

FRAMEWORK FINANCING AGREEMENT
(INDIA: KOLKATA ENVIRONMENTAL IMPROVEMENT INVESTMENT PROGRAM)

Parties	This Framework Financing Agreement ("FFA") dated 8 August 2013 is between India, acting by its President ("INDIA"), and Asian Development Bank ("ADB").													
Investment Program	<p>INDIA is committed to and will cause the State of West Bengal (the "State") to implement the Kolkata Environmental Improvement Investment Program, which is an integral part of the Road Map for Kolkata. Both the Road Map and the Investment Program are described in Schedule 1 hereto.</p> <p>The total cost of the Kolkata Environmental Improvement Investment Program over the period 2013 to 2022 is expected to be \$570 million (five hundred seventy million US dollars) equivalent. The total cost of the Road Map, over the period 2012 to 2022 is expected to be \$3,600 million (three thousand six hundred million US dollars) equivalent.</p>													
Multitranche Financing Facility	<p>The Multitranche Financing Facility (the Facility) is intended to finance subprojects under the Investment Program provided that such subprojects comply with the criteria set out in Schedule 4 hereto and that understandings set out in this FFA are complied with.</p> <p>These may include:</p> <ul style="list-style-type: none"> (i) Rehabilitation of inefficient and outdated water supply assets; (ii) Continuation of sewerage extension to newly developed areas; and (iii) Further development of financial and project management capacity. <p>This FFA does not constitute a legal obligation on the part of ADB to commit any financing. Exercised reasonably, ADB has the right to deny any financing request made by INDIA, cancel the uncommitted portion of the Facility, and withdraw INDIA's right to request any financing tranche under the Facility. Financing tranches may be made available by ADB provided matters continue to be in accordance with the general understandings and expectations on which the Facility is based and which are laid out in this FFA.</p> <p>This FFA does not constitute a legal obligation on the part of INDIA to request any financing. INDIA has the right not to request any financing under the Facility. INDIA also has the right at any time to cancel any uncommitted portion of the Facility.</p> <p>INDIA and ADB may exercise their respective rights to cancel the Facility or any uncommitted portion thereof, and ADB may exercise its right to refuse a financing request, by giving written notice to such effect to the other parties. The written notice will provide an explanation for the cancellation or refusal and, in the case of a cancellation, specify the date on which the cancellation takes effect.</p>													
	<p>Financing Plan</p> <p>The financing plan for the Kolkata Environmental Improvement Investment Program is summarized below.</p> <table> <tr> <th>Financing Sources</th><th>Total (\$ million)</th><th>Share (%) of Total</th></tr> <tr> <td>Asian Development Bank</td><td>400</td><td>70</td></tr> <tr> <td>India</td><td>170</td><td>30</td></tr> <tr> <td>Total</td><td>570</td><td>100</td></tr> </table>		Financing Sources	Total (\$ million)	Share (%) of Total	Asian Development Bank	400	70	India	170	30	Total	570	100
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Financing Terms	<p>ADB will provide loans to finance subprojects and components under the Investment Program, as and when the latter are ready for financing, provided, INDIA is in compliance with the understandings hereunder, and the subprojects are in line with those same understandings. Each loan will constitute a tranche.</p> <p>Each tranche may be financed under terms different from the financing terms of previous or subsequent tranches. The choice of financing terms will depend on the project, and ADB's financing policies, all prevailing on the date of signing the legal agreement for such tranche.</p> <p>Tranches may be provided in sequence or simultaneously, and some may overlap in time with each other.</p> <p>Commitment charges are not payable on the Facility. They are payable only on financing actually committed by ADB as a loan. ADB rules on commitment charges, which are in effect, when the legal agreements are signed for a tranche, will apply with respect to such tranche.</p> <p>Amount The maximum financing amount available under the Facility is four hundred million US dollars (\$400,000,000). It will be provided in individual tranches from ADB's Ordinary Capital Resources.¹</p> <p>Availability Period The last date on which any disbursement under any tranche may be made will be 31 August 2023. The last financing tranche is expected to be executed no later than 31 December 2017.</p> <p>Terms and Conditions India will cause the proceeds of each tranche to be applied to the financing of expenditures of the Investment Program, in accordance with conditions set forth in this FFA and the legal agreements for each tranche.</p>
Execution	<p>The executing agencies will be the State and Kolkata Municipal Corporation ("KMC"). The executing agencies will implement the Investment Program in accordance with the principles set forth in Schedule 1 to this Agreement, and as supplemented in the legal agreements for each tranche.</p>
Periodic Financing Requests	<p>INDIA may request, and ADB may agree, to provide loans under the Facility to finance the Investment Program upon the submission of a Periodic Financing Request (PFR). Each PFR should be submitted by INDIA. INDIA will make available to the State and through the State to KMC, the proceeds of each tranche in accordance with the PFR, and the legal agreements for the related tranche.</p> <p>Each individual tranche will be for an amount of no less than one hundred million US dollar (\$100,000,000), or its equivalent. ADB will review the PFR(s) and, if found satisfactory, prepare the related legal agreements.</p> <p>The subprojects for which financing is requested under the PFR will be subject</p>

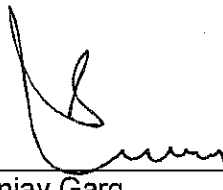
¹ Provisions of the Ordinary Operations Loan Regulations applicable to LIBOR-Based Loans Made from ADB's Ordinary Capital Resources, dated 1 July 2001, would apply to each loan, subject to modifications, if any, that may be included under any Loan Agreement (said Ordinary Operations Loan Regulations as so modified, if any, being hereinafter called the Loan Regulations).

	<p>to the selection criteria set out in Schedule 4 hereto, satisfactory due diligence, and preparation of relevant safeguard and fiduciary frameworks and other documents. The Facility will be implemented in accordance with the general framework set out in Schedule 3 to this FFA, and the Facility Administration Manual agreed between INDIA and ADB.</p> <p>Until notice is otherwise given by INDIA, the Secretary, Additional Secretary, Joint Secretary, any Director or any Deputy Secretary in the Department of Economic Affairs, Ministry of Finance will be INDIA's authorized representative for purposes of executing PFRs.</p>
General Implementation Framework	The Facility will be implemented in accordance with the general framework set out in Schedule 3 hereto.
Procedures	<p>Tranches to be provided under the Facility will be subject to the following procedures and undertakings:</p> <ul style="list-style-type: none"> (i) India will notify ADB of a forthcoming PFR in advance of the submission of the PFR. (ii) India will submit a PFR in the format agreed with ADB. (iii) ADB may, in its sole discretion, for the reasons provided, decline to authorize the negotiation and execution of any legal agreement for a tranche. (iv) If ADB confirms acceptance of the PFR, the legal agreements will be negotiated and executed by the parties.
PFR Information	<p>The PFR will substantially be in the form attached hereto, and will contain the following details:</p> <ul style="list-style-type: none"> (i) Loan cofinancing (if any) amount; (ii) Description of subprojects/components to be financed; (iii) Cost estimates and financing plan; (iv) Implementation arrangements specific to the project; (v) Confirmation of the continuing validity of and adherence to the understanding in this Agreement; (vi) Confirmation of compliance with the provisions under previous Loan Agreement(s) and Project Agreement(s), as appropriate; (vii) Other information as may be required under the Facility; and (viii) Facility/Project Administration Manual.
Safeguards	<p>Attached as Schedule 5 are references to the Safeguard Frameworks that will be complied with during the implementation of the Facility.</p> <p>ADB's Safeguard Policies in effect as of the date of signing of legal agreements for a tranche will be applied with respect to the subprojects financed under such financing tranche.</p>
Procurement	All goods and services to be financed under the Facility will be procured in accordance with ADB's Procurement Guidelines (2013, as amended from time to time).
Consulting Services	All consulting services to be financed under the Facility will be procured in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).
Advance contracting; Retroactive financing	Under each tranche, ADB may, subject to its policies and procedures, allow on request: (i) advance contracting of works, goods, services and consultants; and

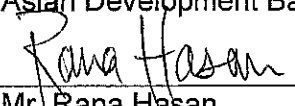
	(ii) retroactive financing of eligible expenditures for works, goods, services and consultants up to 20% of proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related legal agreement. INDIA, the State and KMC acknowledge that any approval of advance contracting and/or retroactive financing will not constitute a commitment by ADB to finance the related project.
Disbursements	<p>Disbursements will be made in accordance with ADB's Loan Disbursement Handbook (2012, as amended from time to time).</p> <p>Each loan under the Facility will have its own first-generation imprest account in the Reserve Bank of India. The State and KMC may, at their option, establish a sub-account for each loan, if necessary or required, in and with a bank acceptable to ADB. The amount at any given time in the first-generation imprest accounts and sub-accounts shall not exceed 6 months of estimated expenditures or 10% of the related loan amount, whichever is lower. Individual payments under the statement of expenditures procedures (SOE) will be \$100,000.</p>
Monitoring, Evaluation, and Reporting Arrangements	The State and KMC, which will act as the executing agencies of the investment program, will be responsible for overall implementation of the Investment Program. KMC has a project director, who is responsible for overall supervision and continuous monitoring of the Investment Program. The project director will be responsible for coordinating with INDIA and the State, and coordinating with and reporting to ADB. Schedule 2 hereto sets as the Design and Monitoring Framework for the Facility, against which the implementation effectiveness will be evaluated.
Undertakings	Attached as Schedule 6 are the undertakings provided by INDIA, the State and KMC.

Signed in New Delhi as of the day and year first above written.

INDIA


 Mr. Sanjay Garg,
 Director (MI),
 Department of Economic Affairs

Asian Development Bank


 Mr. Rana Hasan,
 Officer in Charge,
 Indian Resident Mission

SCHEDULE 1

MULTITRANCHE FINANCING FACILITY CONSTITUENTS

A. Roadmap

1. **Sector Goals.** There are five policy documents which provide policy guidance on the service level targets of India, the State, and the Kolkata Municipal Corporation (KMC), as shown in Table 1. Although there are some variances in technical numerical targets, broad strategic directions are consistent—goals for water supply and sewerage are: (i) 100% coverage of 24-hour water supply through metered connections; and (ii) 100% sewerage coverage with 100% sewage treatment.

Table 1: Strategic Directions in Policy Documents

Organization	Policy Documents	Targets
Water supply		
The United Nations	Millennium Development Goal (India is signatory)	<ul style="list-style-type: none"> • 94% urban households with access to drinking water by 2015. • 100% urban water supply by 2012.
Planning Commission, the Government of India	The 11 th Five-Year Plan 2007 - 2012	
Ministry of Urban Development, the Government of India	Handbook for Service Level Benchmarking, June 2010	<ul style="list-style-type: none"> • 100% water supply coverage; • 135 liter per capita per day supply; • 15% nonrevenue water rate; • 100% household metered; • 24-hour continuity of supply.
Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, the Government of India	Manual on Water Supply & Treatment, May 1999	<ul style="list-style-type: none"> • 150 liter per capita per day at metropolitan and mega cities.
Kolkata Municipal Corporation	Draft Road Map for Self Sustainable Water Supply System in Kolkata, 2010	<ul style="list-style-type: none"> • 100% water supply coverage by 2017; • 150 liter per capita per day supply by 2017; • 10% nonrevenue water rate by 2018; • 100% household metered by 2018; • 24-hour continuity of supply by 2018.
Sewerage		
The United Nations	Millennium Development Goal (India is signatory)	<ul style="list-style-type: none"> • Half the proportion of people without sustainable access to basic sanitation
Planning Commission, the Government of India	The 11 th Five-Year Plan 2007 - 2012	<ul style="list-style-type: none"> • 100% urban sanitation coverage by 2012
Ministry of Urban Development, the Government of India	Handbook for Service Level Benchmarking, June 2010	<ul style="list-style-type: none"> • 100% coverage of sewerage network services • 100% adequacy of sewerage treatment capacity • 80% reuse and recycling of waste water
Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, the Government of India	Manual on Sewerage and Sewage Treatment, December 1993	<ul style="list-style-type: none"> • 80% sewerage collection efficiency

Source: Kolkata Municipal Corporation. 2011. *Kolkata Urban Sector Investment Plan*. Kolkata.

