



**ASIAN INFRASTRUCTURE  
INVESTMENT BANK**

P000453  
March 25, 2021

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**Project Document  
of the Asian Infrastructure Investment Bank**

**Sovereign-backed Financing**

**Republic of India**

**Kerala Solid Waste Management Project**

**Currency Equivalents**  
(As at September 25, 2020)

Currency Unit – Indian National Rupee (INR)  
INR1.00 = USD0.014  
USD1.00 = INR73.68

**Borrower's Fiscal year**  
April 1 – March 31

**Abbreviations**

AIIB	Asian Infrastructure Investment Bank
BCC	Behavioral Change Communications
BDW	Biodegradable Waste
CA	Constitutional Amendment
COVID-19	Coronavirus Infectious Disease of 2019
CPCB	Central Pollution Control Board
DPMU	District-level Project Management Unit
EA	Economic Analysis
ES	Environmental and Social
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESIA	Environmental and Social Impact Assessment
ESP	Environmental and Social Policy
FPICon	Free, Prior and Informed Consultation
GBV	Gender-based Violence
GHG	Greenhouse Gas
GoK	Government of Kerala
HKS	Haritha Karma Sena
IBRD	International Bank for Reconstruction and Development
IEC	Information Education Communication
IFR	Interim Financial Reports
IP	Indigenous People
IPF	Investment Project Financing
KLGS DP	Kerala Local Government Service Delivery Project
KSAD	Kerala State Audit Department
KSWMP	Kerala Solid Waste Management Project
LSGD	Local Self Government Department Division
M&E	Monitoring and Evaluation
MCF	Material Collection Facility
NBDW	Non-biodegradable Waste
NBDW	Non-biodegradable Waste
O&M	Operations and Maintenance
OP	Operational Policy
PIE	Project Implementing Entity

PIM	Project Implementation Manual
PIU	Project Implementation Unit
PMC	Project Management Consultant
PPM	Project-affected People's Mechanism
RPF	Resettlement Policy Framework
PPP	Public Private Partnership
RRF	Resource Recovery Facility
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
SM	Suchitwa Mission
SPMU	State-level Project Management Unit
SWM	Solid Waste Management
TA	Technical Assistance
TDF	Tribal Development Framework
TPD	Tons of waste Per Day
TSC	Technical Support Consultant
ULB	Urban Local Bodies
WB	World Bank
WSA	Water-shed Areas

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## 1. Summary Sheet

Project No.	PD000453-IND
Project Name	Kerala Solid Waste Management Project
AIIB Member	Republic of India
Borrower	Republic of India
Project Implementing Entity	State of Kerala, through Suchitwa Mission (SM) under its Local Self Government Department (LSGD)
Sector	Urban
Sub-sector	Solid Waste Management
Project Objective	To strengthen the institutional and service delivery systems for Solid Waste Management (SWM) in Kerala.
Project Description	The project will provide a combination of technical and financial assistance to the participating ULBs and to the state agencies. The project will support all 93 ULBs across 14 districts in Kerala in improving access to efficient and reliable delivery of SWM services to their populations.
Implementation Period	Start Date: June 1, 2021 End Date: June 30, 2027
Expected Loan Closing Date	June 30, 2027
Cost and Financing Plan	Project cost: USD300 million Financing Plan: (i) Asian Infrastructure Investment Bank (AIIB) Loan: USD105 million (35 percent) (ii) International Bank for Reconstruction and Development (WB) Loan: USD105 million (35 percent) (iii) Govt of Kerala: USD90 million (30 percent)
Size and Terms of AIIB Loan	USD105 million. A Sovereign-Backed Loan with the final maturity of 13.5 years, including a grace period of 6 years, at AIIB's standard interest rate for sovereign-backed variable spread loans.
Cofinancing (Size and Terms)	WB: USD105 million.
Environmental and Social Category	World Bank (WB) Category A (equivalent to Category A if AIIB's ESP were applicable)
Risk (Low/Medium/High)	High
Conditions of Effectiveness	(i) signing of Project Co-lenders' Agreement between WB and AIIB; and (ii) effectiveness of the Financing Agreement between the WB and the Government of India (Gol).

Key Covenants/Conditions for Disbursement	<p>GoK, through SM, shall:</p> <p>(i) establish and maintain, until the completion of the project, the Project Steering Committee (PSC), the State-level Project Management Unit (SPMU), the District-level Project Management Units (DPMU), and recruit the Project Management Consultant (PMC) as well as the independent verification agent, with terms of reference, functions and resources acceptable to the WB and AIIB;</p> <p>Participating ULBs shall:</p> <p>(i) ensure that project activities are implemented according to the Participation Agreement (PA) between SM and each participating ULB.</p> <p>Conditions for disbursement for Component B will include: (i) the PSC, the SPMU and the 14 DPMUs have been established and the PMC has been recruited; (ii) one PA has been signed; (iii) there is no default by the Project Implementing Entity or a participating ULB under applicable safeguard obligations at that time; (iv) the Project Implementation Manual (PIM) has been adopted, in form and substance satisfactory to the WB and AIIB; and (v) the annual work plan and budget for the period has been prepared.</p>
Retroactive Financing (Loan % and dates)	n/a
Policy Waivers Requested	n/a
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that AIIB is in compliance with the policies applicable to the Project.

President	Jin Liqun
Vice President	D.J. Pandian
Director General	Rajat Misra (Acting)
Manager	Rajat Misra
Team Leader	Sangmoo Kim, Sr. Investment Operations Specialist (Urban)
Team Members	<p>Amy Chua, Environmental Specialist</p> <p>Ankur Agrawal, Young Professional</p> <p>Bernadette Ndeda, Procurement Specialist</p> <p>Christopher Damandl, Legal Counsel</p> <p>Shodi Nazarov, Financial Management Associate</p> <p>Susrutha Goonasekera, Sr. Social Development Specialist</p>

## 2. Project Description

### A. Project Overview

1. **Project Objective.** The project's objective is to strengthen the institutional and service delivery systems for Solid Waste Management (SWM) in Kerala. The project will help: (i) improve environment, public health, and urban living conditions; (ii) contribute to climate change mitigation and adaptation through an integrated SWM service delivery model, climate and disaster resilient infrastructure design, waste minimization, resource recovery and reuse;<sup>1</sup> and (iii) strengthen the government's capacity to plan for and provide effective waste management services and improve the institutional and financial systems at ULB level.

2. **Project Description.** India's ongoing urbanization<sup>2</sup> and economic growth have led to a rapid increase in municipal waste generation,<sup>3</sup> while its proper handling, transport, treatment and safe disposal remains problematic. Kerala is no exception as the second most urbanized state<sup>4</sup> in the country. Rapid urbanization in Kerala is not adequately translating into economic opportunities and high living standards due in large part to deficient urban infrastructure and poor urban management. SWM services in Kerala are particularly constrained owing to lack of adequate infrastructure and service delivery systems across the SWM value chain. If not addressed quickly, the SWM challenges will impede economic growth and may disrupt successful urbanization. An integrated and modernized SWM system, covering waste collection, transportation, processing and disposal, is urgently needed in Kerala.

3. Urban Local Bodies (ULBs) in Kerala, despite mandated to provide SWM services, lack resources and institutional capacity<sup>5</sup> to comply with the national and local SWM rules. Numerous state-level agencies<sup>6</sup> have been created and/or tasked to strengthen the SWM service delivery systems in ULBs. However, weak coordination of

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<sup>1</sup> The project will contribute towards climate mitigation by providing an integrated SWM service delivery model which includes enhanced waste collection, treatment and safe disposal facilities, which will reduce methane generation from business-as-usual scenario. For the climate change adaptation, the project support will focus on waste minimization and treatment, and design and site the SWM infrastructure considering climate and disaster resilient factors thereby reducing the vulnerability of SWM facilities to climate risks. The enhanced service delivery model will also be designed to handle the surges in waste generation due to extreme weather events.

<sup>2</sup> From 2001 to 2011, India's urban population grew by 86.1 million, equivalent to the entire population of Germany. The UN projects the country will add another 100 million new urban residents every decade through 2050.

<sup>3</sup> In general, the amount of waste generated in urban area is proportional to the population and the average income of the people. In addition, other factors such as climate, level of education, social and public attitude also affect the amount as well as composition of waste.

<sup>4</sup> In 2011, 47.7 percent of Kerala's total population was already urban (26.0 percent in 2001). share of the urban population is expected to increase to 68.9 percent by 2030, according to 2030 Kerala Perspective plan by the State Planning Board.

<sup>5</sup> Kerala is one of the leading states in the implementation of 74<sup>th</sup> Constitutional Amendment and has decentralized 17 out of 18 urban functions to the ULBs. Given Kerala's heavy reliance on decentralized systems in a largely unregulated manner, compliance with the SWM regulations is weak. Involvement of multiple agencies has weakened the accountability mechanisms at state and local levels. The monitoring mechanisms of state's regulatory institutions are inadequate to hold the service delivery institutions and citizens accountable for illegal practices (e.g., dumping, open burning). Financially, ULB fiscal architecture is not conducive for addressing SWM issues. The annual planning guidelines do not require ULBs to undertake a multi-year capital investment planning and implementation approach that is critical for addressing core SWM service delivery priorities. The funds for SWM prescribed in the annual planning guidelines are also insufficient to meet the SWM investment requirements (both capital and O&M).

<sup>6</sup> It includes Hariitha Karma Sena (HKS) for primary waste collection; Suchitwa Mission (SM) for technical support, monitoring and capacity building; and the Clean Kerala Company (CKC) for the storage and treatment of waste, primarily plastic waste.

these agencies with the ULBs and between them has led to fragmentation across the value chain and poor accountability to citizens. Critical support to the ULBs is needed in assuming their functional mandate and developing systems and capacities to deliver essential SWM infrastructure and services.

4. The project will support the government to improve the SWM situations in Kerala through a bi-pronged approach of: (i) providing SWM infrastructure investments at both regional and municipal-levels; and (ii) providing institutional and capacity development support to the participating ULBs as well as the state agencies. The project will provide a combination of technical and financial assistance to the participating ULBs and to the state agencies. The project will support all 93 ULBs across 14 districts in Kerala in improving access to efficient and reliable delivery of SWM services to their populations.

5. **Expected Results.** The project objectives will be evaluated against the following key result indicators: (i) number of people with access to improved SWM services; (ii) solid waste disposed safely in engineered landfills; and (iii) number of ULBs that accessed incentive grants for improving SWM services. A results framework containing result indicators, and monitoring and reporting arrangements is attached in Annex 1.

6. **Expected Beneficiaries.** Three main target groups will directly benefit from the project in the 93 ULBs: (i) over 7.5 million residents, through increased access to improved SWM services and environmental, social and health conditions; (ii) municipal staff, through improved institutional capacity for planning, implementing, and financing systems for SWM; and (iii) sanitation workers through improved working conditions and better livelihood opportunities in waste management sector.

## B. Rationale

7. **Strategic fit for AIIB.** The project is consistent with AIIB's mandate and thematic priority to promote green infrastructure. The project is also aligned with the Sustainable Cities Strategy that targets promoting integrated development, providing basic infrastructure, and improving city resilience. The project would result in improved access to critical SWM services which is expected to bring significant economic benefits with high social value. It is also expected to help improve the efficiency and sustainability of SWM investments by strengthening institutional systems and capacities of the participating ULBs. The project is expected to help address the following challenges, among others, facing the ULBs in Kerala.

- (i) Lack of waste collection and disposal capacity. Despite the Government of Kerala (GoK)'s efforts in improving the SWM system, waste collection and disposal capacity is still limited. Less than half of total waste generated in urban Kerala is collected, while uncollected waste is often informally burned, buried, or illegally dumped in streets, public spaces, drainage channels, and waterways. This has resulted not only in serious public health hazards<sup>7</sup> and the contamination of the

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<sup>7</sup> Solid waste burning can be a significant and costly source of air pollution in urban areas. Waste burning contributes to respiratory infections for urban residents resulting in significant health damages and lost working



environment, including air, water and soil, but also the blocking of major drainage channels and sewerage networks. The state has currently no engineered landfills and/or centralized waste management facilities for municipal waste.

- (ii) Plastic waste and marine litter. Currently, a small portion of the plastic waste (3 percent<sup>8</sup>) is collected and transported to the processing facilities, where it is shredded, baled and sold for road construction and to recyclers. The remaining plastic leaks into the environment, causing a plethora of problems. It pollutes marine life, and affects economic activities such as tourism, fishing etc. The project will adopt a mix of preventive and responsive measures to address mismanaged plastic waste problems in urban areas (particularly in ULBs along the coastline or adjacent to water bodies).
- (iii) Climate and disaster resilience. The coastal towns that are prone to floods, sea level rise and storm surges are particularly at high risk due to mismanaged solid waste problem. Uncollected wastes clog the drainage systems, block waterways and exacerbate flooding. It also contaminates underground water. The project will fully mainstream climate change and disaster resilience throughout its entire investment cycle. Specifically, SWM infrastructure envisioned under components A and B will incorporate resilient planning, sustainable design, construction and O&M of facilities in areas prone to extreme weather events, adapting to the climate change vulnerability and disaster risks. Also, improvements in waste management under the project will prevent leachate, blocking of waterways and hence would address flood and pollution.
- (iv) COVID-19 Pandemic. The existing biomedical waste management systems in urban areas are inadequate to manage the medical waste in compliance with the national biomedical waste management rules and the new national COVID-19 medical waste management guidelines issued by the Central Pollution Control Board (CPCB). Under the project, ULBs will develop institutional systems and undertake critical capital and maintenance expenditures required to sustain adequate waste management, sanitization, public hygiene, and cleanliness activities for better health risk preparedness.
- (v) Private sector participation in SWM. The role of the private sector across the SWM value chain in Kerala is limited due to: (i) the limited opportunities at a scale that ensures financial viability; (ii) high-risk perception by private operators due to the history of public protests; and (iii) weak project development and contractual modalities that lack objective performance metrics, clearly defined obligations, and risk sharing mechanisms, among others. The project seeks to enhance private sector participation in SWM services by: (i) providing technical assistance for robust project structuring and adoption of performance based contracting for SWM services; (ii) support for formalizing the regional coordination mechanisms for PPP projects through inter-municipal agreements with clearly defined responsibilities and cost-sharing frameworks; (iii) building SM and ULB's capacity for robust PPP

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days. In addition, uncollected waste in municipal areas leads to the promotion of pests and diseases, lower property values and decreases the city's attractiveness to outside investments. Poor and vulnerable populations are the most likely to suffer from inadequate sanitation due to uncollected waste, which can be a heavy financial burden through health-related expenditures and lost productivity.

<sup>8</sup> GoK survey, 2018.

contract management and supervision systems; (iv) setting up revenue security and viability gap funding mechanisms in sub-project structures to reduce the private sector's financial risks through escrow and intercept mechanisms; (v) strengthening regulatory enforcement mechanisms to enhance compliance with technical specifications and service level benchmarks; (vi) facilitating frequent interaction, as well as project sounding events/roadshows with private sector during the project development and contracting cycle; and (vii) setting up robust monitoring and grievance addressal mechanisms for PPP sub-projects.

8. The project is also aligned with national priorities for providing sustainable urban infrastructure and services<sup>9</sup> including SWM as well as the core priorities under the Rebuilding Kerala Initiative of the GoK undertaking multi-year and resilient infrastructure investments. The project is also consistent with the state's SWM strategy<sup>10</sup> that follows an integrated service delivery approach. The project will help improve the quality of urban environmental conditions and achieve the environmental targets of the government's plan. The project supports the GoK's climate policy objectives as articulated in the State Action Plan on Climate Change. The project also supports Kerala's efforts in managing COVID-19 pandemic by supporting development of adequate waste management, sanitization, public hygiene and cleanliness activities and specifically improving existing biomedical waste management systems in urban areas.<sup>11</sup>

9. **Value addition by AIIB.** In the context of the worsening SWM conditions and mandated critical roles to be played by ULBs in SWM, the project will help close financial gaps in essential SWM infrastructure with greater coverage of ULBs and strengthen institutional systems at the local level. The project will achieve desired outcomes by taking an integrated service delivery value chain approach for SWM, and by taking a regional approach for efficient SWM processing and disposal. AIIB, together with the WB, will provide necessary support to enhance quality of environmental and social management for project ULBs. AIIB team will also help ULBs adopt lessons learned from similar projects elsewhere and reflect them throughout the project life cycle.

