

**REPORT AND RECOMMENDATION  
OF THE  
PRESIDENT  
TO THE  
BOARD OF DIRECTORS  
ON A  
PROPOSED LOAN  
TO  
INDIA  
FOR THE  
CALCUTTA ENVIRONMENTAL IMPROVEMENT PROJECT**

**November 2000**

## CURRENCY EQUIVALENTS

(as of 16 November 2000)

Currency Unit	-	Indian Rupee/s (Re/Rs)
Re1.00	=	\$0.021
\$1.00	=	Rs46.675

The exchange rate of the rupee is determined by the Reserve Bank of India under a system of managed float. In this report, a rate of \$1.00 = Rs46.00 is used. This was the rate generally prevailing at the time of appraisal.

## ABBREVIATIONS

ADB	-	Asian Development Bank
AP	-	affected people
ARI	-	acute respiratory infection
ARV	-	annual ratable value
BME	-	benefit monitoring and evaluation
CBO	-	community-based organization
CBP	-	capacity building program
CEMSAP	-	Calcutta Environmental Management Strategy and Action Plan
CMA	-	Calcutta metropolitan area
CMC	-	Calcutta Municipal Corporation
CMDA	-	Calcutta Metropolitan Development Authority
DFID	-	Department for International Development of the United Kingdom
EA	-	executing agency
EIRR	-	economic internal rate of return
GAP	-	Ganga action plan
GDP	-	gross domestic product
ha	-	hectare
ICI	-	industrial, commercial, and institutional
IEE	-	initial environmental examination
IWD	-	Irrigation and Waterways Department
km	-	kilometer
km <sup>2</sup>	-	square kilometer
MIC	-	mayor-in-council
MIS	-	management information system
NGO	-	nongovernment organization
O&M	-	operation and maintenance
PIU	-	project implementation unit
PMU	-	project management unit
SCP	-	stakeholder consultation process
SDP	-	state domestic product
STP	-	sewage treatment plant
SWM	-	solid waste management
74 <sup>th</sup> CAA	-	74 <sup>th</sup> Constitutional Amendment Act
TA	-	technical assistance

## NOTES

- (i) The fiscal year (FY) of the Government ends on 31 March.
- (ii) In this report, "\$" refers to US dollars.

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## LOAN AND PROJECT SUMMARY

<b>Borrower</b>	India
<b>Project Description</b>	<p>The Project will improve the welfare and well being of the people of Calcutta, especially the poor, through an improved urban environment, equitable access to municipal services, and more effective municipal management. It is a high priority investment for the government of West Bengal, and is designed to support the government's move to devolve responsibility for urban management from the states to the municipal administrations. Under the Project, a policy and institutional framework will be established to sustain the investments in sewerage and drainage, solid waste management, slum improvements, and canal rehabilitation. A stakeholder consultative process, woven into every aspect of the Project, will ensure the design is responsive to the community and addresses basic human needs. Assistance will be provided to implement the Project, together with capacity building to support municipal services.</p>
<b>Classification</b>	Primary: human development Secondary: environment
<b>Environment Assessment</b>	Category B An initial environmental examination was undertaken; the summary is a core appendix.
<b>Rationale</b>	<p>Calcutta was prioritized for assistance because it suffers from severe environmental problems, and has a municipal corporation that has implemented progressive urban governance reforms in recent years. In Calcutta, urban infrastructure deficiencies are clearly evident. In the project area, only 17 percent of the population are connected to a sewerage system, and less than 50 percent of the area is covered by a drainage system, which is grossly inadequate. Industrial wastes flow, largely untreated, into the surrounding environment, exposing the community to acids, toxic chemicals, paints, varnish, and other highly toxic compounds. During the wet season, flooding occurs frequently, resulting in widespread exposure to pathogens, particularly in the low-lying slum areas. The high population density of the slum settlements remains a major public health concern with regard to the transmission of communicable diseases, especially tuberculosis. Around 50 percent of the target population in the project area live in slum housing or worse; this represents around 700,000 people. An estimated 26-30 percent of the slum dwelling households in the target area fall below the poverty line — some 180,000-210,000 people, or 13-15 percent of the population in the project area.</p>
<b>Objectives and Scope</b>	<p>The Project comprises the highest priority investments under the Municipal Calcutta Environment Improvement Program, a long-term master plan prepared under Asian Development Bank (ADB) technical assistance. The objectives of the Project are to (i) improve the environment in the outer areas of Calcutta, (ii) reduce poverty in the low-income areas through affordable</p>

access to basic urban services, (iii) facilitate community empowerment through participatory processes, (iv) protect the environment from adverse developmental impacts, and (v) help develop Calcutta Municipal Corporation (CMC) as a proficient and autonomous municipality. The Project has six components: A. a stakeholder consultation process, designed to promote stakeholder participation, support policy reform through improved awareness, and educate communities about environmental health linkages; B. sewerage and drainage improvements; C. solid waste management; D. slum improvements; E. canal improvements; and F. implementation assistance and capacity building.

### Cost Estimates

The Project cost is estimated at \$360 million equivalent, of which \$103.7 million is foreign currency cost and \$256.3 million equivalent is local currency cost. Under a parallel financing agreement with CMC, the Department for International Development of the United Kingdom will also provide grant funding (\$30 million equivalent) to support the comprehensive capacity building program required to sustain the project investments.

### Financing Plan

Source	(\$ million)			
	Foreign Exchange	Local Currency	Total Cost	Percent
ADB	103.7	146.3	250.0	69
State Government	0.0	54.6	54.6	15
CMC	0.0	55.4	55.4	16
<b>Total</b>	<b>103.7</b>	<b>256.3</b>	<b>360</b>	<b>100</b>

### Loan Amount and Terms

A loan of \$250.0 million is proposed from ADB's ordinary capital resources for 25 years, including a grace period of 6 years, at ADB's pool-based variable interest rate.

### Period of Utilization

Until 31 December 2007

### Implementation Arrangements

Overall direction and guidance will be provided by a steering committee under the minister, municipal affairs and urban development department, government of West Bengal. A project management unit will be established in each of the two executing agencies. They will be responsible for the coordination and management of all project activities. Project implementation units will be established at the borough level and will have responsibility for local implementation.

### Executing Agencies

CMC and the Irrigation and Waterways Department

### Procurement

Procurement of goods and services financed under the ADB loan will be in accordance with ADB's *Guidelines for Procurement*. Equipment, selected materials and civil works, will be procured using international competitive bidding and international

shopping procedures as appropriate. Civil works contracts less than \$3 million in value will be carried out using local competitive bidding procedures that are satisfactory to ADB.

**Consulting Services and Technical Support**

Selection and engagement of consultants under the loan will be in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB on the engagement of domestic consultants. A team of international and domestic project management consultants will help implement, manage, and monitor project activities. A total of 330 person-months of consulting services is required (108 international and 222 domestic). A team of domestic consultants is required for project engineering design and construction supervision. A total of 1,610 person-months of domestic consulting services is required. About 810 person-months of services from nongovernment organizations will be required to manage the stakeholder consultation process and resettlement operations. In addition, a professional media management agency will be recruited to manage the dissemination of information about the Project. A further 1,788 person-months (356 international and 1,432 domestic) will be provided for capacity building in municipal management under a parallel financing arrangement funded by DFID.

**Estimated Project Completion Date**

30 June 2007

**Project Benefits and Beneficiaries**

The Project will seek to halt the environmental degradation of Calcutta through equitable and urgently needed investments in urban infrastructure, and the sustained delivery of basic municipal services. It will assist in implementing the intent of the 74<sup>th</sup> Constitutional Amendment Act, bringing about a greater degree of independence for CMC, and reducing the financial burden of the state government. In addition, CMC staff, which currently number over 42,000, will benefit from an improved working environment and skills development. The Project will directly benefit about 190,000 slum dwellers, 1.4 million people through improved sewerage and drainage, and about 5 million people through improved solid waste management. Slum improvements will assist the welfare of the dwellers through improved environmental health and facilitating their mainstreaming into the city economy. About 180,000-210,000 of the slum dwellers live below the poverty line. In addition, the stakeholder consultation process will help to empower communities, and give them confidence to participate in the affairs of their local area.

## I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on (i) a proposed loan to India for the Calcutta Environmental Improvement Project, and (ii) the proposed administration by the Asian Development Bank (ADB) of a grant to be provided for the capacity building program under the Project by the Department for International Development of the United Kingdom (DFID).

## II. INTRODUCTION

2. In response to a request from the Government, a project preparatory technical assistance (TA) was provided to undertake a feasibility study and project design to develop investment proposals to improve the urban environment of Calcutta municipality.<sup>1</sup> A loan fact-finding mission of the ADB visited India on 6-16 March 2000. Subsequently, a loan preappraisal mission<sup>2</sup> visited India on 23 May-8 June 2000 and reached an agreement on the proposed project scope, estimated cost, financing and implementation arrangements, and other related details. The preappraisal mission was upgraded to appraisal status on 9 October 2000, following submission by CMC of a resettlement plan acceptable to ADB. This report is based on the findings of these ADB missions, consultation with project beneficiaries, reports prepared by the TA consultants, discussions with the central and state governments and the executing agencies, and discussions with other international assistance agencies. Appendix 1 sets out the project design in a logical framework.

## III. BACKGROUND

### A. Urban Sector

#### 1. India

3. The face of urban India has changed dramatically during recent decades. India's central and state governments have made considerable progress in bringing about economic reforms and greater liberalization, which has resulted in the emergence of cities as the engines of economic growth. India's cities now contribute over 50 percent of the country's gross domestic product (GDP), and their economies are growing so rapidly that they are expected to contribute over 60 percent to India's GDP by the year 2001. More than 90 percent of all government revenues come from its cities. There has been a price to pay for this growth, however. The demand for labor has attracted many rural migrants, whose increasing numbers have swelled the population particularly in the slums and poorer sections of society. The urban population in 1997 was over 260 million, and is projected to grow to nearly 300 million by 2001 and 550 million by 2020. Urban population growth is largely concentrated in cities having populations of 100,000 or more (Class I), and especially in the megacities (populations in excess of 10 million). India currently has two megacities (Calcutta and Mumbai) and is expected to have six by 2025. In the Class I cities, and particularly the megacities, up to 30

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<sup>1</sup> TA 3089-IND: *Calcutta Environmental Improvement Project*, for \$1,000,000, approved on 16 October 1998.

<sup>2</sup> The mission comprised G. Jackson, Sr. Project Engineer and Mission Leader; K. Gerhaeusser, Sr. Programs Officer; A. Goswami, Counsel; R. Jayewardene, Social Development Specialist; S. Popov, Environmental Specialist and I. Walker, Financial Analyst (staff consultant).

percent of the total population is “floating”, i.e., people who come into the city on a daily basis to seek employment.

4. Investment and development has not kept pace with the rising demand of the urban populations, resulting in severe price distortions, environmental degradation, poor environmental health, and increasing poverty levels. The growing population pressures are placing urban infrastructure and municipal services under a great strain. The 1991 census recorded that only one half of urban households have access to safe drinking water, sanitation, or electricity, with an estimated 5 percent of households deprived of all of these basic services. Further, less than 50 percent of wastewater is actually collected, and much less is treated. Environmental health conditions are consequently poor for many sections of society, but none more so than the slums and poorer groups, where conditions are rapidly deteriorating. National poverty levels are over 30 percent.

5. Historically, funding of urban development and services has been provided primarily by the central and state governments, and to a lesser extent by municipalities. However, because the municipalities are unable to mobilize much in financial resources, the central and state governments find it necessary to finance almost all capital investment and subsidize recurrent costs in the urban sector. Due to funding constraints, such assistance is also very limited. Maintaining and increasing the productivity of India’s cities however will require substantial investments in the urban sector. Although this is well recognized by the Government, it is not able to provide adequate financial support to all urban centers, and is encouraging state governments and municipalities to assume greater responsibility for their own socioeconomic development. In this respect, the 74<sup>th</sup> Constitutional Amendment Act (74<sup>th</sup> CAA), 1992, provides a legal framework for decentralized governance down to the municipal level. In support of this legislation, the Government has been progressively working toward more equitable tax sharing arrangements between the central, state, and municipal government levels, and has been encouraging enhanced mobilization of local financial resources. In concert with their state governments, several municipalities have made some progress with implementing the intent of the 74<sup>th</sup> CAA, including the megacity of Calcutta, and the cities of Ahmedabad and Bangalore. However, further and substantial progress needs to be achieved in this area to meet future urban needs.

6. The ability of the governments to meet the funding requirements of the sector is under threat, as the combined fiscal position of the central and state governments has worsened significantly since the mid-1990s. The state governments’ fiscal positions are of particular interest, as they are principally responsible, together with the municipalities, for providing social services and infrastructure development. It is vital for the welfare of urban communities everywhere, and especially the poor, that the state governments and their municipalities fully implement the intent and provisions of the 74<sup>th</sup> CAA. This will require settling issues such as debt financing, municipal financial management, urban planning, and mobilization of local financial resources. Currently, these issues are significant constraints to financing of urban services.

## **2. Calcutta**

7. The Calcutta metropolitan area (CMA) is the capital of the State of West Bengal, and the most populous city in India. CMA comprises three municipal corporations, 34 municipalities, and several village-level committee areas; covers 1,380 square kilometers (km<sup>2</sup>); and has about 12 million people. The nucleus of the city is the Calcutta municipality, which covers 187 km<sup>2</sup> and

houses an estimated 4.5 million people, which is about 40 percent of CMA's population. Municipal administration in Calcutta dates from 1727. The Calcutta Municipal Corporation (CMC) Act, which was introduced in 1980, is a progressive legislation that contains much of the reform currently under consideration in the urban sector in India, and was enacted well before the 74<sup>th</sup> CAA. The CMC Act established the municipal concept of a corporation governed by the elected Mayor-in-Council (MIC), which elects the mayor.<sup>3</sup> The executive power of the corporation is exercised by the MIC, comprising the mayor, deputy mayor, and 10 other elected members of the corporation, each having responsibility for a specific function. The mayor is CMC's chief executive officer, and the state-appointed municipal commissioner is the principal executive officer.<sup>4</sup> The municipal commissioner reports to the mayor and supervises and controls all CMC officers and employees.

8. The MIC is represented at the local level by elected borough committees and ward councils, which have responsibility for limited and specific functions of the CMC. The CMC is made up of 15 boroughs, containing about 141 wards. Each ward is represented by an elected councilor, who sits on the borough committee. The functions of the municipality are discharged through its executive officers and staff who number over 42,000 and are stationed in the head office and the borough and ward offices.

9. In 1970, the Calcutta Metropolitan Development Authority (CMDA) was established by the state government to facilitate the development of Calcutta's urban areas, with a mandate for urban planning and implementation. CMDA has been the vehicle for much of the larger capital investments made in the CMA, including the Ganga Action Plan (GAP), which was developed in the late 1960s to address the severe flooding and sanitation problems. Since that time, CMDA has been gradually constructing the sewerage and drainage works under the GAP, with assistance from the World Bank. Following commissioning of these works, ownership was to be transferred to the municipalities. However, human resource constraints within the municipalities and limited cost recovery levels prevented the level of transfer anticipated. Consequently, operation and maintenance (O&M) of the commissioned water supply and sewerage assets is currently shared by CMDA and the municipalities. In addition to the GAP schemes, CMC has been making small but significant investments in water supply and sewerage, funded from its own resources and to a more limited extent in conjunction with the private sector on some small build-own-transfer projects. However, such private sector initiatives remain small because the sector is not yet sufficiently developed to attract commercial proposals and no regulatory framework exists.

10. CMC's obligatory functions under the CMC Act, 1980, include water supply, sewerage and drainage, solid waste management, streets, building regulations, community health and environmental sanitation, some town planning, and land-use control. The Act permits additional discretionary functions: CMC has found it necessary to become involved in education and health. CMC's sources of funding for these services include the consolidated rate charge (similar to property tax), permits and licenses, and state government transfers. The transfers represent about 50 percent of the total revenue.

11. CMC uses both surface and groundwater sources for water supply, and has traditionally assigned a very high importance to this subsector. Consequently, over 85 percent of the CMC population now have access to a piped water supply. Sewerage has not enjoyed the same level of investment, which is reflected in the fact that only 50 percent of the CMC population have a sewer connection. However, in the outer areas of CMC, this figure drops to

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<sup>3</sup> An MIC is an elected municipal cabinet.

<sup>4</sup> The municipal commissioner may be proposed by the MIC.

about 17 percent. The older systems in the inner core area, many of which are over 100 years old, are generally combined systems, conveying stormwater as well as sewage and/or effluent. Separate sewerage systems are becoming increasingly common, particularly in the newer outer areas. The sewage, effluent, and stormwater from the inner core area of Calcutta is conveyed by canal to the eastern wetland areas, where it is assimilated into the environment of the low-lying swamp areas. The sewage, effluent, and stormwater from the outer areas is conveyed by canal to receiving waters such as the Ganges River. Calcutta's flat topography necessitates pumping of virtually all of the sewage, effluent, and stormwater to the points of discharge. The flat topography leads to severe and rapid silting of many of the canals and drains, which aggravates flooding. Solid waste collection is quite high in the inner core areas, covering about 70-90 percent of the urban population, whereas collection efficiency in the outer areas is much lower. Solid waste is disposed of at three sites in the Calcutta area. Although there is some limited collection and separate disposal of hazardous and biomedical wastes, much enters the waste stream and becomes part of the municipal waste at the landfill sites. CMC has a Bustee Services Cell, which provides support to bustees (slum or low-income communities). Registered bustees represent around 30 percent of the population in the fringe of Calcutta, with refugee colonies, unregistered bustees, and illegal squatters representing around 9 percent.

12. The rapid urbanization of Calcutta has placed a considerable burden on the urban environment. Calcutta is thought to currently have a population four times the size that it can comfortably accommodate: CMC's average density is over 24,000 people/km<sup>2</sup>, one of the highest densities in India. Where sanitation facilities, and sewerage and drainage systems are as yet undeveloped, the overcrowding in the traditional working-class settlements creates serious pollution problems. A lack of housing has forced many of the poor to illegally occupy public lands, such as the banks of drainage canals, which constricts flows and leads to further environmental pollution. Around half of the CMC population live in slum settlements, which are typically in low-lying areas where solid and liquid wastes accumulate. Unsanitary conditions can develop quickly, as inadequate drainage and flood events disperse the wastes in the areas of the slum communities. This results in the contamination of wells used by many poor and vulnerable groups.

## **B. Government Policies and Plans**

13. Within the constitutional framework of India, urban development and housing are state responsibilities, and the central Government plays only a catalytic and supportive role. The central Government's major role in the urban sector is to formulate broad policies at the national level, frame legislation, and provide financial support through centrally sponsored schemes and financial institutions. The mobilization of external assistance and the creation of an appropriate fiscal climate are also important roles.

14. Although India does not yet have a national urban policy, a draft has been prepared, and was released following passage of the 74<sup>th</sup> CAA. The draft is being reviewed by the central Government's Ministry of Urban Development and Poverty Alleviation. There is now a broad consensus that a national policy is required to define and implement the provisions of the 74<sup>th</sup> CAA, to identify policy reform initiatives, and to outline the country's strategies. The central Government prepares five-year development plans, but the emphasis is essentially on housing rather than urban development. Both the eighth (1992-1997) and the ninth (1997-2002) five-year plans are based on the Government's National Housing Policy, adopted in 1994. The ninth plan now promotes the role of state and local governments as managers of

the whole housing and urban development process, and expects them to establish efficient linkages between the components of the process to optimize the efforts of the stakeholders. The ninth plan also promotes legal, institutional, and fiscal reform initiatives aimed at enhancing market-based approaches to housing and urban development.

