and duties of $0.22 million to be financed by the government. Such amount does not represent an excessive share of the project cost.
[c] Loan component in April 2021 prices at an exchange rate of $1.00 = ₹74.80; GEF grant component in November 2021 prices at an exchange rate of $1.0 = ₹74.00; and Japan Fund for Prosperous and Resilient Asian and the Pacific grant component in June 2022 prices at an exchange rate of $1.0 = ₹78.14.
[d] Physical contingencies are computed at 5.0% for civil works and equipment. Price contingencies are computed at 1.6%–1.8% on foreign exchange costs and 4.0%–5.8% on local currency costs, and include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[e] Includes interest and commitment charges. Interest during construction for the Asian Development Bank loan has been computed at the 5-year United States dollar fixed-swap rate plus a spread of 0.5% and a maturity premium of 0.1%. Commitment charges for the Asian Development Bank loan are 0.15% per year, to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

12. The summary financing plan is in Table 2. The Japan Fund for Prosperous and Resilient Asian and the Pacific (JFPR) will provide the additional grant cofinancing of $2.00 million to be administered by ADB. JFPR will finance expenditures in relation to (i) civil works and equipment, (ii) consulting services, (iii) incremental administrative cost, and (iv) part of contingencies. Climate adaptation under the additional financing is estimated to cost $0.07 million for the development of a gender-responsive and integrated response plan for epidemics and flood disasters.[13]

Table 2: Summary Financing Plan

	Current[a]		Additional Financing		Total	
Source	**Amount** ($ million)	**Share of Total** (%)	**Amount** ($ million)	**Share of Total** (%)	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank						
Ordinary capital resources (regular)	251.00	52.29	-	-	251.00	52.04
GEF (grant)[b]	6.88	1.43	-	-	6.88	1.43
JFPR (grant)[b]	-	-	2.00	87.72	2.00	0.41
Government	222.13	46.28	0.28	12.28	222.41	46.12
Total	**480.01**	**100.00**	**2.28**	**100.00**	**482.29**	**100.00**

GEF = Global Environment Facility, JFPR = Japan Fund for Prosperous and Resilient Asia and the Pacific.
[a] Refers to the original amount, including the loan, GEF grant, and the associated government contributions.
[b] Administered by the Asian Development Bank.
Source: Asian Development Bank estimates.

E. Implementation Arrangements

13. The Municipal Administration and Water Supply Department will remain the executing agency, and GCC the implementing agency. Project management and implementation units in GCC will retain their responsibilities. One deputy project director will be added to the project management unit to oversee the JFPR component. Four dedicated staff will be added to the project implementation unit and assigned specifically for grant components.[14] The implementation period is from November 2022 to October 2025. The grant closing date is 30 April 2026. Advance contracting and retroactive financing of civil works, equipment, and consulting services will apply. Disbursement of grant proceeds will follow ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB. Implementation arrangements are described in detail in the project administration manual.

[13] JFPR will finance $0.06 million (85.7%) in adaptation costs and the government will finance $0.01 million (14.3%).
[14] These additional GCC staff include one health officer, one education officer, and two executive engineers.

F. Due Diligence

14. This grant project will be a pilot intervention of ADB COVID-19 and WASH nexus support in India and a model for scaling up an integrated response to epidemics and disasters in urban areas across South Asia. Following the good practices of the ongoing project in Nepal, this project will ensure active community participation to maximize the benefits of target beneficiaries.[15] Proposed interventions to enhance IPC through WASH measures are firmly based on evidence and expanded toward blocking environmental pathways of COVID-19 transmission.

15. The overall project remains economically viable with additional unquantifiable benefits from proposed interventions, such as reduced healthcare costs and avoided economic disruption. Financial sustainability risk remains *moderate* and financial management risk *substantial*. Both can be properly managed with measures and actions proposed in the ongoing project.[16] All procurement of goods and works and consultant recruitment will adhere to the ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time).

16. The additional financing is classified *effective gender mainstreaming.* Awareness campaigns will help slum dwellers, including women and girls, better appreciate WASH services. The project will encourage women and girls living in slums to use health services such as mobile testing facilities. A gender-responsive and socially inclusive integrated plan for response to epidemics and floods will ensure that poor communities are safely evacuated and provided with basic services in rescue camps. It will address the specific requirements of women and girls, people with disabilities, and older persons in both rescue operations and rehabilitation.