10. **Value addition to AIIB.** The project engagement will provide a good opportunity for AIIB to gain experience in enhancing urban resilience through implementation of comprehensive waste management solutions. Waste management is a major challenge across Asian cities and the learning from this project can contribute significantly to the Bank's pipeline as well as future projects in the sector. The project will provide an opportunity to lead the way in building the Bank's presence in the sector and also contribute to global environmental crisis including global warming, depletion of resources, and destruction of global ecosystems as interrelated to SWM.

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<sup>9</sup> Given the growing infrastructure need and urgency to revive the Indian cities, the national agenda places sustainable, inclusive and integrated urban development as a top priority and launched ambitious national-level urban Missions to embark on reforms, increase investments, and improve service delivery.

<sup>10</sup> The Kerala SWM strategy suggests: (i) streamlined institutional framework for SWM at state-level; (ii) policies, institutional and financial systems required at the ULB level for improving SWM; and (iii) technical solutions that include a combination of household and community level systems for waste minimization and recycling and centralized systems for waste processing and disposal. The project will build upon this enabling framework by providing institutional and capacity building at both state and local levels, in addition to investment support.

<sup>11</sup> In compliance with the national biomedical waste management rules and the new national COVID-19 medical waste management guidelines.

11. **Lessons learned.** The project will incorporate the following lessons learned from similar MDB funded projects both in India and in other countries:

- (i) Integrated service delivery approach. Like many other countries, provision of SWM services in Kerala is the ULB's responsibility. Projects across the globe have proved the need for local governments to adopt an integrated service delivery approach for improving SWM (collection, transportation, processing and safe disposal). It has been widely accepted that broken value chain systems are a major reason behind waste leakages, leading to numerous environmental and public health hazards, and eventually negatively impacting the livability and competitiveness of cities in the long run. Global experience in the sector also emphasizes on the importance of enabling policy, regulatory and institutional framework and financial sustainability mechanisms for an integrated and efficient SWM system.
- (ii) Land availability. While waste minimization through the 3R (reuse, recycle, reduce) approach must be at the core of any sustainable SWM system, engineered landfill facilities are always necessary for safe disposal of inerts, rejects, and other residual waste. This is particularly required for urban areas which are rapidly expanding, and where a zero-waste approach is a long-term objective. International experience shows that volume reduction is limited, unless significant efforts in recycling are made, which considerably increases the costs of waste management services. Thus, in all circumstances, although to different degrees, sanitary landfills are essential for final disposal. Construction of disposal facilities can only start when land ownership has been secured and permits have been obtained for waste management facilities.
- (iii) Communication and citizen engagement. Waste management is about habits and perception and necessary change is a complex process of shifting the public perception and ensure social acceptance for SWM treatment and disposal systems. The institutionalization of a permanent two-way-communications campaign is essential to ensure public ownership and support for climate smart and disaster resilient SWM operations. This calls not only for a comprehensive communications program that includes redressal systems for constant communication with the program authorities, but also for a phased approach of the implementation of potentially nimby investments to showcase the need and the benefits of a sustainable system, based on multiple approaches and technologies, where waste reduction is at the core, and where there is a concerted effort to change behaviors and make generators aware of the ultimate fate of the waste.
- (iv) Financial sustainability. Any proposed solution to SWM must be analyzed both technically and financially. Financial analysis must aim at clearly identifying the full cost structure of the SWM system, including capital and O&M expenses for the integrated value chain. While experience in middle and low-income countries show that costs often exceed the revenues, robust financial sustainability plans must be worked out with clear and transparent allocation of revenues and expenditures. Given that operating costs in the SWM sector are high, clear revenue streams must be identified upfront to ensure that O&M is covered preferably from own-revenues (dedicated waste fees or municipal taxes) or through budget support and/or subsidies.

### C. Components

12. The project includes the following components (see Annex 2. for details):

13. **Component A. Development of Regional SWM Facilities** will support construction, rehabilitation, closure, remediation, and equipment of facilities servicing more than one ULB, such as: (i) processing and recycling facilities; (ii) construction and demolition waste management facilities; (iii) transfer stations and regional sanitary landfills for municipal waste disposal; and (iv) closure and/or remediation of existing waste dumpsites and development of incremental waste disposal cells.

14. **Component B. Improvement of SWM Infrastructure in Participating ULBs** will improve local-level SWM service delivery systems by providing funds to the participating ULBs focusing mainly on: (i) primary waste collection and transportation; (ii) source segregation and treatment at decentralized level; (iii) rehabilitation and/or development of resource recovery facilities; (iv) development of biodegradable waste management facilities; (v) development of waste disposal cells as interim disposal facilities; and (vi) public space cleaning, sanitization, and waste removal activities in the context of COVID-19.

15. **Component C. Institutional Development, Capacity Building and Project Management Support** will provide technical assistance and capacity building at state and local levels for: (i) undertaking SWM institutional, financial and policy reforms; (ii) planning, designing, and implementing investment sub-projects for climate-smart and disaster resilient SWM infrastructure and service provision improvements; (iii) organizational development of participating ULBs for inclusive and sustainable SWM service delivery; and (iv) increasing awareness of waste management, sanitization and public hygiene, gender inclusion and stakeholder engagement.

### D. Cost and Financing Plan

16. The total project cost is estimated to be USD300 million, which will be co-financed by AIIB (USD105 million) and the WB (USD105 million, IBRD), and counterpart funds to be provided by GoK (USD90 million). AIIB and WB will co-finance the project in equal shares, with all components financed jointly.

**Table 1.** Indicative Project Cost and Financing Plan (USD million)

Project Component	Cost	Financing Plan		
		AIIB	IBRD	GoK
<i>Component A:</i> Development of Regional SWM Facilities	110	41	41	28
<i>Component B:</i> Improvement of SWM Infrastructure in Participating ULBs	150	49	49	52
<i>Component C:</i> Institutional Development, Capacity Building and Project Management Support	40	15	15	10
<b>Total</b>	<b>300</b>	<b>105</b>	<b>105</b>	<b>90</b>
		<b>(35%)</b>	<b>(35%)</b>	<b>(30%)</b>

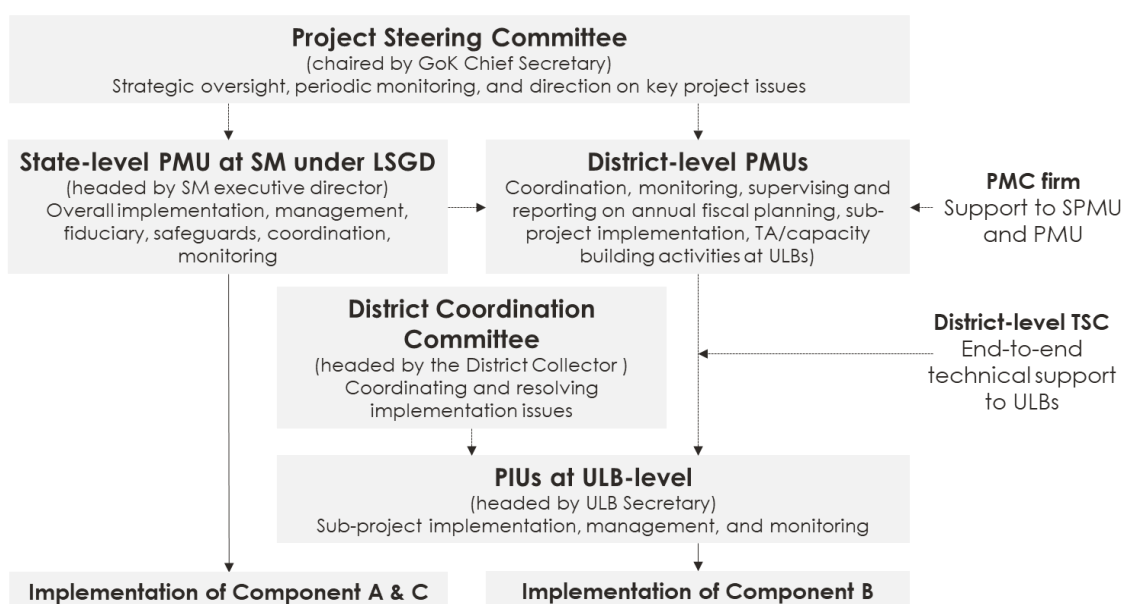
**E. Implementation Arrangements**

17. **Implementation period.** The project is expected to be implemented from June 2021 to June 2027.

18. **Implementation Management.** The Suchitwa Mission (SM) under the Local Self Government Department (LSGD) of Kerala will be the primary Project Implementing Entity (PIE) for the project for components A and C. A dedicated State-level Project Management Unit (SPMU) will be established within the SM headed by the executive director of SM as a project director supported by a full-time deputy project director and a team of core technical staff. The SM will play a critical role in coordinating all agencies involved in project implementation, ensuring overall quality and timeliness of investments, and providing administrative services to the various agencies and ULBs involved in the project. It will be also responsible for the overall fiduciary and safeguard aspects of the project, for monitoring compliance with the environmental and social safeguards, and project Monitoring and Evaluation (M&E).

19. ULBs will be the PIE responsible for the implementation of component B. To support and coordinate project activities of ULBs, the SM will set up a District-level Project Management Unit (DPMU) in each of the 14 districts of the state to cover all their respective ULBs. The DPMU will work closely with the District Collector’s office and District Planning Committee (DPC) as per the government systems and procedures. DPMU will also be responsible for carrying out all the periodic monitoring and reporting, including both physical and financial progress, of all the activities at the ULB level. At the local level, all the participating ULBs will be required to constitute a Project Implementation Unit (PIU) under the Secretary of the ULB.

**Figure 1. Project Implementation Arrangement**



\* Organizational charts of SPMU, DPMU, and PIU is included in the Annex 2.

20. The SPMU and DPMUs will be supported by a Project Management Consultant (PMC) firm, hired by the SM, for carrying out the project management, coordination and supervision activities at the state and district level. In addition, DPMUs will hire a district-

level Technical Support Consultant (TSC) team to provide end-to-end technical support to the participating ULBs in their respective districts in carrying out all the annual fiscal planning, budgeting and reporting activities; sub-project specific planning, design and implementation activities including preparation of all technical documents duly incorporating climate and disaster resilience, environment and social impact assessment, procurement, contract management and implementation supervision.

21. At the state level, a high-level Project Steering Committee will be constituted, headed by the Chief Secretary of GoK, comprising the Revenue Secretary and other relevant Secretaries when needed as well as all the District Collectors. Principal Secretary of LSGD and Executive Director of SM would be the conveners of the committee and will coordinate the functioning of the committee. A district coordination committee headed by the District Collector will be set up to coordinate and resolve implementation issues at ULB level.

22. Under the project, the peer learning process among participating ULBs will be facilitated to improve planning and implementation of SWM services during implementation periods. The project will also draw on prior experience in the implementation of the WB-financed local government service delivery project which supported all the ULBs in the State.

23. **Procurement.** All goods, works, non-consulting services and consulting services to be financed under the project will be procured in accordance with the WB Procurement Regulations for IPF Borrowers, which is materially consistent with the Core Procurement Principles and Standards of AIIB's Procurement Policy. The SPMU at SM will be responsible for overall procurement management of the project, including the preparation and submission of the project procurement plan in the Systematic Tracking of Exchanges in Procurement (STEP) system and will be responsible for carrying out procurements under Component A and C. The ULBs, supported by PIUs and TSCs, will be responsible for the procurements under Component B. Furthermore, the PMC will deploy procurement and contract management professionals (at least 3 at SPMU and 1 each at DPMU) with necessary experience of implementing externally funded projects as key staff members in their team at state and district level to facilitate effective and timely implementation of procurement activities undertaken in the project.

24. As the lead co-financier, the WB will be responsible for overseeing the procurement process, applying its own procurement rules, internal review and clearance procedures, and determining whether the procurement has been conducted in accordance with the agreed implementation arrangements. AIIB will collaborate closely with the WB to review the public investment management and finalize the Project Procurement Strategy for Development (PPSD) and procurement plan for the project.

25. **Financial Management.** Considering the joint co-financing approach, all project disbursements would be handled by the WB according to its disbursement procedures using the WB's Client Connection System. AIIB funds would finance part of the common expenditures in stipulated percentages. The disbursement methods to be used will be Advance and Reimbursement for the WB and AIIB funds. Disbursements amounting to a maximum 15 percent of the total WB/AIIB loan value, will be remitted under the advance method at project commencement, after which the subsequent

disbursements from WB/AIIB would follow the reimbursement method. A pooled Designated Account (DA) denominated in US dollars will be opened. AIIB will process requested funds to the pooled DA after the WB receives withdrawal applications and forwards the payment requests to AIIB. Disbursements will be report-based using Interim Financial Reports (IFRs). At the time of documenting expenditure through a withdrawal application, the common expenditure would be separated into the WB/IBRD share and AIIB share and processed. The details of this arrangement will be finalized through the issuance of the Disbursement and Financial Information Letter (DFIL) by the WB.

26. The Project Implementation Manual (PIM) will include the Financial Management (FM) Chapter where project financial arrangements are described. SPMU will maintain the actual expenditure incurred for Components A and C. ULBs with support from DPMUs will maintain appropriate records and documentation of the expenditure incurred on use of funds and will report actual expenditure incurred to SPMU under Component B. SPMU will collate the expenditure details for all the project components and will prepare the semi-annual consolidated IFRs to be submitted to AIIB and the WB within 45 days following the end of each period. Project Financial Statements, which are prepared based on the Interim Financial Report (IFR) for the second half of the financial year, will be audited by the Comptroller and Auditor General (CAG) of India through the Office of the Accountant General in Kerala and submitted to AIIB and the WB within 6 months following the end of each audit period.

27. **Monitoring and Evaluation.** M&E will take place at both SM and ULB levels. The SPMU will have the overall responsibility of results monitoring and evaluation for the project. It will coordinate the collection of data and individual reports from ULBs for the project and submit a consolidated progress report to AIIB and the WB semi-annually within 60 days after the end of each calendar semester covered by such report. The collected data at the ULB level will be reported to the SPMU through the DPMUs. Detailed M&E arrangements with clearly defined roles and responsibilities as well as the templates for periodic and annual progress reports will be developed and included in the PIM.

28. **AIIB's Implementation Support.** A Project Co-lender Agreement (PCA) will be signed by AIIB and WB. The AIIB team will: (i) provide technical and operational inputs to support preparation and implementation of SWM sub-projects and TA activities; (ii) periodically join the WB's project supervision missions (virtually or otherwise) as necessary; and (iii) confirm that the loan proceeds are used appropriately. The WB/AIIB joint teams may carry out more frequent supervision of the design, construction and environmental and social management activities in the early stages of project implementation. The WB will provide AIIB with copies of all relevant documents, reports, recommendations, no-objections and communications (whether external or internal) received or sent by the WB in connection with any project activity. AIIB will consider hiring a local consultant to help monitor implementation progress of the project. The WB/AIIB will follow a risk-based approach considering the degree of complexity and sensitivity for all investment sub-projects under component A and B of the project. While low risk sub-projects can be approved at ULB level, moderate category sub-projects would require quality assurance review from WB/AIIB on a sample basis. All high-risk sub-projects will be reviewed by WB/AIIB.