2. **Current Sector Performance.** The average performance of water supply and sewerage subsectors in the KMC's administrative area is comparatively high. Service level indicators for (i) water supply and sewerage coverage, and (ii) water supply amount and hours exceed the national average, and some are not far from the national targets. A closer look, however, reveals that the result is the average of very high service levels in KMC's central areas and poor service level in the peripheral areas of KMC, as shown in Table 2.

Table 2: Urban Service Delivery Status in Different Areas of KMC

	Water supply					Sewerage coverage
	coverage	per head amount	hours	Nonrevenue Water	Metered connections	
	(%)	(lpcd)	(hpd)	(%)	(%)	(%)
National targets	100 ^a	135 ^b -150 ^c	24 ^b	20%	100 ^b	100 ^b
National average	81	123	4	n/a	25	28
All KMC area	92	134	8	93	0.1	43
Central area	100	140	9	n/a	n/a	56
East peripheral area	76	109	6	n/a	n/a	19
West peripheral area	45	120	6	n/a	n/a	26
South peripheral area	83	120	6	n/a	n/a	7

hpd = hours per day, KMC = Kolkata Municipal Corporation, lpcd = liters per capita per day.

^a The 11th Five Year Plan 2007-2012.

^b A handbook on Service Level Benchmarking, June 2010.

^c Manual on Water Supply and Treatment, Central Public Health and Environmental Engineering Organization, 1999. The distribution of 4.4 million populations between central, east outer, west outer and south outer areas are 69%, 6%, 7% and 18% respectively.

Source: Kolkata Municipal Corporation. 2011. *Kolkata Urban Sector Investment Plan*. Kolkata.

3. **Water Supply.** KMC's water supply system has been operated since 1865. Over the years, the system was been extended and augmented in stages to meet the increasing urban population and demand for water. The water supply system consists of four supply zones (Palta, Garden Reach, Jorabagan, and Watgauge), each of which has a water treatment plant using surface water from the Hooghly River as raw water source, transmission, storage, and distribution systems to different parts of the city. The water treatment plants have an original cumulative design/production capacity of 1,787 million liter per day (mld), but their present output is 1,260 mld. The KMC area receives 1,186 mld, the remaining 188 mld is sold to other municipalities. Some parts of the KMC area are also served through ground water abstraction (114 mld) from several tube wells. Assessment of the subsector performance is in Table 3.

Table 3: Assessments of water supply subsector performance

Assessment item	Assessment Results
Coverage	The piped water supply system covers 92% of the KMC population. There are 255,442 connections, comprising 245 bulk water connections, 8,865 commercial ferrule connections, and 246,332 domestic connections. In addition, there are about 16,000 stand posts mainly serving the poor in slums. 8% of the population is currently served by groundwater supplied from individual in-house tube wells or by water tanker truck supply. Most of the groundwater supply zone is in the periphery of the KMC area, which is far from the surface water source. The long distance and high water loss in the distribution network makes it difficult to serve these areas through the existing the piped supply network.
Volume	Present average per capita supply for the entire KMC area is 134 lpcd, which is more than the national average of 123 lpcd and close to the target volume of 150 lpcd for metropolitan cities. However, the volume varies from one area to another, from 90 lpcd on average in the groundwater supply areas to 144 lpcd on average in a fraction of the Palta water supply areas. Even within each of the five water supply zones, there are big differences in distribution of water. For example, areas near the main distribution reservoirs receive at the highest volume of 310 lpcd while some areas receive the lowest volume of 40 lpcd.
Quality	The quality of treated surface water supplied fully complies with government standards.

Assessment item	Assessment Results
	In some areas of KMC, groundwater quality is a public health risk because sporadic occurrence of Arsenic beyond the permissible limit (0.05 mg/l) has been found in ground water in a few locations. The concentration of arsenic varies from 0.054 mg/l to 0.71 mg/l.
Duration	The average daily water supply duration in the KMC area is eight hours and is intermittent. A private household reservoir is compulsory as per KMC rules. The current supply duration is above the national average of four hours per day but far below the national target benchmark of 24 hours uninterrupted supply. Supply hours vary in different supply zones — an average of five hours per day in the Garden Reach supply zone, and an average of 11 hours daily supply in the Palta supply zone. Further, the supply hours within each of the supply zones also have huge variations. For example, the upper stream areas of the Palta supply zone achieves 22-hour supply while the lower stream areas receives only 5-hour supply.
Pressure	The average water pressure at consumer end is around 3.6 psi, but this is an average of high and low pressured areas. The water pressure is markedly lower in some areas, especially at the stand posts, ranging from 0.7 psi to 1.4 psi.
Metering	There are 323 metered-connections in 2012, comprising of 75 connections for domestic (13 of them are dysfunctional), 128 connections for bulk domestic, and 120 connections for industrial, commercial and institutional connections. In other words, about 0.1% of the connections are metered.
Water Loss	There are 5,687 km of distribution pipes. There is no accurate datum on water loss in the absence of metering. Observer Research Foundation estimated in 2010 the proportion of water loss based on the assessment in 62 wards. Of the input volume to the water supply system, the sum of apparent losses and real losses is 42%, the unbilled authorized consumption was 55%, and billed authorized consumption is only 3%. In other words, the estimate suggests that 577 mld is lost by leakage and unauthorized consumption. The unbilled authorized consumption is very high, simply because KMC does not levy user charges for the domestic connections.
Staffing	According to the "Schedule of Establishment", including Tollygunge, Garden Reach, South Suburban, and Jadavpur Units for the year 2011-12, as presented before KMC under Sec. 17(5) of the Act on 22 February 2011, the strength of personnel assigned for sanctioned posts of Water Supply Department is 6,267 in total.

km = kilometer, KMC = the Kolkata Municipal Corporation, lpcd = liter per capita day, mg/l = milligram per liter, mld = milliliter per day, psi = pound per square inch.

Source: Asian Development Bank estimates based on Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

4. The main hindrance to providing piped water to 100% of the population for 24 hours is not production capacity insufficiency but inefficiency in production and delivery from KMC's central to peripheral areas. In fact, KMC already has the required production capacity to meet the target. The maximum water consumption volume for the domestic connection at the target service levels is estimated at 673 mld in 2011.² KMC currently provides water to other municipalities (188 mld), industries (142 mld) and floating population³ (15 mld). The total water production requirement to achieve the service level targets is 1,018 mld, while the actual production volume from surface water is 1,260 mld. Thus, the water production capacity is adequate⁴ to serve the population and industries even after 2040.⁵ Intermittent supply hours, and inadequate per capita volume are mainly due to the operational inefficiency, and more specifically to the 'potential' significant water loss in the distribution network. KMC cannot accurately capture the water loss volume and

² The figure is based on 4,484,484 population consumes 150 liters per capita per day (lpcd).

³ The figure is based on 3,000,000 floating population consumes 5 lpcd.

⁴ The estimate is based on 5.3 million population consumes 150 lpcd, KMC sells water to other urban local bodies at 222 mld and to industries 167 mld, and floating population consumes 18 mld. The total consumption will be about 1,200 mld.

⁵ However, KMC informed that the current size of the transmission main does not allow full capacity operations of the water treatment plant in Palta, and augmentation of transmission is not possible since there is no road space, which KMC can lay the large pipes. KMC, therefore, considers construction of a new water treatment is inevitable in the future.

pinpoint the leakages as only 0.1% of connections have water meters.

5. **Sewerage.** KMC has a combined sewerage and drainage system, which was originally introduced in 1859. Both the residential and commercial users' sewage and rainwater flow into the same network of underground pipes. The KMC area is broadly divided into two river catchments: the Hooghly River system, and the Kulti River system. The natural gradient of the city is from the West to the East so that about 90% of the KMC area drains to the East Kolkata Wetlands (EKW) through the Kulti River system. EKW is a complex natural and human-made wetland, designed to function as waste stabilization ponds by using sewage as feeding material in 4,000 hectares of fish farms. Once the sewage is naturally treated in EKW, the effluent flows to outfall channels leading to the Kulti River. The remaining (about 10% of the total) sewage drains to the Hooghly River after treating in the three sewage treatment plants.

Table 4: Assessments of sewerage-drainage subsector performance

Assessment item	Assessment Results
Coverage	<p>Sewerage networks cover 43% of the population with direct connections to underground sewer. There were 417,000 households, which have direct connections to the underground sewer network in 2011. (Additional 262,000 households, or 27% of the population, have indirect connections through interceptor sewers) The coverage is uneven in the KMC area, ranging from 55% in the central area to 7% in the peripheral area. Past ADB's assistance has been addressing service level disparities in sewerage since 2000 through two loans.^a Coupled with KMC's own investment efforts, it has resulted in an increase in the sewer coverage from 31% of population in 2001 to 43% in 2012. After completion of service connections in 2013, the coverage will reach 44% of the population.</p> <p>On the other hand, drainage has wider coverage at 89% of the population or 80% of the KMC area.^b Drainage covers 100% of population in the central area (2,490,245 people in 65 km²) and a part of peripheral areas improved by the ongoing Kolkata Environmental Improvement Project (1,494,240 people in 85 km²).</p>
Treatment capacity	<p>The estimated sewage generation from all KMC area in year 2011 was 90% (1,067 mld) of the total water supplied (1,186 mld including water loss) to the KMC area. 70% of the population is directly or indirectly connected to the sewers, through a lesser amount of sewage reaches the sewerage treatment facilities. The total treatment capacity is 1,120 mld, comprising the existing three sewage treatment plants (154 mld) and the East Kolkata Wetland (966 mld).</p>
Drainage capacity	<p>For the total KMC area of 187 km², storm water runoff is estimated at 1,905 m³ per second for and generated sewage is about 13 m³ per second. Total drainage required will be about 1,918 m³ per second. The network in the central area covering 85 km² requires a capacity of 872 m³ per second but has an actual operating capacity of only 346 m³ per second, or 50% of the capacity, mainly because of siltation. The area covered by the recently completed Kolkata Environmental Improvement Project is 65 km² and has the required capacity of 667 m³ per second. These gives the total operational capacity is 1,103 m³ per second. The operational capacity is, therefore, only 58% of the required capacity for the whole KMC area. The underserved KMC area is 37 km².</p>
Treatment ability	100% of the samples passed the secondary treatment standards.
Recycling	<p>The sewerage reaching the East Kolkata Wetland (966 mld) is fully reused in the fisheries. 50% of the effluent from the sewage treatment plants is reused for agricultural purposes during the dry season. Total percentage reused is 93% of the sewage reaching the treatment facility.</p>
Staffing	<p>According to the "Schedule of Establishment" for the year 2011-12, as presented before KMC under Sec. 17(5) of the Act on 22 February, 2011, the strength of personnel assigned for sanctioned posts of the Sewerage and Drainage Department is 4,211 in total.</p>

ADB = Asian Development Bank, km² = square kilometers, KMC = Kolkata Municipal Corporation, m³ = cubic meters, mld = million liter per day.

^a ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to India for the Calcutta Environmental Improvement Project*. Manila (Loan 1813-IND, \$250 million, approved on 15 November 2000).

ADB 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Supplementary Loan to India for the Kolkata Environmental Improvement Project*. Manila (Loan 2293-IND: \$80 million, approved on 20 November 2006).