15. National initiatives reflect the central Government's priorities in the urban sector—the provision of urban infrastructure and the reduction of poverty. Two such initiatives are the Megacity Scheme and Integrated Development of Small and Medium Towns Scheme. In addition, there have been important central programs for poverty reduction, such as the Swarana Jayanti Shahri Rozgar Yojana (golden jubilee urban employment program), and the urban self-employment scheme. These schemes emphasize the provision of basic services to urban poor, enhancing their employment and income generation opportunities through programs like microcredit and their close participation in urban project implementation. In addition, in April 1999, the Government prepared a draft national slum improvements policy.

16. The most important legislation affecting the urban sector in recent years is the 74<sup>th</sup> CAA, which provides the framework for the devolution of power from the state to the municipal level and below. Since enactment of the 74<sup>th</sup> CAA, municipal elections are held in all states, state election commissions have been established, borough committees and ward councils have been elected, many district and metropolitan planning committees have been elected, and state finance commissions have been established to recommend measures to achieve devolution. At the state level, the government of West Bengal established the State Finance Commission in 1995, which recommended a more equitable tax sharing arrangement between the state and the municipalities. Municipal elections were initiated following enactment of the 74<sup>th</sup> CAA; and CMC held elections for the second time in June 2000. Furthermore, the establishment of a Calcutta Metropolitan Planning Committee is now underway following the municipal elections. At the municipal level, the CMC Act, 1980, is progressive legislation. Preceding the 74<sup>th</sup> CAA by almost 12 years, it contains many of the provisions on cost recovery and devolved functions called for by the national legislation.

17. In the 1990s, faced with severe environmental degradation and a growing urban poverty problem, the government of West Bengal prepared two long-term and important documents— the *Basic Development Plan* and the *Master Plan for Water Supply, Sewerage and Drainage, Calcutta Metropolitan District (1996-2001)*. These plans, which address the institutional and planning aspects of development as well as the physical investment requirements, have been progressively implemented since that time. Calcutta has also benefited from the Government's Megacity Scheme, which promotes the building of revolving funds for sustained investment in urban infrastructure through the adoption of direct and indirect cost recovery measures including bond issues.<sup>5</sup> Under the Basic Development Plan, the Bustee Improvement Program (BIP) began implementation in 1970, and is sometimes known as the "sanitation model of slum improvement." The program was very successful. In 1990, it had covered about 2 million of the 3 million bustee population in the metropolitan area, and about 300,000 of the 1 million people living in refugee colonies. Since that time, further schemes have been initiated such as the Basic Minimum Services Scheme, and the Refugee Colony Improvement Scheme. The Project design is founded on these plans and schemes, and has been developed to take account of contemporary urban demands.

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<sup>5</sup> The megacity scheme was introduced following the recommendations of the National Commission on Urbanization (Government of India, 1998), and covers the cities of Calcutta, Mumbai, Chennai, Hyderabad, and Bangalore.

18. Calcutta's development has been the subject of several national and state plans. Calcutta—City of Joy (CMC, 1986) was the first comprehensive development program that CMC had produced. Although only a small part of the plan has been implemented, it remains significant for its breadth of vision. In 1990, the Perspective Plan for Calcutta 2011 (State Planning Board, 1990) and the Plan for Metropolitan Development 1990-2015 (CMDA, 1990) were released; these documents took the view that Calcutta's development should be viewed as an integral part of the state's urban development. Then, in 1995, the Calcutta Environmental Management Strategy and Action Plan was drawn up to improve the environment in CMA for its 12 million citizens. Finally, in 1996, the government of West Bengal approved the Land Use and Development Control Plan for CMC Area, a useful tool for the future development of the city. The physical layout of the Project has been developed within the general directions of the spatial framework laid down for Calcutta by these plans.

### **C. External Assistance to the Sector**

19. ADB's operations in the urban sector commenced in 1993, and include six loans with a total value of \$1.33 billion—Karnataka Urban Infrastructure Development Project, the Housing Finance Project, Rajasthan Urban Infrastructure Development Project, Karnataka Urban Development and Coastal Environmental Management Project, Urban and Environment Infrastructure Facility and Housing Finance II Project.<sup>6</sup> In addition, ADB has provided 15 TAs amounting to \$7.15 million over seven years for the preparation of projects and capacity building. ADB's assistance has concentrated on generating ownership of investments, poverty reduction, cost recovery, transparency, and good governance. Appendix 2 sets out external assistance in detail.

20. External assistance to the sector from other multilateral and bilateral agencies, including Germany, Japan, Netherlands, United Kingdom, United States, and the World Bank, has been increasing over the past few years. Funding equivalent to \$1.9 billion has been provided for water supply and sanitation, primarily from the Japan Bank for International Cooperation and the World Bank. The states of Andhra Pradesh, Karnataka, Maharashtra, and Tamil Nadu, have been the principal beneficiaries of this assistance. In addition, Rajasthan State has received concessional loans from Germany for improving water supply and sanitation in selected cities. The assistance has focused on improved water supply, environmental sanitation, housing, public health, slum rehabilitation, access to financial services, employment and income generating opportunities, institutional development and capacity building, and enhancement of cost recovery levels. As with ADB, the major thrust of all the key agencies is poverty reduction.

21. One of the most significant external assistance programs to Calcutta commenced in 1962, when the World Health Organization (WHO) commissioned the preparation of a master plan for water supply, sewerage, and drainage for the greater Calcutta area. In 1972, the World Bank provided loan assistance for CMDA to implement the Calcutta Urban Development Project, which included water supply, sewerage, and drainage. The World Bank provided two follow-on projects (1978-1979 and 1984-1992) which included programs for low-income communities to improve their health, education, employment generation, and capacities. In 1991, DFID provided grant assistance to CMDA for the Calcutta Slum Improvement Project

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<sup>6</sup> Loans 1415/1416-IND, for \$105 million, approved on 14 December 1995; 1549/1550/1551-IND, for \$300 million, approved on 25 September 1997; 1647-IND, for \$250 million, approved on 3 December 1998; 1704-IND, for \$175 million, approved on 26 October 1999; 1719/1720/1721-IND, for \$200 million, approved on 17 December 1999, and 1758/1759/1760/1761-IND, for \$300 million approved on 21 September 2000.

(CSIP), which sought to build on the experiences of previous slum improvements, but placed greater emphasis on community participation. In 1995, DFID provided further grant assistance to the government of West Bengal for the Calcutta Environmental Management Strategy and Action Plan (CEMSAP), which sought to develop an integrated approach to address Calcutta's environmental problems. The Project design is consistent with the principles and strategies developed under CEMSAP. More recently, DFID has arranged grant assistance for the Calcutta Urban Services Project (CUSP), which assists several municipalities adjacent to CMC for capacity building in municipal and environmental management. The Project will have strong linkages with the CUSP, as they share many common issues and are geographically very close.

22. One of the key lessons related to external support shared by all external funding agencies is that investment alone is not adequate to achieve the desired goals. Investment has to be supported by a number of other inputs including a strong policy reform agenda, capacity building, improved governance, institutional restructuring, and establishment of partnerships between public and private agencies.

#### **D. Lessons Learned**

23. The proposed Project is the seventh loan to the Government in the sector. Three projects are being implemented, two in Karnataka and the other in Rajasthan.<sup>7</sup> Although some lessons can be drawn from all ADB's projects, those from the Karnataka Urban Infrastructure Development Project (KUIDP) are most relevant to the Project. The lessons learned from the other projects are very similar to those of the KUIDP. Appendix 3 provides a detailed summary of ADB's experience in the sector. Key areas for consideration include advance action, community awareness and participation, implementation arrangements, contracting arrangements, land acquisition, and legislative reform.

24. The KUIDP's executing agency (EA) took nine months to mobilize the consultants. Although the EA estimates that the KUIDP will be completed within the six-year implementation schedule, advance action on the recruitment of consultants would have helped significantly in achieving an early completion. ADB's experience with this project, with respect to community awareness, empowerment, and ownership, also shows that substantial time (12-18 months) is needed to establish the stakeholder groups. Developing the trust necessary to carry out physical works and engendering community involvement takes a concerted effort by the EA, the local government, and nongovernment organizations (NGOs). The NGOs need to be included early in the project preparation process.

25. The roles of the various implementing agencies were not well defined initially, neither were they adequately staffed in terms of capability and numbers. As a result, progress was slow initially. Following a more detailed definition of roles and more attention to staffing, implementation is proceeding satisfactorily. Progress on the KUIDP is also being affected by difficulties due to poor planning and late release of counterpart funding. Counterpart funding requirements, together with a solid commitment, must be clearly agreed and set out during processing, and during each year of implementation. Tender documents for the KUIDP differed in a number of respects to those normally used in the sector in India, such as the cost of third

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<sup>7</sup> Loan No.1415-IND: *Karnataka Urban Infrastructure Development Project*, for \$85 million, approved on 14 December 1995, Loan No.1647-IND: *Rajasthan Urban Infrastructure Development Project*, for \$250 million, approved on 3 December 1998 and Loan No. 1704-IND: *Karnataka Urban Development and Coastal Environmental Management Project*, for \$175 million, approved on 26 October 1999.

party inspection, risk associated with fixed price contracts, the cost of performance bonds, quality control and interest costs. The domestic contractors must be provided with very clear instructions on ADB requirements. Prequalification of contractors must be undertaken carefully, and should be accompanied by some measures, such as workshops, to educate the contracting industry.

26. Land acquisition is the major source of delay in the KUIDP, taking over two years to complete. The KUIDP experience demonstrates the need to establish a solid legal framework for land acquisition during loan processing to avoid unnecessary delays. Consideration should also be given to phased conditionalities to ensure intermediate land acquisition proceeds in a timely manner. Under the KUIDP, a change in property tax valuation was sought, from a rental basis to an area and capital value basis. Difficulties in implementing the reforms primarily result because the legal framework was not clearly established before attempting to introduce the necessary reforms. Such legal amendments must be agreed and passed well in advance of the logistics required to effect such change.

#### **E. ADB's Sectoral Strategy**

27. In India, ADB's overall strategic objectives are to foster sustained economic growth to create employment and reduce poverty. In the urban sector, and in accordance with ADB's overarching objective of poverty reduction, the strategy stresses the importance of focused programs targeting the poorer groups, which form the basis for or are integrated into the overall design of projects. ADB will also promote policy reform measures to address the legal, institutional, and financial constraints in the urban sector. These reform measures will be aimed at liberalizing India's land and housing markets to attract more private sector investment into the sector.

28. ADB's Urban Sector Strategy for India is to assist with urban (i) infrastructure and services, (ii) transportation, and (iii) housing. For urban infrastructure and services, ADB will continue to support integrated urban development projects to improve urban environments and living conditions, especially for the poorer groups, and to strengthen the capacity of local governments in the implementation of projects and delivery of services. Such support will be used as the basis for implementing the decentralization provisions of the 74<sup>th</sup> CAA, and introducing and demonstrating financial sustainability measures. In future, ADB will complement these efforts with assistance in the establishment of urban and environmental infrastructure funds, which will attract public and private sector capital to finance urban development.

29. With regard to urban transportation, transport systems management will be a focus of ADB assistance, either in conjunction with integrated urban development projects or as single projects, to promote low-cost alternative measures that reduce congestion and increase road capacity by regulating the movement of intracity traffic. ADB will help prepare transport system management plans, complemented by capacity building in their implementation, enforcement, and monitoring.

30. ADB will provide assistance to the housing subsector in the three areas: (i) lending to financial intermediaries as a means to link the formal and informal housing finance sectors, thereby increasing the availability and affordability of housing finance to low-income households; (ii) support to low-income housing subprojects with a particular emphasis on using

microcredit schemes for housing and income generation loans; and (iii) provision of TA for secondary mortgage development.

31. All ADB's urban sector programs will incorporate capacity building initiatives aimed at promoting sustainable urban management. In general, ADB's approach to capacity building will be to support the intent and provisions of the 74<sup>th</sup> CAA. Urban management therefore constitutes the principal focus of ADB's urban sector capacity building program.

## **F. Policy Dialogue**

32. Since 1993, ADB and the Government have maintained dialogue on urban policy and related institutional and financial reforms. ADB-assisted urban development projects in Karnataka and Rajasthan were milestones for urban development, built on key policy reforms, which fully supported the central and state governments' efforts to decentralize urban management responsibilities to local governments. During project processing, ADB has pursued an active policy dialogue with the government on institutional, financial, and operational aspects of the sector. The content of the dialogue builds on recent CMC initiatives, together with the policy reform agreed on previous ADB projects, which has been developed to address contemporary issues. Appendix 4 provides a matrix of the policy and institutional reform agenda.

33. The policy dialogue has benefited from the stakeholder workshops conducted since TA inception, and from CMC's general participatory approach for the Project. Accordingly, there is a broad agreement with CMC on a number of policy issues. In view of the progressive nature of the CMC Act, 1980, reforms focus on a few key issues, relating to the creation of frameworks for the sustainable management of municipal services, enhanced levels of resource mobilization, CMC's future role and function, and CMC's improved capability and efficiency. ADB and CMC are also engaged in dialogue on the benefits of pursuing stakeholder participation.

34. **Sustainable Delivery of Urban Services.** The CMC Act, 1980, and the recommendations of the State Finance Commission, 1995, provide the principal framework for managing CMC. The State Finance Corporation recommended a more equitable sharing of taxes between government of West Bengal and CMC. Specifically, it recommended that 16 percent of the tax revenue collected by the state should be transferred to local bodies, of which CMC's share would be 3.9 percent. Further key recommendations were that the state should support 100 percent of the cost-of-living allowance that CMC is obliged to pay to its staff, and that CMC's share of the entertainment tax should be increased from 50 to 100 percent. The government has accepted these recommendations, and appropriate transfers will be made in FY2002. The budgetary allocations that the state has historically been required to provide for water supply and bustee services (on a matching grant basis), are not likely to be continued. However, since these allocations have not been made for several years, CMC should be in a position of net fiscal gain with the new arrangements. The new measures will have a significant and beneficial impact on CMC's financial position.

35. Direct user charges have not been traditionally applied by CMC for water supply, sewerage, drainage, or solid waste management (SWM). Funding for capital investments has been met either by CMC from its consolidated account, or by the government of West Bengal through budgetary allocation. Provision for recurrent costs is nominally from the consolidated rate charge, which CMC is permitted to collect under the CMC Act. The charge, which is

commonly referred to as a property tax, covers many services, including water supply, sewerage, and SWM. According to the CMC Act, 45 percent of the charge is to be allocated to cover the recurrent costs for water supply, sewerage, and SWM—15 percent for each service. In recent years, CMC has only been able to allocate 9-15 percent for water supply, and 7-10 percent for sewerage and drainage. However, SWM has enjoyed allocations of 17-22 percent. Less than 50 percent of the consolidated rate charge is collected, which is undermining CMC's efforts to generate more revenue. CMC has agreed to a time-bound action plan to improve the collections to 80 percent by FY2005. Since the consolidated rate charge must cover many other municipal services, CMC has agreed to change the name of the tax from consolidated rate charge to property tax.

36. Currently, the consolidated rate charge is assessed at fair rental rates for the annual ratable value (ARV). With this method, it is almost impossible to achieve full market rental for a property, thereby constraining revenue. The absence of an organized real estate market leads to the underreporting of rents and capital value in transactions. Further, the wide discretionary powers of assessment staff can lead to gross underassessments of ARV. In the case of CMC specifically, the tax rate is capped at 40 percent, and any property having an ARV of Rs300 or less is exempt from tax. CMC has agreed to reform the method of assessing the consolidated rate charge so it is rated on an area basis, with some consideration for capital value; this will enhance revenues considerably. An amendment to the CMC Act will be required, together with issuance of rules under the CMC Act. Properties will also have to be revalued. The CMC has agreed to undertake these tasks under the Project. A committee has been established to evaluate similar models in India.

37. In addition to the allocation from the consolidated rate charge, the CMC Act also enables the corporation to generate revenue for water supply services through the application of direct user charges. However, until very recently there was no metering in the city, and only the relatively small percentage of consumers with a ferrule (water connection) size greater than 20 millimeters (mm) diameter were required to pay on a flat rate basis. Now, CMC has commenced a metering program under which a few industrial, commercial, and institutional (ICI) consumers have been metered and are beginning to pay by volume consumed. CMC has agreed to increase the cost recovery levels of water supply. This will commence with the progressive application of a flat rate to consumers not having a meter, in parallel with CMC's program to gradually expand metering to all consumers. Subject to the findings of a current World Bank study on water supply in Calcutta, consumer metering will expand, and consumers will be required to pay for the water supply service on the basis of a structured tariff. CMC has also agreed that the 15 percent allocation toward the cost of supply from the consolidated rate charge will remain for the medium term.

38. Although the CMC Act permits user charges to be applied to ICI establishments for the provision of sewerage services, it does not permit them for residences. CMC has tentatively agreed at this stage that the CMC Act, 1980, should be amended to permit the implementation of user charges for sewerage and drainage as a surcharge on the water supply bill. It has also been agreed to retain the 15 percent allocation from the consolidated rate charge for sewerage and drainage, and rename it as an environmental charge.

39. As with sewerage, the CMC Act permits user charges to be applied to ICI establishments for SWM, but also excludes residences. CMC has agreed that the ICI charges will be reviewed to reflect the environmental cost of sanitary disposal, especially for biomedical and hazardous wastes. A direct user charge for solid waste collection for residences is the

ideal long-term goal, but political resistance to implement this charge, in addition to the water supply and sewerage charges, would be insurmountable at this time. Therefore, the 15 percent allocation from the consolidated rate charge will be retained for SWM activities for the short- to medium-term.

40. **Institutional Development.** CMC has indicated its intention to establish a water supply and sewerage utility, which will operate on corporate principles. This type of reform requires a thorough assessment of the water supply subsector, and an implementation program spanning several years. The current World Bank study will prepare a framework for the reform program, including a detailed assessment of the subsector, and the compilation of a comprehensive consumer database. The success of the policy and institutional reform agenda under the Project will be reinforced by the expected outcomes of the World Bank study.

41. CMC has noted that the satisfactory operation of the sewerage component of the Project requires water, which would normally be supplied from a reticulated system. Current assessments show that coverage levels are quite high, and the mayor announced in his budget speech on 11 March 2000 that a substantial amount would be invested in water supply development in the next fiscal year in the project area, with a plan to invest even more in the future. CMC has a medium-term investment plan, including sources of funding for water supply and sewerage, indicating investment in the project area.

42. Because of the considerable demand for urban infrastructure and services in the greater Calcutta area, the government established the CMDA as a metropolitan implementing agency with access to central Government and external funding for major water supply and sewerage infrastructure development. For this purpose, the CMDA has specifically established the Calcutta Metropolitan Water and Sewerage Authority, under the CMDA umbrella. Following implementation, CMC becomes the operator of the assets within its area of jurisdiction. Although CMC is bound by this regulatory requirement, it will not assume ownership of the asset until it is operating satisfactorily. Consequently, many assets remain under the control of the CMDA. CMC has now agreed to develop a time-bound program for transfer of the backlog of assets, including actions to be undertaken. CMC understands that the enhanced levels of cost recovery resulting from the Project will ensure the sustainability of the newly acquired assets. The responsibility for all health and slum improvement programs implemented by CMDA is now with CMC.

43. **Decentralization.** In terms of its functions, CMC will assume a greater role in planning its urban areas in the future, in accordance with the 74<sup>th</sup> CAA. Following the municipal elections in June 2000, ADB was informed that a metropolitan planning committee is now being established, and that CMC would be represented on this committee. This will give CMC a much greater role in the planning of its urban area.