### 3. Project Assessment

#### A. Technical

29. **Project Design.** The project follows a framework approach, wherein the specific investments and capacity building interventions will be determined based on the state and local level SWM planning, citizen engagement and implementation readiness<sup>12</sup> including identification of suitable land parcels for all the SWM facilities. The project will adopt an integrated service delivery approach including segregation, collection and transportation, processing and safe disposal. Implementation of all project activities will be done in compliance with the national SWM rules 2016, the state's new SMW strategy, and other relevant regulations. The technical design of the project is informed by the findings of detailed sector diagnostic assessments, field surveys and consultations at the state and local level, and institutional capacity assessment prepared during project preparation.

30. The project will support a hybrid service delivery model by supporting both decentralized and centralized waste management solutions with customized technology options suited to the geographical and demographical context of Kerala. ULBs will have the complete authority and responsibility to deliver SWM services by: (i) adopting an optimal mix of generator-level, community-level and city-level waste management solutions through a city-wide SWM planning exercise; (ii) strengthening the systems for primary collection, transportation, processing and recycling of waste; and (iii) ensuring safe disposal of residual waste by participating in a regional landfill.

31. Given the urbanization characteristics, land scarcity and weak ULB capacity, the engineered landfills will be developed by SM exclusively at the regional level based on a Waste-shed Area (WSA) planning approach considering the land availability<sup>13</sup>, waste profile, secondary transportation distances, and technical and financial viability. Since some of the participating ULBs are small and may not be able to develop, afford and sustain standalone city-level waste treatment and recycling facilities, the project will also support regional treatment and recycling facilities at the WSA level. The sector assessments have also identified existing open dumping practices as a major issue, which has eventually led to emergence of multiple waste dumpsites across the state. The project will support the closure, remediation and/or rehabilitation of select major waste dumpsites in the urban areas with the objective to carry out proper environmental rehabilitation and reclaim land that may be used for future waste management facilities including interim disposal facilities. Land reclamation through dumpsite remediation and

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<sup>12</sup> To advance the project implementation readiness, SM has already initiated a number of preparatory activities including the identification of investment sub-projects, identification of existing dumpsites for rehabilitation and development of interim disposal facilities, identification of the land parcel for the first long-term regional disposal facility and identification of the first set of ULBs that are committed and ready to start on the SWM interventions under the project. SM has indicated that the first set of investment sub-projects under component A would most likely focus on dumpsite rehabilitation and development of interim waste disposal facilities.

<sup>13</sup> The project plans to start with investments in closure and rehabilitation of polluted dumpsites, followed by developing regional disposal facilities on the lands owned by GoK. The process of identifying the lands has been already started. 7 dumpsites have been preliminarily screened (out of 37 identified dumpsites) and the remaining 30 dumpsites will be assessed in detail to assess their potential usage for creation of any bio/non-bio waste management facilities. The GoK also identified candidate government-owned lands for landfill (e.g., the Government Order has been already issued for a 25 Acres fresh land around Kochi that can be used for addressing the long term (20 years) waste disposal needs). The sites will be finalized after completing technical, social and environmental screening process as well as consultations with relevant stakeholders.



closure is expected to help the state in addressing one of the fundamental binding constraints of land availability for waste management and disposal.

32. The dedicated component, i.e., component C, is designed, as guided by the institutional capacity assessment, to provide critical technical assistance and capacity building support to the state as well as ULBs in planning and implementing the project activities. The ULB financing system under Component B provides formula-based incentive grants to the participating ULBs, linked to critical readiness conditions and institutional reforms required for improving SWM services. The grant mechanism design will be informed by the lessons from the WB-financed Kerala Local Government Service Delivery Project (KLGSDP) and international good practices in other urban service delivery improvement projects. The city-wide SWM plans will be the main instrument to plan the city level SWM systems in a manner that minimizes the residual waste that needs to be disposed-off in landfills by following the 3R approach (reuse, recycle, reduce).

33. **Operational sustainability.** The project adopts a comprehensive approach for improving SWM systems by addressing the key infrastructure gaps along with institutional and financial systems in ULBs which ensures long-term sustainability of SWM services. The grant design will incentivize ULBs to address key institutional constraints to access the financial resources, in addition to improve overall SWM services. The project will provide technical assistance and capacity building to ULBs to implement these institutional reforms. In order to ensure that the SWM facilities are financially and operationally sustainable, the project will support regional facilities<sup>14</sup> for waste processing, recycling and disposal. Investments will be designed in a technically and financially sustainable manner and expect to attract private sector operators for SWM.

34. Sustainability will also be pursued through setting up appropriate budgeting and financial systems for medium to long term cost recovery in the SWM sector. ULBs revenues are not linked to the costs for providing SWM services, let alone to the costs of an integrated end-to-end solution. As the development of an end-to-end service delivery solution takes off, costs will increase and ULBs will be required to develop and implement financial sustainability plans as part of the city-level SWM plan, with a full and transparent cost structure and identification of all revenue streams (both a dedicated SWM fee and an earmark from the ULB general budget) to incrementally meet the O&M costs of the entire system. O&M cost recovery in the initial years of project implementation is expected to mostly come from an expansion in the number of SWM users (domestic, institutional, and commercial). Operational sustainability has been further assessed as part of financial analysis and incorporated into project design.

## **B. Economic and Financial Analysis**

### **35. Economic Analysis.**

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<sup>14</sup> The regional facilities would be developed and managed by SM on behalf of interested ULBs. As a first step, SM will organize the cluster and sign inter-municipal agreement with all the participating ULBs that will outline the management structure, cost sharing and payment mechanisms. The WB/AIIB will work with SM to develop model structure including operation and management of regional facilities which can be adopted for the first few clusters and then modified based on the learning.

36. The economic analysis assessed the economic viability of project in terms of economic internal rate of return (EIRR) and economic net present value (ENPV). A Cost-Benefit Analysis (CBA) was carried out to assess the economic viability of the project comparing “with” and “without-project” scenarios.

- Economic Costs<sup>15</sup>: Economic costs of investments (including infrastructure creation, technological equipment, vehicles etc.; and annual O&M costs) are estimated based on normative financial cost assessment. Investment costs are categorized into four categories: (i) city level waste collection and transportation; (ii) household/community level decentralized and city-level processing/resource recovery; (iii) regional collection and transportation; and (iv) regional sanitary landfill facilities.
- Project Benefits: The expected project benefits include: (i) environmental improvements through Greenhouse Gas (GHG) emission reduction; (ii) reduced contamination of surface and ground water resources; (iii) public health benefits in terms of reduced vulnerability to diseases and avoided medical expenditures; (iv) employment generation and livelihoods opportunities; (v) improved resource recovery; and (vi) enhanced disaster resilience; and land optimization due to dumpsite rehabilitation.

37. The EIRR was estimated at 49 percent and ENPV at USD1,413 million. The economic analysis is conducted on constant price basis for 2020 and covers a period of 30 years from 2020, i.e., 5 years for implementation and 25 years for operations, with future economic values (costs/benefits) discounted to present value using a 6 percent discount rate<sup>16</sup>. Detailed economic analysis is provided in Annex 3.

38. **Financial Analysis.** The current level of expenditures undertaken by the ULBs on SWM is low as the focus is primarily on decentralized systems. In addition, there is no formal system for levying and collecting SWM user charges except for ad-hoc local practices. Since the project will support ULBs in setting up a formal service delivery system for SWM, this would require ULBs to assign much higher level of capital expenditure towards SWM. To avoid reducing the allocation on other expenditure priorities, GoK has decided to provide grants to ULBs for SWM in addition to the current development plan funds to ULBs. Further, GoK will also develop regional disposal and/or processing and recycling facilities. ULBs will be required to meet the O&M expenditures for the entire SWM chain, and pay tipping fees for sending waste to regional landfills and/or cluster-based facilities.

39. The financial analysis focuses on determining: (i) ULBs ability to utilize the additional grants for SWM capital expenditure by comparing the increase in ULB’s capital expenditure to their current levels; (ii) increase in O&M expenditure compared to the current recurring expenditure of ULBs and extent of possible cost-recovery for SWM through user charges; (iii) user charges to be levied for cost recovery, and affordability and feasibility of user charges with respect to average household income; (iv) extent of

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<sup>15</sup> Shadow Exchange Rate Factors, Shadow Wage rate factors and Shadow conversion factors are applied for conversion of financial costs to economic costs. Similarly, the annual O&M costs for operations across the value chain are converted into economic terms for the economic analysis.

<sup>16</sup> Per standard WB guidance, the discount rate is the estimated as the long-term GDP growth rate for the country.

shortfall in cost recovery that may need to be financed by ULB's general budget or existing revenue surplus; and (v) vulnerability of ULBs due to their current fiscal situation.

40. The financial analysis reveals that: (i) the size of the Development Plan of the ULBs will increase by approximately 10 percent per year in FY22, FY23 and FY24 due to additional SWM investments which is not disproportionately high; (ii) the SWM operations will result in an average 15 percent increase in revenue and 26 percent increase in expenditure until FY 2030. Cost recovery through user charges will be 45 percent in FY24 and targeted to be 100 percent by FY30<sup>17</sup>; and (iii) the shortfall in cost recovery in SWM is expected to be met by the general budget of the ULBs. An average of 25.2 percent of revenue surplus from general budget needs to be set aside to meet SWM deficits in the initial years (FY24 to FY26) and the average requirement until FY30 is 11 percent. Out of the 87 ULBs, 30 would need to set aside more than 33 percent of their revenue surplus, and 9 ULBs will slip into revenue deficit after meeting SWM O&M costs; and (iv) to meet the SWM costs, some O&M expenditures (i.e., expenditure on performance-based contracts and on shared facilities) would be permitted under Component B.

41. The increase in cost recovery will be primarily on account of expanding the number of users and only after FY30, once services have been consolidated, user charges are expected to be substantially increased. This provides an opportunity for the ULB to stabilize the user charge system within the project period, and yet maintain financial sustainability of SWM operations. Detailed financial analysis is provided in Annex 3.

### C. Fiduciary and Governance

42. **Procurement.** A procurement assessment undertaken by the WB team identified capacity gaps and challenges in SM, which will be responsible for large-value procurements under Component A. The assessment noted lack of prior experience in procurement related activities such as tendering, tender evaluation and overall contract management, absence of dedicated procurement staff, and lack of a complaint handling mechanism. At ULB level, the engineering divisions will be responsible for all the procurement activities under Component B. The assessment noted that some of the ULBs have previous experience of working in the WB-funded projects but experience in handling high value procurements is limited. To mitigate these risks, apart from adopting the PIM and establishing adequate complaint handling mechanism, the procurement capacity of SM and ULBs will be strengthened under the project by hiring qualified experts and providing specialized trainings. PMC will also deploy qualified procurement professionals as key experts to each DPMU to support ULB-level procurement.

43. **Financial Management.** The project FM assessment has been conducted through the desk-review and based on the information provided in the WB's project document. The assessment noted that the major risk is the limited FM staff capacity of the SM and project ULBs. To mitigate this risk, the implementation units, i.e., SPMU and 14 DPMUs, will be established and capacity building will be provided with a focus on FM

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<sup>17</sup> User charge projections are sensitive to the willingness to pay of commercial establishments that are estimated to contribute to 47 percent of the total user charges. A SWM fee of Rs. 70 per household per month (USD0.92) for SWM accounts for only 0.14 percent of the average household income.

issues at the ULB level. SPMU will recruit an experienced FM specialist who will be responsible for overall FM coordination and management for Components A and C. ULBs will deploy the experienced FM staff for a minimum period of 3 years. Budgeting will be done as per regular state practices. SM will document project financial arrangements and FM procedures in the PIM.

44. ULBs will maintain appropriate records and documentation of the expenditure incurred on use of funds and will report actual expenditure incurred to SPMU under Component B. The SPMU will maintain the actual expenditure for Components A and C. SPMU will collate the expenditure details for all the project components for reporting purposes. The SPMU will prepare the semi-annual consolidated IFRs to be submitted within 45 days following the end of each period. Project Financial Statements, which will be for the second half of the financial year and will capture the financial information for the entire year, will be audited by the CAG of India through the Office of the Accountant General in Kerala. Audited Project Financial Statements will be submitted within 6 months after the end of each audit period. The Kerala State Audit Department (KSAD) is the designated external auditor for the ULBs and will be responsible for issuing the annual audit certificate to ULBs, which will be translated into English and made available for supervision purposes on an annual basis.

45. **Disbursements.** Initially, the WB and AIIB funds will come as advances amounting to a maximum 15 percent of the total WB/AIIB loan value to the pooled DA located at the Ministry of Finance (MoF) and managed by the Controller of Aid Accounts and Audit (CAAA). The subsequent disbursements from WB/AIIB would follow the reimbursement method. The CAAA in turn will transfer the funds to State Consolidated Fund using the regular treasury system of the Government of India. At the SPMU, funds will be made available (including WB's share, AIIB share as well as the relevant state share) in a dedicated special treasury savings bank account to be maintained under the Kerala State treasury system for incurring expenditure under Component A and C (see Annex 3. for detailed fund flow arrangement).

46. The Kerala State treasury system and existing ULB FM systems will be used for releasing grant funds to the ULBs under Component B. ULBs can make payments to suppliers and contractors or to any beneficiary, directly from State Consolidated Fund, by submitting bills, with relevant documents, to concerned treasury attached to the ULB. The SPMU will reconcile the funds released and corresponding utilization made by ULBs from the information provided in the periodic progress and financial reports. In addition, given the identified potential risk of unavailability of required adequate funds in a timely manner, a relevant legal covenant will be included in the project agreement to ensure uninterrupted funds flow and availability of adequate space for expenditure utilization for the project.

47. **Governance and Anti-corruption.** AIIB is committed to preventing fraud and corruption in the projects it finances and may exercise its remedies under the Loan Agreement if the Loan proceeds involve any Prohibited Practice, as defined under the Bank's Policy on Prohibited Practices or PPP (2016). AIIB will monitor the work related to tender document preparation and tender/proposal evaluation and award under its financing. Implementation will also be monitored regularly by AIIB's staff. AIIB reserves the right to investigate, directly or indirectly through its agents, any alleged Prohibited Practices relating to the project and to require the borrower to take necessary measures

to address any issues in a timely manner, as appropriate. To the extent that the prohibited practices covered under WB's Anti-Corruption Guidelines are similar to those under AIIB's PPP, WB's Anti-Corruption Guidelines will apply to the project activities financed under the proposed AIIB and WB Loans. Detailed requirements will be specified in the Loan Agreement and the PCA.

48. **Institutional Capacity.** ULBs in Kerala lack resources and institutional capacity to comply with the National SWM Rules 2016 under Environment Protection Act, ensuing orders issued by National Green Tribunal and Kerala Municipality Act. LSGD has issued SWM Operating Guidelines in 2017 and a state SWM policy in 2018, however there are several inconsistencies and contradictions amongst the national rules and the state policy and operating guidelines. The project, as part of Component C, will provide technical assistance and capacity building at state and local levels. In addition, the project will provide comprehensive project management, coordination and monitoring support at state, district and local levels.

49. **Reporting and Monitoring.** The SPMU will be staffed with requisite experts to ensure quality to the monitoring and reporting on implementation progress. Designated experts in the PMC team will assist the SPMU and DPMUs in reporting and monitoring. Since Kerala lacks comprehensive arrangement for proper collection of SWM data, the project will establish a Management Information System (MIS) that will enable collection of data related to quantity of waste, place of generation, and how much residents are paying for SWM services. The design and implementation of such a system will require capacity building across the different tiers of government.

#### **D. Environmental and Social**

50. **Categorization.** As a co-financed project, the WB's Environmental and Social Safeguard Policies (Safeguard Policies) will be applied to the project since: (i) they are consistent with the Bank's Articles of Agreement and materially consistent with the provisions of the Bank's Environmental and Social Policy (ESP), including the Environmental and Social Exclusion List and the relevant Environmental and Social Standards; and (ii) the monitoring procedures that the WB has in place to ascertain compliance with its Safeguard Policies are appropriate for the project. Under the WB's Safeguard Policies, the project has been assigned Category A by the WB.