^b The total KMC area is 187 km², and the total population is 4,484,484 in 2011.

Source: Asian Development Bank estimates based on Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

6. The main underlying problem concerning sewerage services in KMC is the inadequacy of the sewerage network, caused by lack of physical investment particular in peripheral areas. If the water is supplied in accordance with the service level targets in the KMC area (including 20% water loss), and if the sewerage coverage ratio also achieves 100% of the population, the sewage volume generated would be 934 mld.⁶ While the current total treatment capacity of 1,120 mld may appear to be adequate, there is no treatment plant in some of the underserved catchment areas in the periphery, especially where the natural flow of discharge is to Hooghly River. Therefore, expansion of the sewer network will have to be coupled with the construction of sewerage treatment plants.

7. **Road Map for Achieving Performance Targets.** KMC has been unable to deliver public goods and services adequately, and this justifies public intervention in the sector. In order to gradually achieve national and state targets on water supply and sewerage, KMC has prepared an 11-year road map in the Kolkata Urban Sector Investment Plan⁷ as shown in Table 5.

Table 5: Road Map for Service Standard Targets

Indicator	2011 status	2017 target	2022 target	Gap 2011–2022
Demographic assumption				
Population in service area (000)	4,484	4,503	4,561	76
Water supply				
Population with water supply (000)	4,126	4,322	4,561	435
Coverage of water supply (% of population)	92	96	100	8
Per capita water supply (lpcd)	134	142	150	16
Water loss volume (mld)	550	548	500	50
Continuity of water supplied (hours)	8	16	24	16
Residual pressure (psi)	3.6	7.1	14.2	10.6
Sewerage and drainage				
Population with direct connection (000)	1,923	2,000	2,500	577
Coverage of direct connection (% of population)	43	44	55	12
Population with indirect connection (000)	1,209	1,603	1,824	615
Coverage of indirect connection (% of population)	27	36	40	13
Volume of wastewater collected (% of sewage generated)	70	80	95	24
Treatment capacity available (% of sewage generated)	88	90	95	7
Treatment capacity available (% of sewage collected)	100	100	100	0
Percentage of waste water reused (% of sewage treated)	93	93	93	0
Areas covered under drainage (% of KMC area)	80	91	100	20
Annual water logging frequency	>6	>6	<6	

KMC = Kolkata Municipal Corporation, lpcd = liters per capita per day, mld = million liters per day, psi = pound per square inch.

Source: Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

8. **Sector's Importance to Growth, Poverty Reduction, and Inclusiveness.** The roadmap will bring about following positive influences to growth, poverty reduction, and gender development and inclusiveness.

⁶ The figure is based on domestic consumption (673 mld), industries (142 mld), floating population (15 mld), and water loss (207 mld), multiplied by 90% is 943 mld.

⁷ Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

Areas of impact	Nature of positive impact
Growth	West Bengal's GSDP was ranked 6th among all states in India, but the per capita GSDP was only 17th amongst India's states in FY2011. The importance of urban services in growth has been increasing, since GSDP largely depends on economic activities common in urban areas. In fiscal year 2004/05, for example, Kolkata was the largest contributor (13.2%) to the net district domestic product of West Bengal. Kolkata's net district domestic product comprises a small contribution from the primary sector (0.3%), the secondary sector (11.5%), and a significant contribution from the tertiary sector (88.2%) which is projected to increase further to 92.5% by 2020. Creation of an environment promoting increasing productivity in the city of Kolkata through improvements in water supply and sewerage services, particularly in its peripheral areas, is the key to stimulating growth in the state.
Poverty reduction.	Census in 2011 reported that 1,467,000 people (32%) lived in the slums. 87% of the slum population lived in the central area, and the remaining 23% lived in the peripheral area. The road map seeks to achieve overall improvements in water service delivery in the KMC area. Once KMC achieves 24-hour continuous water supply in a pilot area, the benefit will be shared by both slum and non-slum population. The road map also aims to increase access to sewerage and drainage. Since the coverage in the central area is as high as 75%, the investment focus will be on the peripheral area, ultimately sharing the benefit with 23% of the slum population. Improved delivery of water supply and increase coverage of sewerage will help reduce the life risks deriving from water borne diseases, water logging and water contamination.
Inclusiveness	Better service levels in the central area of the KMC area have lead to skewed gender balance in service availability. There is uneven distribution of male and female citizens. The 2011 KMC population consists of 52.7% men and 47.3% women. The overall KMC gender ratio (number of females per 1000 males) is 899 in 2011 up from 829 in 2001. In the central area of town, however, the gender ratio is much lower compared to the peripheral area. In the central areas, many single young men, mostly migrant workers, live in shared apartments. Families typically inhabit the peripheral areas with children. As a result, the central area (such as boroughs IV and V) houses less than 750 women per 1000 men, but most of the peripheral area has gender ratios well above 900, and the number of women even exceeds the number of men in borough X. Therefore, the expansion of the water supply and sewerage services to the peripheral areas will bring fairer gender balance in service availability.

GSDP = gross state domestic products, KMC = Kolkata Municipal Corporation.

Source: Asian Development Bank . 2011. Feasibility Assessment. Manila

9. **Success Factors for Better Performance.** Improvement in sewerage coverage depends on how fast KMC can identify funding sources and implement the investment in asset creation. On the other hand, the improvement in water supply duration and per capita quantity calls for business process reengineering in operations by replicating practical success factors observed in other States such as Karnataka that achieved 24-hour continuous water supply. The State achieved substantially high operational efficiency through nonrevenue water reduction.⁸ The successful delivery of results was attributed to the quality implementation, attention to detail, and reestablishment of the basic knowledge and competence in normal network management, as summarized in Table 6.

Table 6: Success Factors for Better Performance

Success factor	Activities led to success
Fast demonstration of success	Isolate specific service area as a pilot case to first demonstrate 24-hour continuous supply of water in such area.
Scientific approach to leakage	Test existing pipes and joints in laboratory and analyzed the how and why they resulted in abnormal functioning.
Departure from traditions and norms	Determine the right pipe sizes and materials. Do not just follow traditional and normative guidance, but conduct adequate hydraulic modeling.
Mechanism for perusing higher standard of works	Monitor contractors' works closely, and if necessary, provide handholding assistance to workers for undertaking tasks properly at higher standards.

⁸ Nonrevenue water reduced from more than 40% to less than 17% between 2004 and 2011.

Success factor	Activities led to success
Mechanism for getting right equipment	Ensure quality of water meters with very specific and detailed specification requirements when procuring.
Mechanism for tracking performance	Set performance criteria for operations, and prepare a good database for the improved water network with data loggers used to record regular measurements and understand system performance.
Incentive structure	Link performance criteria with an incentive structure through performance bonuses.
Service improvement first before tariff change	Continue charging the existing fixed rate tariff for a transition period before changing over to volumetric rates, allowing households to see the comparison and adjust their consumption patterns, before having to pay according to the new tariff structure.
Extended help to consumers	Help households conduct necessary plumbing improvements when changing to high-pressured system.
Continuous dialogue with consumers	Continuously organize public communication activities to address consumers' concerns on what would happen to water availability, metering, tariff and billing under unprecedented continuous 24-hour continuous water supply through individual household connections.

Source: Water and Sanitation Program. September 2009. *The Karnataka Urban Water Sector Improvement Project. 24x7 Water Supply is Achievable*. New Delhi.

10. These suggest that replication of success requires guidance and active involvement of experienced water supply operators in a pilot area under a reasonable incentive structure.

11. **Key Player of Roadmap Implementation.** Section 29, Chapter IV of the KMC Act (1980) mandates KMC to provide water supply, sewerage, and drainage services in the KMC area, and assigns it responsibility for asset creation, operations, and maintenance. KMC has a dedicated account for water supply, sewerage and drainage in accordance with Sections 119 and 120, Chapter VIII of the act, and allocate 30% of the amount raised from the property tax. KMC is also entitled to charge fees under Sections 234, 262, 263, 264 and 265, Chapter XVII of the act for water supply, and Sections 307, Chapter XVIII of the act for sewerage.

12. **Physical Investment Bottlenecks for Meeting 2022 Targets.** Lack of physical infrastructure is the major bottleneck to realizing the road map. Physical requirements for major investment items have been estimated as shown in Table 7.

Table 7: Required Infrastructure for Road Map Implementation

Indicator	2011 status	2017 target	2022 target	Gap 2011-2022
Water supply				
Number of water treatment plants (plant)	4	5	5	1
Designed capacity for water production (mld)	1,787	2,172	2,172	385
Operational capacity for surface water production (mld) ^a	1,260	1,485	1,583	323
Operational capacity for ground water production (mld)	114	114	0	(114)
Reservoir capacity (ml)	256	350	470	214
Water supply distribution pipes (km)	5,687	5,800	6,000	313
Number of piped connections	255,442	370,000	501,748	246,306
Extent of metering (connections)	245	8,000	70,000	69,755
Public stand posts (unit)	16,000	13,600	11,200	(4,800)
Sewerage and Drainage				
Number of sewerage treatment plants (plant)	3	6	7	4
Capacity sewerage treatment plants (mld)	154	200	285	131
Capacity sewerage treatment EKW (mld)	966	1,000	1,076	110
Sewer network length (km)	1,778	2,000	2,428	650
Drainage network length (km)	3,006	3,270	3,656	650
Pumping stations (unit)	80	90	97	17

EKW = East Kolkata Wetland, km = kilometer, ml = milliliter, mld = milliliter per day.

^a The figures represent the Kolkata Municipal Corporation's assessment, and the Asian Development Bank's own assessment does not support the increase in water treatment plants.

Source: Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

13. The estimated funding requirements are about Rs70 billion for water supply and Rs112 billion for sewerage as indicated in Table 8. KMC has sought funding from various sources but at present there is no firm source other than the transfers from KMC's general fund account to meet the investment requirements between 2012 and 2022. KMC has sought financial assistance from the Asian Development Bank's (ADB) to finance priority investment activities. It also intends to apply for grant assistance when the Government of India announces the new phase of the Jawaharlal Nehru National Urban Renewal Mission.

Table 8: Cost of Road Map Implementation
(Rs million)

Subsectors	Cost estimates	Requested for ADB financing	KMC financing and source not identified
Water Supply	69,800	7,200	62,600
Sewerage and Drainage	112,300	14,900	97,400
Total	182,100	22,100	160,000

ADB = Asian Development Bank, KMC = Kolkata Municipal Corporation.

Source: Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

Asian Development Bank's assessment on its financing amount.

14. **Nonphysical Investment for Meeting 2021 Targets.** There are three areas for nonphysical investment: capacity to bring efficiency in water supply operations, capacity to accelerate sewerage asset creation, and capacity to accumulate surplus for capital investment, as described in Table 9.