17. The additional financing is *environmental safeguard category C*. The proposed grant comprises small-scale works unlikely to have any notable adverse environmental impacts, as confirmed by the draft due diligence report (DDR). The design of septic tanks includes measures to prevent groundwater contamination from seepage, and portable incinerators for sanitary napkin disposal will have air pollution control unit to meet emission standards. The draft DDR includes an environmental code of practice for construction and will form part of civil works contract. The GCC will update the DDR per final design and submit to ADB for clearance before contract award.

18. Safeguard categorizations for additional financing are *involuntary resettlement C* and *indigenous peoples C*. The proposed civil works to construct or improve toilets and WASH facilities are on GCC land and so unlikely to have involuntary resettlement impacts, as confirmed by the draft DDR. The report will be updated based on final detailed design, reflect site or design changes if any, and be submitted to ADB for clearance before contract award. No impacts on indigenous people are anticipated.

III. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the administration by the Asian Development Bank of a grant not exceeding the equivalent of $2 million to India for the additional financing of the Integrated Urban Flood Management for the Chennai–Kosasthalaiyar Basin Project, to be provided by the Japan Fund for Prosperous and Resilient Asia and the Pacific.

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[15] ADB. 2021. *Grant Assistance Report for Nepal: Prevention and Control of COVID-19 through WASH and Health Initiatives in Secondary and Small Towns.* Manila.

[16] The GCC has assured its provision of adequate budget for consumables needed to operate and maintain assets created under the project.

REVISED DESIGN AND MONITORING FRAMEWORK

The revised design and monitoring framework strikes out content for deletion and underlines content to be added.

Impacts the Project is Aligned with Chennai City made a safe place to live in, with reduced vulnerability to disaster (City Disaster Management Plan)[a]			
Results Chain	**Performance Indicators**	**Data Sources and Reporting Mechanisms**	**Risks and Critical Assumptions**
Outcome Climate and disaster resilience in the Chennai–Kosasthalaiyar River basin strengthened	By 2028: 1.9 million people living in the flood-prone areas of the Chennai–Kosasthalaiyar River basin protected from flood risk from a 1:2-year return period rainfall (2021 baseline: 0) (OPs 3.2 and 4.1)[b]	GCC reports, including rainfall data, flood area records, and flood-affected people records	A: The precipitation level and sea level rise will be within climate change projections under the RCP 8.5 scenario. R: Delay in the completion of other planned water body restoration and channel rehabilitation projects under the Public Works Department may limit full realization of expected benefits[c]
Outputs 1. Climate-resilient urban flood protection infrastructure improved in the Chennai–Kosasthalaiyar River basin	By 2027: 1a. 588 km of new stormwater drains constructed (2021 baseline: 0) (OPs 1.3.1; 3.2.5; and 4.1.2) 1b. 175 km of stormwater drains upgraded (2021 baseline: 0) (OPs 1.3.1; 3.2.5; and 4.1.2) 1c. 11 km stretches in four primary channels (Ambattur, Korattur, Kadappakkam, and Ariyallur) rehabilitated (2021 baseline: 0) (OPs 1.3.1; 3.2.5; and 4.1.2) 1d. One stormwater pumping station of 200 kW upgraded, and one new stormwater pumping station of 200 kW commissioned (2021 baseline: 0) (OPs 1.3.1; 3.2.5; and 4.1.2) 1e. 23,000 catchpits with rainwater harvesting structures constructed (2021 baseline: 0) (OPs 1.3.1; 3.2.5; and 4.3.1) 1f. Four GCC disaster relief camps (one per project zone) rehabilitated, with gender-responsive and socially inclusive features (2021 baseline: 0) (OPs 1.3.1; 2.5.2; and 4.1.2)[d] 1g. By 2025, water retention capacity of Kadapakkam Lake (55 hectares) augmented to 2.2 million cubic meters with nature-based solutions and EWCD-friendly recreational facilities[e] (GEF-funded). (2022 baseline: 1.1 million cubic meters) (OP 1.3.1; 2.5.2; 3.3.3; and 4.3.1)	1a.–1g. Project quarterly progress report, GCC annual reports	R: Heavy monsoons exceeding projections may delay construction. R: Surge in prices of materials and prolonged impact of COVID-19 on movement of goods and services may result in cost overrun and delay in project completion.