51. The WB has conducted due diligence process for environmental and social aspects during project preparation, which has identified substantial environmental and social risks and impacts. Six WB Safeguard Policies have been applied to the project, namely WB's Operational Policies (OP) on Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP/BP4.09), Physical Cultural Resources (OP/BP 4.11), Indigenous Peoples (OP/BP 4.10), and Involuntary Resettlement (OP/BP 4.12). An Environmental and Social Management Framework

(ESMF) has been prepared in accordance with the WB's OPs and disclosed in-country<sup>18</sup> and disclosed on the WB's website<sup>19</sup>.

52. The project activities will be overseen by SPMU established in SM and DPMUs at each District. SPMU will have a State Level Environmental and Social Development Unit (S-ESDU) and each DPMU will have a District level ESDU (D-ESDU). S-ESDU will have an Environmental Engineer, a Social Development Specialist and a Communications Specialist to support the implementation of the ESMF. The SPMU will be the focal point for the communication with the WB and AIIB on the safeguard's aspects of the project. D-ESDU will have an environment engineer and a social development cum communication specialist. ESDU will be supported by the PMC. The PMC will have environmental and social experts and ensure the services of biodiversity / natural habitat specialists for sub-projects near natural habitats. Attached to D-ESDU, a district-level support organization will be mobilized for outreach program, social mobilization and other activities to build partnership with the community throughout the life of the sub-project cycle.

53. **Environment.** The project aims at improving environmental and health conditions by investing in the SWM sector in Kerala, where current SWM practices have negative impacts on environmental well-being. This project will finance complex regional infrastructure sub-projects including landfills, processing facilities, and dumpsite remediation. Other investments may include construction of recycling, resource recovery and treatment plants at community or city level. The potential environmental risks and impacts of the project will be related to construction of these facilities such as air pollution, surface water, groundwater and soil contamination.

54. The ESMF describes the existing environmental and social sensitivities of Kerala State, potential impacts due to proposed development, regulatory and environmental aspects related to various SWM options to device or guide sustainable SWM solutions for the project. Long-term impacts on sensitive areas are avoided through exclusions and screening. A negative list of investments has been included to avoid major irreversible environmental impacts, which is to be complied with by SM and ULBs while planning investment sub-projects. The ESMF provides comprehensive guidance on interventions near sensitive natural habitats, physical cultural resources management framework, pest management, environmental code of practices, health and safety guidelines for water, sanitation, SWM, and health care facilities. It also includes special guidance from World Health Organization (WHO) and the WB guidelines on COVID-19 waste management, health care, civil works and labor management during pandemic.

55. **Climate Change.** Service delivery in Kerala is increasingly affected by numerous natural hazards resulting from climate change. The Kerala State Disaster Management Plan has identified Kerala as a multi hazard prone state. Floods are the most common natural hazard in Kerala followed by debris flow landslides due to heavy precipitation. To reduce the devastating consequences of the increasingly frequent

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<sup>18</sup> <http://sanitation.kerala.gov.in/>

<sup>19</sup> <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/788471589794618595/environmental-and-social-management-framework-introduction-and-environmental-assessment>

natural hazards requires improving systems of planning and implementing climate smart and disaster resilient infrastructure, including SWM infrastructure. The project aims to reduce climate change vulnerability by incorporating appropriate adaptive measures into the project design. Both the ESMF and PIM will help the investments be designed taking into consideration the climate and disaster resilience aspects. Technical design guidelines for climate smart and disaster resilient SWM infrastructure in the PIM will guide the flood mitigation or planning structural design to protect life and increase the project's capacity to reduce exposure to natural hazards. Potential positive impacts from project activities also include addressing increased leachate treatment needs and waste collection around waterways with flooding risks, preventing waste from blocking drains and causing flooding. Therefore, this project is considered contributing to climate adaption financing.

56. This project also contributes to climate mitigation finance. GHG impact was assessed for the construction of: (i) decentralized household composting systems for Bio-degradable Waste (BDW); (ii) centralized composting or anaerobic digestion facilities; (iii) material recovery and resource recovery facilities; (iv) regional sanitary landfill facilities for the disposal of the inert; and (v) remediation and rehabilitation of existing dumpsites. The tools used for GHG accounting were: (i) CURB: Climate Action for Urban Sustainability – Waste Disposal; and (ii) Institute for Global Environmental Strategies (IGES) GHG Calculator for Solid Waste – Waste Collection. The calculation for GHG accounting for dumpsite remediation is based on a first order decay model. Based on the assessments, the GHG emission reduction from: (i) proposed SWM service delivery system is estimated as 453,595 tCO<sub>2</sub>e per year; and (ii) proposed dumpsite remediation financing is estimated as 19,110 tCO<sub>2</sub>e. The detailed description is provided in Annex 4.

57. **Social Aspects.** The project is expected to lead to the overall well-being of the urban population in participating ULBs; enhance the value chain of SWM leading to improved livelihood opportunities for service providers; improve working conditions for service providers; promote responsible behavior in waste generators to reduce the quantum of waste generated at the source; and reduce land requirement to process solid waste through decentralized practices for waste minimization and diversion. Key social risks arise due to: (i) exclusion of women, vulnerable and tribal communities from planning process as well as accessing benefits such as livelihood opportunities and skill development; (ii) poor community participation throughout the sub-project cycle; (iii) incidence of gender-based violence (GBV) and inadequate response or support services; (iv) weak accountability and transparency of communication and service delivery; (v) health and safety risk of unorganized labor engaged in SWM; (vi) weak enforcement of labor laws and lack of labor influx management plans (in case migrant workers will be hired); (vii) ineffective communication and limited capacity to bring about behavior change towards SWM; (viii) negative impact on host community at the landfill and waste management sites; (ix) loss of livelihood of the most vulnerable such as rag-pickers, informal recyclers and scrap-dealers (who are currently dependent on informal waste management activities) when SWM operations are formalized; (x) lack of adequate unencumbered land for waste management and disposal facilities; (xi) ineffective systems for community feedback and unresponsive grievance redressal systems; and (xiii) COVID-19 pandemic is aggravating economic, health, education, and livelihood

crisis impacting the access to basic services and pushing the already vulnerable to further margins.

58. Indigenous Peoples (IP)<sup>20</sup>, known as Scheduled Tribes in India have been identified in 3 districts of the participating ULBs. The key risks to tribal communities include: (i) selection of sites for waste management facilities, which are close to the tribal groups; and (ii) inadequate communication and engagement with the tribal communities during the sub-project planning and implementation process through culturally appropriate tools.

59. To mitigate these social risks, the ESMF<sup>21</sup>, including a Tribal Development Framework (TDF) and a Resettlement Policy Framework (RPF), has been prepared in accordance with National and State laws and WB's policy. ESMF includes: (i) screening to identify social risks and impacts including specific risks and impacts on tribal communities; (ii) Social Impact Assessment based on identified risks and impacts and for preparation of SMP, TDP and RAP; (iii) stakeholder mapping, Citizen Engagement and Social Behavior Change Communication Strategy including Free Prior Informed Consultation (FPICon) with tribal groups, awareness of social mobilization, behavior change of waste generators, participatory planning, and monitoring, strengthening local governance, accountability, transparency, social audit and a robust grievance redressal management system; (iv) strategies to ensure inclusion of women and vulnerable groups and enhance their voice in project planning; (v) a Gender Action Plan for closing gender gaps and enhancing benefits to women with a focus on women SWM workers who are the most vulnerable; (vi) GBV Action Plan for prevention and response on sexual harassment, abuse, violence in sites and institutions; (vii) labor management procedures for improving database, systems, accountability of hiring agencies and contractors for working conditions, rights, welfare, benefits, opportunities, and restoration of livelihoods particularly the informal/unorganized labor in SWM. The labor management procedures also provide a code of conduct for labor camps and guidance for preparing labor influx management plans in case migrant workers are hired; (viii) institutional mechanisms to ensure effective social management at ULB, District and State level; (ix) screening criteria for selection of investments for infrastructure facilities and scheme cycle covering the process for planning and implementation of sub-projects; (x) capacity development plan; (xi) reporting monitoring systems and indicators; and (xii) budgets.

60. **Gender Aspects.** Women are key service providers in the SWM value chain - often considered for roles that include collection, sorting, cleaning, and separation of the

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<sup>20</sup> Kerala has tribal population (1.45% of the state's total population) spread across 3 districts and 12 ULBs. Tribal population in the urban areas' accounts for 0.3% of the total urban population. The state also has Scheduled Tribe (ST) population in urban areas.

<sup>21</sup> Appropriate mitigation measures have been developed and included in the ESMF to avoid and/or mitigate the identified risks. The ESMF includes: (i) screening to identify social risks and impacts including specific risks and impacts on tribal communities; (ii) social impact assessment based on identified risks and impacts and for preparation of Social Management Plan, Tribal Development Plan, and Resettlement Action Plan; (iii) stakeholder mapping, citizen engagement and social behavior change communication strategy; (iv) strategies to ensure inclusion of women and vulnerable groups and enhance their voice in project planning; (v) Gender Action Plan for closing gender gaps and enhancing benefits to women with a focus on women SWM workers who are the most vulnerable; (vi) GBV Action Plan for prevention and response on sexual harassment, abuse, violence in sites and institutions; (vii) labor management procedures and restoration of livelihoods particularly the informal/unorganized labor in SWM; and (viii) screening criteria for selection of investments for infrastructure facilities and scheme cycle covering the process for planning and implementation of sub-projects etc.



waste. Women in SWM are predominately informal workers and work in unsanitary conditions. The project will provide a mix of technical and financial assistance to upgrade skills to the last mile. SWM women workers are to have improved access to employment opportunities in core SWM activities including entrepreneurial opportunities for increased income. The tracking of the number of women who receive skill upgradation training and the number of women linked to SWM value chain activities and entrepreneurial activities will be essential for monitoring the gender outcome i.e., percentage increase in women SWM workers accessing services. This will be included in the result framework which will be monitored independently<sup>22</sup>.

**61. Occupational Health and Safety, Labor and Employment Conditions.** It is envisaged that the project will lead to positive impacts in Kerala as compared to the current waste management practices which have negative impacts on community and worker health and safety. Construction workers will be guided by the ESMF and PIM which provides the use of the WB Group Environmental, Health and Safety (EHS) Guidelines for Water, Sanitation, Solid Waste Management and Health Care Facilities. The project also supports training in solid waste management which will include practices for managing medical waste (COVID-19 related), robust protocols for ensuring continuity of waste management services and use of protective gears/equipment by sanitation workers to minimize health risks.

**62. Stakeholder Engagement, Consultation and Information Disclosure.** The ESMF includes a stakeholder engagement plan for identifying and mapping areas of influence and a road map for information dissemination, consultation, and collaboration during the preparation of city-wide SWM Plan and site-specific investment. The special emphasis will be to hold FPICon in the 9 municipalities of the 3 districts that have tribal inhabitants. The project will also document inputs from the comprehensive multi-level stakeholder consultations, pertaining to the state- and regional-level components. Consultations with the identified stakeholders will be carried out during the preparation of an Environmental and Social Impact Assessment (ESIA) at the sub-project level. Stakeholder identification and mapping will be carried out during the ESIA for all sub-projects and during SWM plan preparation to study the profile of the stakeholders identified and the nature of the stakes; understand each group's specific issues, concerns as well as expectations from the project that each group retains; and gauge their influence on the project. The consultations will be continued during the implementation phase of the project. The ESMF, TDF and RPF have been prepared in accordance with National/State laws and the WB's Safeguard Policies and disclosed in English on WB's website as above. The Borrower had disclosed the Executive Summary in Malayalam language on the Borrower's website (<http://sanitation.kerala.gov.in/>).

**63. Project Grievance Redress Mechanism and Bank's Project-Affected People's Mechanism.** The GoK offers local level, state level, face to face, telephonic and online complaint registration services: (i) Chief Ministers Public Grievance Redressal Cell- network connecting more than 10,000 officials (offices) equipped with Modern technology to receive petitions from public; (ii) the LSGD offers a complaint icon

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<sup>22</sup> In addition, the Environmental and Social Development Unit (ESDU) will also regularly document and report on number of women provided skill upgradation training, number of women linked to higher SWM value chain activities and entrepreneurial activities, percentage of increase in income levels and success stories.

on its website (<https://pqlsgd.kerala.gov.in/>) for citizens to submit online complaints; (iii) the citizen's call center is a single window, IT enabled facility of Government that enables Government to Citizen interface- includes consumer toll free helpline for all government services; and (iv) ULB websites also have a complaint icon which has many options but it does not have an option for SWM or sanitation. The project will strengthen the system and augment it with a toll-free number so that it is accessible by all including women and vulnerable.

64. **Applicable Independent Accountability Mechanism.** Pursuant to AIIB's agreement with WB, the WB's Environmental and Social Safeguard Policies will apply to this Project instead of AIIB's ESP. The WB's corporate Grievance Redress Service (GRS) and its Independent Accountability Mechanism, the Inspection Panel, which reviews the WB's compliance with its policies and procedures, will handle complaints relating to ES issues that may arise under the Project. In accordance with AIIB's Policy on the Project affected People's Mechanism (PPM), submissions to the PPM under this Project will not be eligible for consideration by the PPM. Information on WB's corporate GRS is available at <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. Information on WB's Inspection Panel is available at <http://www.inspectionpanel.org>.

#### E. Risks and Mitigation Measures

65. The overall project risk is rated "High" (see Table 2).

**Table 2: Summary of Risks and Mitigation Measures**

<b>Risk Description</b>	<b>Assessment</b>	<b>Mitigation Measures</b>
<b>Political and Governance Risks</b>  Uncertain political environment resulting from political turnover, fraud and corruption risk	Medium	Political risk will be mitigated through a broader set of stakeholder engagement, dissemination and IEC activities on the merits (health, environmental) of a SWM system, especially in the current COVID-19 situation. Local and districts knowledge and eventual ownership of the project can secure long term community engagement to serve as a counterbalance of political turn-over. High fiduciary standards as per the WB's fiduciary requirements will also prevent corrupt practices.
<b>Macroeconomic risks</b>  Kerala's high fiscal-deficit due to low own-revenues and high committed expenditure	Medium	The state cabinet has already decided to use the project resources only for SWM including provision of additional grants to ULBs (beyond the existing plan funds), which will ringfence the project investments from macroeconomic imbalances.
<b>Institutional Capacity for Implementation and Sustainability</b>	High	The project provides robust institutional and capacity building programs that support the SM and project ULBs for carrying out all the investment activities and undertake institutional reforms for long-term sustainability of the project. In addition, the SPMU and DPMUs will be supported by a PMC firm in

Weak institutional capacity of the state and ULBs		coordinating and overseeing all project activities. Individual experts will be appointed under the project to strengthen the SM and ULBs, and ULBs will be also technically supported by district TSCs to be hired.
<b>Fiduciary risk</b> Implementing agencies lack prior experience of procuring and managing high-value SWM contracts	Medium	Sustainable training and capacity building initiatives will be implemented to strengthen the procurement and FM functionaries of the ULBs. The SPMU will design the capacity building interventions for ULBs to focus on procurement and FM issues at the ULB level. The PMC's team of experts will help the SM by carrying out day-to-day activities and will facilitate periodic formal training sessions.
<b>Environmental and Social</b> Complex sub-projects in SWM Negative environmental and social impacts from the project Land acquisition and COVID-19 restriction could delay implementation	High	An ESMF, Strategic Environment Assessment (SEA) and PIM has been prepared and will provide necessary technical guidelines and guidance to avoid long term irreversible impacts on sensitive areas, selects interventions based on SWM planning, and sub-projects would be subject to proper environmental and social due diligence and follow regulations and best practices.  The project design and implementation arrangements are also supported by technical assistance and project management support for monitoring of safeguards risks and mitigation actions.
<b>Stakeholder risks</b> Opposition from local communities and other key stakeholders.	High	It can be mitigated by generating trust amongst the public that local governments have the capacity to manage these facilities in a safe and scientific manner. Dedicated Stakeholder Engagement Plan (SEP) has been prepared for the project as a part of ESMF that elaborates the stakeholder engagement and community mobilization procedures to be followed for adequate consultation and transparency.