Table 9: Required Capacity Building Activities for Road Map Implementation

Objective	Capacity building activities
Bring efficiency in water supply operations	In order to reduce water loss, it is necessary for KMC to adopt a modern approach to water leakage reduction, which is water loss management. The approach includes establishment of DMAs, pilot 24-hour continuous water supply to the DMAs, installation of water meters at each connection and hydraulically strategic points, intensive and active leakage detection and repair per DMA. To regularize the practice and institutionalize skills for water loss management, KMC will first (i) establish a water loss management unit, and (ii) engage a water loss management operator, which will demonstrate water loss reduction and train the water loss management unit on-the-job.
Accelerate sewerage asset creation	KMC utilized Rs1,271 million for the capital investment in water, sewerage and drainage in FY2009/2010 from the water and sewerage account. Approximately 42% was used for sewerage and drainage. In addition, KMC disbursed about Rs1,750 million in 2009 under ADB financed loans for the Kolkata Environmental Improvement Project. This suggests that KMC has the capacity to utilize roughly Rs2,250 million per year for investment in sewerage assets. Since the cost of achieving the road map for sewerage is estimated at Rs112,300 million, it will take 50 years to complete the investment works. To shorten the time requirement, KMC will have to increase its annual capital expenditure. The most efficient approach is to strengthen the PMU by transforming it to an autonomous entity, which can recruit more staff through flexible human resource and remuneration policies.
Accumulate surplus for capital investment	In FY2009/2010, the size of KMC's annual operation was about Rs3.5 billion. With the state government's subsidy on salaries, KMC was able to meet the operating cost from the user charges and allocation from KMC's property tax revenue. The surplus was about Rs0.6 billion. KMC supplemented the surplus with the transfer from its general fund account, and spent Rs1,271 million for capital investment. Considering further increase in repairs and maintenance cost for the ageing water supply assets, and the size of investment requirements for sewerage, KMC will have to find a way to enhance its revenue. To explore the future revenue source in line with KMC's policy on cost recovery, <i>Road Map for Self Sustainable Water Supply System in Kolkata</i> (2012), it is necessary to establish a utility finance improvement unit, which will focus on drafting water user charges and sewerage surcharges for both volumetric and

Objective	Capacity building activities
	non-volumetric domestic connections in line with KMC's road map, aiming to sustain full O&M cost recovery, and move towards accumulation of retained surplus in the water supply and sewerage account to pay for asset expansion.

ADB = Asian Development Bank, DMA = district metered area, FY = fiscal year, KMC = Kolkata Municipal Corporation, O&M = operation and maintenance, PMU = project management unit.

Note: The meaning of water loss follows the definition by the International Water Association.

B. Strategic Context

15. **Country Partnership Strategy.** India's draft country partnership strategy, and ADB's assistance program for 2013–2015 have been designed to support the Government of India's efforts to address the binding constraints in the 12th FYP through three strategic pillars. One of the strategic pillars puts emphasis on environmentally sustainable growth in various sectors, including urban.

16. **Long-Term Partnership.** In 2000, ADB provided a project loan for improvement of the combined system of sewerage and drainage in Kolkata through the Kolkata Environmental Improvement Project. A supplementary loan to the project was provided in 2006. The Country Operations Business Plan for India 2012-2014 emphasized the importance of continuing ongoing ADB's assistance to make best use of the human capital for project management and implementation developed throughout the past ADB loans, and envisaged further financial assistance to water supply and sewerage infrastructure in Kolkata through a multitranches financing facility for 2013. Also, there are two technical assistances, intended to assist KMC prepare a performance-based contract for nonrevenue water management, and develop of a method for setting water and sewerage user charges for domestic connections.

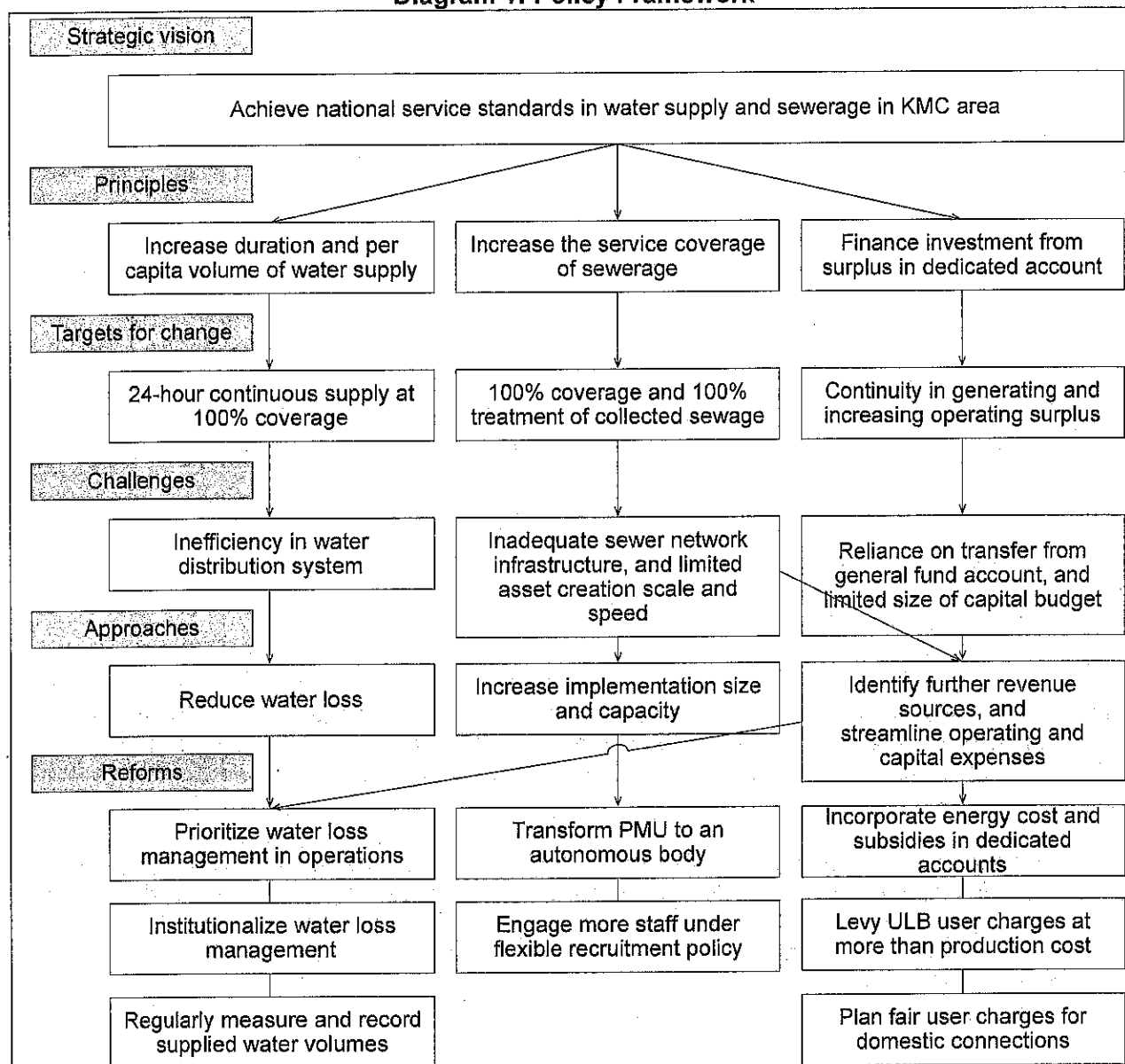
C. Policy Framework

17. **Strategic Vision.** The policy framework sets the strategic vision for the water supply and sewerage subsectors in the city of Kolkata, and highlights the challenges, principles, and targets for change from the road map. The flow of the logic is described in Diagram 1. The strategic vision is to achieve the national service standards in water supply and sewerage services in the KMC areas.

18. **Principles and Targets for Change.** KMC will realize the vision following three key principles: increase the duration and per capita volume of water supply, increase the service coverage of the sewerage, and finance future capital investment from the surplus in the account dedicated for water supply and sewerage. In the long-run, KMC will achieve 24-hour continuous water supply at 100% coverage, 100% sewerage coverage with treatment of all collected sewage, and continuity in generating operating surplus in the water supply and sewerage account.

19. **Challenges, Approaches and Reforms.** KMC is facing three challenges in pursuing these targets, and will address these challenges by undertaking various reforms as described in Table 10.

Diagram 1: Policy Framework



KMC = Kolkata Municipal Corporation, PMU = project management unit, ULB = urban local body.
Source: Asian Development Bank assessment.