44. **Governance.** CMC is the largest municipal administration in India and has over 42,000 staff. Although its responsibilities are considerable, CMC recognizes that it is overstaffed. A major cause of the overstaffing is the practice of staff handing down their positions to relatives and friends upon retirement. CMC issued a directive in February 2000 ceasing this practice. CMC's total staff number will decline through natural attrition in the next few years. This rationalization process will be accompanied by a reorganization of CMC and redeployment of its staff to meet the challenges of the future. CMC's workforce is to be reduced by least 10 percent by FY2007. Guided by the loan covenants, and assisted by the extensive capacity building program under the Project, CMC will develop into an efficient and autonomous

megacity corporation. New accounting and auditing systems will be installed, together with asset management systems, and geographic and financial management information systems (MISs).

#### **IV. THE PROPOSED PROJECT**

##### **A. Rationale**

45. Calcutta Municipality was selected as a high priority for ADB assistance in the urban sector because it (i) suffers from severe environmental problems, (ii) has a high percentage of poor people, (iii) has a municipal corporation that has implemented progressive urban governance reforms in recent years, (iv) has demonstrated willingness to implement further reforms, and (v) will serve as a useful model for other large municipalities.

46. The Calcutta Municipality can be broadly classified into an inner core area where population densities are very high, and the outer urban areas where populations are less dense. The urban environmental infrastructure in the inner core area is among the oldest in India, with some drainage systems around 140 years old, and in urgent need of rehabilitation and upgrading. In the outer fringe areas, sewerage and drainage infrastructure is seriously deficient. Reticulated water supply systems cover around 30 percent of the 1.4 million people in the project area, and a further 43 percent have tubewell supplies. Groundwater supplies are being gradually replaced by reticulated systems, as more booster pumping stations and mains are constructed. Although water supply coverage is improving, substantial further investment is needed. CMC has agreed to provide ADB with a detailed investment plan for water supply over the next five years, which will demonstrate how full coverage will be achieved.

47. The population density of the inner urban areas of Calcutta is very high at around 29,000 people/km<sup>2</sup>, falling to around 7,000/km<sup>2</sup> in the outer areas. The density distribution is presently skewed toward the inner core area and some outer areas, where densities are up to four times more than can be supported on a sustainable basis. Population densities are expected to become more even. Nevertheless, the overall population of the project area is expected to increase by 2.5 percent per annum, to 1.88 million by 2011. Urban infrastructure deficiencies are clearly evident in the outer areas—only 32 percent of the outer population are connected to a water system and 18 percent to a sewerage system, less than 50 percent of the area is covered by a drainage system, and under 70 percent of the area is served by solid waste collection. Industrial wastes flow, largely untreated, into the surrounding environment, exposing the community to acids, toxic chemicals, paints, varnish, and other highly toxic compounds.

48. Because Calcutta's terrain is very flat, stormwater and sewage have to be pumped into receiving waters. During the wet season, flooding is exacerbated by undersized drains, drains blocked by uncollected solid waste, and silted canals. The frequent flooding increases exposure to pathogens from overflowing septic tanks, flooded garbage heaps, and other sources, and is most severe in the low-lying slum areas.

49. The population density, typical of slum settlements, remains a major public health concern with regard to the transmission of communicable diseases, especially tuberculosis. Around 50 percent of the target population in the project area live in slum housing or worse;

this represents around 700,000 people. About 26-30 percent of the slum dwelling households in the target area fall below the poverty line—this is about 180,000-210,000 people, or 13-15 percent of the total population in the project area.<sup>8</sup> Low-income or slum settlements comprise registered bustees (20 percent of the target population), refugee colonies (2 percent), unregistered bustees and canal bank settlements (10 percent), and the homeless (1 percent). Inadequate shelter compounds the poor environmental health conditions in the slum areas. Of the total slum population in the project area, around 70 percent occupy a single room structure, and around 80 percent occupy dwellings of 36 square meters (m<sup>2</sup>) or less. Smoke from the burning of dung, wood fuel, coal, and kerosene inside slum dwellings predisposes occupants especially young children and women, to acute respiratory infections (ARIs). Although CMC's database on public health is very limited, it shows that mortality rates due to ARI and diarrhea account for around 29 percent of all infant deaths.<sup>9</sup>

## **B. Objectives and Scope**

50. The primary objective of the Project is human development, with environment as the secondary objective. The specific objectives of the Project are to (i) improve the environmental conditions in the outer areas of Calcutta; (ii) reduce poverty in the low-income areas through affordable access to basic urban services; (iii) facilitate community empowerment through participatory processes; (iv) protect the environment from adverse developmental impacts; and (v) help CMC develop as a proficient and autonomous municipality. The Project covers the highest priority investments under the Municipal Calcutta Environment Improvement Program, which is a long-term master plan prepared under ADB TA. The project area covers boroughs I, XI, XII, XIII, XIV, and XV (outer areas of Calcutta municipality) for parts B, D and E of the Project, with parts A, C and F covering all boroughs within the municipality (the project parts are described in detail below). The total population of the outer area is about 1.4 million people, whereas the total population of Calcutta municipality is around 5.0 million. The number of people expected to benefit directly from the Project ranges from 65,000 to 5.0 million across the various components. The Project will support CMC in developing a sustainable urban governance framework in accordance with the intent and provisions of the 74<sup>th</sup> CAA, by establishing frameworks and capacity building at the municipal level. It will also help improve the environmental health conditions of the outer boroughs of Calcutta, including slum and low-income areas. The Project has six parts. Appendix 5 provides a summary project description.

### **1. Part A: Stakeholder Consultation Process**

51. The stakeholder consultation process (SCP) will promote stakeholder involvement in the Project and contribute to the effective implementation of the project investments. The SCP is designed to ensure stakeholder awareness, participation, and education with respect to the implementation and management of the project facilities. It will also educate the communities about environmental sanitation and health linkages. The project beneficiaries will be consulted about project operations, as well as the implications to the community in terms of benefits and responsibilities. Information about the stakeholders' needs and expectations under the Project will flow to the project management teams. Using existing community networks where possible, stakeholders will be encouraged to become involved in the project design, implementation, O&M, and monitoring. As a cross-cutting component, the SCP will underpin the promotion of

<sup>8</sup> The poverty line in India is defined as income necessary to buy food to meet a daily intake of 2,400 calories of energy in rural areas (2,100 calories in urban areas), and certain basic nonfood items such as clothing and transportation. In monetary terms, this is about Rs300 (\$6.50) for urban areas.

<sup>9</sup> Based on a pilot area program – Calcutta Slum Improvement Project.

affordable access of the poor to basic urban services in low-income areas, and facilitate community empowerment through development and adoption of demand-led, participatory approaches across all components. NGOs will be recruited under part F to manage the SCP, together with the supply of equipment, materials, and staff resources. The NGOs will work with community-based organizations (CBOs) and other civil society organizations. The total number of beneficiaries is expected to be about 5.0 million.

## **2. Part B: Sewerage and Drainage Improvements**

52. This component will (i) optimize sewage collection, removal, and treatment; and (ii) reduce flooding through improved stormwater drainage. The component will cover the following four areas of CMC: (i) Cossipore-Chitpur (part of borough I); (ii) Jadavpur (part of boroughs XI and XII); (iii) South Suburban (part of boroughs XI, XIII, and XIV); and (iv) Garden Reach (part of borough XV). All of these areas have inadequate sewerage and drainage systems. Although these areas already have a number of sewers and drains constructed under the GAP, only a few house connections exist. As a result, the GAP systems are grossly underused, and the levels of coverage of the population are low. The Project therefore seeks to make effective use of the existing GAP infrastructure.

53. The Project will (i) optimize sewage interception and collection systems providing secondary sewers (450 km); (ii) build trunk sewers in addition to existing GAP trunk lines (50 km); (iii) develop separate stormwater drainage systems, including pumping stations, where appropriate; (iv) connect properties to the existing and newly extended networks; (v) construct/rehabilitate five pumping/lift stations; (vi) upgrade three treatment plants and construct two new treatment plants where necessary; and (vii) desilt and rehabilitate selected outfall canals. Based on a least-cost analysis, separate sewerage and drainage systems are proposed where feasible. Where existing infrastructure dictates, or where streets are narrow, combined sewers are to be used. Where necessary, alternative engineering solutions such as interceptor tanks and small bore sewers will be examined and used. The treatment process proposed is extended aeration. This type of treatment is recommended due to its simple requirements for O&M, sludge digestion, and reduced power requirements. In addition, numerous reservoirs and water bodies in the CMC area need urgent attention, as their environmental degradation endangers public health. The exact location of the treatment plant and pumping station sites will be fixed during detailed design. At that time, all land acquisition must comply with the agreed resettlement framework and the Bank's Resettlement Policy. The Project will provide for the rehabilitation of the Rabindra and Subhas lakes, both major water bodies in the CMC drainage area. The total number of beneficiaries is about 1.4 million people.

## **3. Part C: Solid Waste Management**

54. Part C will introduce improvements to the municipal, hazardous, and biomedical waste streams. For municipal wastes, the component will (i) enhance stakeholder awareness, including informal education and training for trash sorters, (ii) extend door-to-door collection services to cover the entire CMC area, and (iii) encourage waste generators to manage and segregate recyclable and nonrecyclable wastes at source. To achieve these objectives, the Project will improve solid waste transportation by (i) replacing open containers with closed containers; (ii) optimizing container locations; (iii) phasing out open-back trucks, and replacing them with compactor trucks; (iv) using bulldozers and other equipment necessary for efficient landfill operations; (v) introducing mechanical road sweepers; and (vi) progressively phasing

out night soil tankers as the sewerage system is expanded. The total number of beneficiaries is expected to be around 5.0 million.

55. With regard to municipal waste, the component is based on segregation of waste at source, effective collection of the various wastes, and disposal in an environmentally safe manner. With support from the SCP, waste will be segregated at source into recyclable material (23 percent), biodegradable matter (58 percent), and inorganic waste (19 percent). The recyclable material will be segregated by sources, collected and removed by NGOs, and transported for sale to dealers, retailers, and wholesalers. The biodegradable matter will be segregated by NGOs and transported to landfill sites where it will be composted and sold. The remaining inorganic waste material will be taken to the existing landfill sites, which will be upgraded to assimilate the waste in an environmentally safe manner. This approach to waste management will considerably increase the time the existing landfill sites can be used. To supplement the 700 tonnes per day composting plant at Dhapa, an additional plant is proposed at the same site to handle 1,150 tonnes per day.

56. With regard to hazardous waste, dedicated transport vehicles will be provided, and an integrated hazardous waste management facility developed at the Dhapa landfill site. The facilities will be equipped with adequate leachate collection and treatment.

57. The major elements of the biomedical waste management strategy are improved handling and transport of the waste, and cost-effective treatment and disposal. The Project will finance dedicated transport vehicles and a central biomedical waste treatment facility. Biomedical wastes will be incinerated at the central biomedical waste treatment facility at the Dhapa landfill. The larger generators of biomedical waste will separate biomedical waste for recycling and incineration at source; this will be achieved through extensive stakeholder awareness programs. Nonplastic biomedical wastes will be incinerated at Dhapa. For generators of large volumes of plastic biomedical wastes, assistance will be provided to shred and disinfect the waste.

#### 4. Part D: Slum Improvements

58. Part D will address the environmental conditions of informal and formal low-income settlements. The Project will improve environmental services in these settlements including water supply, drainage, and sanitation. For settlements not yet recognized by CMC, the Project will support recognition through zoning, site planning, and registration of dwelling units, as well as physical investments. The component will address the immediate needs of the poor through a crisis management approach, and also through longer-term improvements.

59. A **crisis management approach** will be adopted to address the immediate needs for water supply and sanitation in unrecognized low-income settlements. Up to 65,000 slum-dwellers will benefit from targeted settlements in Cossipore, Garden Reach, and Jadavpur. Civil works proposed include (i) provision of water standposts (9,350 units); (ii) construction and/or conversion of sanitary latrines (4,200 units); (iii) construction and/or renovation of community latrines (910 units); and (iv) construction of washing/bathing platforms (430 units).

60. **Longer-term improvements** will include a wide range of amenities to improve the living conditions of slum dwellers. The same rights and responsibilities that have been conveyed by CMC to registered bustee dwellers will accrue to the unrecognized slum dwellers. This will be achieved through a pilot scheme to establish land titles, registration of dwellings, recognition of

tenancy rights, rent control, and municipal tax liability. Security of tenure will enhance the creditworthiness of the tenants and improve their access to financing for physical improvements. A small-scale loan facility of \$60,000 will be established to finance physical improvement of slum dwellings on a pilot basis. Civil works proposed include (i) widening and realignment of neighborhood access lanes (1,490 meters [m]); (ii) electric lighting to illuminate lanes and open public spaces (40 poles and wiring); (iii) widening, realignment, and lining of drains (595 m); (iv) construction of sewer/drainage lines (380 m); (v) construction of water supply lines (785 m); (vi) provision of solid waste containers (6 units); and (viii) improvements to public open space (3,182 m<sup>2</sup>). An estimated 190,000 people will benefit from improved facilities under this component.

61. NGOs will be mobilized to design and manage the program. The NGOs will facilitate consultation, community mobilization, participation in prioritizing community requirements, planning and scheduling of civil works, management of the small-scale loan facility, and maintenance. The NGOs will work with CBOs and other civil society organizations.

## **5. Part E: Canal Improvements**

62. Under part E, about 53 km of canals will be improved. These canals, which are the major outfalls for the sewerage and drainage systems under part B, are almost completely silted up and are very polluted. They will be dredged and desilted. Lining will be undertaken to improve hydraulic efficiency in some areas, and culverts and bridges will be replaced/upgraded, as appropriate, to eliminate drainage constrictions. Existing pumping stations will be rehabilitated and augmented and new pumping stations will be constructed to ensure uninterrupted flow, particularly during heavy rainfall and high tide levels in the Ganges River. The canals to be improved include the Tollygunge-Panchannagram Main Channel with its intercepting and branch channels, the Keorapukur Canal and its tributaries, the Begore Canal, the Manikhali Canal, and the Churial Canal. The sediment material, from dredging the canals and desilting the sewers and drains will be screened for a wide range of contaminants. Contaminated sediment will be transported to a secure landfill site at Dhapa. Uncontaminated sediment may be used as construction fill material.

63. Improvement of the canals will require the resettling about 11,000 people living on the canal banks. Dwellings and privies on canal banks constrict canal flows, leading to the accumulation of silt and vegetation, and prevent regular cleaning and maintenance. Because the canals need to be dredged and desilted regularly, some of the current encroachers must be permanently relocated. The Project will examine ways of involving canal bank dwellers in the long-term management and maintenance of the canals wherever possible. The resettlement will be carried out in accordance with ADB's *Involuntary Resettlement Policy* (1995) and guidelines outlined in the *Handbook on Resettlement: A Guide to Good Practice* (1998).

## **6. Part F: Implementation Assistance and Capacity Building**

64. CMC has substantial experience in municipal management. However, constrained investment levels in the past have not permitted its staff to gain experience implementing big projects, although they have implemented many small- to medium-sized projects. The Project will supplement CMC's resources with project management consultants, comprising international and domestic experts. The consultants will also provide specific support to the

Irrigation and Waterways Department (IWD), although this will be limited, because IWD has substantial experience in canal development and rehabilitation.

65. A team of domestic consultants will carry out the geodetic survey and detailed design and construction supervision. For the sewerage and drainage component, in-depth appreciation of the dynamics of the complex systems is required before detailed design can proceed. A dynamic flood study of the sewerage and drainage system will therefore be included as part of the detailed design consulting services package.

66. A local NGO will be engaged to manage the SCP. The NGO will be experienced in working with government agencies and communities in planning and implementing environmental and slum improvements projects, and preferably will have had experience with resettlement. The NGO will facilitate the implementation of the resettlement programs for CMC and IWD. To ensure the public is fully aware of the Project and its implications for civil society in general, a public relations agency will be recruited to provide professional media management for the Project.

67. Due to a lack of funding, CMC's staff have not been able to develop CMC's management systems and skills to a level commensurate with the largest municipality in India. In addition, CMC has not yet developed the community consultation skills or participatory systems to adequately meet the needs of civil society. A capacity building program will therefore be implemented, and consulting services (international and domestic) will be engaged to deliver the program (para. 82) The capacity building program will be funded by DFID under a parallel financing arrangement, and administered by ADB.

68. Part F will provide a substantial and fully equipped office for CMC and its consultants for their project activities. An office of a more modest nature will be necessary for IWD, for the canal rehabilitation component. Part F will provide vehicles and minor equipment for the Project, and incremental administration costs associated with the Project, logistics, training, and other support.

### **C. Technical Justification**

69. The TA conducted a comprehensive evaluation of combined and separate sewerage systems, based on considerations such as (i) existing sewerage and drainage systems, (ii) adequacy of road width for laying new sewers/drains, (iii) degree and type of present and future urban development, (iv) location of major drains and outfall canals, and (v) land availability for treatment plants and pumping stations. The comparison of the cost-effectiveness of alternative designs indicated that the best approach generally would use separate sewerage and drainage systems, but that combined sewers may be the most suitable option in some cases. Partly combined systems were found to be unsatisfactory. The Project will include the construction of sewage treatment plants, which will use the extended aeration treatment process in preference to the activated sludge process model. Extended aeration is recommended due to its simple requirements for O&M, sludge digestion, lower power requirements, and easier laboratory control. The Project will require the treatment process at the South Suburban East sewage treatment plants to be changed to aerated lagoons, as the current anaerobic process is not consistent with Government guidelines, 1993.

## D. Cost Estimates

70. The total cost of the Project is estimated at \$360 million equivalent including duties and taxes. Of the total cost, \$103.7 million (29 percent), is the foreign exchange cost, including \$38.1 million in capitalized interest, and \$256.3 million equivalent (71 percent) is the local currency cost. DFID is providing a further \$30 million for a comprehensive capacity building program for CMC to support the project investments. Table 1 summarizes the cost estimates. Detailed cost estimates are provided in Appendix 6.

**Table 1: Summary of Project Cost Estimates**  
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
<b>A. Base Cost<sup>a</sup></b>			
Part A: Stakeholder Consultation Process	-	0.3	0.3
Part B: Sewerage and Drainage Improvements	34.5	110.4	144.9
Part C: Solid Waste Management	13.8	17.8	31.6
Part D: Slum Improvements	2.5	8.6	11.1
Part E: Canal Improvements	-	44.5	44.5
Part F: Implementation Assistance and Capacity Building <sup>c</sup>	3.3	14.9	18.1
<b>Subtotal</b>	<b>54.0</b>	<b>196.5</b>	<b>250.5</b>
<b>B. Contingencies</b>			
Physical contingency	5.4	19.7	25.1
Price contingency	6.2	22.6	28.8
<b>Subtotal</b>	<b>11.6</b>	<b>42.3</b>	<b>53.9</b>
<b>C. Interest</b>			
Interest during construction	38.1	17.5	55.6
<b>Total<sup>b</sup></b>	<b>103.7</b>	<b>256.3</b>	<b>360.0</b>

<sup>a</sup> At November 2000 prices.

<sup>b</sup> Includes duties and taxes estimated at \$15.5 million (4.3 percent of total Project cost).

<sup>c</sup> Excludes \$30 million equivalent to be provided by DFID as a grant under a parallel financing arrangement.

Source: Staff estimates.

## E. Financing Plan

71. The Government requested that ADB provide a loan of \$250.0 million from its ordinary capital resources, representing approximately 69 percent of the total project costs. The loan will be for a term of 25 years, including a grace period of 6 years, and with interest to be determined in accordance with ADB's pool-based variable lending rate for US dollar loans. The loan of \$250.0 million is proposed to finance \$103.7 million of the foreign exchange cost and \$146.3 million equivalent of local currency costs. The local cost financing is proposed to cover part of the costs relating to civil works, equipment, consulting services, and resettlement, but excluding all land and duties and taxes. The foreign exchange risk will be borne by the central Government. Table 2 summarizes the proposed financing plan.