## Annex 1: Results Monitoring Framework

<b>Project Objective:</b> To strengthen the institutional and service delivery systems for solid waste management in Kerala										
Indicator Name	Unit of measure	Base-line Data Year	Cumulative Target Values					End Target	Frequency	Responsibility
			YR1	YR2	YR3	YR4	YR5			
<b>Project Objective Indicators:</b>										
1. Number of people with access to improved solid waste management services	Number (Thousand)	0.0	500	1,000	2,000	3,000	4,000	6,000	Annual	Prepared by DPMU (inputs from ULBs)
2. Solid waste disposed safely in engineered landfills	Metric tons/year (cumulative)	0.0	-	-	30,000	90,000	120,000	146,000	Annual	SPMU
3. Number of ULBs that accessed incentive grants for improving SWM services	Number	0.0	-	-	30	60	60	60	Annual	SMPU (inputs from DPMU)
<b>Intermediate Results Indicators:</b>										
1. Number of dumpsites closed	Number	0.0	0	0	0	1	2	3	Annual	SPMU
2. Number of landfills constructed and operational	Number	0.0	0	0	1	2	3	3	Annual	SPMU
3. Number of inter-municipal coordination arrangements in place for regional disposal systems	Number	0.0	1	2	3	3	3	3	Annual	SPMU
4. Household coverage of door to door segregated municipal waste collection services	Percentage	0.0	10	15	20	30	50	70	Annual	DPMU (inputs from ULBs)

<b>Project Objective:</b> To strengthen the institutional and service delivery systems for solid waste management in Kerala										
Indicator Name	Unit of measure	Base-line Data Year	Cumulative Target Values					End Target	Frequency	Responsibility
			YR1	YR2	YR3	YR4	YR5			
5. Share of plastic waste recycled at the local level	Percentage	10%	10	20	30	40	50	50	Annual	DPMU (inputs from ULBs)
6. Number of ULBs with improved human resource capacity for SWM	Number	0.0	10	20	40	60	60	60	Annual	DPMU (inputs from ULBs)
7. Number of ULBs that adopted cost recovery system for SWM	Number	0.0	5	20	40	60	60	60	Annual	DPMU (inputs from ULBs)
8. Number of women's groups implementing SWM services financed by the project	Number	0.0	20	30	40	100	150	190	Annual	DPMU
9. Share of the complaints registered resolved within 30 days	Percentage	0.0	50	70	75	80	80	80	Annual	DPMU (inputs from ULBs)
10. Number of ULBs in which beneficiary satisfaction survey is conducted	Number	0.0	60	-	60	-	-	60	Annual	DPMU (inputs from ULBs)
11. Number of cities that have issued SWM by-laws	Number	0.0	5	40	60	60	60	60	Annual	DPMU
12. Number of participants in SWM training sessions	Number	0.0	2,500	6,000	10,000	12,000	14,000	16,800	Annual	PMU
13. Number of cities with city SWM plans	Number	0.0	5	40	60	60	60	60	Annual	DPMU (inputs from ULBs)

## Annex 2: Detailed Project Description

1. The project will provide a combination of technical and financial assistance as well as capacity building support to the participating ULBs and the state government along the full value chain to improve their institutional systems, organizational capacity, infrastructure and service delivery systems for SWM and will support a hybrid approach for service delivery improvements comprising decentralized waste management systems (at generator and community level) and centralized waste management and disposal systems (at local and regional level).
2. Aligned with the decentralized service delivery framework in Kerala, the participating ULBs will have a lead role in delivering SWM services at the local level, including facilitating generator level waste segregation and treatment, primary collection and transportation, waste processing and recycling. Owing to the demographic and geographic profile of the state, characterized by closely located medium and small-sized ULBs and peri-urban areas with high population density, the project will also support a regional approach for SWM and disposal in a technically feasible and financially sustainable manner.
3. **Component A: Development of regional SWM facilities.** The component will finance the development of regional processing and recycling facilities for municipal solid waste, construction and demolition (C&D) waste and medical waste, regional sanitary landfill facilities and transfer stations for solid waste disposal, and closure and remediation of existing waste dumpsites. All the sub-projects will be implemented in compliance with the National SWM Rules 2016 and guidelines issued by the Central Pollution Control Board (CPCB) and Kerala State Pollution Control Board (KSPCB).
4. Regional solid waste disposal facilities. A cluster approach will be adopted for the planning, design and development of the regional sanitary landfills. For each of the regional landfills, a Waste-shed Area (WSA) will be established around the land parcel being identified by the government and the WSA will define the number of ULBs and other local governments in the peri-urban areas, from which the respective landfills will receive the residual waste for safe disposal. The selection of the land for the development of the regional landfill will be done in adherence with siting specifications as detailed in National SWM rules, 2016, ESMF and any other relevant national and state level regulations and guidelines. The WSA for a regional solid waste disposal system will be planned by SM around the identified land parcels, based on population distribution and projections, haul distance and municipal solid waste generation. The landfill facility will be designed to cater to the disposal requirements of the WSA for 15-20 years and landfill cells will be developed in phased manner. Once the WSA is identified, SM will organize the inter-municipal agreement amongst the participating ULBs and other peri-urban LGs to establish the institutional and financial arrangements for the development, operations and maintenance and cost-sharing of regional disposal facility. The government is identifying land parcels and assessing existing dumpsites as potential sites for new regional landfills. The land parcels currently being explored are mostly owned by the state government agencies but will have to transferred to SM following the due legal process for land transfer.

5. Regional municipal waste processing and recycling facilities. Within the planned WSAs, regional processing and/or recycling facilities can be planned, depending on the land availability and waste generation profile of the participating ULBs. The regional processing facilities can be developed for various waste streams – Bio-degradable Waste (BDW), Non-Biodegradable waste (NBDW), non-recyclable waste etc. The regional approach will be encouraged for those participating ULBs who either are not able to identify land parcels for land-based facilities in their geographic jurisdictions, or where the individual ULB specific facilities may not be operationally and financial sustainable due to inadequate waste generation. These regional facilities can be planned either for the entire WSA or sub-areas within the WSA depending on technical feasibility and financial sustainability.
6. Closure and remediation of existing dumpsites. Within the identified WSAs, all the existing dumpsites will be identified and screened based on the rapid risk assessment which will comprise of set of basic technical, environment and social criteria, as detailed out in the PIM. The selection of the dumpsite remediation will also be contingent on the access to a waste disposal facility for the rejects from the dumpsite– which can either be a disposal cell in the existing dumpsite or a regional sanitary landfill. Thus, the implementation of the closure system for existing dumpsites can only be initiated after such facilities and improvements for safe disposal of the residuals are established. Once the dumpsites have been shortlisted based on the rapid risk assessment, SM will undertake necessary technical investigations and fields surveys of dumpsites as per national rules, technical guidance in PIM and ESMF to assess the volume of the waste assessment and waste compositional analysis (including soil contamination assessment). The dumpsite will be considered for remediation only if the soil is free of any contamination (devoid of heavy metals, chemicals or other toxic substances) and minimum of 75 percent material recovery (solid/ rocks or recyclables (metals)) is envisioned.
7. Depending on the results of the technical investigations and field surveys, the selected dumpsites can be remediated and/or closed in an engineered way through any of the following approaches: (i) biomining; (ii) waste removal and transportation to the new landfill for safe disposal; (iii) reshaping and capping using impermeable cap system or combination of the above approaches. Biomining as remediation option will be considered only if: (i) the soil is free of any contamination (devoid of heavy metals, chemicals or other toxic substances) (pre-identified number of lab tests will have to continue to take place throughout the process); (ii) there is substantial land reclamation potential through biomining, that will be used for establishment of waste management facilities; (iii) there are adequate downstream linkages for the management/disposal waste being bio-mined. Once the technical solution for the remediation is selected, SM will undertake: (i) detailed technical investigations, technical and financial feasibility analysis; (ii) preliminary engineering design; and (iii) ESIA to prepare the sub-projects and then, undertake the implementation. The capital expenditure items will include site preparation works and equipment.
8. Regional medical waste and C&D waste management. This activity would support the planning and development of state level waste management and recycling facilities for medical waste and C&D waste. The focus of supporting the medical waste management

systems would be primarily to strengthen the capacity and systems of the state and ULBs to be able to manage COVID-19 related waste issues. Accordingly, integrated system will be developed for medical waste management including collection, transportation, treatment and safe disposal, as per national rules and CPCB and KSPCB guidelines including the COVID-19 medical waste management guidelines. For C&D waste, the focus would be on strengthening the waste collection and transportation systems and development of recycling/treatment facilities as per the national rules for C&D waste.

9. **Component B: Improvement of SWM Infrastructure in Participating ULBs.** Financial assistance will be provided to participating ULBs over and above their existing fiscal transfers (provided as plan funds), as dedicated grants through a two-tranche system comprising: (i) Basic Grants (BG), which the ULBs can access after they sign the Participation Agreement (PA) with the LSGD/SM; and (ii) Incentive Grants (IG), which the ULBs can access upon qualifying a pre-defined eligibility criteria.
10. Eligibility criteria of grant allocations. The grants will be allocated to ULBs on a per-capita basis (with a differentiation between 6 MCs and 87 municipalities). 40 percent of the total proceeds at the ULB level will be allocated as BGs and 60 percent as IGs according to the eligibility criteria presented in Table 1. The eligibility criteria for IGs are targeted towards building the institutional systems of the ULBs for planning, implementing and managing climate-smart and disaster resilient SWM projects and hence are targeted towards a set of key institutional results and technical readiness activities. IGs can be accessed by ULBs in two stages based on eligibility criteria, comprising of one-time institutional activities to be completed by ULBs.

Table 1. Eligibility criteria of grant allocations

Grant allocation ceiling	Eligibility Criteria
Basic Grants (40%)	Available once ULBs sign a Participation Agreement
Incentive Grants (40%)	ULBs must have fulfilled all following three conditions: <ul style="list-style-type: none"> <li>• Prepared a 5-year city-wide plan for climate-smart and disaster-resilient SWM, which has been approved by SM.</li> <li>• Issued SWM by-laws that incorporate the principles of GoK’s new SWM strategy.</li> <li>• Confirmed access to/use of facility for safe disposal of waste.</li> </ul>
Incentive Grants (20%)	5% grants on fulfilling each of the following four conditions: <ul style="list-style-type: none"> <li>• Hired top two-level staff as per SWM org. structure approved by GoK.</li> <li>• Signed performance-based contracts for waste collection and transportation (C&amp;T) services.</li> <li>• Plan developed for levying user charges and O&amp;M budgeting.</li> <li>• Implemented M&amp;E including grievance redressal mechanism.</li> </ul>

11. The qualification of ULBs against the eligibility criteria will be verified by an independent verification agent based on milestones and verification protocol outlined in the PIM.
12. Eligible investments. The eligible investment menu follows the assessment of the current systems and identifications of key gaps and is in line with the service delivery model adopted



by the State as per the new SWM strategy. ULB sub-projects investments will be segregated into:

- (i) *Track I activities (to be funded by BGs)*. It comprises investments that can be initiated by ULBs upon signing the PA - for expanding the coverage of decentralized BDW management systems (generator and community level), upgrading the existing waste processing/recycling facilities, closure remediation of existing dumpsites and development of incremental disposal cells as interim facility, routine public space cleaning and sanitization and other waste management activities related to COVID-19 like procurement of protective gears, and equipment for sanitation workers, financial support to existing women self-help groups engaged for ongoing waste collection services, O&M support for tipping fee for regional disposal facilities, and
- (ii) *Track II activities (to be funded by IGs)*. It comprises investments that can be initiated only when the ULBs have achieved the eligibility criteria – these would include establishing/strengthening primary waste collection and transportation systems, developing new waste management/processing facilities and new material recovery facilities (MRFs)/recycling facilities for NBDW. The investments will be picked by ULBs from this menu as part of city SWM plans.

\* Track I activities are investment sub-projects which do not require land and/or access to disposal facility and can be initiated by the ULBs immediately. Track II activities are sub-projects which require land and access to disposal facility.

13. *Determinants of actual grant expenditures*. ULBs will be informed on their grant allocation ceiling for the project period right at the beginning of the project, so that they can undertake a multi-year investment planning exercise to prepare city-wide 5-year SWM plans (SWMP). The specific grant allocation will gradually increase as ULBs meet their eligibility criteria. During the project period, the ULB can incur eligible expenditure within its authorized grant ceiling, phased as per SWMP, only subject to the compliance with the with Annual Triggers (ATs). Compliance with ATs will be annually checked by the DPMUs for all ULBs to ensure that the sub-projects are part of the eligible investment menu and are designed and implemented in compliance with basic technical, fiduciary and safeguards systems as outlined in PIM and ESMF. DPMUs will submit the AT compliance reports for all ULBs to the SPMU, who will then authorize the grant funding for the next FY.

- (i) *City level SWM Investment Planning*. Based on the grant allocation ceiling, each ULB will prepare a city-level SWMP in the beginning of the project, as per the national guidelines, state level SWM strategy and the detailed stepwise guidance provided in the PIM. The SWMP will be based on sector-wide integrated approach for improving the SWM services in a climate-smart and disaster resilient manner and will identify the infrastructure and service delivery interventions cross the entire value chain. The ULBs will have the flexibility to modify and update the SWMP once during the implementation period and seek approval from the municipal council and SPMU for the modifications. The objective of the SWMP will be to optimize the SWM service delivery and minimize

the waste disposal to landfills through resources recovery by following the 3R approach – Reduce, Reuse and Recycle.

The SWMP will identify interventions to increase the source segregation, and will promote decentralize treatment of BDW, promoting climate smart and disaster resilient SWM solutions when feasible. The SWMP will also plan for safe disposal of residual waste aligned with regionalization/ cluster approach, and wherever needed will also propose interim solutions for waste disposal through rehabilitation/conversion of existing dumpsites. The plan will also detail the mechanisms to ensure full coverage of collection and transportation systems. The SWMP will also detail out the treatment capacity requirements, treatment options, and options for rehabilitating the existing treatment systems for both BDW and NBDW to minimize the final waste disposal to the landfills. The investments will be prioritized based on implementation readiness (specifically land identification with social consensus), technical feasibility, extent of addressal to climate change, service delivery value chain integration, environment and social safeguards screening, compliance with national regulations and financial sustainability.

The SWMPs will be developed as per the standard technical guidelines included in the PIM with detailed activities for each of the 5 years duration of the project and in compliance with the national SWM 2016 rules, state SWM strategy/policy and other relevant regulations. An environmental and social assessment will be carried out as part of the SWMP preparation as per ESMF. SM will need to review, appraise and approve the SWMPs for all the ULBs.

- (ii) *Annual Grant Cycle.* The project will follow the GoK's current system of annual planning, budgeting and disbursement that is being used for providing fiscal transfers to the local governments under the current planning guidelines. Prior to beginning of each fiscal year, the ULBs will identify the investment sub-projects from their SWMP to be taken up for implementation in that year and include their proposed capital expenditures under the Annual Development Plan. The Annual Plan for the project will include the annual budget for the ULBs to design and implement SWM subprojects under the project, which they can access subject to qualifying the eligibility criteria and ATs.
- (iii) *Annual Triggers (ATs).* At the beginning of each financial year, an assessment of whether a ULB has complied with ATs up to the third quarter of the fiscal year will be carried out. At the same time the ULBs will also prepare and submit their annual development plan for expenditure under the project for the next fiscal year, in line with GoK's existing annual planning guidelines. Approval of the Annual Plan for the Project will depend on whether the ULB has complied with the ATs. DPMU will carry out an annual verification exercise of the ATs for the ULBs in their respective districts and submit the report to SPMU. Depending on the nature of non-compliance with ATs, the whole or part of the annual plan proposed for the next fiscal year may be suspended temporarily until corrective actions are taken. During the fiscal year, the ULB may rectify the non-compliance and to that extent, the access to the grant allocation or part thereof may be restored. Thus, the ULB will be able to incur expenditure up to its grant allocation

less any unrestored suspended amount. Suspended amounts can be restored during the fiscal year without waiting for the next annual assessment in January.