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
2. Urban flood and epidemic preparedness of the GCC and project communities enhanced	**Integrated urban planning** 2a. By 2024, guidelines for integrating flood hazard zoning with spatial plans and land use, building and development regulations endorsed by the GCC (2021 baseline: no guideline) (OPs 3.2.4 and 4.3.1) 2b. By 2025, baseline FRI and FRI framework for four river basins and the entire Chennai City established (2021 baseline: not applicable) (OP 4.2.1) 2c. By 2024, manual for green infrastructure design, including rainwater harvesting, endorsed by the GCC (2021 baseline: not applicable) 2d. By 2025, investment readiness road map to replicate nature-based solutions of Kadapakkam Lake adopted for at least one other city in Tamil Nadu (GEF-funded). (2022 baseline: not applicable) (OP 3.3.4) **Citizen's engagement and awareness** 2e. By 2025, FCO for Chennai City operationalized (2021 baseline: not applicable) (OP 6.2.4) 2f. By 2025, at least 200 persons (including at least 50% women) in project community reported increased knowledge on green infrastructure schemes, including rainwater harvesting; flood risks and impacts; and the links between flooding, solid waste management, sewerage service house connections, and the protection of water bodies (2021 baseline: not applicable) (OPs 2.5 and 4.3.2) **Institutional capacity building and knowledge dissemination** 2g. By 2025, at least 50% of GCC technical staff (Storm Water Drain Department) in the project area, including 80% of women technical staff, reported increased knowledge on planning and design for stormwater drainage systems and management of solid waste and flood risks (2021 baseline: 0) (OPs 2.2; 4.3.2; and 6.1.1) 2h. By 2026, at least two knowledge products on good practices and lessons on integrated urban flood management published and presented to at least 100 key government officials and sector experts, of whom at least 80 participants reported increased knowledge (2021 baseline: 0) 2i. By 2025, at least 50 participants from Indian cities (including at least 40% women) reported increased knowledge on nature-based urban flood risk management through workshops and	2a. and 2c. GCC council resolutions 2b.,~~, and~~ 2d., and 2k.–2n. Project quarterly progress report 2e.–2j. Pre- and post-training survey and assessment	R: Competing priorities and turnover of key GCC staff disrupt business continuity and delay completion of target outputs.

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
	trainings (GEF-funded) (2022 baseline: 0) (OP 2.5) 2j. By 2025 at least 10 officers of GCC and Government of Tamil Nadu (including at least 40% women) reported increased knowledge on integrated sustainable urban development through global and national dialogues (GEF-funded) (2022 baseline: 0) (OPs 2.5; 4.3.2; and 6.1.1) **Integrated flood and epidemic risk management** 2k. By 2025, gender-responsive and socially inclusive WASH measures and practices established in 65 schools (2022 baseline: 0) (OPs 1.3.1, 2.4.1, and 4.1.1)[f] 2l. By 2025, gender-responsive and socially inclusive COVID-19 infection prevention and control and WASH measures and practices established in 17 urban primary health centers. (2022 baseline: 0) (OPs 1.3.1, 2.4.1, and 4.1.1)[f] 2m. By 2025, surveillance system consisting of eight mobile COVID-19 and communicable diseases diagnostic laboratories and four mobile water quality testing laboratories, with gender-responsive and socially inclusive features operationalized in flood-prone urban low-income communities (2022 baseline: 0) (OPs 1.1.2 and 2.2.2)[g] 2n. By 2025, integrated response plan with gender-responsive and socially inclusive features for epidemics and flood disasters for flood-prone urban low-income communities developed (2022 baseline: 0) (OPs 3.2.2, 3.2.4, and 6.2.4)[h]		
3. Measures for sustaining O&M of stormwater drainage system established in the GCC	3a. By 2023, a key performance indicator-based stormwater drainage operation performance improvement system established in 12 out of 15 zonal offices of the GCC (2021 baseline: not applicable) (OP 6.2.1) 3b. By 2025, Sustainable Operation and Maintenance Improvement Plan of stormwater drainage system with gender-responsive and socially inclusive features approved by the GCC (2021 baseline: not applicable) (OPs 2.3.2; 3.2.2 and 4.3.1)[g] 3c. By 2024, road map for municipal resource mobilization approved by the GCC (2021 baseline: 0) (OP 4.2.2) 3d. By 2025, at least 50% of GCC technical staff (Storm Water Drain Department) in the project area, including 80% of women technical staff, reported increased knowledge on sustainable	3a.–3c. GCC annual report, GCC budget 3d.–3e. Pre- and post-training survey and assessment	R: Change in leadership may affect momentum on reform program.