**Table 2: Proposed Financing Plan**  
(\$ million)

<b>Source</b>	<b>Foreign Exchange</b>	<b>Local Currency</b>	<b>Total Cost</b>	<b>Percent</b>
Asian Development Bank	103.7	146.3	250.0	69
State Government	0.0	54.6	54.6	15
CMC	0.0	55.4	55.4	16
<b>Total<sup>a</sup></b>	<b>103.7</b>	<b>256.3</b>	<b>360.0</b>	<b>100</b>

<sup>a</sup> Includes duties and taxes estimated at \$15.5 million.

72. The Borrower will be the Government of India. The loan to the Government will be passed to the government of West Bengal as 70 percent debt and 30 percent grant. This will result in a subsidiary loan of \$175 million at an on-lending rate of 13 percent per annum for a period of 25 years, including a 6 year grace period. The remaining \$75 million will be provided as a grant.

73. The government of West Bengal will on-lend the full amount of the loan to CMC on the same terms. The \$75 million Government grant will be passed on to CMC also as a grant. In addition, the government of West Bengal will provide further budgetary support of \$54.6 million, of which \$27.3 million will be allocated to IWD as a grant to meet the cost of canal improvements and resettlement, and \$27.3 million allocated as a grant to CMC. CMC will meet the balance of the project costs of \$55.4 million. The sewerage connections will be financed under the Project, and CMC will recover the cost (estimated at \$30 million) from customers over a 2-3 year period in accordance with affordability levels. Under a parallel financing agreement with CMC, DFID will provide grant funding (\$30 million equivalent) to support the comprehensive capacity building program required to sustain the project investments.

74. Provision for financing local currency costs is justified under ADB's local currency financing policy. Because of the constraints imposed on national savings by the low per capita income, assistance is required to support the local currency costs of development projects. Furthermore, public finances remain under severe pressure. A significant domestic resource gap will persist for some time. Based on these considerations and the overall lack of domestic budgetary resources in the sector, and given the relatively high local currency cost in a project of this nature, ADB assistance for local currency expenditures related to the Project is justified. ADB financing of local currency costs represents 59 percent of the total loan, 57 percent of the total local currency cost, and 41 percent of the total project cost.

## **F. Executing Agencies**

75. The Project will have two executing agencies (EAs). CMC will be the principal EA, responsible for parts A, B, C, D, and F. IWD of the government of West Bengal will be the EA for part E. Although part A will be essentially under the responsibility of CMC, it will also provide services to IWD on the resettlement aspects of the canal improvements component. Part F will provide support to IWD in terms of consulting services and incremental administration. CMC is very experienced with its routine municipal functions, but not with large projects. Similarly, IWD is very experienced in the development and maintenance of canals and waterways, and is well equipped to manage the design of the proposed dredging and

desilting of the canals. However, project management experience is limited. Therefore, CMC, and to a lesser extent IWD, will be supported in project management.

## **G. Implementation Arrangements**

### **1. Project Organization and Management**

76. A steering committee will be established to generally oversee the implementation of the Project, provide guidance on policy and institutional reforms, ensure provision of counterpart funding, and ensure that the overall objectives of the Project are achieved. The steering committee will be chaired by the minister of municipal affairs and urban development of the government of West Bengal. The deputy chairman will be the mayor of Calcutta, and the municipal commissioner will be the secretary. The steering committee members will include the secretaries of IWD, municipal affairs and urban development, finance, land and land reforms, the chairman of West Bengal pollution control board, the chief executive officer of CMDA, the members of mayor-in-council for water supply and sewerage, and the chairmen of the boroughs within the project area. The steering committee will meet quarterly, or as required.

77. A project management unit (PMU) will be established in both CMC and IWD. The PMU in CMC will be headed by a project director, with joint commissioner rank. The PMU in IWD will be headed by a project director, with chief engineer rank. The PMUs will be responsible for the overall management of the Project, including recruitment of consultants, procurement, project accounting, land acquisition, monitoring of resettlement, stakeholder consultation, slum development, review and approval of detailed designs, review and approval of contract awards, implementation of the physical works, quality assurance, and monitoring of the institutional and policy reforms. The PMUs will provide the coordination points for CMC, CMDA, the government of West Bengal, IWD, and all consultants. Both PMUs will be staffed with qualified, experienced, and computer-literate personnel in the fields of project management, accounting, engineering, and procurement. The key PMU personnel, will be sourced from line departments in CMC and IWD, will be assigned for the entire project duration, and ultimately will be incorporated into the organizational structure responsible for the assets and systems implemented under the Project. Both PMUs will be assisted in their work by the associated line departments, the PMC, and the design and construction supervision consultants. The slum improvements component will be implemented with support from NGOs and CBOs and borough, and ward-level committees using the SCP.

### **2. Implementation Schedule**

78. The Project is to be implemented over a six-year period, with consulting services commencing by mid-2001 and civil works construction starting in 2003. Completion is scheduled by mid-2007. The project implementation schedule is shown in Appendix 7.

### **3. Procurement**

79. Goods and services to be financed by ADB will be procured in accordance with ADB's *Guidelines for Procurement*. Contracts for major civil works in excess of \$3 million will follow international competitive bidding procedures. Smaller civil works packages will be done through local competitive bidding procedures acceptable to ADB. The PMU will produce an updated procurement plan, detailing the proposed procurement for the next financial year, and

submit it to ADB by 31 May, annually. Indicative procurement packaging is shown in Appendix 8.

80. Utility vehicles and equipment for packages less than \$0.5 million in value will be procured following international shopping procedures. Minor items such as office equipment and consumables (valued at less than \$100,000) may be procured by direct purchase according to the Government's standard procedures acceptable to ADB.

#### **4. Consulting Services**

81. A team of international and domestic project management consultants will assist the PMUs to implement, manage, and monitor project activities. A total of 330 person-months of consulting services is required (108 international and 222 domestic). A team of domestic consultants for a total of 1,610 person-months is required for detailed engineering design and construction supervision. About 810 person-months of services from NGOs will be required to manage the stakeholder consultation process and resettlement operation. A public relations agency will be recruited to provide professional media management for the Project. All the consulting services will be financed under the ADB loan. The consultants will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB on the engagement of domestic consultants.

#### **5. Capacity Building Program**

82. A comprehensive capacity building program (CBP) to strengthen all aspects of CMC will be funded through a parallel financing arrangement between DFID and CMC. The CBP will be an integral part of the Project, and will come within the operational responsibility of the PMU. The CBP is designed to help CMC meet its obligations under the loan covenants. Selection and recruitment of consultants and procurement of all equipment and materials for the CBP will be in accordance with DFID's policies and guidelines. The CBP, which has 10 packages, will be managed and coordinated through a CBP manager who will be responsible to the PMU. Overall administration of the CBP will be undertaken by ADB as part of the routine loan review missions. The CBP manager is provided for as one of the packages of the CBP. A total of 1,788 person-months (356 international, 1,432 domestic) is to be provided for the CBP. The CBP will (i) develop and implement an institutional and organizational plan; (ii) computerize CMC's operations; (iii) develop and implement a geographic information system; (iv) develop and implement an integrated financial MIS; (v) develop and implement an integrated asset management system; (vi) develop and implement a composite area-linked system for the levy of property taxes; (vii) develop and implement a preventive O&M program, with particular emphasis on health and safety, and effluent monitoring; (viii) develop and adopt urban poverty reduction approaches within the Bustee Services Cell; (ix) develop and implement a human resources development program; and (x) establish the CBP manager. Package (viii) will also develop a policy on involuntary resettlement for the government of West Bengal, including implementation guidelines and capacity building for its implementation. DFID are currently considering expanding the scope of the CBP, before formalizing agreement with the Government. The agreement is linked to the Project through a cross-effectivity clause.

#### **6. Disbursement and Imprest Fund Account**

83. The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook*. To expedite implementation of the Project through the timely release of funds, an

imprest account may be established for each of EA for the exclusive use of the Project. Imprest accounts will be managed, replenished, and liquidated in accordance with ADB's *Loan Disbursement Handbook* and detailed arrangements agreed to by the Borrower and ADB. The initial amount to be deposited in the imprest account will be determined by the Bank in consultation with the Borrower. The statement of expenditures procedures may be used for reimbursement and liquidation of the imprest account for eligible expenditures up to a maximum of \$50,000 per expenditure.

## **7. Land Acquisition and Resettlement**

84. For the sewerage and drainage component, the project proposals will require about 220 hectares (ha) of land. Approximately 180 ha are required for SWM, but this land is available at the Dhapa landfill site. The remaining 40 ha is required for the sewerage and drainage component. The exact locations of land requirements could not be identified during project preparation, although land areas and approximate locations are known. A detailed description of land acquisition procedures is in Appendix 9. The procedures for land acquisition will commence immediately following the system operational analysis in the early stages of detailed design. Compulsory land acquisition will be undertaken either on application by CMC to the state government under the 1980 CMC Act and the 1894 Land Acquisition Act, or by the state government of its own accord under the 1894 Land Acquisition Act. Adequate time for land acquisition is provided for in the implementation schedule. Should involuntary resettlement be involved, a resettlement plan must be prepared and implemented in accordance with ADB's policy and guidelines.

85. Some of the illegal settlers along the banks of the canals to be rehabilitated under the project must be resettled. It is expected that about 3,600 households (about 11,000 people) have to be moved. Resettlement will be undertaken in accordance with a resettlement plan that has been prepared and approved by ADB; a summary resettlement plan is presented in Appendix 10. The resettlement plan will be implemented by the government of West Bengal and CMC.

## **8. Stakeholder Consultation Process**

86. During project formulation, stakeholder participation was ensured through open workshops and consultations with beneficiary groups and elected civic leaders. Although summarized as a discrete component under the Project, the SCP will be integrated throughout all components. Stakeholders will be continuously consulted during project implementation and maintenance of the completed facilities, to ensure their interests have been addressed and to bring about their greater "ownership" of the facilities and cost recovery measures. Existing stakeholder networks will be used in the delivery of the process, and will serve as a conduit for the Project. The SCP is designed to involve all stakeholders in the decision-making processes of planning and implementing of the Project. The SCP will also cover community awareness, participation, and environmental health education. NGOs will be recruited to manage the SCP. The NGOs will be responsible to CMC and IWD, through the PMUs.

## **9. Reports, Accounts, and Audit**

87. The project directors will be responsible for providing ADB and the steering committee with quarterly progress reports on project implementation. The reports will be prepared by the PMU, based on data collected from the EAs. The reports will particularly address the

institutional and policy development aspects of the Project. They will provide a description of progress, details of any modifications required to project schedule, problems encountered, and institutional and policy development aspects of the Project. They will provide a description of progress, details of any modifications required to the project schedule, problems encountered, and an outline of the work in the ensuing quarter. The reports will also provide summary financial accounts of the Project, consisting of expenditure during the quarter, year-to-date expenditure, and expenditure to date. The EAs will also submit to ADB within three months of substantial physical completion of Project, a completion report that will cover the details of implementation, costs, benefit monitoring and evaluation (BME) activities, and other information reasonably requested by ADB.

88. The PMUs will establish and maintain accounts and records to facilitate identification of income and expenditures related to the Project, and will do this by the approval date of prequalification documents for civil works. The PMUs will contain an adequate number of suitably qualified accounting staff. All the accounts and statements of expenditure and revenues will be audited annually by auditors acceptable to ADB. Audited financial statements and subproject accounts, together with the report of the auditor, will be submitted within 12 months of the close of the financial year. The responsibility for preparing all reports, accounts, and statements, and ensuring that they are submitted in accordance with the agreed time frame, will rest with the project director.

## **10. Benefit Monitoring and Evaluation**

89. To ensure that project facilities are managed efficiently and that the benefits reach the target groups, a BME program is included under the Project.<sup>10</sup> This program will monitor the delivery of services anticipated and measure benefits as they accrue. To measure the health and social benefits resulting from the Project, the PMU will carry out periodic surveys to determine the changes in key social indicators over time, including health, welfare, and economic and physical conditions. The indicators to be monitored have been formulated and agreed upon. These include indicators pertaining to environmental improvements, public health, changes in property values, poverty and community development, and operational efficiency of the Project. The PMU will submit a detailed implementation plan for BME and for preparing benchmark information for ADB's review and concurrence within six months of loan effectiveness. The PMU will be assisted by the detailed design and construction supervision consultants in carrying out this monitoring. The findings of periodic monitoring will be used to adjust the scope of project improvements, particularly for the slum and community development components.

## **11. Mid-term Review**

90. A comprehensive midterm review, with participation of senior central and state government officials and ADB staff, will be carried out after the Project has reached the implementation stage, at which time detailed design is expected to be complete and major contracts will have been awarded and commenced. This is envisaged to be about 24 months after loan effectiveness. The reviewers will critically evaluate actual project progress, implementation procedures, procurement methodology, BME activities, and the performance of consultants. Following the review, corrective measures will be introduced to remedy any identified weaknesses.

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<sup>10</sup> BME will be undertaken within the framework of ADB's project performance monitoring system, which is currently being pilot tested.

## H. Environmental and Social Measures

91. By reducing pollutants discharged, the Project will improve the quality of receiving waters. A summary initial environmental examination report is attached as Appendix 11. An expanded environmental examination has been prepared, and is available for review. The rehabilitation and expansion of sewers and drains will help improve public health and the quality of life of communities in the project area, and will help improve and protect the quality of groundwater, which is currently being contaminated. The construction of sewage treatment plants will reduce the load of heavy metals, organic chemicals, and other potential contaminants added to the city's urban environment. The livelihood of over 20,000 people depends on the nutrients in the effluent flows to produce crops and fish. Reduced levels of pollutants in the city's effluent discharges will (i) reduce the potential adverse health impacts resulting from the irrigation of crops and the farming of fish in the East Calcutta Wetlands, and (ii) preserve the unique biological values of the wetlands. Rehabilitating the outfall canals in Calcutta will reduce the potential for flooding in the city and enhance the quality of life of individuals currently residing in areas subject to inundation. An environmental impact assessment (EIA) will be carried out for all project facilities during the initial stages of detailed design, and upon identification of all land sites, before any construction commences. The EIAs will be carried out in accordance with the Bank's *Environmental Guidelines* and the requirements of the Borrower and the government of West Bengal.

92. Improved SWM will reduce the adverse health impacts on people associated with unsanitary SWM practices, and will reduce health problems caused by disease vectors. In addition, improved landfill operations will reduce the potential for surface and groundwater contamination at the Dhapa site in the East Calcutta Wetlands, and the adverse biological impacts at the site. Improving the management of biomedical wastes will help protect the community from infectious and injurious wastes. Improved hazardous waste management will substantially reduce the discharge of contaminants into the environment. The eventual closure of the landfill sites at Dhapa and Noapara (in 2012) will affect the livelihood of trash sorters, most of whom are women and children. CMC has prepared a rehabilitation framework, and will prepare a detailed rehabilitation plan and census during project implementation. Under the Project, immediate measures will be taken to ensure safer and more hygienic conditions of work for the sorters, including the provision of protective clothing and health checks.

93. A social analysis has been prepared in accordance with ADB's guidelines (Appendix 12). The Project has been prepared on the basis of a participatory approach using stakeholder consultations, socioeconomic surveys, and workshops. The Project is thus responsive to the needs and preferences of the stakeholders, and will have no adverse social impacts. Social measures incorporated into the Project are designed to ensure that no population groups are disadvantaged, that there is equitable accessibility to municipal services, and that the services are affordable to the poorer groups. To ensure that the consultative process is maintained, the project design includes a stakeholder consultation process.

94. To ensure access to the Project for all income groups, financing support schemes will be available to all households regardless of income. For sewerage connections, a deferred payment scheme will be implemented under which CMC will finance the connection into the sewerage system and the households will repay CMC through the consolidated rate charge system. Similarly, a small-scale loan facility will be established through which slum dwellers can improve their housing structures. Discounts will be offered to those able to repay quickly to reduce the revolution time of the fund, thus making it available to a wider group of people.

NGOs will manage the fund under the SCP. The monthly fee for sewerage and drainage will be maintained at 1.8 percent of monthly household income for the poorer groups, which will permit the total cost for water supply and sanitation services to remain below the universally accepted guideline of 5-6 percent of household income.

95. A detailed resettlement plan, approved by ADB, has been prepared for the settlers along the canal banks who will be relocated in a socially responsible way. The resettlement plan also addresses the particular needs of the socially disadvantaged trash sorters, who will lose their means of income as the landfill sites gradually become more sanitary. The resettlement plan also includes an approved resettlement framework, which will be followed for the preparation of further resettlement plans if future land acquisition under the Project involves resettlement. Where resettlement is involved, relocation will be undertaken in strict accordance with the ADB's *Involuntary Resettlement Policy* (1995), thus ensuring that no population group is disadvantaged as a result of project implementation.

#### **I. Impact on Poverty**

96. An estimated 200,000 people live below the poverty line in the project area. The SCP and the CBP will have a direct impact on the poor groups through the development of mechanisms and approaches to the design and operation of projects, which will specifically make provision for the underprivileged. In addition, the SCP will empower communities, enabling them to participate more actively and constructively in all civic matters. Up to 5.0 million people will benefit from the Project, of which some 50 percent reside in slum settlements. Under the CBP, skills will be developed in the CMC, NGOs, and CBOs to ensure the effective delivery of such approaches, and systems will be institutionalized under the Project. This approach will also empower civil society in general. Extending access to the sewerage system and ensuring better SWM for the poor will enhance their health. The project interventions in the slum communities will address poverty in two ways. First, the slum communities will have greater access to basic facilities such as water supply and sanitation. Second, the standard of shelter in the slums is expected to improve, as the communities will be offered financial assistance to rehabilitate their homes, where appropriate.

97. The canal bank dwellers who are relocated under the canal rehabilitation works will have improved quality of life through the provisions of the ADB-approved resettlement plan. The government of West Bengal and CMC have recognized this exercise as an opportunity to assist the canal bank dwellers to improve their standard of living. The resettlement plan ensures a minimum standard of housing for relocation, and addresses the special needs of vulnerable groups such as children and female household heads through specially designed rehabilitation programs.

### **V. PROJECT JUSTIFICATION**

98. The Project will improve the urban environment and enhance human capital, which will lead to improved health and increased productivity, particularly among the slum dwellers. In the longer-term, improved health will, in turn, contribute to better educational standards and economic growth. The SCP will underpin the sustainability of the Project through improved representation. In addition, the SCP will empower communities, enabling them to participate

more actively and constructively on all civic matters. Up to 5.0 million people will benefit from the Project, of which some 50 percent reside in slum settlements.

99. Accessibility by the poor and underprivileged to basic services and improved shelter in the slum settlements will help them enter the mainstream of society. This will alleviate their personal burden and will provide considerable benefit to the people of Calcutta as a whole. Some 65,000 slum dwellers will benefit from direct slum intervention under the Project. Many more will benefit indirectly from improved municipal services, and improved employment opportunities generated by the considerable labor requirement for the construction work.

## **A. Economic and Financial Evaluation**

### **1. Economic Analysis**

100. The Project will improve the living and environmental conditions in the CMC area. The sewerage, drainage and canal components (parts B and E) will benefit approximately 1.4 million people of the outer areas of Calcutta. The SCP, SWM and capacity building components (parts A, C, and F) will benefit all of CMC, with an estimated population of 5.0 million. The slum improvements component (part D) will benefit 190,000 people. The economic capital costs and incremental O&M costs of all components have been considered. Per capita values for each economic benefit have been calculated and multiplied by the target population in each case.

101. The main economic benefit of the Project is improved human health. The Project will reduce waterborne and water-related diseases due to reduced flooding, installation of sewerage systems, and improved SWM. Cost savings will include reduced (i) hospital and health care; government expenditure on (ii) household medical expenditure; and (iii) expenses for cleaning septic tanks; removing solid waste dumped into the canals; and repairing roads, vehicles, and dwellings due to flood damage. Reduced flooding also will save time in travelling to work, and benefits will be obtained from recycling and composting solid waste. Benefits arising from the Project that are difficult to value will also have a positive impact on the population of Calcutta. These benefits include increases in land values, reduction of flood impacts on economic activities, benefits to people resident outside the CMC area, benefits to visitors, and the psychological benefits of reduction in morbidity and mortality.