In order for ULBs to get actual payment releases from the project, they will have to comply with five ATs (conditions to incur expenditures), relate to compliance with: (a) environmental and social safeguards systems as per ESMF; (b) external statutory audit; (c) procurement systems as per PIM; (d) technical guidelines in PIM and national/state regulations; and (e) eligible investment menu as per PIM. In the case of non-compliance with each annual trigger the remedial actions impacting the approval of the annual plan for the next fiscal year will be taken.

**14. Component C: Institutional development, capacity building and project management.**

The component will finance activities to: (i) provide technical assistance at state and local level for (a) undertaking the necessary SWM sector focused institutional and policy reforms, (b) planning, designing and implementing investment sub-projects for SWM infrastructure and services improvement, (c) capacity building and organizational development of participating ULBs for sustainable SWM service delivery; and (d) awareness generation, inclusion of women and vulnerable, and stakeholder engagement for improved service delivery; and (ii) provide project management, coordination and monitoring support for the entire project at state, district and local level. The key activities to be supported under this component are described below.

- (i) Provision of technical assistance to state agencies, i.e., LSGD, SM, and KSPCB. This activity will provide TA to LSGD for policy, regulatory and institutional reforms and to SM for identifying, planning, designing and implementing regional SWM and COVID-19 medical waste projects. TA to LSGD would include, inter alia (a) updating the state's SWM policy and operating guidelines; (b) drafting revisions to the Kerala Municipality Act (KMA) and Rules, and drafting Government Orders for model SWM organizational structures at ULB level; (c) updating annual planning guidelines to allow for multiyear SWM sub-project investments; (d) developing guidelines for public space cleaning and sanitization in the context of COVID-19, as well as guidelines for compliance with safety standards for labor-force involved in waste management activities in the aftermath of COVID-19 crisis; (e) undertake annual local government cleanliness surveys and performance monitoring for ULBs; and (f) developing institutional guidelines and operating procedures for women sanitation workers including access for safety equipment, information on evolving SWM practices and technologies, and access to finance. TA to SM will aim at (a) strengthening its organizational capacity and institutional systems to assume its role as lead agency for regulating; (b) monitoring and supervising all activities at the local government level; and (c) supporting design, implementation and management of regional SWM facilities, as well as coordinating all the participating ULBs and peri-urban LGs in the use of these facilities. TA will also be provided to KSPCB for strengthening the regulatory monitoring and enforcement mechanisms for SWM to ensure compliance with national rules.

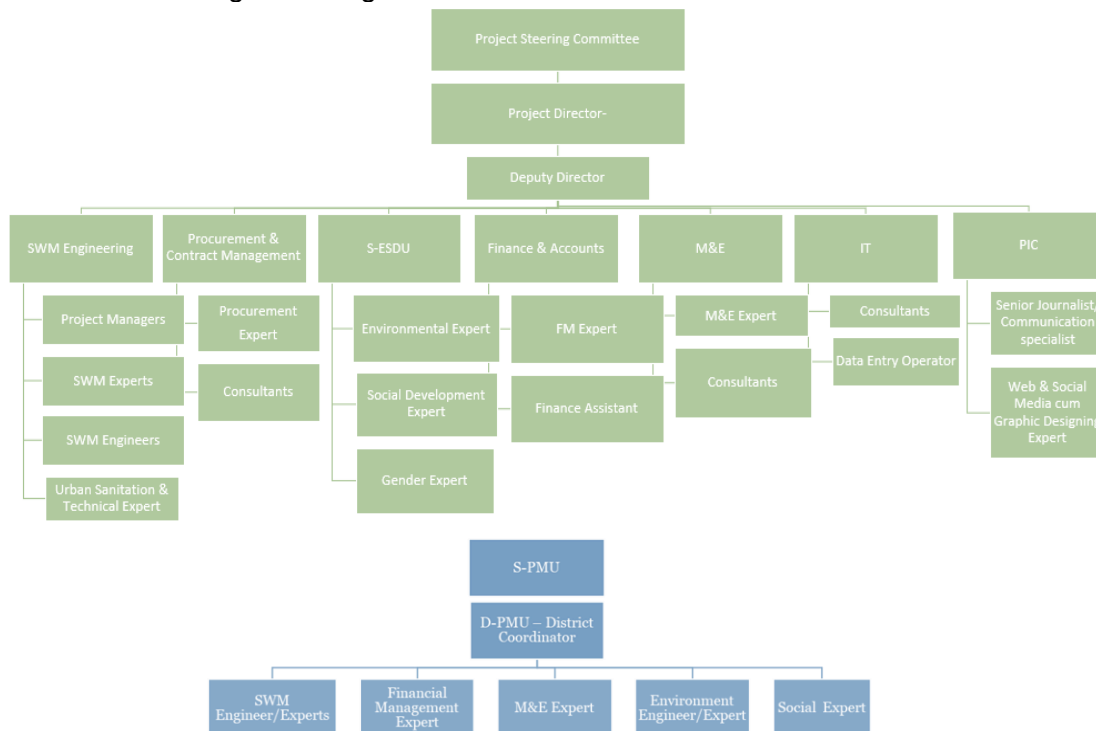
- (ii) Provision of technical assistance to project ULBs. This activity will provide TA to participating ULBs for, inter alia (a) institutional and policy reforms for strengthening the overall SWM service delivery system; (b) for strengthening the financial systems including cost recovery mechanisms; (c) preparing city-wide long-term SWM Plans to identify the priority investments and service delivery targets for the project; (d) for achieving the eligibility criteria and institutional results to access the full incentive grants under component B; (e) annual fiscal planning, budgeting, fund utilization and reporting; (f) sub-project planning, designing and implementation; (g) incorporating climate change mitigation measures into sub-project design; and (h) establishing clear mechanisms for ULBs to formally engage with Kumdumbashree groups as service providers of solid-waste management, including collection and transportation. This activity would also support developing ULB systems for undertaking COVID-19 waste management, cleanliness/sanitization activities, and strengthening the systems for ensuring the safety and health risk reduction of the sanitation workers including women.
- (iii) Provision of SWM training and awareness generation, information, education and communication support. Under this, formal trainings will be provided to all the relevant officials/technical experts at the state, district and local level on SWM service delivery issues and ESMF. Formal training would also be provided for strengthening the local level systems and practices for managing medical waste (COVID-19 related), robust protocols for ensuring continuity of waste management services and use of protective gears/equipment by sanitation workers to minimize health risks. This activity will also support the development of skills and capacity building activities for women sanitation workers on technological advances, access to finance, management of performance-based contracts, and entrepreneurship development opportunities in the SWM sector. The activity will be led by SM. SPMU will identify key topics for formal training based on training needs assessment and consultations at the district and local level, develop annual training plan comprising the number of training sessions on each topic in each district and outlining the profile of eligible participants.
- (iv) Project management support. Under this activity, project management, coordination and monitoring support will be provided to the implementing and coordinating agencies at state, district and local level. This activity will support a dedicated project management team established in the SM (SPMU) and at each one of the 14 districts (DPMU) for managing, coordinating and monitoring the project activities, including due diligence, quality control and reporting to the bank on fiduciary, environmental and social safeguards and technical aspects. The project management activities financed under this component will enable SPMU to prepare annual work plans, manage overall fund flow and disbursements, utilization and reporting, prepare project documentation in standard formats for the Bank's review and no-objection, develop financial reports and procurement compliance reports, ensure compliance with environmental and social safeguards as per ESMF, technical guidelines as per PIM, undertake M&E of the project and periodic review of project documents. In addition to the overall project management coordination, SPMU will also be responsible for undertaking the due-diligence and appraisal activities for all the sub-projects being implemented at the ULB level under

component B and ensure compliance with the requirements set forth and agreed in the PA.

**Project Implementation Arrangements**

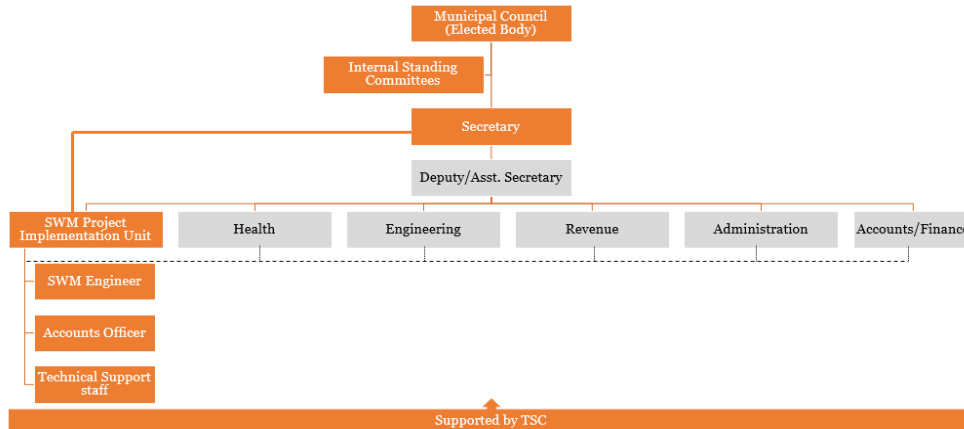
15. The Suchitwa Mission (SM) under the LSGD of Kerala will be the primary Project Implementing Entity for the project for components A and C. A dedicated State-level Project Management Unit (SPMU) will be established within the SM headed by the executive director of SM as a project director supported by a full-time deputy project director and a team of core technical staff. The SM will play a critical role in coordinating all agencies involved in project implementation, ensuring overall quality and timeliness of investments, and providing administrative services to the various agencies and ULBs involved in the project. It will be also responsible for the overall fiduciary and safeguard aspects of the project, for monitoring compliance with the environmental and social safeguards, and project M&E.

**Figure 1: Organization structure for SPMU and DPMU**



16. ULBs will be the primary PIE responsible for the implementation of component B. To support and coordinate project activities of ULBs, the SM will set up a District-level Project Management Unit (DPMU) in each of the 14 districts of the state to cover all their respective ULBs. The DPMU will work closely with the District Collector’s office and District Planning Committee as per the government systems and procedures. DPMU will also be responsible for carrying out all the periodic monitoring and reporting, including both physical and financial progress, of all the activities at the ULB level. At the local level, all the participating ULBs will be required to constitute a PIU under the Secretary of the ULB.

Figure 2: Organization Structure of PIU



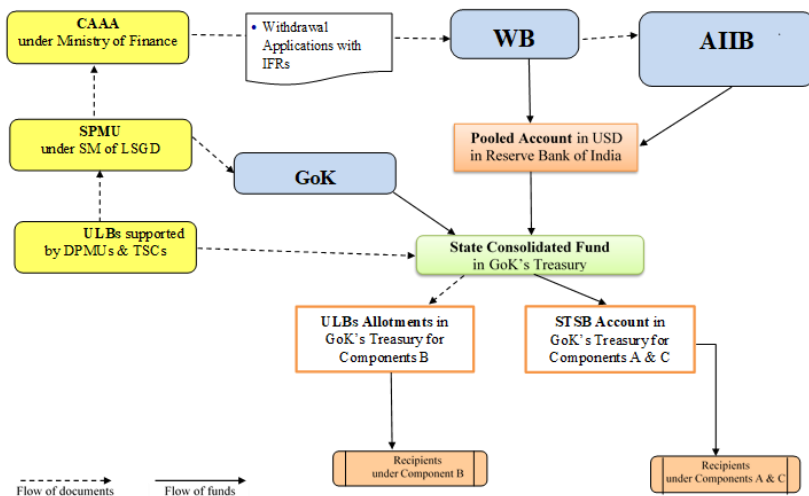
17. The SPMU and DPMUs will be supported by a Project Management Consultant (PMC) firm, hired by the SM, for carrying out the project management, coordination and supervision activities at the state and district level. In addition, DPMUs will hire a district-level Technical Support Consultant (TSC) team to provide end-to-end technical support to the participating ULBs in their respective districts in carrying out all the annual fiscal planning, budgeting and reporting activities; sub-project specific planning, design and implementation activities including preparation of all technical documents duly incorporating climate and disaster resilience, environment and social impact assessment, procurement, contract management and implementation supervision.

### **Fund Flow Arrangements**

18. Budget provisions (allotments) with adequate amounts will be provided by GoK under an appropriate account head for the funds received from CAAA for all components including for state funds. This will be as per the regular state practices that would involve major heads and sub heads as relevant and applicable. For components A and C, SPMU will receive funds through the state consolidated funds where a special treasury savings bank account will be opened for this purpose. For component B, ULBs would access funds through the state consolidated funds where direct allotments for each ULB will be issued for entire annual funds request. The grant release/allotment (for WB share, AIIB share as well as the relevant state share) will be made to the eligible ULBs directly from the state consolidated fund in a single annual tranche that will reconcile with the ULB annual planning cycle and aligned to the advances received from the WB and AIIB based on the annual cash forecast given in IFRs.
19. In line with existing grants mechanisms, release will not mean the actual/physical flow of cash but will constitute an authorization limit/allotment for the ULB to incur expenditure to that (accumulated) limit over a specific period. ULBs will be given direct allotments from the state consolidated fund. ULB's can make payment to suppliers/ contractors or to any beneficiary, directly from consolidated fund of the state, by submitting bills, with relevant

documents, to concerned treasury attached to the ULB. ULBs are already mapped with a treasury and bills can be submitted to that treasury. Through GoK, each ULB will maintain a project specific dedicated line to track the allotted amount under the project and the information regarding the approved allotted amount per ULB will also be communicated to the treasury as well. Once expenditures are incurred at ULB level, the documentation required for payments will be transmitted to the treasury and the payments will be processed at the treasury level.

Figure 3: Fund Flow Diagram



20. There had been some issues experienced in the funds flow and expenditure utilization under the previous KLGSDP throughout various stages of implementation. Considering that a portion of the WB and AIIB funds are disbursed in advance at commencement of project, also in order to ensure smooth implementation of KSWMP activities and subsequently under the reimbursement approach where GoK would need to pre-finance expenditures, the following has been agreed in principle by the state. The state treasury will: (i) give priority to process the payments related to the project and expenditure freezes applicable for other state expenditure would not apply to the project; (ii) issue authorization/re-authorization as applicable in time at the beginning of each year including for previous year rolled over unutilized allotments; and (iii) not impose ways and means clearance that is restricting payments being made above a certain limit for project payments. A legal covenant has been included in the project agreement between Kerala and AIIB, to provide for uninterrupted funds flow and availability of adequate space for expenditure utilization for the project.

21. Unutilized allotment balances in the ULBs at the end of the year will be carried over to the next financial year. SPMU will reconcile the funds released and corresponding utilization made by ULBs from the information provided in the periodic progress and financial reports. Funds provided by the WB and AIIB which remain unutilized by ULBs and SPMU STSB account, on the closing date of the project will be refunded to the WB and AIIB. The administrative and financial approvals for the sub-projects implemented by ULBs will be as per ULB regulations.