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
	O&M of stormwater drainage systems and management of solid waste and flood risks (2021 baseline: 0) (OPs 2.2; 4.3.2; and 6.1.1) 3e. By 2025, 100 drain desilting workers and conservancy workers (including at least 50 women workers) reported increased knowledge and skills of cleaning and maintaining stormwater drainage systems (2021 baseline: 0) (OP 2.2)		

Key Activities with Milestones

1. Climate-resilient urban flood protection infrastructure improved in the Chennai–Kosasthalaiyar River basin

1.1 Award all works contracts by June 2021
1.2 Complete all civil works funded by the loan by June 2027
1.3 Complete augmentation of capacity of Kadapakkam Lake funded by the GEF grant by December 2024

2. Urban flood and epidemic preparedness of the GCC and project communities enhanced

2.1 Draft guidelines for integrating flood hazard zoning with spatial plans and land use, building and development regulations by June 2023
2.2 Develop FRI for four basins and Chennai City by December 2022
2.3 Draft and adopt FRI framework for four basins and Chennai City by December 2024
2.4 Draft green infrastructure design manual by December 2023
2.5 Draft investment readiness road map to replicate nature-based solutions of Kadapakkam lake by December 2025.
2.6 Draft concept paper and detailed feasibility report for FCO by December 2023
2.7 Prepare and adopt FCO by December 2024
2.8 Conduct knowledge-building workshops on green infrastructure, including rainwater harvesting, by June 2025
2.9 Conduct six awareness workshops on flood risks and impacts and the links between flooding, solid waste management, sewerage house service connections, and the protection of water bodies by June 2024
2.10 Conduct knowledge-building workshops on the planning and design of urban drainage systems by June 2025
2.11 Prepare knowledge products on the good practices and lessons of the project, and conduct a dissemination workshop by July 2026
2.12 Conduct knowledge dissemination workshops on nature-based solutions for urban water body rejuvenation by December 2025
2.13 Participate in Global and National dialogues organized by UrbanShift by December 2025.
2.14 Award contracts for WASH in schools and urban primary health centers and a surveillance system by December 2022
2.15 Complete works related to WASH in schools and urban primary health centers and a surveillance system by June 2025
2.16 Develop a response plan for epidemics and flood disasters for flood-prone urban low-income communities by October 2025

3. Measures for sustaining O&M of stormwater drainage system established in the GCC

3.1 Prepare and adopt baseline key performance indicators by December 2022
3.2 Prepare an inclusive sustainable O&M improvement plan by December 2024
3.3 Draft a road map for municipal resource mobilization by December 2023
3.4 Conduct knowledge-building workshops on sustainable operation and management of urban drainage systems by June 2025
3.5 Conduct training on cleaning and maintaining stormwater drainage systems for drain desilting workers and conservancy workers by June 2025

Project Management Activities

Mobilize project support consultant by July 2021
Mobilize institutional strengthening and reforms consultant by November 2021
Mobilize individual consultants supporting GEF-funded components by September 2022
Mobilize implementation consultant by January 2023
Implement gender equality and social inclusion action plan from July 2021 to June 2027
Review missions, midterm review, and preparation of progress and annual reports

Inputs

Asian Development Bank: $251.00 million (regular ordinary capital resources loan)
Cofinancing from Global Environment Facility: $6.88 million (grant)

Cofinancing from Japan Fund for Prosperous and Resilient Asia and the Pacific: $2.0 million (grant) Government: ~~$222.13~~$222.41 million

A = assumption; COVID-19 = coronavirus disease; EWCD = elderly, women, children, and persons with disabilities; FCO = flood citizen observatory; FRI = flood resilience index; GCC = Greater Chennai Corporation; GEF = Global Environment Facility; km = kilometer; kW = kilowatt; O&M = operation and maintenance; OP = operational priority; R = risk; RCP = Representative Concentration Pathway; WASH = water, sanitation, and hygiene.