102. An integral economic analysis has been made for the Project as a whole, excluding component A. The economic analysis is presented in detail in Appendix 13. The aggregate economic internal rate of return (EIRR) obtained for the Project is 14.5 percent, which is higher than the economic opportunity cost of capital of 12 percent. The economic net present value of the Project has been calculated for discount rates of 10 and 12 percent. In both cases, it is positive. The results of the sensitivity analysis show that the EIRR is most sensitive to delays in the realization of benefits. However, the EIRR remains above 12 percent in all sensitivity analyses.

### **2. Financial Sustainability**

#### **a. Current Financial Practices and Position of CMC**

103. A financial analysis is presented in Appendix 13. While CMC follows generally accepted accounting principles, because CMC lacks computerized accounting systems, it relies on cash-

based financial reporting rather than accrual accounting procedures. This system has a limited ability to track and manage receivables and payables, and CMC urgently needs to implement a full accrual based accounting system. All CMC revenues are credited to the municipal fund. The CMC Act, 1980, requires that the municipal fund be maintained in five accounts covering a range of urban services which, as yet, excludes SWM. A separate account for SWM is essential if this activity is to be operated on corporate principles.

104. CMC's operations are funded by state government transfers and locally generated revenue. Historically, the state transfers have included a cost-of-living allowance, octroi motor vehicles tax, entertainment tax, grants for water supply and sewerage operations (on a matching grant basis), bustee services (on a matching grant basis), development grants, and project-specific grants. The most important transfers are the cost-of-living adjustments; and the development grant, which is paid in lieu of the abolished octroi. For FY2000, these transfers represented 89 percent of the total state transfers.

105. Records show that the state was not always able to transfer the required amount. This, together with inadequate financial management, resulted in CMC running operating deficits of 33-48 percent between 1993 and 1998. Following the abolition of the octroi, and motor vehicle tax, and the adoption of the State Finance Commission's recommendations (1995) in the budget for FY2000, the state transfers have been rationalized, and include (i) allocation of 16 percent of sales tax to local bodies as untied funds (CMC to receive 3.9 percent), (ii) cost-of-living allowance to cover 100 percent of CMC's liability, (iii) all state taxes on entertainment to be handed over to the local bodies, (iv) CMC empowered to issue trade licenses, and (v) CMC may impose higher tolls on heavy vehicles (still under consideration). The provision of matching grants for water supply, sewerage, and bustees will likely cease.

106. CMC generates its local revenue through a mix of direct user charges, rents or leases, and taxes. For water supply, user charges are applied to water consumers having a connection of 20 mm or greater; for sewerage, charges are applied to ICI users; and for SWM, charges are also applied to ICI establishments. Rents are received from the leasing of markets and, more recently, payments are being received from some build-own-transfer schemes. There are a variety of taxes, but by far the most significant is the consolidated rate charge, which accounts for some 26-36 percent of total revenue; the sum of all taxes amounts to about 37-42 percent of total revenue. However, the locally generated revenues only recover around 20 percent of water supply services, 3-7 percent of sewerage and drainage, and almost nothing for SWM. In total in FY2000, user fees for water supply, sewerage, and SWM represented only 9 percent of estimated revenues.

107. Since FY1995, recurrent expenses for water supply have been in the range of 9-15 percent of total expenditure, 7-10 percent for sewerage and drainage, 17-22 percent for SWM, and 3-17 percent for bustee services. Locally generated revenues are providing an increasing share of total revenues, but this is because the state transfers have been decreasing in absolute terms. Since FY1994, internally generated revenue has risen from 52 to 60 percent of total revenue. It is becoming increasingly necessary for CMC to reduce its dependence on state transfers to bring about a real improvement in Calcutta's urban environment.

108. Although the general ledger and trial balance (cash) are computerized, most other accounting functions are manual. The CMC Act, 1980, provides for audit of CMC's accounts, but does not set any time limit for the preparation of financial accounts by CMC, for completion of the audit. The delayed preparation and audit of accounts means that proper financial

information is not available on a timely basis. This is of some concern, as CMC has substantial arrears. The audit of the accounts for FY1991 has only just been completed by a private firm on behalf of CMC. CMC advised ADB that this will now allow the completion of the accounts for the following fiscal year (FY1992) and their subsequent audit, and so on. Due to the lack of up-to-date financial data, CMC's annual budgetary statements of receipts and expenses (both capital and operational) must be relied upon when reviewing past financial performance. CMC does, however, provide unaudited copies of its income statement (cash basis, excluding depreciation) within 12 months of the end of the fiscal year to the examiner of local fund accounts, government of West Bengal.

109. Computerized information of receipts and expenditures for the last three financial years is available, whereas prior to FY1996, only estimates are available. A review of CMC's past financial performance for these three years (actuals) of computerized data shows that in FY1997 (year ending 31 March 1997) and FY1998, CMC achieved a cash surplus from its operations of \$4.4 million equivalent and \$2.3 million equivalent, respectively. In FY1999 an operating deficit of \$12.7 million equivalent was incurred, which was met from additional State transfers. This is less than the projected budgeted deficit of \$14.7 million equivalent, but is substantially different to the estimated results for FY1999, which indicated a surplus of \$3.3 million equivalent. For FY2000, a deficit of \$15.0 million equivalent is expected.

110. The consolidated rate charge is an area of concern, as it could be a substantial source of revenue for CMC. Currently, it is the single largest source of tax revenue for CMC, but generates the lowest revenues per capita among India's major cities.<sup>11</sup> However, there has been major progress since 1998 when CMC's master record files were computerized. The consolidated rate charge arrears are now computerized and statements issued. Accordingly collection efficiency of present demand bills is above 60 percent, and receipts have been rising at 15 percent per annum over the last five years. The method CMC uses for determining annual valuations for the consolidated rate charge is to value properties on their estimated ARV, assessed at fair rental rates. With this method, it is almost impossible to achieve full market rental for a property, as the level of rent is limited by legislation, thereby constraining revenue (para. 36).

#### **b. Assumptions and Bases for the Financial Projections**

111. The proposed funding and cost recovery mechanisms for Calcutta's sewerage and drainage are the implementation of a two-part fee structure. The system is based on a water tariff surcharge and the allocation of a fixed percentage of the consolidated rate charge collections to cover all recurrent costs and some capital cost of sewerage and drainage facilities. The SWM component includes 3 subcomponents: municipal waste management, biomedical waste, and hazardous waste. The assumptions and bases for the financial evaluation are designed to ensure CMC's financial sustainability, while maintaining affordable charges and taxes. The key financial assumptions and bases are discussed in paras. 112-118.

#### **c. Affordability and Willingness to Pay**

112. The financial projections are presented on a fiscal year basis, ending on 31 March. Projections are prepared to FY2012 and are, of necessity, based in part on actual, estimated, and budgeted financial data. Inflation has been projected at the local rate, and state domestic

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<sup>11</sup> Second Municipal Finance Commission, Government of West Bengal.

product growth has been assumed at 6.7 percent with the assumption that most revenues and costs will increase at around half this rate in real terms at 3.35 percent per annum. Population growth, although quite low at around 0.6 percent for CMC as a whole, is projected to increase at around 2.5 percent per annum in the project area. The consolidated rate charge collection efficiency is projected to increase to 80 percent by FY2005, and the method of assessment is expected to be reformed by FY2003 (para.36). All water supply consumers with a connection of 20 mm dia. or greater, will be required to pay a minimal charge, and a 50 percent surcharge for sewerage and drainage by FY2002. The cost-of-living allowance will continue to cover CMC's full liability. The government of West Bengal will transfer 3.9 percent of the state's tax revenue annually to CMC under the agreed tax sharing arrangement.

113. A typical water supply or sewerage connection can serve the needs of several households. About 18 percent of the population (250,000 people) in the project area are served by the sewerage system, and each connection typically serves 2.5 households. Adopting this ratio, and an urbanization rate of 2.5 percent per annum in the project area, the number of sewerage connections in the project area will reach 100,000 by FY2007, covering some 60 percent of the target population.

114. Based on the universally adopted guideline that the total cost of direct user charges for water supply and sanitation services should not exceed of 5-6 percent of monthly household income, affordability levels have been examined. Water tariffs will be increased over the next few years, but the exact level is not yet known. Based on ADB's general experience however, water supply and sanitation each represent about 50 percent of the total. Therefore, sanitation charges should not exceed 2.5 percent of monthly household income. Based on this premise, two representative income levels are considered in the affordability analysis. The first is the median household income level (Rs3,700 per month in 1999). The second is the income level (Rs2,670 and below in 1999), below which community water standpipes and latrines would be the affordable and appropriate option.

115. Costs for sewerage and drainage will be partly recovered through the consolidated rate charge, and partly through a direct user charge. The monthly direct user charge is projected for the years FY2002 (year of introduction), FY2006, and FY2016, and expressed as a ratio of the projected median and lower bound income, respectively. In FY2002, the user charge would represent 1.1 percent and 1.6 percent; in FY2006, it would represent 1.3 and 1.8 percent; and in FY2011, it would represent 1.2 and 1.6 percent. All of these ratios are substantially below the affordability limit of 2.5 percent. If the consolidated rate charge (indirect recovery) is also considered, then based on a 15 percent allocation of the average tax of Rs600/annum, or Rs50/month, the indirect charge would represent 1.3 percent of the median household income. With respect to the poorer groups, the lowest level of consolidated rate charge payable is currently Rs300/annum, which is considered to be the cut-off point for poor households; below this level poor households are exempt from the consolidated rate charge. For the median case therefore, the sum of direct and indirect user charges will represent 2.6 percent of household income, and for the poorer groups the direct user charge will represent 1.8 percent of household income. On this basis the proposed cost recovery mechanisms are considered affordable.

116. Indirect recovery of costs for the SWM operations is proposed through the consolidated rate charge (15 percent allocation), as is currently applied. This will represent 1.3 percent of the median household income. As with sewerage and drainage, poor households will not contribute because they are exempted from the consolidated rate charge.

#### d. Cost Recovery Mechanisms

117. Virtually the whole water supply system is unmetered, except for a few ICI establishments. CMC has indicated its intention to implement a metering program under which all unmetered connections will pay a flat rate of Rs100/month. Once a meter is installed, the consumer is to begin paying on a progressive block rate tariff system, which will incorporate a lifeline charge for the poorer groups. For sewerage and drainage, a 50 percent surcharge on the water tariff of domestic consumers and 80 percent on ICI consumers will be set up to recover part of the costs. In addition, 15 percent of the consolidated rate charge will be allocated for supporting water supply, 15 percent for sewerage and drainage, and 15 percent for SWM.

118. The initial connection charge to the system will be around Rs6,000, depending on the location of the premises. It is proposed that CMC will finance the cost of connections under the Project, and recover the cost through the consolidated rate charge collection system and/or water bills, over a two-year period.

#### d. Financial Evaluation

119. Financial projections of CMC's operations, including the proposed project investments, have been prepared and evaluated to FY2012. The projections are based on the assumptions discussed in paras. 112-118, the proposed cost recovery mechanisms, proposed operational requirements, and the population forecasts and planning targets. The projections indicate that, as a result of the Project, CMC will become financially stronger. CMC will be able to recover all current and incremental O&M costs, and service 100 percent of project debt (interest and principal repayments) after project completion.

### B. Risks

120. Through legal due diligence during processing, ADB has sought to identify all significant risks, and devise a management strategy to mitigate the risks to the proposed Project. These risks relate to land acquisition, user charges, rationalization of CMC staff, property tax reform, and audit requirements.

121. **Land Acquisition.** Some land will need to be acquired for the sewerage and drainage component. The two risks associated with land acquisition are (i) delays in acquisition, and (ii) unfair compensation. These risks are mitigated by acquiring all land on a solid legal basis, for which the Land Acquisition Act of 1894 provides the necessary legal base. The 1894 act provides for compensation on a comprehensive basis. The risk of inappropriately low compensation triggering litigation and attendant delays is mitigated by the West Bengal Land Acquisition Manual of 1991, which guides the state government in calculating compensation.

122. **Property Tax Reform.** Some reform measures are needed to improve CMC's financial position. The basic reform is to change the capital valuation of property from an ARV to an area-based method of assessment. Therefore, capital valuation of property, as currently set forth in the CMC Act, should be implemented by area. Assuming the legal framework is set down in a very clear manner, the logistical problems of tax reform will still need to be addressed. This risk is to be mitigated through (i) a comprehensive capacity building component, and a program of workshops/seminars with similar progressive municipalities in Bihar, Gujarat and Karnataka; and (ii) loan conditionalities.

123. **Government of West Bengal's Public Finances.** The state government is a subsidiary borrower under the Project. It is also taking on debt to finance other projects such as water supply and highways. These investments will affect the state government's fiscal performance. To assess the risk of adverse fiscal impact, ADB assessed the state government's fiscal situation. Although the study revealed that the government needs to improve its fiscal performance to meet future investments, it concluded that the state can afford the Project. The government's annual counterpart commitments represent only approximately 2.0 percent of the total state budget. The risk of default on counterpart contributions due to inadequate fiscal resources is therefore minimal, and mitigated through assurances that the government will meet all necessary counterpart funding requirements.

## VI. ASSURANCES

### A. Conditions for Loan Effectiveness

124. As a condition to the effectiveness of the Loan Agreement, the state government will have enacted amendments to the CMC Act, which will (i) enable CMC to issue regulations or adopt budget estimates, requiring all users to pay a direct flat rate surcharge based on consumer connection size for sewerage and drainage for all unmetered water connections; (ii) ensure that CMC will be externally audited on an annual basis no later than 12 months after the end of each fiscal year; and (iii) enable CMC to have a separate account for SWM as part of the municipal fund, and allocate 15 percent of the amounts realized from the consolidated rate charge to that account.

125. As further conditions to the effectiveness of the Loan Agreement, (i) the on-lending agreement, satisfactory to ADB, will have been executed and delivered on behalf of the state government and CMC, and will have become fully effective and binding upon the state government and CMC in accordance with its terms; and (ii) the DFID agreement will have been executed and delivered, and all conditions precedent to its effectiveness shall have been fulfilled, or arrangements satisfactory to ADB shall have been made for its fulfillment.

### B. Specific Assurances

126. The Government, government of West Bengal, and CMC have given the following specific assurances, in addition to the standard assurances, which have been incorporated in the legal documents.

- (i) The Government, state government, and CMC will execute the policy and institutional action plan as agreed with them and ADB.
- (ii) The Government, the state government, and CMC will ensure that water supply investments in the project area will continue to FY2007 at a level that will result in at least 100,000 total connections and an incremental 57,000 connections by the end of that fiscal year (an average of 8,000 connections per annum).
- (iii) CMC will undertake a program of metering of all water supply consumers with 20 mm connections or more. The CMC shall also take account of the ongoing World Bank studies in undertaking a program of metering all water supply

consumers having a connection less than 20 mm. dia. based on consumption to be agreed with ADB such that (a) 25 percent will be metered by the end of FY2003, (b) 50 percent by the end of FY2004, and (c) 100 percent by the end of FY2005. All consumers are expected to be metered by the end of FY2010.

- (iv) CMC will implement property tax reform acceptable to ADB by no later than the end of FY2004 in accordance with actions agreed to between the state government, CMC, and ADB under the Policy and Institutional Reform Agenda.
- (v) Subject to the ongoing World Bank studies on metering, the state government and CMC will ensure that a progressive block rate water tariff and sewerage surcharge, based on metering of water supply consumers as previously agreed to with ADB, will be implemented so that (i) a CMC regulation on a progressive block rate water tariff and sewerage surcharge will be approved by the state government and issued by CMC by the end of FY2003; (ii) the scope of the CMC regulation will be extended as wards are metered and a progressive block rate water tariff and sewerage surcharge is imposed in the fiscal year immediately following metering; and (iii) the adoption of the water tariff and sewerage surcharge is completed in the CMC's jurisdictional area by the end of FY2008.
- (vi) CMC will ensure that, pending the progressive block rate water tariff and sewerage surcharge as set out in the Policy and Institutional Reform Agenda, the flat rate surcharge based on consumer connection size for unmetered water connections will be retained.
- (vii) CMC will ensure that external auditors acceptable to ADB will have audited CMC's unaudited accounts, and that such external auditors will have audited (a) all CMC's unaudited accounts for years prior to and including FY1994 by December 2000, (b) CMC's unaudited FY1995 accounts by March 2001, (c) CMC's unaudited FY1996 accounts by June 2001, (d) CMC's unaudited FY1997 accounts by September 2001, (e) CMC's unaudited FY1998 accounts by December 2001, and (f) CMC's unaudited FY1999 accounts by March 2002. The audit of FY2001 accounts will be completed by 30 June 2002, and thereafter audits will be completed annually within 12 months of each year-end.
- (viii) The state government will ensure that annual transfers are provided to CMC at levels prescribed by the State Finance Commission, in respect of (a) entitlements of local self government, and (b) cost-of-living allowances.
- (ix) The state government will ensure that appropriate budget estimates are adopted and appropriate charges on the consolidated fund of the State are made each fiscal year under Article 202(3) (c) of the Constitution of India to finance the state government's counterpart funding expenditures and obligations to the Project in accordance with the proposed financing plan.
- (x) CMC will ensure that appropriate budget estimates are adopted and appropriate budget allocations are made each fiscal year to finance CMC's counterpart funding expenditures and obligations to the Project in accordance with the proposed financing plan.

- (xi) CMC will ensure that a dedicated operating account is established for SWM by no later than the end of FY2002.
- (xii) The state government and CMC will ensure that CMC will have issued regulations or have adopted budget estimates to ensure full O&M recovery and 30 percent allocation from the consolidated rate charge for water supply, sewerage, and drainage by the end of FY2005.

## **VII. RECOMMENDATION**

127. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and recommend that the Board approve (i) the loan of \$250,000,000 from ADB's ordinary capital resources to India for the Calcutta Environmental Improvement Project, with a term of 25 years, including a grace period of 6 years, and with interest to be determined in accordance with ADB's pool-based variable lending rate system for US dollar loans, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board, and (ii) the administration of a grant in an amount of \$30,000,000 equivalent to India for the Calcutta Environmental Improvement Project to be provided by DFID, and to be administered by ADB under the terms of a letter of administration to be entered into between ADB and DFID.

TADAO CHINO  
President

15 November 2000

## Appendixes

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### Supplementary Appendixes (available on request)

- A. Detailed Project Description
- B. Detailed Cost Estimates
- C. Detailed Implementation Arrangements
- D. Outline Terms of Reference for Consulting Services
- E. Focused Initial Environmental Examination
- F. Resettlement Plan
- G. Detailed Economic Calculations
- H. Detailed Financial Sustainability Analysis
- I. Legal and Regulatory Framework
- J. Property Tax Reforms
- K. Small-scale Loan Facility for Slum Dwellers
- L. Design Standards
- M. Staffing Arrangements
- N. Stakeholder Consultation Process
- O. Legal and Regulatory Action Plan
- P. Capacity Building Program
- Q. Detailed Social Assessment
- R. Gender Analysis

## PROJECT FRAMEWORK

Design Summary	Targets	Project Monitoring Mechanisms	Risks/Assumptions
<b>Goals</b>			
Sustained improvement in the environmental health and quality of life for the communities of Calcutta (base year FY1999).	Percentage of people below the poverty line reduced by 5 percent by FY2005.	Calcutta Municipal Corporation health records	Government and CMC able to provide adequate budgetary and technical resources to the social sectors.
	Average number of days Calcutta affected by floods reduced by 10 percent.	CMC records	
<b>Purpose</b>			
Sustainable management of urban environmental waste and drainage	CMC to meet all operation and maintenance costs by FY2007.	Operating records and loan review missions	Skilled resources remain in place.
	CMC to cover its debt service commitment by FY2008.	Audits	
<b>Objectives and Outputs</b>			
a. Improve the environmental conditions in the outer areas of Calcutta.	100,000 sewerage connections in the project area by FY2007.	CMC records and loan review missions	Investments in water supply development continue as planned.
	2,500 tons/day of solid waste transported to landfill site by FY2010.	CMC records and loan review missions	Community is receptive to awareness program.
b. Reduce poverty in the low-income areas through affordable access to basic urban services.	Water and sanitation services to represent no more than 5 percent of average monthly household income.	Consumer surveys	Economic conditions do not adversely affect affordability levels.
c. Empowerment of communities through participatory processes.	Community representatives involved in the project steering committee and management procedures.	Official notification and loan review missions	Community remains committed to the Project.
d. Protect the environment from adverse developmental impacts.	Sewerage effluent from all treatment plants meets the specified standards (20/30 effluent).	CMC records and loan review missions	Skilled resources remain in place.
e. Develop CMC as a proficient and autonomous municipality.	CMC to assume responsibility for urban planning progressively.	Loan review missions	Skilled resources remain in place.
	CMC to operate water supply and sewerage on corporate principles by FY2003.	Loan review missions	World Bank PPF recommendations.