### Annex 3: Economic and Financial Analysis

#### Economic Analysis

1. Economic analysis has been carried out to analyze the cumulative potential economic costs and ensuing economic benefits on account of addressing the sectoral needs for SWM across participating ULBs. The economic analysis has been limited to cost/benefit assessments related to SWM service delivery and doesn't consider the potential interventions related to special waste (C&D waste, medical waste). The economic analysis is conducted on constant price basis for 2020 and covers a period of 30 years from 2020, i.e., 5 years for implementation and 25 years for operations, with future economic values (costs/benefits) discounted to present value using a 6 percent discount rate.
2. **Economic Costs:** Economic costs of investments (including infrastructure creation, technological equipment, vehicles etc.; and annual O&M costs) are estimated based on normative financial cost assessment conducted as part of preparatory work. Investment costs are categorized into four categories: (i) city level waste collection and transportation, (ii) Household/community level decentralized and city-level processing/resource recovery (iii) Regional collection and transportation (iv) Regional Sanitary landfill facilities. Further, the categorization of traded components and non-traded components is done and related shadow factors (Shadow Exchange Rate Factors, Shadow Wage rate factors and Shadow conversion factors) are applied for conversion of financial costs to economic costs. Similarly, the annual O&M costs for operations across the value chain are converted into economic terms for the economic analysis.
3. **Economic Benefits:** Investments under the project in the state are envisaged to yield substantial economic benefits from the anticipated overhaul in SWM services in participating ULBs and the State. The economic benefits, listed below, have been assessed based on differential impact between the key parameters in 'project' and 'no project' scenarios.
4. **Environmental improvement:** The economic benefits from environmental improvement include:
  - Reduction in GHG from reduced waste burning and reduced untapped methane generation from adoption of controlled BDW processing technologies as well as methane capture solutions in the sanitary landfill sites. These economic benefits are assessed considering the characteristics of the avoided emissions from uncontrolled burning, methane capture potential of the BDW, and the global norms for shadow price of each type of emission (CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub>, and particulate matter). The improvement of city level collection and transportation systems, provisioning of city level processing facilities and regional level sanitary landfill facilities for safe disposal would result in annual reduction of 80 percent in GHG emissions for participating ULBs. This results in net annual economic benefit of ~USD75 million.
  - Minimised waste leakages and reduced contamination of surface water resources and ground water in 'project scenario' viz-a-viz 'no-project' scenario on account of direct interventions related to provisioning of collection and transportation systems to



households in participating ULBs, and spill over/indirect effect of interventions related regional facilities to remaining 6 ULBs. While such benefits will have a state-wide and cross-sectoral economic implication, limited benefits have been quantified in terms of 'impact on tourism' and 'impact of fishery and marine product industry'. The tourism industry in Kerala presently attracts ~1.3 million foreign tourists and ~18 million domestic tourists. Based on the correlation between the impact of SWM practices on the tourism industry, the net benefit from avoided cost of tourism reduction is valued at USD1.6 million annually.

5. **Public Health benefits:** The economic benefits to public health from improved SWM will accrue from:
  - Reduced vulnerability of citizens to fever, allergies and skin related diseases due to decreased probability of direct exposure to mismanaged solid waste between the 'with project' and 'no project' scenario. Further, public health benefits will accrue from reduced vulnerability to water borne disease, but impacts are state-wide and have not been valued. The economic benefits of reduced exposure to mismanaged SWM has been calculated for participating ULBs in terms of 'number of man-days lost from sickness' and consequent 'economic loss of income' on account of differences between 'project' and 'no project' scenario. The project interventions will result in net annual economic benefits worth USD85 million from avoidance in man-days lost.
  - Avoided medical expenditure for the estimated number of people affected with fever, allergies and skin related disease between the 'with project' and 'no project' scenario, translating into an incremental economic benefit of ~USD8.7 million annually. Significant but unquantifiable indirect tangible and intangible economic benefits would accrue from reduced number of man days' and avoided medical expenditures for water borne diseases, and reduced air borne diseases, but this has not been considered for the economic calculations.
6. **Employment generation:** The infrastructure creation, O&M and the overall SWM service delivery, particularly built around promoting private sector participation, in the 'project' scenario provides for significant livelihood generation. Further, intangible economic benefits will accrue from increased financial sustainability of the self-help groups (HKS & Kudambashree) promoted under the State livelihoods program. The net economic benefits of the employment generation potential have been conservatively assessed based on manpower requirement across the value chain between the 'project' and 'no project' scenario and that results in annual economic benefits of USD11 million.
7. **Improved resource recovery:** Economic benefits will accrue from improved city level processing and recycling facilities ensuring the value enhancement required for robust market linkages for processed/recycled saleable outputs in the 'project' scenario. The net economic benefits are estimated based on the increased quantum of saleable outputs (compost, recyclables) and respective market prices, translating into average annual economic benefits of USD24 million.
8. **Enhanced Disaster resilience:** This relates to reduced waste littering in water resources;

adoption of flood resilient engineering practices for infrastructure creation; and technology selection between the 'project' and 'no project' scenarios. The economic benefits on this include direct and indirect impact on disruption of services. The economic benefits have been conservatively valued as in terms of annual damage and rehabilitation costs, based on the probability on return period of extreme flooding events and damage reduction potential of improved SWM services. The estimated net average annual economic benefits are of ~USD51 million.

9. **Dumpsite rehabilitation and land optimization:** Multi-fold economic benefits will accrue in the 'project' scenario viz-a-viz 'no project' scenario due to i) land recovered through dumpsite rehabilitations; ii) improvement in land value around rehabilitated dumpsites, iii) land value improvements on account of rehabilitations of existing city level infrastructure; and iv) optimized usage for land parcels associated with planned city level and regional facilities. The economic benefits on this account have been valued for on an annual net benefit of USD14 Million.
10. The EIRR was estimated at 49 percent and ENPV at USD1,413 million. The economic analysis is conducted on constant price basis for 2020 and covers a period of 30 years from 2020, i.e., 5 years for implementation and 25 years for operations, with future economic values (costs/benefits) discounted to present value using a 6 percent discount.

## **Financial Analysis**

11. The current level of expenditures undertaken by the ULBs on SWM is low as the focus is primarily on decentralized systems. In addition, there is no formal system for levying and collecting SWM user charges except for ad-hoc local practices where HKS/Kudumbashree women groups collect user charges directly from the household for primary collection of plastic waste. Since the project will support ULBs in setting up a formal service delivery system for SWM this would require ULBs to assign much higher level of capital expenditure towards SWM. To avoid reducing the allocation on other expenditure priorities, GoK has decided to provide grants to ULBs for SWM in addition to the current development plan funds to ULBs. Further, GoK is also developing regional disposal and/or processing/recycling facilities. ULBs will be required to meet the O&M expenditures for the entire SWM chain; and pay tipping fees for sending waste to regional landfills and/or cluster-based facilities.
12. The financial analysis<sup>1</sup> is focused on assessing: (i): ULBs ability to utilize the additional grants for SWM capital expenditure by comparing the increase in ULB's capital expenditure to their current levels, (ii) increase in O&M expenditure compared to the current recurring expenditure of ULBs and extent of possible cost-recovery for SWM through user charges, (iii) user charges to be levied for full cost recovery and affordability/feasibility of user charges with respect to average household income, (iv) extent of shortfall in cost recovery that may need to be financed by ULB's general budget or existing revenue surplus, and (v)

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<sup>1</sup> Since ULBs receive the entire investment as a grant, FIRR calculations are not relevant, and are not presented

vulnerability of ULBs due to their current fiscal situation/stress.

**13. Comparison of proposed capital expenditure with current capital expenditure trends.**

The table below presents a comparison of current capital expenditures of 87 ULBs under their annual development plan; and the additional expenditure on SWM financed under the proposed project. ULBs are expected to implement approximately 50 percent of the capital expenditure under the proposed project. This expenditure (apportioned over the project period) is compared with the projected development plan fund size of ULBs.

	Unit	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26
Capital Expenditure of all ULBs	USD mn	89	109	119	134	150	168	188	211	236	265
Out of which, SWM expenditure	USD mn	1	3	2	2	3	3	3	4	4	5
Projected incremental capex	USD mn	NA	NA	NA	0	4	19	20	21	22	5
<b>Ratios</b>											
Increase in Development Plan size due to additional SWM investments	%	NA	NA	NA	0	2	11	10	9	9	1
Increase in SWM capital expenditure	Times	NA	NA	NA	0	1	5	5	5	4	1

14. The size of the Development Plan of the ULBs will increase by approximately 11.3 percent, 10.6 percent and 9.9 percent in FY22, FY23 and FY24 respectively. This is considering that only 50 percent<sup>2</sup> of the capital expenditure under the project is implemented by ULBs and that the remaining 50 percent is implemented by State Government agencies for regional facilities (and hence will not be counted as ULB's allocation). The increase in capital expenditure is not disproportionately high as compared to past trends (in FY 2018, the size of development plan increased by 23.1 percent). Since ULB's existing expenditures on SWM are negligible, (~2.3 percent) of the Development Plan funds, the increase in capital expenditure on SWM in the project is significant, at 5.6, 5.3 and 4.6 times the likely capital expenditure on SWM without the project in FY22, FY23 and FY24.

**15. Increase in recurring expenditure, own source revenues and impact on revenue surplus.** Currently, the user charges are collected from residential and non-residential properties. The collection and disposal of waste services are provided by HKS, municipalities, and small private operators. The user charges vary based on the type of user i.e. household, commercial establishment and institutions, and the financial analysis assumes that that user charges vary by type of user and by level of use (generators who

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<sup>2</sup> The proposed allocation to SWM under this project is additional to plan funds and is not subject to sectoral caps required to be followed under the Development Plan.

process waste at source are charged less). User charges for households are expected to increase gradually covering 33 percent of customers in the beginning and reaching a coverage of 100 percent of customers by year 2031. The user charges for commercial establishments are expected to increase gradually covering 24 percent of establishments in the beginning and reaching a coverage of 100 percent of customers by 2032. User charges for institutions are expected to increase gradually covering 26 percent of institutions in the beginning and reaching a coverage of 100 percent of customers by year 2032. It is assumed that the number of commercial establishments and institutions will grow by 1 percent and 0.5 percent y-o-y respectively.

16. Based on a survey conducted in 12 towns, the following user charges have been assumed in the financial analysis. These are in line with current practices. As a conservative assumption, tariff revisions are assumed only once in 4 years by 5 percent (1.22 percent per annum) for all user types.

<b>Particulars</b>	<b>User Charges (in INR/month/unit)</b>	<b>Tariff revision</b>
Households	70	5% once every 4 years
Commercial establishments	350	5% once every 4 years
Institutions	1,300	5% once every 4 years

17. The key categories of the SWM O&M expenditure are (i) primary collection and transportation; community level BDW processing facilities, (ii) city level processing and treatment of both BDW and NBDW, (iii) secondary transportation including transfer stations, (iv) waste disposal at regional landfill and cluster facilities, and (v) routine replacement of minor equipment such as bins, carts, etc. Average per ton cost for collection, treatment and disposal is estimated at INR 2,989 (USD40). Based on waste generation data, this translates to a per capita O&M expenditure of INR 630 (USD8.5) per annum (2020 prices). Costs are expected to increase by 5 percent per annum.
18. The key findings of the analysis are: (i) SWM operations will result in an average 15 percent increase in revenue and 26 percent increase in expenditure until FY30. SWM O&M cost recovery is projected to be achieved only by year 2030, (ii) Cost recovery in FY24 is projected at 45 percent, in FY25 it increases to 60 percent and by FY 2030 it exceeds 100 percent. The average cost recovery in the first 3 years of operations is 62.5 percent and the average annual deficit until FY 2030 is USD10.8 million for all 87 ULBs; (iii) Households are expected to contribute around 23 percent of all SWM user charges. While this reduces social opposition, the cost recovery remains vulnerable to the willingness to pay of commercial establishments (assumed to contribute 47 percent of user charges), especially since they also have an obligation to treat biodegradable waste at their own cost within their premises, and (iv) The shortfall in cost recovery in SWM is expected to be met out of the general budget of the ULB. An average of 25.2 percent of revenue surplus from general budget of ULBs needs to be set aside to meet SWM deficits in the initial years (FY 2024 to FY 2026) and the average requirement until FY30 is 11 percent. If no user charges are collected, the

SWM deficits will reduce projected revenue surplus by 66 percent on an average until FY 2030.

19. **Categorization of ULBs based on fiscal situation:** The below categorizes the ULBs based on the expected fiscal impact of SWM. The ULBs are divided into four categories based on the projected SWM deficit/ revenue surplus. While 57 out of 87 ULBs (accounting for 69 percent of urban population) face only a moderate impact, the remaining 30 ULBs will face significant reduction in revenue surplus. 9 out of the 30 ULBs will slip into a revenue deficit.

<b>SWM Revenue Deficit/ Surplus</b>	<b>Moderate 0% to 33%</b>	<b>Significant 33% to 66%</b>	<b>Heavy 66% to 100%</b>	<b>Deficit ULBs – SWM deficit is higher than revenue surplus</b>
Number of ULBs out of 87	57	17	4	9
Share of population	69%	19%	5%	8%

20. **Affordability Analysis:** As per the Economic Review 2018 prepared by the Kerala State Planning Board, the per capita income in Kerala is approximately USD2,035) per year (approximately USD8,143 per year per HH). The user charge of USD1 per household per month for SWM accounts for only 0.14 percent of the average household income.

**Proposed mitigation measures in the project**

21. While SWM deficits are not significant for ULBs covering 69 percent of population, risks on user charges remain; and 30 ULBs will see significant or severe reduction in their revenue surplus. For this, the project will support LSGD and SM in developing a state-wide framework for user charges to ensure uniformity across the State and to minimize social opposition. To mitigate the SWM deficits and to encourage participation in regional facilities, the project will provide O&M support for specific categories of expenditure under component B including – (i) Cost of new activities in the SWM value chain for which ULBs are encouraged to enter into performance-based contracts such as payments under performance-based collection and transportation contracts and payments for citywide composting facilities operated under a contract, and (ii) charges to be paid for participating in shared regional facilities including tipping fees to cluster facilities and regional landfills, and charges for secondary transportation to regional landfills.
22. The O&M support to participating ULBs will provide an opportunity to stabilize the user charge system within the project period, not rely excessively on subsidies from the general budget and yet maintain financial sustainability of SWM operations. It will bridge 50 percent of the SWM deficit between FY24 to FY26. The remaining 50 percent is expected to be met by ULBs from the revenue surplus (12.6 percent of revenue surplus to be set aside by an average ULB). This also provides adequate cushion for ULBs with less than average revenue surplus to meet the SWM deficit.

**Annex 4: Climate Finance**

1. Following are the climate resilient interventions proposed in the project.

Components/ indicative amounts	Project activities	Adaptation <sup>#</sup> / Mitigation <sup>*</sup>
<b>Component A</b>		
Regional Landfills (USD30 million)	- Capture or flare the gas generated from decomposing organic waste. Although the landfills are mostly for inert waste, they are likely to receive contaminated waste such as plastics with food which cannot be efficiently put to reuse or recycle. The main impact in terms of GHG reduction will come from large scale introduction of sanitary landfilling and thus collection of landfill gas.	Mitigation <sup>3</sup>
Dumpsite remediation (USD40 million)	- Remediate identified dumpsites to reduce GHG emissions by mining RDF and composting organics and significantly reducing leachate, given that solid waste dump sites (SWDSs) have been recognized as major GHG emission sources in developing countries.	Mitigation <sup>4</sup>
Floods resilience (USD30 million)	- Upgrade/develop SWM facilities to withstand rising levels of flooding. This is critical to improve floods resilience, since large parts of Kerala are prone to flooding and risks are increasing with more frequent and peak rainfall incidents and rising sea levels. - Properly designed landfills and dumpsite remediation will also reduce the quantity of waste finding its way to water bodies thereby blocking the natural waterways and exacerbating flooding.	Adaptation
<b>Component B</b>		
Reducing emissions from Transportation (USD40 million)	-Plan and implement efficient transportation through switching to fuel-efficient vehicles. -Strengthen decentralized waste management especially for organic fractions to reduce the need for transportation to far-off sites.	Mitigation <sup>5</sup>
Reducing emissions from untreated organic waste (USD50 million)	-Plan and implement community level facilities for HH not having decentralized facility for organic waste	Mitigation <sup>6</sup>

<sup>3</sup> 6.2 – Waste management projects that capture or combust methane emissions.

<sup>4</sup> 6.2 - Waste collection, recycling and management projects that recover or reuse materials and waste as inputs into new products or as a resource (only if net emission reductions can be demonstrated).

<sup>5</sup> 3.4 - Vehicle fleet energy efficiency and low-carbon fuels.

<sup>6</sup> 6.2 - Waste management projects that capture or combust methane emissions.