Table 10: Challenges, Approaches and Reforms

Targets of change	Challenges, Approaches and Reforms																				
24-hour continuous water supply at 100% coverage	<p>Inefficiency in water distribution system is the major challenge in aiming 24-hour continuous water supply at 100% coverage. The inefficiency is mainly due to water loss, and this calls for KMC's continuous effort in water loss management. To achieve this, KMC will initiate a reform to set water loss management as the institutional priority. The detailed actions are as follows:</p> <table border="1"> <thead> <tr> <th data-bbox="492 415 797 445">Year</th><th data-bbox="797 415 1406 445">Reform Actions</th></tr> </thead> <tbody> <tr> <td data-bbox="492 445 797 558">By 31 March 2014</td><td data-bbox="797 445 1406 558">Prepare a policy paper to show KMC's intent to prioritize water loss management and implement a pilot project, and submit the Corporation the policy paper for approval.</td></tr> <tr> <td data-bbox="492 558 797 617">By 31 December 2013</td><td data-bbox="797 558 1406 617">Create initial positions for water loss management unit under the project management unit.</td></tr> <tr> <td data-bbox="492 617 797 760">For duration of the facility</td><td data-bbox="797 617 1406 760">Engage water loss management staff to collect and maintain the data on flow meter readings, which were set up under the Kolkata Environmental Improvement Project, and report results of readings as a part of Quarterly Progress Report for tranche 1 project.</td></tr> <tr> <td data-bbox="492 760 797 919">By 31 March 2014</td><td data-bbox="797 760 1406 919">Establish the first pilot zone for water loss management, and engage a contractor specialized in water loss management, which will establish a district metered areas, install meters, actively detect and repair the leakages in a strategic manner, and manage optimum pressure on a pilot basis.</td></tr> <tr> <td data-bbox="492 919 797 1012">For duration of the water loss management contract</td><td data-bbox="797 919 1406 1012">Prepare and disclose to the public the progress in water loss reduction showing the volume of water saved every three months.</td></tr> <tr> <td data-bbox="492 1012 797 1205">By end FY 2017</td><td data-bbox="797 1012 1406 1205">Complete expansion of the water loss management unit, comprising meter management cell, water loss planning cell, water loss analysis cell, leakage detection cell, and engineering and construction cell. 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Increase the service coverage of the sewerage	<p>An inadequate sewer network is the key challenge to increasing the sewerage service coverage. The speed of the sewerage network expansion depends on KMC's asset creation capacity. This calls for an increase in implementation scale. To achieve this, KMC will initiate a reform to strengthen the project management unit as follows:</p> <table border="1"> <thead> <tr> <th data-bbox="492 1738 797 1768">Year</th><th data-bbox="797 1738 1406 1768">Reform Actions</th></tr> </thead> <tbody> <tr> <td data-bbox="492 1768 797 1881">By 31 August 2014</td><td data-bbox="797 1768 1406 1881">Finalize a report by the consultant to KMC, which assesses and recommend options for transforming the project management unit to an autonomous entity, such as a society, a company, or a fund.</td></tr> <tr> <td data-bbox="492 1881 797 1902">By 31 December 2014</td><td data-bbox="797 1881 1406 1902">KMC finalizes the report, identifies the most appropriate</td></tr> </tbody> </table>	Year	Reform Actions	By 31 August 2014	Finalize a report by the consultant to KMC, which assesses and recommend options for transforming the project management unit to an autonomous entity, such as a society, a company, or a fund.	By 31 December 2014	KMC finalizes the report, identifies the most appropriate														
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Targets of change	Challenges, Approaches and Reforms																									
		option, and submits the report to the Corporation for approval.																								
	By 30 June 2015	KMC finalizes legal documents for establishing such entity, a business plan, operations manuals, financial statements, cost recovery policy, and human resource management policy.																								
	By 31 March 2016	Submit to the Corporation a draft notification on establishment of an autonomous entity for approval.																								
	By 31 March 2017	Issue a notification on establishment of an autonomous entity.																								
	After establishment	Recruit additional staff by tapping into the flexibility in recruitment and remuneration as an autonomous entity.																								
Finance investment from surplus in dedicated account	<p>KMC largely depends on transfers from its general fund for funding capital investment. The investment and operating costs will increase as the service coverage increases. To finance both capital and operating expenses for water supply and sewerage from the dedicated account, it is necessary to identify further revenue sources, while streamlining the capital and operating expenses. To achieve this, KMC will initiate a reform to strengthen KMC's financial management as follows:</p> <table><tr><th>Year</th><th>Reform Actions</th></tr><tr><td>By 31 March 2014</td><td>Establish a utility finance improvement unit under the project management unit.</td></tr><tr><td>By 31 March 2015</td><td>Incorporate energy cost accrued for water supply and sewerage operations, and state government subsidies accrued for offsetting energy cost in the water supply, sewerage and drainage account of KMC, and submit as a part of Quarterly Progress Report.</td></tr><tr><td>By 31 March 2015</td><td>Finalize a report recommending an appropriate unit price for bulk water supply to other urban local bodies so as to adequately cover the production and distribution cost.</td></tr><tr><td>By e31 March 2015</td><td>Finalize a report on KMC's policy on subsidy and cost recovery in line with the Facility's gender action plan.</td></tr><tr><td>By 30 September 2015</td><td>Submit the Corporation the report recommending an appropriate unit price for bulk water supply to other urban local bodies for approval.</td></tr><tr><td>By 30 September 2015</td><td>Submit the Corporation the policy on subsidy and cost recovery in line with the Facility's gender action plan for approval.</td></tr><tr><td>By 31 March 2016</td><td>Finalize water user charges and sewerage surcharges for both volumetric and non-volumetric domestic connections predominantly in line with KMC's <i>Roadmap for Self Sustainable Water Supply System in Kolkata</i> (2012) and KMC's policy on subsidy and cost recovery, aiming to sustain full O&M cost recovery, but move towards accumulation of retained surplus in the water supply, sewerage and drainage account to pay for asset expansion.</td></tr><tr><td>By 31 March 2016</td><td>Revise the unit price for bulk water supply to other urban local bodies.</td></tr><tr><td>By 31 March 2017</td><td>Submit the Corporation the proposal for water user charges and sewerage surcharges for both volumetric and non-volumetric domestic connections for approval.</td></tr><tr><td>Upon completion of water loss management pilot project</td><td>Consult the community in pilot area about introduction of user charges.</td></tr><tr><td>By 31 March 2018</td><td>Submit to the Corporation the proposal for amending the KMC Act to enable introduction of water user charges and sewerage surcharges for both volumetric and</td></tr></table>		Year	Reform Actions	By 31 March 2014	Establish a utility finance improvement unit under the project management unit.	By 31 March 2015	Incorporate energy cost accrued for water supply and sewerage operations, and state government subsidies accrued for offsetting energy cost in the water supply, sewerage and drainage account of KMC, and submit as a part of Quarterly Progress Report.	By 31 March 2015	Finalize a report recommending an appropriate unit price for bulk water supply to other urban local bodies so as to adequately cover the production and distribution cost.	By e31 March 2015	Finalize a report on KMC's policy on subsidy and cost recovery in line with the Facility's gender action plan.	By 30 September 2015	Submit the Corporation the report recommending an appropriate unit price for bulk water supply to other urban local bodies for approval.	By 30 September 2015	Submit the Corporation the policy on subsidy and cost recovery in line with the Facility's gender action plan for approval.	By 31 March 2016	Finalize water user charges and sewerage surcharges for both volumetric and non-volumetric domestic connections predominantly in line with KMC's <i>Roadmap for Self Sustainable Water Supply System in Kolkata</i> (2012) and KMC's policy on subsidy and cost recovery, aiming to sustain full O&M cost recovery, but move towards accumulation of retained surplus in the water supply, sewerage and drainage account to pay for asset expansion.	By 31 March 2016	Revise the unit price for bulk water supply to other urban local bodies.	By 31 March 2017	Submit the Corporation the proposal for water user charges and sewerage surcharges for both volumetric and non-volumetric domestic connections for approval.	Upon completion of water loss management pilot project	Consult the community in pilot area about introduction of user charges.	By 31 March 2018	Submit to the Corporation the proposal for amending the KMC Act to enable introduction of water user charges and sewerage surcharges for both volumetric and
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Targets of change	Challenges, Approaches and Reforms
	non-volumetric domestic connections for approval.

KMC = Kolkata Municipal Corporation, O&M = operation and maintenance.

Note: The meaning of water loss follows the defined by the International Water Association.

D. Investment Program

20. The investment program is a part of investment requirements identified in the road map. The investment program comprises priority physical and nonphysical investment envisaged in the investment plan, as shown in Table 11.

Table 11: Investment Gap in Road Map and Investment Program Outputs

Indicator	Gap 2011–2022	IP Outputs	T1	T2	T3
Water supply					
Number of water treatment plants (plant)	1	0	0	0	0
Designed capacity for water production (mld)	385	0	0	0	0
Operational capacity for surface water production (mld) ^a	323	104	104	0	0
Operational capacity for ground water production (mld)	(114)	0	0	0	0
Reservoir capacity (ml)	214	0	0	0	0
Water supply distribution pipes (km)	313	0 ^b	0	0	0
Number of piped connections	246,306	0	0	0	0
Extent of metering (connections)	69,755	69,755	4,000	32,877	32,877
Public stand posts (unit)	(4,800)	0	0	0	0
Sewerage and Drainage					
Number of sewerage treatment plants (plant)	5	3	0	2	1
Capacity sewerage treatment plants (mld)	131	47	0	35	12
Sewer network length (km)	650	135	12	90	33
Drainage network length (km)	650	0	0	0	0

EKW = East Kolkata Wetland, IP = investment program, km = kilometer, ml = milliliter, mld = milliliter per day, T = Tranche.

^a The figures represent the Kolkata Municipal Corporation's assessment, and the Asian Development Bank's own assessment does not support the immediate increase in water treatment plants.

^b The investment program will not result in additional length of distribution pipes but in active leakage detection and repair of 700km pipes.

Source: Kolkata Municipal Corporation. 2012. *Kolkata Urban Sector Investment Plan*. Kolkata.

21. The impact of the investment program will be access of the urban population to water supply and sanitation facilities improved in Kolkata. The expected outcome will be service quality and operational sustainability increased in water supply and sewerage in 20% of the KMC area.⁹

22. To increase service quality and operational sustainability in water supply and sewerage operations, the project will deliver four outputs:

- (i) **Output 1: Inefficient and outdated water supply assets rehabilitated.** The investment program will aim to minimize the unnecessary cost of operations under Tranche 1. It will restore the production capacities of the two existing water treatment plants, replace the inefficient electromechanical equipment in the water treatment plants, augment transmission mains, and update the spatial and attribute database on the assets for better monitoring and future planning. The

⁹ After completion of the Kolkata Environmental Improvement Project, the sewerage will cover 150 square kilometers (km²) out of 187 km² of the KMC area. Also, an inadequate level of the water supply service is salient in the peripheral area, which is a part of the remaining 37 km² of the KMC area.

investment program will also reduce water loss¹⁰ in distribution, and aim to achieve 24-hour continuous water supply from one hydraulic area to another throughout the investment program. It will first support KMC setting up a water loss management unit¹¹ and engage a water loss management contractor¹² in a pilot area under Tranche 1, and expand it under Tranche 2 and 3. KMC's continuous effort in water loss management will ultimately allow KMC to postpone capital investment in new water production assets, and enable the unit to acquire skills on-the-job. The staff of the water loss management unit will participate in international workshops to showcase the results and efforts in each year, when they successfully outperform the annual water loss reduction targets in the previous year.

- (ii) **Output 2: Sewerage extension to newly developed areas continued.** The investment program will minimize the geographical disparity of the sewerage service availability and improve run-off¹³ in the Southern part of the KMC area. It will install about 170 km pipes and 27,000 connections, and construct three sewerage treatment plants and at least twenty pumping stations under Tranches 1, 2 and 3, which will be connected to the networks developed under the ongoing loans.¹⁴
- (iii) **Output 3: Financial and project management capacity further developed.** Continuous reduction in water loss will allow KMC to increase hydraulic areas with 24-hour continuous water supply, and expansion of the sewer network will increase the service coverage. This will give KMC greater confidence in building up consensus towards introduction of user charges. The investment program will help KMC establish a utility finance improvement unit under Tranche 1. The unit will draft water user charges¹⁵ and sewerage surcharges for both volumetric and non-volumetric domestic connections,¹⁶ aiming to sustain full operations and maintenance cost recovery, and move towards accumulation of retained surplus in the dedicated account to pay for asset expansion. The unit will also revise the unit price of bulk water under the existing supply contracts between KMC and adjacent urban local bodies to sell at prices more than the production cost. The investment program will support the project management unit (PMU) in subproject preparation, monitoring, engineering design, site supervision activities and public

¹⁰ The meaning of water loss follows the definition by the International Water Association.

¹¹ At the start of the water loss management contract, the water loss management unit will have five cells: meter management cell, water loss planning cell, water loss analysis cell, leakage detection cell, and engineering and construction cell. The staff of the water loss management unit will participate in international workshops to showcase the results and efforts each year, when they successfully outperform the annual water loss reduction targets in the previous year.

¹² ADB will support the water loss management unit in preparing a performance-based water loss management contract under the ongoing TA 7327-IND on Preparing Second Kolkata Environmental Improvement Project.

¹³ The sewer will also serve as drainage, which helps the residents in service areas to cope with the risk of flooding.

¹⁴ ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to India for the Calcutta Environmental Improvement Project*. Manila (Loan 1813-IND, \$250 million, approved on 15 November 2000).

ADB 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Supplementary Loan to India for the Kolkata Environmental Improvement Project*. Manila (Loan 2293-IND: \$80 million, approved on 20 November 2006).

¹⁵ ADB will also support KMC's new utility finance improvement unit in developing and introducing water tariff through the ongoing TA 8036-REG on Promoting Financially Sustainable Regulatory Framework for Water Tariff in South Asia as one of the pilot cities.

¹⁶ KMC will then plan volumetric water charges in hydraulic zones achieving 24-hour water supply as a result of the water loss management activities. For the rest of areas, KMC will plan a flat rate user charge until such areas achieve 24-hour water supply.

communications by teams of consultants. Following the endeavor of other states, such as Karnataka and Tamil Nadu, the investment program will help KMC develop a plan to evolve the PMU to an independent entity, which will allow retaining institutional knowledge and skills, and have flexibility in staff recruitment. This will pave a way for KMC to further increase its loan absorptive capacity, and for ADB to plan larger assistance in the future. Infrastructure support to PMU will also be provided.

23. The investment program is estimated to cost \$570.00 million (Table 12). The expected sizes of Tranche 1, 2 and 3 are \$100 million, \$200 million and \$100 million respectively.

Table 12: Investment Plan^a
(\$ million)

Item ^b	Cost
A. Base Cost^c	
Output 1: Inefficient and outdated water supply assets rehabilitated	150.00
Output 2: Sewerage extension to newly developed areas continued	310.00
Output 3: Financial management and project implementation capacity further developed	40.00
Subtotal (A)	500.00
B. Contingencies^d	50.00
C. Financial Charges^e	20.00
Total (A+B+C)	570.00

Note: Numbers may not sum precisely because of rounding.

^a Indicative.

^b Includes taxes and duties of \$57.8 million to be financed by the state government of West Bengal and Kolkata Municipal Corporation.

^c In late 2012 prices.

^d Physical contingencies computed at 10% for civil works and water loss management. Price contingencies computed at minus 3.9%–0.5% on foreign exchange costs and 6.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^e Includes interest and commitment charges. Interest during construction for ADB loan(s) has been computed at the 5-year forward London interbank offered rate plus a spread of 40 basis points and an applicable maturity premium. Commitment charges for an ADB loan are 0.15% per annum, accrued on the full amount of the loan less amounts withdrawn from time to time.