Design Summary	Targets	Project Monitoring Mechanisms	Risks/Assumptions
	Decrease CMC workforce by at least 10 percent by FY2007.	Official notification and loan review missions	No labor unrest.
	Set up computerized accounting systems for each urban service, and integrate into a consolidated accounting system for the whole of CMC by FY2003.	Audited accounts, loan review missions, and project performance audit report	
	Property tax collection efficiency to be 80 percent by FY2005.	CMC records and audited accounts	Change in political parties, and thus political will to implement.
	Indirect and direct user charges, based on cost recovery principles, to be progressively established by FY2005.	CMC records and audited accounts	Political will remains strong.
<b>Activities/Inputs</b>			
a. Civil works contracts and materials supply contracts	Civil works contracts and supply contracts valued at approximately \$200.0 million	Loan review missions	
b. Implementation assistance	Consulting services, equipment, and offices valued at approximately \$20.0 million	Loan review missions	
	Capacity building services valued at approximately \$30.0 million.	Loan review missions	
	CMC and Irrigation and Waterways Department meet incremental administration costs valued at approximately \$5.0 million.	Loan review missions	

## EXTERNAL ASSISTANCE TO THE URBAN SECTOR IN INDIA, 1989-2000

Project	Year Approved	Source	Amount (\$million)
<b>A. Investment Projects—Loan Financed</b>			
Housing Development Finance Corporation	1989	Germany	13.37
Hyderabad Water Supply and Sanitation	1990	World Bank	100.00
Urban City Water Supply Project	1992	Japan	62.45
Yamuna Action Plan Project	1992	Japan	134.00
Financial Institutions Reform and Expansion Program Urban Infrastructure Development	1994	USAID	125.00
Second Chennai Water Supply Project	1995	World Bank	61.00
Lake Bhopal Conservation and Management Project	1995	Japan	64.91
Chennai Sewerage Renovation and Functional Improvement Project	1995	Japan	157.30
Karnataka Urban Infrastructure Development	1995	ADB	105.00
Bangalore Water Supply and Sewerage	1995	Japan	261.76
Setting up of a Water Treatment Plant	1996	France	6.30
Master plan, leakage study, ground water recharge study	1996	France	4.20
Mumbai Sewage Disposal Project	1996	World Bank	192.00
Urban Water Supply and Sanitation Improvement Project	1996	Japan	96.00
Kerala Water Supply Project	1996	Japan	110.37
Housing Finance Project	1997	ADB	300.00
Rajasthan Urban Infrastructure Development	1997	ADB	250.00
Setting up of a Water Treatment Plant	1998	France	7.00
Karnataka Urban Development and Coastal Environmental Management Project	1999	ADB	175.00
Urban and Environmental Infrastructure Facility	1999	ADB	200.00
Setting up of Dam Fusegates	1999	France	4.76
Improvement of Water Supply and Network Rehabilitation	1999	France	13.72
Setting up of a Water Treatment Plant	1999	France	4.44
Groundwater Study	1999	France	0.63
Pilot Project for Rehabilitation and Improvement of Calcutta Network	1999	France	5.04
Study on Impact of Mining Activities on the Catchment Area of the Subarnarekha	1999	France	2.52
Housing Finance II	2000	ADB	300.00
<b>Total (A)</b>			<b>2,756.77</b>
<b>B. Investment Projects—Grant Financed</b>			
Vizakapatnan Habitat Improvement Project	1988	United Kingdom	16.07
Hyderabad Habitat Improvement Project	1989	United Kingdom	24.59
Urban Basic Services	1990	United Nations	19.00
Calcutta Habitat Improvement Project	1990	UNICEF	22.18
Indore Habitat Improvement Project	1990	United Kingdom	25.31
Vijaywada Habitat Improvement Project	1990	United Kingdom	26.70
Hyderabad Waster Management Project	1995	Ausaid	4.38
Keshopur Sewage Management Project	1997	Ausaid	0.39
Cuttack Urban Services Improvement Project	1998	United Kingdom	15.12
Calcutta Slum Improvement Project	1998	United Kingdom	2.80
Cochin Urban Poverty Reduction Project	1998	United Kingdom	14.20
Urban Environmental Sanitation: Capacity Building for Municipal and National Decision Makers	1998	UNDP/World Bank	1.00
Strategic Sanitation Planning	1998	UNDP/World Bank	0.25
Strategic Planning for Solid Waste Project in Kuppam	1998	UNDP/World Bank	0.01
Participatory Learning Assessment with Dutch Assisted Water Supply and Sanitation Project	1998	UNDP/World Bank	0.02
Public Private Partnership in Water Supply and Sanitation Management Project in Meerut District	1998	UNDP	0.02
Community Based Sustainable Portable Drinking Water Supply in West Bengal	1999	UNDP/World Bank	0.16
Environment and Sanitation	1999	UNICEF	15.20
Small Grants Facility to Support Initiatives in the Water & Environmental Sanitation Sector	1999	UNDP	3.00

Project	Year Approved	Source	Amount (\$million)
Municipal Services for Urban Poor, Hyderabad, Andhra Pradesh	1999	UNDP/World Bank	0.08
Andhra Pradesh Urban Services for the Poor	1999	United Kingdom	177.48
UNICEF/Government of India, Child's Environment: Hygiene, Sanitation and Water Supply Programme	1999	United Kingdom	26.86
Maharashtra Water and Environmental Sanitation Project	1999	United Kingdom	118.50
Translating RWSS Policy Reforms into Reality: A Strategy for Change	1999	UNDP/World Bank	1.39
Bangalore Water Supply and Environmental Sanitation Master Plan	2000	Ausaid	3.96
<b>Total (B)</b>			<b>518.67</b>
<b>C. Technical Assistance—Grant Financed</b>			
Uttar Pradesh Water Supply VI Community Participation	1989	Netherlands	0.46
Environmental/Sanitary Kanpur/Mizapur Phase II	1989	Netherlands	4.60
Andhra Pradesh Sanitation Informal Sector in an Urban Economy	1989	Netherlands	1.74
Indo-German bilateral project, Watershed Management	1990	Canada	0.02
Housing Finance Development Fund and Miscellaneous Activities	1990	GTZ	8.82
Housing Finance System Expansion Program	1991	Netherlands	1.02
Management Development for Senior Urban Public Health Officials	1992	United States	4.30
Urban Infrastructure Development	1993	United Kingdom	1.26
Urban Sector Profile	1993	ADB	0.60
Capacity Building for Improved Infrastructure Development in selected Municipalities in Karnataka State	1994	ADB	0.40
Indo-German Changer Eco-Development Project	1994	ADB	0.60
Watershed Development Programme Maharashtra, Phase 1	1994	GTZ	7.84
Low Maintenance Waste Water Treatment Systems	1994	KFW	6.00
		Euro Commission	1.03
Domestic Waste Management in a Basti, New Delhi	1995	Euro Commission	0.07
Institutional Strengthening of Karnataka Urban Infrastructure Finance Corp.	1995	ADB	0.10
Resource Mobilization Study for Local Governments in Karnataka	1995	ADB	0.30
Rajasthan Urban Infrastructure Development	1995	ADB	0.60
SCF—Kalahandi Water and Development Project	1995	United Kingdom	1.11
Water Resource Development and Energy Conservation for Sustainable Management of the Environment	1996	CIDA	1.44
Housing Finance Facility Project	1996	ADB	0.10
Water and Sanitation Project	1996	DANIDA	10.01
Coastal Wetlands Mangrove Conservation and Management	1996	CIDA	2.29
UNICEF Control of Diarrhoeal Diseases CDD-WATSAN Project	1996	United Kingdom	7.74
Ghogha Regional Water Supply and Sanitation Project	1997	NDA	10.16
Local Water Supply and Sanitation Project, Viziagram	1997	NDA	1.28
Socio Economic Unit Foundation	1997	NDA	1.44
Watershed Development Programme Maharashtra, Phase 2	1997	KFW	12.50
Slum Improvement Project	1997	GTZ	1.86
Integrated Watershed Management and Water Storage in Pushkar Lake, Ajmer District	1997	CIDA	0.70
Karnataka Coastal Environment Management and Urban Development	1997	ADB	0.80
Urban and Environmental Infrastructure Fund	1997	ADB	0.40
Strengthening Housing Finance Institutions	1997	ADB	0.60
Urban Community Water Supply and Sanitation	1998	WHO	0.08
Healthy Cities	1998	WHO	0.13
Promotion of Chemical Safety & Promotion of Environmental Epidemiological Studies	1998	WHO	0.18
Support to Hospital Waste Management	1998	WHO	0.38
Improvement of Low Income Settlements	1998	USAID	0.01
Low Income Community Baseline Health Information	1998	USAID	0.04
Community Based Environmental Improvement Program	1998	USAID	0.01
International Post Graduate Course in Hydrology	1998	UNESCO	0.01

<b>Project</b>	<b>Year Approved</b>	<b>Source</b>	<b>Amount (\$million)</b>
Mitigation of Land and Water Salinity in the Gujarat Coastal Region	1998	UNESCO	0.01
Indo-German Watershed Development Programme, Ahmednagar, Maharashtra	1998	GTZ	1.61
Sustainable Development and Water Resource Management of Loktak Lake	1998	CIDA	3.32
Environment Regeneration Project	1998	CIDA	0.06
Restructuring State-level Housing Institutions	1998	ADB	0.50
Calcutta Environmental Improvement	1998	ADB	1.00
UNDP/World Bank Water and Sanitation Programme	1999	United Kingdom	1.26
Gomti River Pollution Control Project in Lucknow	1999	United Kingdom	7.90
Sustainable Drinking Water Supply in the Humid Tropics of Kerala	1999	CIDA	1.19
Community Participation in Urban Environmental Improvement	1999	ADB	0.15
Strengthening Micro Finance Institutions for Urban and Environmental Infrastructure Finance	1999	ADB	0.50
Strengthening Institutional Capacities for Urban Infrastructure Finance and Development	1999	ADB	0.50
Capacity Building to Formulate City Development Strategy for Ahmedabad and Bangalore	2000	Ausaid	0.03
<b>Total ( C )</b>			<b>111.06</b>

UNCEF = United Nations Children's Fund; USAID = United States Agency for International Development; WHO = World Health Organization

## REVIEW OF PROJECTS AND LESSONS LEARNED

1. The Project is the seventh loan to the Government of India in the urban development and housing sector. The first six loans are (i) Housing Finance (Loan 1549/1550/1551), for \$300 million approved on 25 September 1997; closing date on 30 June 2003; (ii) Karnataka Urban Infrastructure Development Project (KUIDP Loan 1415), approved for \$85 million on 14 December 1995; closing date on 30 June 2002; (iii) Rajasthan Urban Infrastructure Development Project (Loan 1647), approved for \$250 million on 3 December 1998; closing date on 30 June 2005; (iv) Karnataka Urban Development and Coastal Environmental Management Project (Loan 1704), approved for \$175 million on 26 October 1999; closing scheduled on 30 June 2005; (v) Urban and Environmental Infrastructure Facility (Loan 1719/1720/1721) approved for \$200 million on 17 December 1999; closing is scheduled for 22 September 2006; and (vi) Housing Finance II (Loan 1758/1759/1760/1761) approved for \$300 million on 21 September 2000; closing is scheduled for 30 June 2007. Although some lessons can be drawn from all these projects, the KUIDP is most relevant to the Project, and provides the most lessons. The lessons learned from the other projects are very similar to those of the KUIDP.

### A. Lessons Learned

#### 1. Overall Implementation Schedule

2. The appraisal schedule envisaged an implementation period of six years commencing in January 1996 with full completion of all KUIDP activities by the end of December 2001. The executing agency (EA) took nine months to mobilize the consultants and a further year to complete the designs before procurement could commence. Despite delays and slow progress and disbursements, the EA estimates that the KUIDP will be on schedule. Thus, six years is an adequate period of time for implementing an integrated urban development project. However, advance action to field consultants immediately following loan effectiveness would help significantly.

#### 2. KUIDP Implementation Arrangements

3. The EA established a project management unit (PMU). The PMU is assisted by an international project management consultant and two domestic design and construction supervision consulting firms. A domestic consultant for the benefit monitoring and evaluation program commenced work in March 1999. The PMU is responsible for coordinating and managing all KUIDP activities, and coordinating all consulting services. The delineation of responsibility between project management and design and supervision services is proving to be very effective. The poverty alleviation components are being implemented through nongovernment organizations (NGOs) and community-based organizations, which are being financed under the Project. Even with the help of these grassroots organizations, it has taken 12-18 months to gain the trust of the communities and mobilize their resources. Adequate time needs to be provided to ensure the true participation of communities in projects. Further, experienced NGOs should be used. Inexperienced NGOs can cause serious delays in mobilizing a program. NGOs have reported however, that the KUIDP has generally benefited their other development programs by legitimizing their presence, providing improved access to local governments, and generally heightening their status.

4. The 11 implementing agencies (IAs) in four towns are involved in executing the KUIDP. To support the PMU and the town-level IAs, project implementation units (PIUs) have been established in each project town. Loan reviews revealed that the roles of the PIUs were not well

defined. As a result, the IAs did not seek/accept support from the PIUs. Following a more detailed definition of roles, the arrangement appears to be working well. The IAs are now developing greater skills through the revised arrangements, preparing them much better to take over operation of the new facilities following completion of the KUIDP. The PMU, PIUs, and IAs must be adequately staffed in terms of capability and numbers, and continuity of leadership must be maintained. The IAs tend to suffer from inadequate staffing. Project planning should take into consideration such constraints.

### **3. Contract Awards and Disbursements**

5. A number of problems with procurement of civil works, engineers' estimates, Asian Development Bank (ADB) procedures, and quality control have been experienced under KUIDP. The tender documents include a number of provisions that differ from the tender conditions normally used by the IAs, such as the cost of third party inspection, the risk associated with fixed price contracts, the cost of performance bonds, quality control, and interest costs. The domestic contractors must be given very clear instructions on ADB requirements, prequalification of contractors must be undertaken carefully, and greater effort is required to educate the contracting industry. A series of workshops may be appropriate.

#### **B. Land Acquisition**

6. Delayed land acquisition has delayed the KUIDP's initial implementation. One component for industrial sites and services has been dropped because the land could not be acquired. The KUIDP experience demonstrates the need to undertake land acquisition procedures as early as possible to avoid delays, and consider phased conditionalities to ensure intermediate procedures are proceeding in a timely manner. Further, a solid legal framework should be established for land acquisition during loan processing to avoid any changes to the scope of work during implementation as a result of failure to acquire the land needed. Based on the KUIDP experience, land acquisition can take more than two years to complete.

#### **C. Legislation Amendments for Property Tax Reform**

7. Under the KUIDP, increased revenue generation was sought through property tax reform. This comprised changing the basis of annual ratable valuation from a rental to an area basis. There have been some difficulties in implementing the reforms, primarily because the legal framework was not clearly established before attempting to introduce the necessary reforms. Such legal amendments must be agreed and passed well in advance of the logistical measures required to effect such change. One successful measure taken under the KUIDP to improve property tax revenue has been to computerize the billing and collection, which has substantially increased revenue.

## POLICY AND INSTITUTIONAL REFORM AGENDA

Objective	Current Situation	Action			
		FY2002	FY2003	FY2004	FY2005
<b>1. Implement the Recommendations of the State Finance Commission.</b>	Several recommendations were made by the State Finance Commission in 1995, designed to improve the equitability of revenue sharing between the state and municipalities, including the Calcutta Municipal Corporation (CMC). Decisions on these recommendations rest with the state government, which has agreed in principle to most of them.				
a. State government to equitably distribute the proceeds of entitlements for local self-government to municipalities, and discontinue the small grants in lieu of the profession and motor vehicle taxes. 16% of the net proceeds of all State taxes should be transferred to local bodies as untied fund, and 3.88% to CMC.		Expected in FY2002.			
b. Cost-of-living allowance should be increased to cover 100% of CMC's liability.		Expected in FY2002.			
c. State taxes on entertainment should be handed over to local bodies.		Expected in FY2002.			
d. CMC should be empowered to issue trade licenses with an increase in fees, and to impose higher tolls for heavy vehicles using municipal roads.		Expected in FY2002.			
<b>2. Policy</b>					
a. CMC to assume responsibility for urban planning.	Calcutta Metropolitan Development Authority (CMDA) is responsible.	Metropolitan Planning Committee being established. CMC to serve on Committee.	CMC to commence preparation of its own urban plans.	Urban plan approved by CMC and Metropolitan Planning Committee.	
b. CMC to progressively adopt the water supply and sewerage assets within its geographical boundaries, and currently under the control of CMDA.	Operation of the assets is currently shared between CMDA and CMC.	In a joint exercise between CMC and CMDA, submit to the Asian Development Bank (ADB) a sustainable program for the transfer of assets to CMC.	First phase of transfer.	Second phase of transfer	Transfer complete.

## POLICY AND INSTITUTIONAL REFORM AGENDA

Objective	Current Situation	Action			
		FY2002	FY2003	FY2004	FY2005
c. Reform Property Tax.	Currently based on annual rental.	Prepare draft legislative amendment for CMC Act, 1980. Report on property tax reform by Indian Statistical Center. Study other municipalities in India undertaking property tax reforms. Commence recording and survey of all properties for management information system and (MIS) and geographic information system (GIS).	Finalize and approve legislation. Continue record and survey exercise.	Continue record and survey exercise. Implement an area-based method of annual valuations.	Continue record and survey exercise.
<b>3. Institutional</b>					
a. Establish a computerized billing and collection system for water supply and sewerage.	Water supply operated as part of CMC's consolidated operations.	Determine requirements, and design an appropriate system. Issue tenders for supply and installation of systems.	Implement systems and commission.		
b. Progressively reorganize and redeploy CMC workforce, in accordance with the CMC Act (1980). Achieve a 10% reduction by FY2007.	CMC currently has a workforce of 42,000.	Progressive redeployment.	Progressive redeployment.	Progressive redeployment.	Progressive redeployment.
<b>4. Financial</b>					
a. Establish a fully computerized MIS, including all municipal accounting functions.	Partly computerized. Stand alone stations.	Identify training and systems needs, and procure.	Implement MIS and training.	Ongoing training.	
b. Establish a dedicated accounting system for solid waste management (SWM).	SWM expenditures are not clear. They are a part of the consolidated accounts.	Set up a dedicated accounting system for SWM.			
c. Improve property tax collection efficiency to 80%.	Taxation collection efficiency has recently improved; is estimated at 60% .	Achieve 65% collection efficiency.	Achieve 70% collection efficiency.	Achieve 75% collection efficiency.	Achieve 80% collection efficiency.