Expanding waste collection (USD40 million)	-Expand waste collection systems up to 100% HHs to avoid littering of waste and serve to prevent waste from blocking drains and causing flooding.	Adaptation
<b>Component C</b>		
IEC and citizen engagement program (US 5 million)	<ul style="list-style-type: none"> <li>- Educate citizens and communities on climate impacts/risks/behaviors.</li> <li>- IEC activities and technical support to make decentralized systems efficient at HH level.</li> <li>-Conduct capacity building of SM and ULBs for disaster management for preparation of ULB-specific Disaster Management Plans and consider disaster resilience as an integral part of planning, design, implementation and operation of SWM facilities.</li> <li>-Conduct climate resilience capacity building activities for SM and ULBs for preparation and implementation of climate resilient SWM investment plans.</li> <li>-Funding for identification and implementation of adaptation and mitigation actions to embed and enhance climate resilience and lower carbon footprint of municipal SWM sector.</li> </ul>	Adaptation
<p>* As per Joint methodology for tracking climate change mitigation finance table A.C. 1          #As per Joint methodology for tracking climate change adaptation finance</p>		

## **Annex 5: Member and Sector Context**

1. After growing at a healthy rate of 7.4 percent between FY2014 and FY2018, the Indian economy experienced a slowdown in recent years. Growth slowed down to 4.2 percent in FY2019 due to distress in the rural economy, financial sector stress weakness in private consumption, investment, and exports, owing to rural distress, stress in the financial sector, and sluggish global demand. Growth in the first half of the FY2020 was significantly dented by COVID-19 outbreak and the associated lockdown, with economic output contracting by 15.7 percent. Growth is expected to recover during the remainder of year as social distancing measures were eased and economic activity revived.
2. India's economic growth was also accompanied with unprecedented rate of urbanization with the rate of urbanization increasing from 27.8 percent in 2001 to 31.2 percent in 2011 and further to over 34.0 percent in 2018. The proportion is expected to grow to 43.0 percent by 2031 with Indian cities likely to contribute about 70 percent of GDP.<sup>7</sup> India is expected to add 416 million urban dwellers between 2018 and 2050 with 17 of the 20 fastest growing cities in the world between 2019 and 2035 being from India.<sup>8,9</sup> However, the rapid growth of urban population is imposing increasing pressure on already stretched basic urban services and creating lags in service delivery, inefficient economic activity and environmental degradation. Water supply and sanitation access remains low through large parts of urban India with quality and duration of such services remaining low. For example, in 2017, only 72 percent of the urban population in India had access to basic sanitation services compared to a global average of 84.4 percent.
3. Rapid urbanization in India has resulted in steady growth in the generation of solid waste. In recent years per capita waste generation has increased by 1.3 percent annually to reach 450 grams per day.<sup>10</sup> Nearly 62 million tonnes of municipal waste was generated in India in 2016 and it is expected to increase to 165 million tonnes by 2031 and 436 million tonnes by 2050. It is estimated that while 75 to 80 percent of the total municipal waste is collected only 22 to 28 percent of this is processed and treated. Thus, a large portion of this collected waste is often dumped indiscriminately, clogging the drains and the sewerage system. It is estimated that If cities continue to dump their waste at present rate without treatment, it will need 1240 hectares of land per year and with projected generation of 165 million tonnes of waste by 2031, the need of setting up of landfill will require 66,000 hectares of land.<sup>11</sup>
4. Kerala is second most urbanized state in India, after Tamil Nadu, with an urbanization rate of 47.7 percent, significantly higher than the national average. The share of urban population between 2001 to 2011 nearly doubled from 26.0 percent in 2001. The urbanization has been

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<sup>7</sup> Government of India, Planning Commission. 2012. Report of the Steering Committee on Urbanization, Twelfth Five Year Plan (2012–2017). Delhi.

<sup>8</sup> World Urbanization Prospects 2018, Key Facts, Department of Economic and Social Affairs, United Nations

<sup>9</sup> Global Cities: The Future of the World's Leading Urban Economies to 2035, Oxford Economics

<sup>10</sup> Satpal Singh, (2020) Solid Waste Management in Urban India: Imperatives for Improvement, ORF occasional Paper No. 283

<sup>11</sup> Press Information Bureau, "Solid Waste Management Rules Revised after 16 years; Rules now extend to Urban and Industrial Areas" Ministry of Environment, Forest and Climate Change, April 5, 2016.



driven by the significant increase in census towns, due to result of people in rural areas shifting from agriculture to non-agricultural sectors such as construction, trade, and manufacturing.<sup>12</sup> A large share of the urban population is forced to live in crowded areas with the population density of 859 persons per sq.km, nearly thrice the national average 382 persons per sq.km. Rapid urbanization has put a strain on the existing infrastructure in the state. While Kerala, tops the ranking of Indian states' performance on Sustainable Development Goals, it is ranked in the lower half in case of SDG-6 (Goal of Clean Water and Sanitation).

5. Kerala has made significant progress in decentralizing urban functions to Urban Local Bodies (ULBs) and leads other States in having decentralized most of the urban functions. This includes allocating a significant proportion of the state's budget to fiscal transfers to local governments. However, despite significant decentralization, the state has not been able to benefit from nor keep pace with rapid urbanization in terms of service delivery and Kerala is markedly below prescribed national service level benchmarks including in solid waste management, drinking water supply, waste-water management, and drainage. Kerala's overall municipal revenue per capita remains well below the national average as is the share of municipal revenue raised by the local bodies. Other key factors impacting service delivery include weak investment planning and budgeting, long approval processes and inadequate technical manpower and project execution capacities.
6. Solid waste management (SWM) suffers from a lack of adequate infrastructure and service systems. In particular there is a lack of waste collection systems, waste disposable facilities, engineered landfills and centralized waste management facilities and weak service delivery systems. According to the World Bank, ULBs in Kerala generate around 3,750 tons of solid waste per day (TPD), out of which nearly 82 percent is biodegradable waste (BDW) and the remaining is non-biodegradable waste (NBDW). Only 20 percent of the BDW is treated at household or community levels, while the remaining is not properly treated and disposed. Likewise, around 60 percent of the NBDW is dumped illegally or burned, while the remaining waste is collected informally by rag-pickers. Consequently, a major fraction of municipal waste has been openly dumped in public spaces, low-lying lands, and water bodies for many years now, posing serious environment and public health hazards.
7. A study compiled by the Kerala State Literacy Mission Authority (KSLMA) found that solid waste accounts for 53 percent of the pollution in water sources with 73 percent of water bodies being either completely or partly polluted.<sup>13</sup> Another survey indicates that plastic burning is a common phenomenon with 44.65 percent of population burn plastics with only 5.62 percent of the population giving used plastic for recycling. Similarly, 32.3 percent people leave their household waste in the house premises, 26.3 percent people throw the

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<sup>12</sup> Census towns are areas that are not notified as a town by state governments but have acquired urban characteristics (population exceeds 5,000, at least 75 percent of the male working population is engaged in non-agricultural activities, and a population density of more than 400 persons per sq. km)

<sup>13</sup> A Study Report on the Status of Water Resources, Kerala State Literacy Mission Authority, General Education Department, Government of Kerala.

waste in distant places and 12.5 percent people burn household waste.<sup>14</sup>

8. GoK has recognized the need to improve SWM services and has implemented the following measures, including, creating a state-wide cleanliness mission (Harith Kerala Mission HKM), promoting a decentralized SWM approach by requiring local governments improve source segregation and promoting household composting and bio-digestion, engaging women self-help groups, establishing community level material collection and resource recovery facilities and developing community compost plants. To support these initiatives, the state has allocated 15 percent of its development grants to local governments to support SWM.
9. Despite these efforts, local SWM continues to have minimal treatment of biodegradable waste resulting from a lack of primary collection and transportation, low-capacity local treatment facilities and lack of centralized processing and disposal facilities. Non-biodegradable waste services also remain inadequate as they focus mostly on high value plastics and rely on informal collection and sorting. Decentralization has also highlighted institutional challenges including that ULBs continue to lack resources and institutional capacity to comply with National and State SWM regulations. Numerous State level agencies have been created to strengthen service delivery systems in ULBs. However weak coordination between themselves and with ULBs has led to inconsistent approaches and poor accountability. Additionally, enforcement and compliance with regulations, policies and guidelines is weak with inconsistent interpretation and application of enforcement.

ULB fiscal systems are also not suitable for sustainably addressing SWM financial needs. Fiscal planning does not require ULBs to adopt multi-annual capital investment plans nor are the prescribed SWM funds sufficient to meet SWM investment and operational needs. Adding to the low infrastructure investment is the fact that ULBs have traditionally allocated more resources to scaling up decentralized SWM systems, including subsidies for households for biodegradable waste treatment equipment, rather than funding infrastructure for primary collection, processing and disposal facilities. Lastly a lack of political and policy commitment to PPPs has resulted in limited formal private sector participation across the SWM value chain. This is exacerbated by a lack of formal cost recovery systems for SWM services at the ULB level.

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<sup>14</sup> <https://timesofindia.indiatimes.com/city/thiruvananthapuram/most-keralites-dispose-plastic-by-burning-survey/articleshow/58627206.cms>

**Annex 6: Sovereign Credit Fact Sheet**

**A. Recent Economic Development**

1. India is a lower-middle-income country, with a GDP per capita at USD 2,104 and a population of 1.37 billion in 2019.<sup>35</sup> It is the world's third largest economy by purchasing power parity. India's economy grew at an average annual rate of 7.4 percent between FY2014 and FY2018 but has slowed down in recent years.<sup>36</sup> Following disruptions due to the demonetization initiative in November 2016 and the rollout of goods and services tax in July 2017, growth slowed to 7.0 percent in FY2017 and 6.1 percent in FY2018.<sup>37</sup> Growth slowed down further to 4.2 percent in FY2019 due to sluggish growth in private consumption, investment and exports, owing to weak rural income growth, stress in the financial sector, and sluggish global demand. Growth in the last quarter of FY2019 (January to March 2020) and first quarter of FY2020 (April to June 2020) was significantly dented by COVID-19 outbreak and associated lockdown introduced by the government.<sup>38</sup> The Indian economy contracted by 23.9 percent in the first quarter of FY2020.

2. Low food prices helped inflation declining from 4.5 percent in FY2016 to 3.4 percent in FY2018. This allowed the central bank to reduce key policy rates by 135 basis points between February 2019 and October 2019. Inflation started inching up from mid-2019 on account of higher food prices and rise in retail oil prices. Inflation averaged 6.8 percent in the first half of FY2020 due to supply side disruptions. Despite this, the central bank reduced the repo and reverse repo rates by 115 and 155 basis points to 4.0 and 3.35 percent respectively, to stimulate aggregate demand, which had declined due to the lockdown. The central bank introduced several measures to reduce the borrowing cost, bolster liquidity, and improve credit flow to the productive sectors.

3. After rising for two years, the current account deficit shrank to 0.9 percent of GDP in FY2019. Slowdown in economic activity led to a contraction in merchandise imports while exports remained weak as global demand turned sluggish. The current account recorded a surplus of 3.9 percent of GDP in the first quarter of FY2020 due to a sharp fall in trade deficit, and stable services balance. A drop in oil prices and weak domestic demand led to merchandise imports contracting by 40 percent in the first half of FY2020 while exports declined by a smaller 21.3 percent.

4. General government fiscal deficit at 8.2 percent of GDP remained high in FY2019, reflecting tepid growth in revenue and higher recurrent expenditure. A downturn in revenue due to economic slowdown and higher spending on the stimulus package resulted in the fiscal deficit in the first half of FY2020 exceeding the annual target.

**B. Economic Indicators**

**Selected Macroeconomic Indicators (FY2015-FY2021)**

Economic Indicators#	FY 2016	FY 2017	FY 2018	FY 2019*	FY 2020*	FY 2021*

Real GDP Growth	8.2	7.0	6.1	4.2	-10.3	8.8
Inflation (% change, average)	4.5	3.6	3.4	4.8	4.9	3.7
Current account balance (% of GDP)	-0.6	-1.8	-2.1	-0.9	0.3	-0.9
General government overall balance (% of GDP)	-7.1	-6.4	-6.3	-8.2	-13.1	-10.9
Nominal gross public debt (% of GDP)	68.8	69.4	69.6	72.3	89.3	89.9
Public gross financing needs (% of GDP) <sup>1</sup>	11.1	11.0	10.5	11.4	17.6	15.4
External debt (% of GDP) <sup>1</sup>	20.6	20.0	18.9	19.1	19.2	19.1
Gross external financing need (% of GDP) <sup>1</sup>	9.3	9.6	10.4	10.0	9.5	11.0
Net Foreign Direct Investment Inflow (% of GDP)	1.6	1.1	1.1	1.3	...	...
Gross reserves (USD billion) <sup>**</sup>	370.0	424.5	412.9	434.0	551.5	...
Broad money (M2, % change)	10.1	9.2	10.5	9.7	...	...
Exchange rate (Rupee/USD, EOP) <sup>**</sup>	67.9	63.7	69.6	76.6	73.8	...

Note: # Data is based on fiscal years.

\* denotes projected figures.

\*\* FX data from Financial Benchmarks India FX rate as of October 29, 2020 while Reserves data pertains to August 2020.

<sup>1</sup> For FY2020 and FY 2021, AIB Staff Estimates based on IMF Data

Source: IMF, World Economic Outlook Database, April 2020, IMF Country Report No. 19/385, December 2019 and Reserve Bank of India, Government of India.

### C. Economic Outlook and Risks

1. According to the World Economic Outlook, released in October 2020, the economy is expected to contract by 10.3 percent in FY2020. The imposition of a lockdown, with limitations on mobility of people and products, to contain the outbreak, has significantly disrupted demand and supply. With the gradual easing of lockdown from June 2020, many of the high frequency indicators like purchasing managers' index, electricity generation, freight traffic e-way bills, registering interstate shipments indicate a revival of economic activity in the second quarter of FY2020. Growth is expected to pick up strongly in FY2021 as COVID-19 dissipates and stimulus measures have an impact with a lag.

2. In May 2020, Moody's downgraded India's rating to Baa3 with a negative outlook and in June, Fitch revised India's outlook to negative, due to slow reform momentum and challenging economic environment, limited fiscal space and stress in the financial sector.
3. Overall inflation is expected to increase marginally to 4.9 percent in FY2020, due to inflationary pressures from disruptions in supply chains. However, sluggish aggregate demand on account of the lockdown and lower oil prices may dampen the inflationary pressures. Stickiness in food prices and rise in oil prices could raise inflation above the expected level.
4. Recognizing that an expansionary fiscal policy is required to mitigate the economic effect of COVID-19 pandemic, the central government announced several fiscal support measures. These include (a) direct spending including cash transfers, wage support and providing food and cooking gas to low-income households (2.0 percent of GDP), (b) foregone or deferred revenue (0.3 percent of GDP) and (c) credit provision (5.2 percent of GDP). An additional 0.1 percent of GDP has been allocated for health infrastructure. In October 2020, additional measures amounting to 0.2 percent of GDP was announced to support consumption. Various states have also announced additional relief measures. The anticipated economic contraction in FY2020 will adversely impact tax collections. The general government fiscal deficit is expected to significantly increase to 13.1 percent of GDP in FY2020. Public debt is also estimated to rise sharply to 89.3 percent of GDP in FY2020, levels last witnessed in early 2000s. Despite being high, India's public debt remains sustainable given favorable debt dynamics and the projected increasing economic growth trend in the medium term. Furthermore, with public debt having a long and medium maturity, being denominated in domestic currency and primarily held by residents, the debt profile is favorable. India's external debt is expected to remain stable.
5. The current account balance is expected to record a small surplus in FY2020. Sluggish domestic economic activity and subdued oil prices will result in import bill declining significantly. Exports of goods and services are likely to contract given the decline in global demand. Remittances are also expected to decline as lower oil prices in Middle East and spread of the COVID-19 pandemic in advanced economies reduce economic activity in these countries, where most migrant Indian workers are employed.