Source: Asian Development Bank estimates.

SCHEDULE 2

DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Access of the urban population to water supply and sanitation facilities improved.	By 2025, coverage of water supply service maintained at or above 92% (baseline = 92% in 2011). By 2023, coverage of underground sewerage service through direct connection increases to 55% from 43% in 2011.	KMC's customer records and population projection (GEN). KMC's customer records and population projection (GEN).	Assumptions 10-year population growth and water consumption do not substantially deviate from the projection.
Outcome Service quality and operational sustainability increased in water supply, sewerage and drainage in 20% of KMC area.	By 2024, water supply hour in pilot areas increased to 24 hours from 4-7 hours in 2011. By 2023, 100% of collected sewage continues to be treated. (baselines = 100% in 2011) By 2024, incidence of flood reduced in 98% of area (baseline = 80%) By 2024, O&M cost recovery, including state subsidies and KMC's property tax, maintained at more than 100%.	Readings from meters in each DMA. Sewage treatment plant's operations monitoring reports. KMC's report on incidence of flood. KMC's audited financial statement of water and sewerage account.	Assumptions Rainfall and overall climate variability fall within projected range.
Outputs 1. Inefficient water supply assets rehabilitated.	By 2023, water production capacity restored to 1,478 mld (baseline = 1,374 mld in 2011) By 2023, leakages on 700 km of water pipes detected and repaired through PBC. (baseline = 0 km in 2011) By 2023, water meters installed at least in 40,000 connections in pilot area, 15% of which are VWH, and maintained and read through PBC. (baseline = 0 in 2011)	PPMS and KMC's reports. WLM contractor's progress reports and their party's progress validation reports. WLM contractor's progress reports and their party's progress validation reports (GEN).	Assumptions KMC receives national and state's statutory clearances on time. ADB's technical assistance successfully prepares PBC.
2. Sewerage extension to peripheral areas continued.	By 2023, three sewage treatment plants (47 mld) constructed with GHG reduction measures. (baseline = 0) By 2023, 170 km of sewerage-drainage pipes installed. (baseline = 0 km in 2011)	PPMS and KMC's reports. PPMS and KMC's reports.	

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
	By 2023, 27,000 direct connections newly installed, 15% of which are VWH. (baseline = 0 in 2011)	KMC's customer records and population projection (GEN).	
3. Financial and project management capacity further developed.	<p>By 2023, operating receipts and state subsidies exceeds operating expenses. (baseline = N in 2011)</p> <p>Contract award and disbursement achieved not less than 80% of the annual targets in each year during 2013-2022</p> <p>By 2023, at least 90 PMU staff (at least 30% women) retrained in ADB's updated policies and procedures. (baseline = 0 in 2011)</p>	<p>KMC's audited financial statement of water and sewerage account.</p> <p>KMC's signed contracts and disbursement claims.</p> <p>Training seminar attendance and completion certificates (GEN).</p>	Experienced staff continues to stay with PMU.
Activities with Milestones			Inputs
1.1 Rehabilitate the existing water treatment plants. (Q2 2014-Q2 2018)			MFF
1.2 Augment transmission main in Garden Reach zone (Q2 2014-Q2 2018)			ADB \$400 million
1.3 Establish WLM unit in KMC with dedicated staff. (Q2-Q3 2014)			KMC \$170 million
1.4 Identify and repair the leakages in pilot area. (Q3 2014-Q2 2018)			Total \$570 million
1.5 Identify and repair the leakages in wider area. (Q1 2017-Q1 2020)			Tranche 1
1.6 Train WLM unit on OJT. (Q3 2014-Q1 2020)			ADB \$100 million
1.7 Establish database on water assets. (Q2 2014-Q4 2015)			KMC \$40 million
1.8 Make official arrangement for sharing database. (Q1-Q4 2015)			Total \$140 million
2.1 Construct new water treatment plant. (Q2 2015-Q4 2018)			Tranche 2
2.2 Construct sewage network in borough XIV. (Q3 2014-Q2 2019)			ADB \$200 million
2.3 Construct sewage network in borough XII, XIV, XV. (Q3 2015-Q1 2021)			KMC \$90 million
2.4 Construct sewage network in borough XI, XII, XIV, XV. (Q3 2015-Q1 2021)			Total \$290 million
2.5 Provide direct connections to sewer. (Q1 2017-Q1 2021)			Tranche 3
3.1 Establish a utility finance improvement unit in KMC. (Q1 2014-Q3 2014)			ADB \$100 million
3.2 Revise and renegotiate existing bulk water contract. (Q1 2015-Q1 2016)			KMC \$40 million
3.3 Integrate energy cost in water account. (by Q1 2015)			Total \$140 million
3.4 Establish cost recovery and subsidy policy. (Q3 2015-Q1 2016)			
3.5 Develop domestic water tariff and sewer surcharge. (Q2 2016-Q1 2017)			
3.6 Arrange billing-collection for domestic users. (Q2 2017-Q1 2018)			
3.7 Submit tariff proposal to Corporation. (Q2 2017-Q1 2018)			
3.8 Establish project performance monitoring system. (Q3 2013-Q4 2017)			
3.9 Send PMU staff to ADB's training programs. (Q3 2013-Q3 2022)			
3.10 Procures contractors and suppliers for all activities. (Q2 2013-Q4 2017)			
3.11 Submit proposal for autonomous entity to Corporation. (Q3 2014-Q1 2016)			
3.12 Prepare legal documents for autonomous entity. (Q2 2015-Q1 2016)			
3.13 Issue notification on establishment of autonomous entity (Q2 2016-Q1 2018)			
3.14 Disclose project information to public. (Q2 2013-Q1 2021)			

ADB = Asian Development Bank, DMA = district metered area, GEN = collect and maintain data in a sex-disaggregated, poverty level categorized, and vulnerability identified manner, GHG = greenhouse gas, km = kilometer, KMC = Kolkata Municipal Corporation, mld = million liters per day, O&M = operations and maintenance, OJT = on-the-job training, PBC = performance-based contract, PMU = project and program management unit, Q = quarter, VWH = vulnerable and/or women-headed households, WLM = water loss management.

Source: Asian Development Bank estimates based on Kolkata Municipal Corporation, 2011. *Kolkata Urban Sector Investment Plan*. Kolkata.

SCHEDULE 3

IMPLEMENTATION FRAMEWORK

1. In addition to the standard assurances, INDIA, the State, and KMC have given the following assurances on implementation of the Investment Program, which will be incorporated in the individual loan and project agreements as applicable, subject to any amendments to be mutually agreed among the parties.

A. Project Management Setup

2. The State and KMC will establish the Steering Committee with a first meeting held in these, no later than 31 October 2013.

3. KMC will engage the existing PMU, led by a full time Project Director, that will be responsible for management, monitoring and supervision of the Facility and each subproject no later than 30 September 2013.

4. The PMU will employ sufficient staff with adequate, relevant expertise and gender balance, and will be equipped with necessary office space, facilities, equipment, support staff and management information systems for the duration of the Facility. To the extent reasonably possible, the same persons will continue to be assigned to key positions in the PMU for the duration of the Facility.

5. KMC will establish a special committee for water loss management, which will be headed by the project director, to provide strategic guidance on 24-hour continuous pressured water supply and water loss management in pilot areas to the water loss management contractors, and to evaluate the performance of the water loss management contractors in accordance with the performance matrix in each contract.

6. ADB will be promptly notified of any proposal to amend, cancel, or repeal any of the provisions of the constitutional documents of KMC will give ADB an adequate opportunity to comment on such proposals.

Investment Program implementation organizations	Key Management Roles and Responsibilities
Kolkata Municipal Corporation	Executing agency
Steering Committee (its composition is fully described in the Facility Administration Manual)	Steering Committee will: <ul style="list-style-type: none"> (i) Provide strategic guidance, and oversee the implementation of the investment program. (ii) Appoint auditors and fix their remuneration, and ensure auditing of each project account. (iii) Review and provide policy direction on: <ul style="list-style-type: none"> (a) Implementation of the urban and institutional reform agenda; (b) Compliance with loan covenants under the ADB loans; (c) Compliance with environment and social safeguards; and (d) Critical implementation issues and in inter-departmental coordination. (iv) Approve: <ul style="list-style-type: none"> (a) Balance sheets, audit report and other annual reports of the investment program and each project, if necessary;

Investment Program implementation organizations	Key Management Roles and Responsibilities
	<ul style="list-style-type: none"> (b) Evaluation reports prepared by tender evaluation and consultant selection committees; and (c) Contract award and variation proposals. (v) Consider and take decision on: <ul style="list-style-type: none"> (a) Annual budget; and (b) Annual action plan. (vi) Establish PMU. (vii) Delegate powers, other than those of making rules, to the project director or other authorities. (viii) Ensure timely release of funds to each project.
<p>Program Management Unit (its composition is fully described in the Facility Administration Manual)</p>	<p>Program Management Unit will:</p> <ul style="list-style-type: none"> (i) Liaise and correspond with ADB on all issues related to the investment program and each project. (ii) Coordinate with: <ul style="list-style-type: none"> (a) National and state agencies to resolve any inter-departmental issues; and (b) Other aide agencies for implementation of non-physical investment activities. (iii) Establish a subaccount of imprest account with a commercial bank acceptable to ADB. (iv) Prepare and submit: <ul style="list-style-type: none"> (a) Reports to the Steering Committees for consideration and approval; (b) Periodic progress reports on each investment activities; (c) Internal audit report; and (d) Reports mandated under the loan and project agreements. (v) Approve: <ul style="list-style-type: none"> (a) Detailed engineering design; and (b) Training and capacity building program. (vi) Facilitate collection of data for detailed engineering design. (vii) Procure works, goods and consultancy services for implementation of each project. (viii) Manage program management consultants, design and supervision consultants, contractors and suppliers as an employer. (ix) Implement: <ul style="list-style-type: none"> (a) Resettlement plans; and (b) Environment management plan. (x) Obtain right of way clearances. (xi) Plan, implement, and monitor: <ul style="list-style-type: none"> (a) Public relations activities; (b) Gender mainstreaming initiatives; (c) Community participation activities; and (d) Safeguard compliance activities. (xii) Maintain each project account and submit consolidated monthly reports. (xiii) Obtain statutory clearances. (xiv) Coordinate for obtaining right of way clearances with related State and National agencies. (xv) Make payments. (xvi) Disbursement application to ADB. (xvii) Safeguards plans and corrective action plans consistent with safeguard frameworks. (xviii) Submit reports of external auditor to the Steering Committee. (xix) Obtain necessary data for maintaining and updating the PPMS.

Investment Program implementation organizations	Key Management Roles and Responsibilities
	(xx) Monitor physical and non-physical investment activities under each project. (xxi) Monitor implementation of safeguards plans, guide PIU, as and when necessary, and prepare reports. (xxii) Disseminate information related to the investment program and each project to the public and media. (xxiii) Establish and maintain a project performance monitoring system at each subproject level, as well as a project and investment program levels.
Special Committee for water loss management (its composition is fully described in the Facility Administration Manual)	(i) Seek Mayor's policy decisions related to 24x7-pressured water supply in pilot areas; (ii) Implement the Mayor's policy decisions on 24x7-pressured water supply in pilot areas in collaboration with KMC departments; (iii) Endorse annual program on repair works proposed by water loss management contractor; (iv) Endorse technical solutions proposed by water loss management contractor; (v) Endorse the measured performance of water loss management contractor for performance-based payment; (vi) Assess contract extension in the final year of water loss management contract.
Consultant Selection Committee (its composition is fully described in the Facility Administration Manual)	(i) Open EOIs and proposals; (ii) Evaluate EOIs and proposals; (iii) Prepare evaluation reports; and (iv) Submit recommendation to the Steering Committee through PMU.
Tender Evaluation Committee (its composition is fully described in the Facility Administration Manual)	(i) Open tender; (ii) Evaluate bids; (iii) Prepare evaluation reports; and (iv) Submit recommendation to Executive and Tender Approval committee.