**POLICY AND INSTITUTIONAL REFORM AGENDA**

Objective	Current Situation	Action			
		FY2002	FY2003	FY2004	FY2005
d. Implement a flat rate charge for water supply consumers not having meters, but having a connection size 20 mm or greater, or having excessive consumption.	Only a small percentage of industrial, commercial, and (ICI) consumers are metered. Most consumers are not charged. charges where applied are too low.	Apply a flat rate charge to all nonmetered connections, with a connection of 20 mm or greater, or having excessive consumption.			
e. Implement a flat rate surcharge on water supply for sewerage and drainage.	Only a few premises charged.  (Issue necessary regulations in FY2001).	Apply a flat rate surcharge to all nonmetered connections, with a connection of 20 mm or greater, or having excessive consumption.			
f. Implement a water supply metering program to all with 20 mm connections or greater, or having excessive consumption.	Only a few ICI users have meters.		25% coverage.	50% coverage.	100% coverage.
g. Apply a structured tariff to all metered water supply consumers.	Flat rate applied to a few consumers only.		25% coverage	50% coverage.	100% coverage.
h. Allocate funds annually from the property tax to the dedicated account for drainage operations, sufficient to cover all operation and maintenance (O&M) costs and debt service.	Drainage O&M is funded as needed from the consolidated CMC accounts.		Establish a well-structured preventative maintenance program. Allocate sufficient funds annually to the dedicated account to cover all O&M.		
i. Allocate funds annually from the consolidated rate charge to the dedicated account for SWM, sufficient to cover all O&M costs and debt service.	Solid waste O&M is funded on an as needed basis from the consolidated CMC accounts.		Establish a well-structured management program. Allocate sufficient funds annually to the dedicated account to cover O&M and debt service.		

## SUMMARY OF PROJECT COMPONENTS

**Table A5.1: Sewerage and Drainage Component**

Activity	Cossipore-Chitpur Area		South Suburban Area		Garden Reach Area	Jadavpur Area	
	Borough I (Wards 1 to 6)	Borough XI	Borough XIII	Borough XIV	Borough XV	Borough XI	Borough XII
<b>Sewerage</b>							
Service area, ha	644	156	719	566	306	388	1,362
Trunk sewers, km	14		13	11	9		
Secondary sewers, km	94	23	105	82	45	56	99
Property connections, no.	23,850	2,300	15,600	10,150	8,750	8,150	21,200
New pumping stations, no.	2				1		TBD
Augment pumping stations, no.	2		2	2	1		TBD
Pumping mains, km	1.5	0.1	2.3	1.0	0.4		
Land Acquisition, STPs, ha	None	None	15	None	None	None	15 (TBD)
Treatment plants	Upgrading of Bangur STP from 45 to 90 ML/d		Upgrading of S. Suburban STP from 30 to 60 ML/d		Upgrading of Garden Reach STP from 47.5 to 60 ML/d		Construction of two new STP 25 ML/d
<b>Drainage</b>							
Drainage catchment							
Service area, ha	644	156	719	566	306		
Main drains, km	29		28	16	21		
Secondary drain, km	203	49	227	179	97		
New pumping stations, no.	2		4	1	2		
Augmented pumping stations, no.							
Rehabilitation of facilities at Rabindra and Subhas Lakes	156						
Cleaning and other equipment	Jetting machines, 2 nos; Mud suckers, 2 nos; Choke machines, 4 nos; Safety equipment; Communication facilities						
Land acquisition, (sewerage and drainage), ha.	0.4		1.0	0.2	0.4		

**Table A5.2: Municipal Waste Management Component Facilities**

	Municipal Solid Waste	Municipal Solid Waste	Biomedical and Hazardous Waste
Office, Dhapa, 200 m <sup>2</sup>		30,000 collection buckets	Integrated hazardous waste facility
Container washing shed, 1,000 m <sup>2</sup>		7,500 push carts	Biomedical waste facility
Garage facilities, Dhapa, 500 m <sup>2</sup>		650 containers	Biomedical waste incinerator
Approach road, Dhapa, 2.5 km		5,000 trash bins	Leachate treatment plant
Internal road, Dhapa		182 dumper placers	On-site laboratory
Drainage works, Dhapa		2 pay loaders	
Electrification, water supply, Dhapa		2 track type loaders	
Check post and fencing, Dhapa		2 bulldozers	

## SUMMARY OF PROJECT COMPONENTS

Municipal Solid Waste	Municipal Solid Waste	Biomedical and Hazardous Waste
New and renovated ward offices, 84 Garage facilities at Jadavpur, 2 ha Land acquisition for Jadavpur, 2 ha	4 mechanical sweepers 40 transport vehicles for trash bins	

**Table A5.3: Slum Improvements Component Tasks**

The Crisis Management Task	The Slum Improvements Task
Provision of 8,600 water standpoints Construction and/or conversion of 4,200 sanitary latrines Construction and/or renovation of 700 community latrines Construction of 280 washing/bathing platforms	Widening, realignment, and lining of 28 km of drains Construction of 52 km of sewer and water lines Provision of solid waste containers, 222 units Improvement of 178,000 m <sup>2</sup> of public open space

**Table A5.4: Canals Component**

Activity	Tollygunge- Panchannangram Drainage Basin	Keorapukur Drainage Basin	Begore Canal	Manikhali Drainage Basin	Churial Canal Drainage Basin
Urgent Desiltation & Excavation	9 km	9 km	0.6 km	10 km	24 km
Lining	6 km		1.12 km	0.7 km	4 km
Construction and rehabilitation of bridges	21 bridges	5 bridges	4 bridges		
Upgrade/construction of new pumping station (PS)	Chowbhage PS upgrade to 56.63 m <sup>3</sup> /sec	Augment pumping capacity, TBD		New Manikhali PS, 45.31 m <sup>3</sup> /sec	New Churial Khal PS, 66.54 m <sup>3</sup> /sec

ha = hectare, km = kilometer, m<sup>2</sup> = square meter, m<sup>3</sup>/sec = cubic meter per second, ML/d = megaliters per day, no = number, PS = pumping station, STP = sewage treatment plant, TBD = to be determined.

**DETAILED COST ESTIMATES**  
(\$ million)

	ADB	GOWB	CMC	Foreign Exchange	Local Currency	Total Cost
<b>Base Costs:</b>						
<b>A. Stakeholder Consultation Process</b>						
Workshops, seminars, study tours	0.3	0.0	0.0	0.0	0.3	0.3
educational materials and equipment						
<b>Subtotal</b>	<b>0.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.3</b>	<b>0.3</b>
<b>B. Sewerage and Drainage</b>						
Civil Works	116.5	8.1	8.2	34.5	98.3	132.8
Land acquisition	0.0	0.0	6.3	0.0	6.3	6.3
<b>Subtotal</b>	<b>116.5</b>	<b>8.1</b>	<b>14.5</b>	<b>34.5</b>	<b>104.6</b>	<b>139.1</b>
<b>C. Solid Waste</b>						
Civil Works	8.6	0.0	1.2	2.6	7.2	8.8
Equipment	10.7	0.0	1.9	8.4	4.2	12.6
Vehicles	5.9	0.0	1.1	2.8	4.2	7.0
Land acquisition	0.0	0.0	0.5	0.0	0.5	0.5
<b>Subtotal</b>	<b>25.2</b>	<b>0.0</b>	<b>4.7</b>	<b>13.8</b>	<b>16.1</b>	<b>29.9</b>
<b>D. Slum Improvement</b>						
Civil Works	8.9	0.0	1.2	2.5	7.6	10.1
<b>Subtotal</b>	<b>8.9</b>	<b>0.0</b>	<b>1.2</b>	<b>2.5</b>	<b>7.6</b>	<b>10.1</b>
<b>E. Canals</b>						
Civil Works	0.0	27.3	0.0	0.0	27.3	27.3
Equipment	4.7	0.0	0.0	0.0	4.7	4.7
Land acquisition for Resettlement	0.0	0.7	0.0	0.0	0.7	0.7
Resettlement	4.8	0.0	0.0	0.0	4.8	4.8
<b>Subtotal</b>	<b>9.5</b>	<b>28.0</b>	<b>0.0</b>	<b>0.0</b>	<b>37.5</b>	<b>37.5</b>
<b>F. Implementation Assistance</b>						
Incremental Administration	0.7	0.4	3.8	0.4	4.5	4.9
Project Management	3.2	0.0	0.0	2.4	0.8	3.2
Capacity Building and Training						
NGOs	1.9	0.0	0.0	0.0	1.9	1.9
Public Relations	2.0	0.0	0.0	0.0	2.0	2.0
Design and Contract	6.1	0.0	0.0	0.4	5.7	6.1
Documentation						
<b>Subtotal</b>	<b>13.9</b>	<b>0.4</b>	<b>3.8</b>	<b>3.2</b>	<b>14.9</b>	<b>18.1</b>
<b>Subtotal (A-F)</b>	<b>174.3</b>	<b>38.5</b>	<b>24.2</b>	<b>54.0</b>	<b>181.0</b>	<b>235.0</b>
<b>Taxes and Duties</b>	0.0	8.3	7.2	0.0	15.5	15.5
<b>Contingencies</b>						
Physical Contingencies	17.4	4.5	3.2	5.4	19.7	25.1
Price Contingencies	20.2	5.3	3.3	6.2	22.6	28.8
<b>Interest During Construction</b>	38.1	0.0	17.5	38.1	17.5	55.6
<b>Total</b>	<b>250.0</b>	<b>54.6</b>	<b>55.4</b>	<b>103.7</b>	<b>256.3</b>	<b>360.0</b>

CMC = Calcutta Municipal Corporation, DFID = Department for International Development of the United Kingdom, GOWB = Government of West Bengal, NGO = nongovernment organization.

## IMPLEMENTATION SCHEDULE

Description	2001				2002				2003				2004				2005				2006				2007							
	Q1	Q2	Q3	Q4																												
<b>A. Stakeholder Consultation Process</b>																																
Workshops, Seminars																																
Study Tours																																
Development of educational material																																
Video equipment																																
NGOs																																
Service Contract for an Advertisement Company																																
<b>B. Sewerage and Drainage</b>																																
Civil Works																																
Equipment																																
Land Acquisition and Resettlement																																
<b>C. Solid Waste</b>																																
<b>Municipal Solid Waste</b>																																
Civil Works																																
Equipment																																
Land Acquisition																																
Biomedical Waste																																
Civil Works																																
Equipment																																
Hazardous Waste																																
Civil Works																																
Equipment																																
<b>D. Slum Improvements</b>																																
Civil Works																																
Crisis Management																																
Slum Improvements																																
<b>E. Canals</b>																																
Civil Works																																
Equipment																																
<b>E. Implementation Assistance</b>																																
Incremental Administration																																
Capacity Building and Training																																
MIS																																
GIS																																
Financial management																																
Property tax reform																																
Asset management																																
Capacity Building of CMC Human Resources Management																																
Billing and collection (Water and Sewerage)																																
Slum management																																
Urban planning																																
Metering																																
Training of CMC																																
Design and Contract Documentation																																
Project Management Consultants																																
Project Design and Supervision																																

CMC = Calcutta Municipal Corporation, GIS = geographic information system, MIS = management information system, NGO = nongovernment organization.

## INDICATIVE PROCUREMENT PACKAGES

Components		Estimated Contract Value (\$ million)	No. of Packages	Mode of Procurement
<b>A. Sewerage &amp; Drainage</b>				
1. Treatment plants	(i) 90 ML/d (upgrading)	3.0 )	1	ICB
	(ii) 60 ML/d (upgrading)	3.0 )		
	(iii) 60 ML/d (upgrading)	5.0 )		
	(iv) 25 ML/d (construction)	8.0 )		
	(v) 25 ML/d (construction)	8.0 )		
	<b>27.0</b>			
2. Pumping stations	Sewage pumping stations (10 units)	3.0 )	1	ICB
	Drainage pumping stations (9 units)	)		
		9.0 )		
		<b>12.0</b>		
3. Sewers, drains and house connections	Sewers (300 km)	30.0 )	3	ICB
	Combined drains (99 km)	7.0 )		
	Storm drains (907 km)	47.0 )		
	Connections (100,000)	10.0 )		
		<b>94.0</b>		
4. Lake rehabilitation works	Drainage and civil works	1.0	1	LCB
5. Equipment	Miscellaneous	1.0	Several	IS
	<b>Subtotal</b>	<b>135.0</b>		
<b>B. Solid Waste Management</b>				
1. Biomedical waste facilities	Site works	2.0	1	LCB
	incinerator	5.0	1	ICB
2. Hazardous waste facilities	Dhapa landfill – site works	2.0	1	LCB
	Waste treatment facility	12.0	1	ICB
3. Municipal waste vehicles	Collection, compaction, transfer, excavation	7.0	1	ICB
4. Laboratory facilities	Miscellaneous sampling, testing and analytical equipment	1.0	1	IS
5. Municipal waste containers	Collection bins and push carts	2.0	Several	IS
	<b>Subtotal</b>	<b>31.0</b>		
<b>C. Slum Improvements</b>				
a. Crisis management	Various improvements	10.0	10	LCB
b. Improvements	Miscellaneous works	5.0	5	LCB
	<b>Subtotal</b>	<b>15.0</b>		
<b>D. Canal Rehabilitation</b>				
a. Pumping stations	Civil and mechanical works (3 stations)	8.0 )	5	LCB
b. Dredging and desilting	5 canal systems	3.0 )		
		)		
c. Concrete lining	5 canal systems	6.0 )		
d. Bridges	Railroads and road crossings	5.0 )		
		)		
	<b>Subtotal</b>	<b>22.0</b>		
<b>TOTAL</b>		<b>203.0</b>		

ICB = international competitive bidding, IS = international shopping, km = kilometer, LCB = local competitive bidding, ML/d = megaliters per day.

## LAND ACQUISITION ARRANGEMENTS

### A. Legal Framework

1. The sewerage and drainage component of the proposed Project requires that substantial land be acquired quickly and efficiently (no longer than 24 months), but with due regard for transparency and compensation for those whose land is being acquired. The two possible alternative procedures for land acquisition under consideration are (i) negotiated acquisition by Calcutta Municipal Corporation (CMC) under Section 536 of the CMC Act of 1980; and (ii) compulsory land acquisition through a CMC application to the state government under Sections 533 and 537 of the CMC Act of 1980, or state government compulsory land acquisition under the Land Acquisition Act of 1894. Under Section 446 of the CMC Act 1980, however, the land acquisition powers of CMC only relate to acquisition of rights of users of bustees, and therefore appear not to be suitable for most project-related land acquisition. The most suitable alternative is compulsory land acquisition under the Land Acquisition Act of 1894.

### B. Policies and Procedures for Land Acquisition

2. The 1894 Land Acquisition Act sets forth the procedures for land acquisition. First, under Section 4(1) of the 1894 Act, when the state government seeks to acquire land in any locality for any public purpose the state government has to provide (i) a publication of a preliminary notification in the official gazette, (ii) publication in two daily newspapers of which at least one will be in the regional language, and (iii) public notice at convenient places in the locality. After such notification, entry and surveys can be carried out by the state government in accordance with Sections 4(2) and 5 of the 1894 Act. Second, after notification, any person interested in land that has been notified can raise objections under Section 5A of the 1894 Act and will be heard by the collector. No time is specified in Section 5A for disposition of such objections hearings, but the state government's decision is final at this stage. Third, under Section 6 of the 1894 Act, the state government declares the intended acquisition, but only after it has the funds for compensation payments. The declaration has to be published in the official gazette, and in two daily newspapers of which at least one shall be in the regional language, and public notice of the declaration has to be provided in convenient places in the locality.

3. Fourth, under Section 8 of the 1894 Act, the collector (head of the district) marks out the land to be acquired and under Section 9 of the 1894 Act, the collector provides public notice to interested persons to appear in person or by an agent before him regarding claims for compensation and objections to Section 8 measurement. Under Section 11A, a maximum of two years is allowed from the declaration of intention to acquire to the collector's award of compensation, failing which the acquisition lapses. The collector is entitled to take possession of the land under Sections 16 and 17 of the 1894 Act. Finally the 1894 Act procedure for land acquisition allows the collector's award of compensation to be appealed to the courts under the 1894 Act Sections 18 to 28. Appeals to the district court, high court, and supreme court are possible. However, the risk of litigation-attendant delays are mitigated for priority acquisition of land such as for the proposed Project through the narrow test for such litigation in the 1894 Act and adherence by the collector to the procedures and basis for compensation set forth in the 1894 Act and the West Bengal Land Acquisition Manual 1991 (para. 5).

4. Section 23 of the 1894 Act provides for compensation on a comprehensive basis consisting of (i) market value of land acquired; (ii) damages for standing crops and trees on the land; (iii) damages for severing land when the collector takes possession of it; (iv) damages for

the acquisition injuriously affecting the person's other movable or immovable property; (v) reasonable expenses for change of residence or place of business; (vi) damages for loss of profits between publication of the declaration and the collector's possession of the land; (vii) loss of earnings from loss of the land acquired; (viii) 12 percent of the market value of the acquired land from the publication of the notification under Section 4(1) to the date of award of the Collector or taking possession of the land, whichever is earlier; and (viii) 15 percent of the market value of the acquired land for the compulsory nature of the acquisition.

5. The risk of inappropriately low compensation triggering litigation and attendant delays is mitigated by the West Bengal Land Acquisition Manual of 1991 (the Manual), which guides the state government in calculating compensation. Thus, section 64 of the Manual states.....“As far as possible, everyone who is deprived of property by compulsory acquisition should be enabled by the compensation awarded to him to place himself in substantially the same position in which he was before the acquisition”.... In addition, section 68 of the manual provides for an objective basis for market valuation of the land by (i) referring to the average of sales that took place at the time of the notification of similar lands in the same or adjoining localities, and (ii) a review of 15-20 deeds executed on dates immediately before the relevant date taken from the local subregistry office for similar land in the same locality. Similarly, section 73 of the manual provides helpful guidance on calculation of damages, loss of earnings, expenses, and loss of profits. The district magistrate responsible for the district in which the majority of land will be acquired reports that all land acquisition is normally completed within 6-12 months.

### **C. Scale of Land Acquisition**

6. The precise locations of the land areas required for the Project cannot be determined yet. During the detailed design process, land locations will be finalized, and acquisition procedures put in place. Table A9 gives some indication of land requirements.

**Table A9: Land Acquisition Requirements**

<b>Project Component</b>	<b>Purpose</b>	<b>Area (ha)</b>	<b>Cost (Rs million)</b>	<b>Location</b>	<b>Owner</b>	<b>Acquisition Date</b>
Sewerage and drainage	Sewerage treatment plant	15.00	81.6	Boroughs XI, XIII, XIV	Private	April 2002
	Sewerage treatment plant	15.00	90	Borough XII	Private	April 2002
	Sewage pumping station (2)	0.50	20	Borough I (Ward 2) Borough XV (Ward 136)	Private	April 2002
	Drainage pumping stations (8)	4.00	80	Borough I (Ward 4) Borough XIII (Ward 116) Borough XIII (Ward 117) Borough XIII (Ward 122) Borough XIII (Ward 115) Borough XIV (Ward 131) Borough XV (Ward 136) Mahestala Municipality	Private	April 2002
Solid Waste	Resettlement			Various locations	CMC	April 2001
	Garage Facilities	2.00	23.90	Jadaypur	Private	April 2002
	Landfill at Dhapa	180.00	0	Dhapa	CMC	April 2001
	Landfill at Noapara	2.28	0	Noapara	CMC	April 2001
Canals	Resettlement			Various locations	CMC	April 2001

CMC = Calcutta Municipal Corporation, ha = hectare, Rs = Rupees.