[a] Greater Chennai Corporation. 2017. *City Disaster Management Plan*. Chennai.

[b] A 1:2-year return period rainfall corresponds to rainfall intensity of 68 millimeters per hour. People protected from flood risk is the number of people not subjected to any kind of inundation on days when the rainfall intensity published by India Meteorological Department's Redhills rain gauging station is less than 68 millimeters per hour. It is calculated by deducting the population of reported inundation areas within the project area as per GCC records from the total population of the project area. The minimum number from such daily calculations in a year is reported as the project outcome.

[c] Other planned projects include (i) water body restoration in Ambattur lake, Korattur lake, Retteri lake, Sadayankuppam lake, Ariyalur lake, Kadapakkam lake, Madhavaram Periyathoppu lake, and Kolathur lake; and (ii) channel rehabilitation in Ratteri South channel, Ratteri North channel, and Puzhal channel.

[d] A gender-responsive and socially inclusive relief camp will have the following features: (i) at least one female worker or caretaker with supplies of sanitary napkins, soap, and a basic first aid kit with medicines; (ii) safe spaces (affording privacy and security) for women, especially nursing mothers and adolescent girls; (iii) separate, well-lit, and clean toilets for men and women, with barrier-free access for people with disabilities and older persons; water, hooks, ledges, and shelves in the toilet; (iv) provisions for washing and disposal of menstrual products; (v) regular (daily) visits by female student volunteers and awareness generation on mechanism to address women's vulnerability to violence and trafficking; (vi) regular interaction between volunteers and people with disabilities within the relief camp; and (vii) helpline numbers displayed on walls.

[e] EWCD-friendly features include safety rails, signages, child, elderly and persons with disability compatible toilet facilities, separate toilet facilities for women and men, accessible pathways, side benches, drinking water facilities, rain shelters, illumination along pathways, display of emergency contact numbers, etc.

[f] Schools and urban primary health centers supported under the project will provide separate sanitation facilities for girls and women and all-gender toilet(s) with disability-friendly access. WASH community outreach material (which modify and transform gender stereotyping) will be developed and disseminated in 65 schools and 17 urban primary health centers. WASH trainings in 65 schools and 17 urban primary health centers will include separate sessions with girls and women on menstrual hygiene management.

[g] Women and girls from low-income communities will be given priority to access mobile diagnostic laboratories.

[h] The integrated response plan will include special early warnings for locked-down communities to ensure their effective evacuation or sheltering in place and assurance of safety from disasters to prevent panic, physical distancing in relief camps, the prioritized provision of WASH to rescue and health centers, and emergency management arrangements to sustain health services provided by primary and critical care facilities. It will include provisions for addressing the specific requirements of women and girls, people with disabilities, and older persons—both in rescue operations and rehabilitation.

[i] The Sustainable Operation and Maintenance Improvement Plan identifies the institutional, technical, financial, and social requirements to ensure the sustainable operation and maintenance of the stormwater drainage system. It will include community responsibility and participation, including women's participation.

Contribution to Strategy 2030 Operational Priorities

Expected values and methodological details for all OP indicators to which this operation will contribute results are detailed in Contribution to Strategy 2030 Operational Priorities (accessible from the list of linked documents in Appendix 2).

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=49107-013-2

1. Grant Agreement
2. Project Agreement
3. Sector Assessment (Summary): Water and Other Urban Infrastructure and Services (Urban Flood Protection)
4. Project Administration Manual
5. Financial Analysis
6. Economic Analysis
7. Summary Poverty Reduction and Social Strategy
8. Risk Assessment and Risk Management Plan
9. Contribution to Strategy 2030 Operational Priorities
10. Climate Change Assessment
11. Gender Equality and Social Inclusion Action Plan
12. Environmental Due Diligence Report
13. Land Acquisition and Resettlement Due Diligence Report