ADB = Asian Development Bank, EOI = expression of interest, KMC = Kolkata Municipal Corporation, PMU = investment program management unit, PPMS = project performance monitoring system.

B. Project Implementation (general)

7. KMC will ensure that the PMU will be responsible for managing all contracts under each subproject throughout the duration of the Facility, and ensure that PMU will have adequate expertise and staff through deputation or new recruitment.

8. All consents and approvals required for implementation of subprojects will be obtained in accordance with applicable laws and regulations of the Government, the State or KMC; and any consents or approvals from any other agencies or third parties that have any claim or authority over the site of subproject

9. KMC will ensure that the PMU will make the information on project scope, implementation progress, benefit and financial statements under subprojects available to the public.

10. Towards smooth implementation of subprojects, KMC will ensure that grievance(s), if any, from stakeholders, relating to subproject implementation or use of funds are addressed effectively and efficiently.

11. Mechanism under the safeguards requirements, KMC will prepare a grievance redress mechanism for the PMU, acceptable to ADB, to receive, resolve or act, independently and

expeditiously, upon complaints, grievances or reports from stakeholders on misuse of funds and other implementation irregularities relating to subproject. KMC will inform stakeholders of their right to submit complaints or grievances relating to each project.

C. Monitoring

12. Within six months of the Effective Date, KMC shall through PMU, establish the Facility and subproject performance and monitoring system to track implementation activities under subprojects, with corresponding target dates, expected outcomes, and assigned responsibilities under a monitoring mechanism formulated, discussed and agreed between ADB and KMC.

13. The Facility and subprojects shall be under regular review by: (i) the PMU (monthly), (ii) KMC (quarterly); and (iii) Steering Committee (semiannually).

14. KMC will submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission.

15. KMC will submit to ADB, within 3 months of physical completion of the each Project under the Facility, a completion report that will cover the details of the Project, and within 3 months of physical completion of the last Project under the Facility, a completion report that will cover the details of the investment program implementation, costs, monitoring and evaluation activities, and other information requested by ADB.

D. Accounting, Auditing, and Reporting

16. KMC will (i) maintain separate accounts and records for the projects; (ii) prepare annual financial statements for the projects in accordance with accounting principles acceptable to ADB; (iii) have such financial statements for the projects audited annually by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB, in accordance with international standards for auditing or the national equivalent acceptable to ADB; (iv) as part of each such audit, have the auditors prepare a report (which includes the auditors' opinion on the use of the loan proceeds and compliance with the financial covenants of the legal agreements as well as on the use of the procedures for the imprest account(s) and statement of expenditures) and a management letter (which sets out the deficiencies in the internal control of the projects that were identified in the course of the audit, if any); and (v) furnish to ADB, no later than 6 months after the close of the fiscal year to which they relate, copies of such audited financial statements, audit report and management letter, all in the English language, and such other information concerning these documents and the audit thereof as ADB shall from time to time reasonably request.

17. In accordance with the Public Communication Policy (2011), ADB will disclose the annual audited project accounts and auditor's opinion for the projects within 30 days of the date of their receipt by posting them on ADB's website.

18. KMC will enable ADB, upon ADB's request, to discuss the financial statements for the projects with the auditors appointed by KMC and will authorize and require any representative of such auditors to participate in any such discussions requested by ADB. This is provided that such discussions shall be conducted only in the presence of an authorized officer of KMC, unless KMC will otherwise agree.

E. Consideration of Second tranche under the MFF

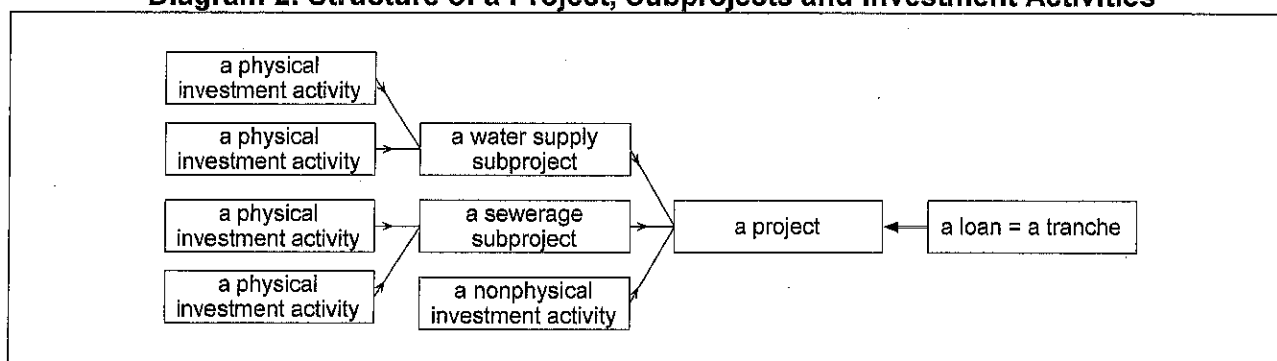
19. Consideration of second periodic finance request under the Facility shall be subject to compliance with the requirements of undertakings by KMC as included under paragraph 6 of Schedule 6 to this Framework Financing Request.

SCHEDULE 4

INVESTMENT SELECTION CRITERIA AND APPROVAL PROCESS

1. **Project, Subproject, and Investment Activity.** Various physical investment activities for a subsector will form a subproject. A subproject for a subsector and/or another for the other subsector, and nonphysical investment activities for a subsector or across subsectors will form a project. A project will be financed by a tranche. The structure is illustrated in Diagram 2.

Diagram 2: Structure of a Project, Subprojects and Investment Activities



2. **Subproject Eligibility Criteria.** The executing agency will determine eligibility of a subproject based on the following criteria:

- (i) The projects will finance subprojects for water supply, and sewerage combined with drainage, and capacity building activities by consultants and/or through training programs;
- (ii) For water supply subsector, in accordance with ADB's Water Operations Plans 2011-2022, the facility will focus on water loss management, which will be implemented either by water loss management contractors, or works contractors supervised by operational consultants under management contracts. The projects will not support construction of new water treatment plants;
- (iii) For sewerage subsector, the projects will focus on expansion of the sewer network combined with drainage, and construction of new sewage treatment plants in case there is no treatment plant for the newly expanded areas, or there is no additional absorptive capacity in the East Kolkata Wetland; and
- (iv) The PMU will manage (bid notification and evaluation, management of contractors and payment to the contractors) all contracts under the projects.

3. **Subproject Selection Criteria.** Once the executing agency confirms the eligibility, it will assess subproject feasibility in the form of a subproject appraisal report (SAR). The executing agency will prepare an SAR for each subproject, and will prove that following subproject selection criteria are fully met.

Technical criteria:

- (i) The subproject complies with the latest Master Plan.
- (ii) The subproject will achieve the service level standards of the Government of India, the State government and Kolkata Municipal Corporation ("KMC");
- (iii) The subproject will first rehabilitate the existing usable assets to achieve optimum utilization;

- (iv) The subproject incorporates the least cost option for the location, materials, technologies, designs and operations and maintenance, using an appropriate discounting rate;
- (v) The subproject will have user-friendly designs for both men and women;
- (vi) The assets have seismic resistant structure in accordance with the Bureau of Indian Standards;
- (vii) The subproject follows the standards and guidelines of the Government of India and the State government; and
- (viii) KMC has already identified all the lands, visually confirmed the locations through site visits, and verified the ownership in writing. Further, KMC is ready to have the land transferred.

Financial criteria:

- (i) The subproject implementation will be conducted in parallel with new or ongoing activities, which support design and revision of user charges and subsidies incorporating special concession to vulnerable households;
- (ii) The subproject implementation will be conducted in parallel with new or ongoing activities, which support improving accounts dedicated for water supply and sewerage following the accrual-based double entry accounting system, capturing all accrued cost, particularly energy.
- (iii) The subproject implementation will be conducted in parallel with new or ongoing activities, which support improvement of service specific financial statements;
- (iv) The subproject will have financial projections¹⁷ of service operations for 25 years, proving that the projected receipts will not only recover operating expenses but also a part of capital expenses, to ultimately reduce reliance on the transfer from the general fund account; and
- (v) The executing agency continues to have adequate financial management capacity to implement the subproject, and operate the newly created assets.

Economic criteria:

- (i) The result of the willingness-to-pay survey is based on the contingent valuation method, and shows what number of people are willing to pay what amount of user charges;
- (ii) The result of the affordability test shows that the sum of user charges for water supply and sewerage is below the affordability limit;
- (iii) The rationale of the physical investment activity is the failure of either: (a) market to adequately provide what society wants, or (b) public institutions to deliver public goods or services;
- (iv) The least cost analysis assess at least three alternative design options (in terms of location, technology, and/or material) with estimation of lifecycle cost for each option, and proves that the selected design is the least-cost option; and
- (v) The subproject demonstrates an economic internal rate of returns¹⁸ at a value higher than the economic opportunity cost of capital, with sensitivity analysis.

¹⁷ The investment program will improve a part of one system for water supply and sewerage in phases. The financial internal rate of returns is based on the revenues and expenditures as a result of the all physical and nonphysical investment activities under the investment program, and each periodic financing request will update the financial internal rate of return.

¹⁸ The investment program will improve a part of one system for water supply and sewerage in phases. Therefore, the calculation of the economic internal rate of returns is based on the cost and benefit of the all investment activities envisaged under the investment program, and each periodic financing request will reassess the demand, least-cost designs and the economic internal rate of return.

Social and environmental criteria:

- (i) The subproject follows social and environmental selection guidelines provided in the Environmental Assessment and Review Framework;
- (ii) The subproject has required safeguard planning documents (environment assessment and involuntary resettlement), following the Environmental Assessment and Review Framework, and the Resettlement Framework;
- (iii) A subproject appraisal report includes gender considerations (e.g. in the form of a gender action plan), inheriting similar principles to those in the gender action plan for tranche 1 project; and
- (iv) There is a record of consultation and participation of stakeholders prior and during feasibility study, and the subproject appraisal report includes a communication strategy, inheriting similar principles to those in the gender action plan and the stakeholder communication strategy for tranche 1 project.

Cost estimate, procurement and use of consultants:

- (i) Cost estimate reflects the current market rate, and shows the unit costs, inputs and the annual distribution of the inputs throughout the implementation period;
- (ii) There is no provision for a percentage charge levied by specialized agencies;
- (iii) The physical investment activity has a procurement plan;
- (iv) The physical investment activity will procure works, goods and services in accordance with the ADB's Procurement Guidelines (2010 as amended from time to time);
- (v) The nonphysical investment activity has terms of reference and detailed cost estimates; and
- (vi) The nonphysical investment activity will engage consultants in accordance with the ADB's Guidelines on the Use of Consultants (2010 as amended from time to time).

4. **Eligible Capacity Building.** The investment program includes three ways of capacity building:

- (i) The program management consultants, and design and supervision consultants will provide capacity building for project management and implementation through on-the-job training. Also, the water loss management contractor will help the staff in the water loss management unit acquire necessary skills and knowledge on-the-job.
- (ii) The staff in water loss management unit will participate in international conferences on water loss to report KMC's effort when the water loss management activities achieve a tangible result (above the annual targets defined in the water loss management contracts) in the previous calendar year. The funding source will be tranche 2 and 3.
- (iii) The investment program will finance additional office equipment and furniture required for efficient operations of the autonomous entity under tranche 2 and 3 after its physical establishment.

5. **Workflow.** Once the physical investment activities are broadly identified, the PMU will prepare a subproject concept paper (SCP) for subsequent tranches. The SCP will be a brief paper, not more than two pages. It will highlight the baseline and 2022 targets for the service level, demand-supply gaps, reasons for demand-supply gaps, a broad cost estimate, preliminary assessment on safeguard requirements. The PMU will have extensive consultation with the

stakeholders in accordance with the Stakeholder Communication Strategy in the Facility Administration Manual, and will add the summary minutes of each consultation in the SCP.

6. ADB will review the SCP, assess the risk and complexity of the proposed subproject based on ADB's operational and safeguard policies, and inform the PMU assessment results. ADB and PMU will broadly agree on the loan amount in the light of the indicative figures in ADB's Country Partnership Strategy and Country Operations Business Plan. Upon receipt of ADB's positive feedback, the PMU will engage the design and supervision consultant to undertake surveys to obtain the primary data. Based on the primary data, the PMU, with assistance of the design and supervision consultant, will undertake a subproject feasibility study and will present it as SAR.

7. SAR will be based on quantitative data, and will include subproject rationale, subproject description, assessment of alternative design options, selection of least-cost design from all options, project cost estimates, implementation arrangements, an operation and maintenance plan with cost estimates, a procurement plan, financial analysis, economic analysis, environmental assessment as applicable, and involuntary resettlement assessment as applicable. Also, the PMU will prepare a gender action plan, a stakeholder consultation plan, and a social and poverty reduction strategy for the project.

8. The PMU will submit the SAR and other documents to ADB for thorough review. ADB may request for site visits and PMU's clarifications or may ask for reconsideration of the subproject design and analysis. The PMU will improve the SAR and other documents based on the ADB's recommendations. Then the PMU will package the subprojects in a project, draft a periodic financing request, and request for ADB's due diligence on the proposed subprojects.

SCHEDULE 5

SOCIAL DIMENSIONS AND SAFEGUARD REQUIREMENTS

1. India will cause the State to ensure that all the requirements prescribed in this Schedule, and the following social and safeguard frameworks and plans that have been prepared with respect to the Facility and the first tranche and of which Asian Development Bank (ADB) has been provided full copies, and which are deemed incorporated herein by reference, are complied with during the processing and implementation of the subprojects under the Facility.

- (i) Environmental assessment and review framework, May 2012,
- (ii) Resettlement framework, May 2012,
- (iii) Environmental management plan, and resettlement plan, May 2012, for the first tranche, and
- (iv) Gender action plan, May 2012.

2. The frameworks cover the Facility-specific information and requirements in accordance with ADB's safeguard policies: (i) the general anticipated impacts of the components or projects likely to be financed under the multitranchise financing facility on the environment, and involuntary resettlement; (ii) the safeguard criteria that are to be used in selecting components, projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, if required), and monitoring and reporting; and (iv) the institutional arrangements (including budget and capacity requirements) and the client's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

3. Prior to the preparation of each periodic financing request, the applicability and relevance of each safeguard framework for environmental assessment, and involuntary resettlement will be reviewed by KMC and updated to ensure relevance and consistency with applicable country legal frameworks and ADB's safeguard policies, as amended from time to time.

4. In all cases, for each new periodic financing request preparation, the client will review ongoing projects to check on the status of compliance with the social and safeguard plans and frameworks, and submit the review reports to ADB, together with other required safeguard documents relevant to the subprojects included in the tranche being processes. In any case, if major noncompliance is discovered in the course of the review of ongoing projects, a corrective action plan will be prepared and submitted to ADB.

SCHEDULE 6

UNDERTAKINGS

1. The implementation of the Facility and projects under the Investment Program shall conform to Asian Development Bank's (ADB's) mandatory policies on safeguards, anticorruption, procurement, consulting services, and disbursement and following undertakings.
2. India, the State, the KMC will ensure that the anticorruption provisions acceptable to ADB and India are included in all bidding documents and contracts, including provisions specifying the right of ADB to audit and examine the records and accounts of KMC, and all contractors, suppliers, consultants, and other service providers as they relate to the projects under the Facility. India, the State, KMC will allow and assist ADB's representative to carry out random spot-checks on the work in progress and utilization of funds for the projects under the Facility.
3. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project. All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activities and may not be awarded any contracts under the project. To support these efforts, relevant provisions are included in the loan and project agreements and the bidding documents for the investment program.
4. The State and KMC will undertake to implement the reforms activities indicated under table 10 of Schedule 1 to this FFA ("Challenges, Approaches and Reforms") in a timely manner as indicated in detail in the stated table towards (i) 24-hour continuous water supply at 100% coverage, (ii) increasing service coverage of the sewerage, and (iii) finance investment from surplus in dedicated account.
5. In addition to the standard assurances, INDIA, the State, and KMC have given the following assurances, which will be incorporated in the individual loan agreements as applicable, subject to any amendments to be mutually agreed among the parties:

Counterpart Funding	Sufficient counterpart funds (including contingency funds to mitigate unforeseen cost increases) will be made available from the Government, State and/or Kolkata Municipal Corporation (KMC) budgets each fiscal year and will be allocated and disbursed in a manner that ensures timely and effective implementation of subprojects.
Project implementation (water)	<p>KMC will give highest priority to water loss management for the duration of the Facility. KMC will implement active leakage detection and repair to minimize the water loss (as defined by the International Water Association). KMC through project management unit (PMU) will engage contractors specialized in water loss management, which will establish district metered areas (DMAs) in assigned hydraulic zones, provide 24-hour continuous water supply to the DMAs, install water meters at each connection and hydraulically strategic points, detect and repair leakages intensively in each DMA, monitor and records the water meters, and actively control the optimum water pressure.</p> <p>No later than awarding of the first contract for water loss management, KMC will establish the water loss management unit under the PMU, which will employ sufficient new staff with adequate, relevant knowledge on water supply and gender balance, and will be equipped with necessary office space, facilities, equipment, support staff and management information systems for</p>

	<p>the duration of the Facility. To the extent reasonably possible, the same persons will continue to be assigned to the same positions in the PMU for the duration of the Facility.</p> <p>During the contractual period for water loss management, KMC will ensure continuous supply of water for 24 hours for all day at an agreed pressure to the areas dedicated for implementation of water loss management.</p> <p>During the contractual period for water loss management, KMC will ensure that the water loss management contractors have full access to maps, technical data, past technical reports and premises necessary for efficient operations of water loss management.</p> <p>During the contractual period for water loss management, KMC will ensure that the contractor will install meters at the strategic hydraulic locations and each domestic and bulk connection within the areas dedicated for implementation of water loss management.</p> <p>When the water loss management unit successfully reduced the water loss amount less than the annual target agreed in the respective water loss management contracts in the previous year, KMC will send the water loss management unit's staff to international conferences on water loss management to report its results and share its experiences. Eligibility for participation to the international conferences will be assessed every year based on the previous years' performance.</p>
Project implementation (sewerage)	<p>No later than end of the fiscal year 2014 (beginning on 1 April 2014 and ending on 31 March 2015), KMC will issue a notification introducing mandatory sewer connections for all premises in service areas under KEIP and KEIP with penalties for non-connection.</p> <p>Upon completion of the sewer network construction under subprojects, KMC will ensure that it will allow connection only when the premises have septic tank till the sewage treatment plants are constructed under the subsequent tranche projects under the Facility.</p>
Cost recovery	<p>No later than 31 December 2014, KMC will establish the utility finance improvement unit under the PMU, which will employ sufficient staff with adequate, relevant knowledge on accounting and finance and gender balance, and will be equipped with necessary office space, facilities, equipment, support staff and management information systems for the duration of the Facility. To the extent reasonably possible, the same persons will continue to be assigned to the same positions in the PMU for the duration of Facility.</p> <p>No later than 31 March 2015, KMC will incorporate energy cost in the water, sewerage and drainage account in order to capture the accrued cost of water supply and sewerage operations.</p> <p>No later than 31 March 2015, the utility finance improvement unit under the PMU will review the unit price for existing bulk water supply contracts with other urban local bodies.</p> <p>KMC will ensure that the bulk water user charge collection efficiency will be maintained at not less than 90% in between fiscal year 2014 and 2022.</p> <p>No later than 31 March 2016, the utility finance improvement unit will draft a policy on subsidy for water supply and sewerage user charges, which incorporates concessionary arrangements for vulnerable and/or women-headed-households. KMC will announce and publish the policy within in the fiscal year 2015.</p> <p>No later than 30 June 2018, the utility finance improvement unit will draft a</p>

	<p>notification on enabling the water supply, sewerage and drainage account to accumulate retained surplus for the purpose of capital investment, and on introduction of water supply user charges on domestic connections, and sewerage surcharges following the principle of KMC's subsidy policy, so as to prevent operating expenses exceed operating receipts in the water, sewerage and drainage account. The draft notification will include volumetric user charges for the domestic connection with meters, and flat rate user charges for domestic connections without meters. By end fiscal year 2020, KMC will adopt such notification.</p> <p>For the duration of the Facility, KMC, with assistance of utility finance improvement unit, will ensure that the operating receipts and subsidies will be equal to or exceed the operating expenses including the energy cost, by revising the unit price for bulk water supply in KMC's Rates, Taxes, Fees, and Charges to be Levied by Corporation (as updated from time to time) or seeking new source of revenue in accordance with the policy on subsidy for water supply and sewerage user charges</p>
Institutional reforms	<p>By 31 December 2013, the project director will form a working group in the PMU. It will devise the way to enhance PMU's contract award and disbursement capacities.</p> <p>By 31 December 2014, it will identify options for transforming the PMU to an autonomous entity, which will have flexibility in human resource management.</p> <p>By 30 June 2015, KMC will draft a notification, and operational and administrative documents required for setting up such autonomous entity, based on the recommendations of the working group. By end fiscal year 2016, KMC will consider adoption of such notification.</p>
Sustainability enhancement	<p>The State, and KMC will implement the Roadmap for "Self Sustainable Water Supply System in Kolkata" dated March 2011 on a timely basis. In accordance with the Road Map, KMC will introduce water metering and water tariff for sections of domestic consumers from FY 2015-2016 in parallel with the progress of water loss management activities.</p> <p>By no later than 31 March 2014, the State and KMC will implement the water loss management activity as agreed with Asian Development Bank, on a pilot basis in Cossipore service zone, ward numbers 1 to 6, to achieve reduction in and measuring of water losses during the Subproject implementation period.</p> <p>Based on the results of the pilot activities in the foregoing paragraph, the State and KMC will introduce volumetric tariff on a pilot basis in the same Subproject area and further expand the same to other Subproject areas.</p>
Geographic information system	<p>No later than 31 December 2016, KMC will ensure that digitized data on water supply and sewerage assets created under subprojects will be shared with other departments of KMC through a common computerized system developed under the Department for International Development assistance.</p>

1. **Actions to be completed as condition precedent to second PFR.** The following activities would require to be complied by KMC before ADB can consider a second periodic financing request under the Facility:

- (i) Actions taken by KMC in accordance with the time bound Action Plan, including sources of funding, to achieve the "Roadmap for Self Sustainable Water Supply System in Kolkata" (2011); including in particular the following:
 - (a) periodic analysis of the flow from commissioning of each bulk flow meter ongoing;
 - (b) increasing the recovery of operation and maintenance charges for water supply and sewerage from the current 50% to 65% by March 2014, and gradually to 90% by October 2015; and

- (c) Finalization of the policy on subsidy and cost recovery by 31 July 2015.
- (ii) KMC charges property tax based on the unit area assessment method starting 30 June 2014; and
- (iii) Audited Financial Statements of KMC being received by ADB on a timely basis.