## SUMMARY RESETTLEMENT PLAN

1. This summary draws on the resettlement plan (RP) prepared for the Project. Two project components will require land acquisition: (i) sewerage and drainage improvements (part B), and (ii) solid waste management (part C). Canal improvements (part E) will require the relocation of informal dwellers from government-owned lands (canals); for the purpose of this appendix, this will be classified as “land acquisition”.

### A. Implementation Arrangements

2. Resettlement will be the responsibility of the Irrigation and Waterways Department (IWD) of the government of West Bengal and the Calcutta Municipal Corporation (CMC). Each organization will have a project management unit, which will contain personnel with community development skills for managing the resettlement operations. Nongovernment organizations (NGOs), engaged under the loan, will facilitate implementation of the resettlement plan, and will serve as the link to the affected people. The NGOs will involve the affected people in all decision-making regarding relocation and resettlement criteria, facilitate formation of livelihood groups, encourage the formation of community-based organizations, and ensure that affected people are assisted according to agreed entitlements. No Calcutta NGOs have resettlement experience; however, some Calcutta NGOs have demonstrated experience and skill in implementing community development programs and would be suitable for this activity. At the community level, community resettlement groups will be established. These will be broad-based groups to provide representation for all affected people. At least 50 percent of committee members will be women.

### B. Scope of Land Acquisition and Resettlement

#### 1. Sewerage and Drainage Improvements (Part B)

3. The land required for development works under this component is not large, i.e., 15 hectares (ha) for the sewage treatment plant, and 0.25-4.0 ha for each of the nine pumping stations. Two possible locations for the sewage treatment plant have been identified, one of which is in the jurisdiction of the Rajpur Sonarpur Municipality (RSM). Although the municipality and CMC own these marshy lands, the lands' encroachers are living on them. About 50 encroachers are on the CMC and about 25 are on the RSM land. When these lands are taken over by CMC, these encroachers will lose their livelihoods. Except for the Beerpara sewerage pumping station, tracts of marshy lands belonging to CMC are being considered for the remaining eight pumping stations. For the Beerpara pumping station, the possible sites identified include two public parks and one pond near a railway bridge.

#### 2. Solid Waste Management (Part C)

4. About 2 ha of land will be required for the construction of garage facilities in Javadpur. Privately owned land suitable for the purpose has been identified. While 80 ha of land required for the compost plant is already available at Dhapa, the development program will eventually close off the existing landfill to trash sorters. Approximately 625 trash sorters will lose their livelihoods. While 2.28 ha of land required for the compost plant is already available at Noapara, the Project will also eventually close the site to trash sorters, about 30 sorters will lose their livelihoods.

### **3. Canal Improvements (Part E)**

5. About 58 settlements are located along 34 km of canals that will be improved under the Project. The Project will potentially displace about 3,600 households (11,000 people) along the canal banks. Efforts have been made to minimize displacement by reducing the width of the canals, reclaiming of land from canal banks, and maneuvering rights-of-way to allow the households to remain in place. Where relocation is unavoidable, people will be moved to sites as close to their existing homes as possible, at a maximum distance of 800 meters and up to 2 kilometers in some unavoidable cases. By avoiding relocation to distant sites, affected people will be able to continue with their present employment.

#### **C. Policy Framework and Entitlements**

6. The Asian Development Bank policy on Involuntary Resettlement and the 1894 Land Acquisition Act provide the framework for resettlement. Within this framework, the resettlement plan provides a comprehensive package of compensation and assistance to all affected people. The plan provides mitigation for (i) loss of assets, including land, house, or workplace; (ii) loss of livelihood or income opportunities; and (iii) collective impacts on groups, such as the loss of community assets and other common property resources.

7. Affected people will be given the option to relocate themselves to a place of their preference or to move to a relocation site. Those who relocate themselves will be paid an amount equivalent to the replacement value of their existing structure. Affected people moving to relocation sites will be allocated a plot area of 17 square meters for households with 5 members, and 20 square meters for households with more than 5 members or more than 3 adult members. People who have no legal title to their land constitute the majority of affected persons under the Project. The housing package for canal dwellers and others with no legal title will include (i) a plot area for a house, (ii) replacement value of the existing structure, less salvage value; (iii) assistance for upgrading from a thatched-roof structure to a structure comprising bamboo and roofing material; and (iv) a resettlement allowance for a reasonable period as will be decided by the implementation committee. The implementation committee will comprise project management unit staff and canal-level community resettlement groups. CMC will assist specially vulnerable households to build their houses in the relocation sites.

8. Canal improvement works will commence only after relocation is complete. Affected people will transfer to the relocation houses only after their new houses are built. Affected people will build their own houses in the new sites. Once the movement to the new site is completed, the affected people, with assistance from IWD/CMC, will demolish the old houses. The affected people will be encouraged to salvage materials at the time of demolition.

#### **D. Consultations and Disclosure of Information**

9. Consultations and numerous discussions have been held with key people and stakeholders. To make the public consultations effective, participatory rapid appraisal exercises in the form of group meetings and discussions were conducted with groups of stakeholders. Key people were identified in each locality. Most key people are actually the local ward committee, municipal, and village councilors or members; political and religious leaders; youth representatives; schoolteachers; or other eminent people within the locales. The key people were instrumental in discussions with affected people on the design of resettlement packages, options for housing, location of new sites, etc. Separate meetings were held with women to identify their specific needs and concerns. The more vulnerable among the women were

identified for added assistance. The women were also consulted on site selection, housing pattern, civic amenities, and livelihood concerns. The Project takes adequate measures for disclosure of the resettlement plan.

#### **E. Grievance Redress and Transparency**

10. The Project will establish a grievance redress mechanism to deal with complaints from affected people. There will be one information booth for each canal-level community resettlement group. Each group will have a member secretary who will be responsible for disseminating information and receiving the summary requirements of the settlement-level community resettlement group and stakeholder complaints. The NGOs will ensure that grievances are acted upon in an effective manner. The Project's participatory approach to implementation will ensure transparency and accountability. NGOs are expected to play a significant role in this approach. To avoid any accusation of impropriety and corruption, all payments relating to compensation and resettlement assistance will be made publicly.

#### **F. Vulnerable Groups**

11. People who will be affected by the Project are mostly living below the poverty line. There are 2,157 households who are considered poor, and 317 are households headed by women, and 264 by elderly people. Many children between the ages of 7 and 14 years work in the settlements. Boys work mostly in teashops and small roadside shops or industries. Girls mostly work as domestic helpers. During the monsoon months, children work in prawn processing centers. When there is a short supply of prawns, children then move on to work as trash sorters in landfill sites. In the Dhapa landfill site, sorters (adults and children) will lose their livelihood with the mechanization of solid waste management by the year 2010. The resettlement plan incorporates an action plan for retraining sorters at the Dhapa landfill site. In the interim period, sorters will be provided with gloves, boots, aprons, and masks, and will be given periodic health check-ups. With the closure of the landfill site, they will be assisted to establish alternative livelihoods. An action plan for the rehabilitation of child workers from canal settlements and landfill sites is part of the resettlement plan. Children will be withdrawn from employment and assisted in getting accommodation in schools, and for those who are 7 years old and above, they will be trained for one year to prepare them for admission to existing formal schools.

#### **G. Monitoring and Evaluation**

12. The social development unit within CMC will be responsible for internal monitoring. The focus of internal monitoring will be on (i) compensation and assistance package, (ii) resettlement, (iii) recovery, (iv) vulnerable groups, (v) women, (vi) information sharing and consultation, (vii) grievance redress, and (viii) budget and implementation scheduling. The social development unit will contract out external monitoring to a qualified social science research institute, an NGO, or a consulting firm. The external monitoring agency will submit quarterly reports in the first three years of the Project, and then two reports a year for the remaining project duration. External monitoring will verify the results of internal monitoring, and evaluate whether the objectives of the resettlement plan are being met.

## SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

### A. Introduction

1. The summary initial environmental examination is based on the initial environmental examination (IEE) report prepared for the Project. Intensive discussions were held with the state government, community-based organizations, and nongovernment organizations, and site visits. The Project is a comprehensive six-year project to improve environmental quality within the Calcutta Municipal Corporation (CMC) area. The principal objective of the Project is to prepare an urban infrastructure and environmental management investment to achieve a sustainable improvement in the environment of Calcutta. The Project's components are: (i) stakeholder consultation process, (ii) sewerage and drainage improvements, (iii) solid waste management (SWM), (iv) slums improvements, (v) canal improvements, and (vi) implementation assistance and capacity building. The Project will improve wastewater and storm drainage management, and SWM systems to address solid waste including biomedical and hazardous wastes. The Project will improve living conditions for slum dwellers and increase the efficiency of the system of canals that carries surface and wastewater away from Calcutta.

### B. Summary Environmental Improvements due to Project Interventions

2. The construction of wastewater treatment plants will reduce the load of heavy metals, organic chemicals, and other potential contaminants in the city's wastewater discharges. Reducing the volume of these contaminants will improve the quality of wastewater flows currently being discharged to the Ganges or Kulti rivers through the system of channels and canals, and will reduce the potential for health impacts as wastewater effluents are widely used to irrigate crops and to support fish farms. Rehabilitating the channels and canals in Calcutta will reduce the potential for flooding in the city and will enhance the quality of life of people in areas subject to inundation.

3. Enhanced SWM will improve garbage collection and upgrade current management practices. This will reduce the health impacts caused by unsanitary SWM practices and help reduce problems caused by disease vectors. An increased program of separating waste at source, recovering recyclable materials, and improving landfill operations will reduce the contamination of surface and groundwater flowing into the East Calcutta Wetlands. Expanding the program of managing biomedical and hazardous wastes will help protect the public from potentially infectious or injurious wastes that are improperly managed. Enhanced hazardous waste management will help address current problems caused by the discharge of heavy metals, solvents, organic chemicals, and other contaminants into the sewers and wastewater channels as well as the solid waste. The program of slum enhancement will increase the availability of potable water supplies and sewer systems. This will increase the quality of life of the slum residents, especially women and children, and help protect public health.

4. The proposed Project will result in a cumulative improvement of environmental conditions and social well being in the Calcutta area. Advances in sewerage and drainage will upgrade the overall quality of life. Individuals residing in slums will benefit from the supply of potable water and the removal of domestic waste. Enhanced management of solid, biomedical, and hazardous wastes will help protect public health and minimize potential problems from the uncontrolled release of contaminants. The Project will help protect the East Calcutta Wetlands and the livelihoods of the individuals who depend on the food produced there.

### C. Description of the Environment

5. Calcutta is within the lower tidal reaches of the Ganges River. The area is mostly flat, sloping in general from north to south, containing numerous low-lying areas, marshes, wetlands, and shallow lakes. The city is highly urbanized and the land-use pattern reflects the relatively flat landscape and the historical sequence of development. The area is seismically stable. The climate is hot and humid and temperatures in Calcutta remain high throughout the year.

6. The CMC jurisdiction receives 80 percent of its water from surface sources and 20 percent from groundwater. The majority of the surface water is extracted from the Ganges River at Palta, approximately 25 kilometers upstream of the city, where it is treated prior to distribution. The principal productive aquifer generally occurs between 50 and 180 meters (m) below the ground level, while a shallow aquifer, tapped by small diameter tubewells, occurs between 20 and 40 m below the ground level. The receiving waters in Calcutta that have been classified are all in Class E: "Irrigation, industrial cooling, and controlled waste disposal." Throughout the Ganges River Basin a huge quantity of water is drawn from the river and returns as wastewater without treatment. Domestic and industrial pollution, along with run-off from areas that drain to the river, has led to deterioration in the quality of water in the river.

7. In the CMC area, the development of sanitary sewers and combined sewers to collect and transport wastewater and urban runoff away from the city was initiated in 1885. However, sewers serve only 45 to 50 percent of the city. In the project areas, only 17 percent of the households are connected to sewers, while 68 percent use septic tanks and 10 percent use pit latrines. While the existing sewers are adequate in certain areas during dry weather conditions, they are a problem in wet weather due to inadequate channel capacity. About 80 percent of the sewer capacity is blocked with silt and sediment. Encroachment of residences and businesses along the banks of the channels, improperly sized culverts and causeways, and siltation has reduced the capacity of the canals by approximately 50 percent. As a result, approximately 55 percent of CMC residents suffer from frequent water logging after heavy rains.

8. Less than 49 percent of the municipal solid waste is currently collected. Only about 20 percent of the collected waste stream is recycled. It is not possible to estimate the type and amount of hazardous wastes being generated in the CMC area. Approximately 15 tonnes per day of biomedical waste is generated in the CMC area; the collected waste is transported to a disposal facility at Dhapa. Approximately one third of the CMC population of 5.0 million live in bustees (slum areas), with substandard housing and lack or have restricted access to basic urban environmental infrastructure.

9. The project area is highly urbanized. The development of the canal drainage system, combined with the development of roads and buildings has resulted in loss of much of native flora and fauna. The only significant ecological and natural resource are East Calcutta Wetlands, an area of 6,000 hectares, the largest remaining open space in the city and part of the largest wetland areas in South Asia. Calcutta contains significant cultural resource. Calcutta has a number of artificial lakes within its municipal borders; these provide habitat for a number of aquatic and avian species and accommodate recreation activities. Urban development has adversely affected the environment of all urban lakes. Archaeological monuments of north Calcutta reflect the traditional culture, and the structures of central Calcutta reflect the British colonial style and are 50 to 100 years old. Valuable monuments are maintained by the Department of Archaeology or by private concerns.

## **D. Screening of Potential Environmental Impacts and Mitigation Measures**

### **a. Impacts Due to Project Location**

10. Where the proposed improvements, such as the wastewater treatment plants, are constructed, some people may have to be relocated. In addition, permanent relocation will be required to maintain the drainage channels and correct the problems caused by sedimentation and improperly sized culverts. Temporary disruptions could occur in communities where improvements such as sewers will be installed.

11. Surveys of all residences and businesses that could be disrupted as a result of the proposed improvements will be completed before final decisions are made as to the exact locations for new facilities or for the enhancement of existing facilities. These surveys will identify where permanent relocation could be required as opposed to the need for mitigation to address temporary disruption. For example, enhancing the capacity of the canals could require that the residents and businesses located along the banks be permanently moved to protect the design capacity of the channels. On the other hand, installing sewers in city streets could only result in temporary inconvenience to the local residents. Where required, the proposed Project will provide for resettlement consistent with ADB policy.

### **b. Impacts of Construction**

12. Issues that need special attention of the project management during the construction stage include excavation, trenching and tunneling, vehicle and equipment operation, silt runoff during construction, safety factors, health factors, nuisance factors, cultural hazards, and hazardous materials.

### **c. Impacts of Operation of Enhanced/Newly Provided Environmental Services**

13. Some of the adverse environmental impacts of the proposed Project could include failure of pumping stations; overflow/bypassing hazards; illegal industrial discharges; solid waste; sludge treatment and disposal; and accidental spills of municipal, hazardous, and biomedical waste during transportation. However, standard engineering design, equipment, and practices should mitigate these potential problems. Both hazardous and biomedical facilities will have secure treatment and storage capacities. Incinerators should have adequate emission control provisions and as a minimum comprise of (i) a ventury scrubber to lower gas temperatures for subsequent treatment; (ii) a packed tower scrubber utilizing sodium hydroxide solution maintained at pH 10 by auto-dosing; and (iii) an insulated stainless glass stack terminating not less than 30 m above the ground.

## **E. Institutional Requirements and Environmental Monitoring System**

14. The existing institutional framework adequately responds to the goals and the tasks of the Project. The West Bengal pollution control board is responsible for environmental monitoring and enhancement of environmental standards in the CMC area. In addition, project management consultants will assist CMC in developing a monitoring plan to address the environmental monitoring requirements presented in this summary initial environmental examination. It is the responsibility of each executing agency to ensure that all permits and licenses are obtained from the necessary environmental control authorities for all project components.

## **F. Findings and Recommendations**

15. The findings of IEE suggest that the proposed Project has a low level of adverse environmental concern, and will greatly improve the overall environmental situation in Calcutta. The potential adverse impacts are assessed as moderately insignificant assuming that certain mitigation measures will be carried out including:

- (i) development and implementation of resettlement/relocation plans;
- (ii) the program for control and handling of biomedical and hazardous waste;
- (iii) appropriate siting of solid waste disposal sites, treatment plants, sewerage works, and other project facilities;
- (iv) treatment of sewage to appropriate standards to protect receiving waters and community health;
- (v) construction of sewers and drains by trenchless methods, so far as practicable, to mitigate traffic congestion caused by sewer construction;
- (vi) proper operation and maintenance in maintaining a consistently high quality of newly provided/improved services; and
- (vii) adequate training for operating personnel, close supervision and process quality control, and vigorous monitoring of unit operations and processes, to ensure systems effectiveness.

16. However, it is considered good practice to undertake an environmental impact assessment for all treatment plants, sewage pumping stations and solid waste facilities, as soon as the land is identified and the detailed design is substantially developed.

## **G. Conclusions**

17. The proposed Project will not cause significant environmental problems resulting from its planning design, construction, or operation. The Project will provide valuable environmental benefits to the Calcutta area. The need to improve urban infrastructure in the area is urgent, and the Project will provide this in an efficient and environmentally reasonable way. However, environmental impact assessments should be undertaken for all treatment plants, sewage pumping stations and waste facilities, as soon as the land is identified and the detailed design is substantially developed.

## SOCIAL ANALYSIS

### A. Clientele Profile

1. Through improving the environment, the Project's components are expected to improve the human capital and economic growth of the target area and, in particular, reduce poverty through mainstreaming the poorer groups. The profile of the clientele groups is based on the analysis of detailed socioeconomic surveys and intensive consultations with the affected communities.

2. The Calcutta metropolitan area is one of the largest urban centers in India, and is urbanizing at a rate of about 2.5-3.0 percent/annum. The Calcutta municipal area, on the other hand, has a very high population density, and does not experience the same growth. Between 1950 and 1970, the Calcutta municipal area grew by about 20-30 percent each decade, with much of the growth occurring over very short periods, caused by geopolitical events or natural disasters. Since the 1970s however, the rate of population growth has declined considerably. Between 1971 and 1981, the Calcutta Municipal Corporation (CMC) recorded an annual growth rate of less than one half percent, and between 1981 and 1991 the total growth for the decade was registered at a little over 6 percent. The 1991 census recorded a population for the Calcutta municipal area of 4.38 million, with a heavy concentration in the inner wards; the inner wards are thought to have densities up to four times what an urban area can support on a sustainable basis; this figure is now expected to be around 5.0 million. Thus, people in these areas are likely to move to the outer areas, with a consequent readjustment of the population densities. The outer areas, which comprise the project area for most of the components, currently have a total population of around 1.4 million, with densities ranging from 7,000 to 29,000 people per square kilometer. Based on land use maps and recent growth trends, the population in the outer areas is expected to grow to around 1.47 million by 2011, and 1.52 million by 2021.

3. For classification purposes, the term "slum" is used in this document to refer to low-income settlements of high population density that lack adequate public services and amenities. Around 50 percent of the target population live in slum housing or worse. A slum dwelling is typically a single roomed, single story, dwelling constructed of nonpermanent building materials. About 700,000 people live in such houses. About 26-30 percent of the slum dwelling households in the target area live below the poverty line— about 180,000-210,000 people, or 13-15 percent of the total population in the project area.<sup>1</sup> Low-income or slum settlements comprise registered bustees,<sup>2</sup> refugee colonies, unregistered settlements (unregistered bustees and canal bank settlements), and pavement dwellers. These settlements represent 29 percent, 11 percent, and 10 percent of the target population, respectively. The CMC Act, 1980, and the *Thika Tenancy Act* aim to mainstream the poor into society through providing them with security of tenure and basic services. Under a series of refugee rehabilitation schemes, the Government of West Bengal is progressively recognizing refugee colonies (62 colonies recognized to date) by providing them with land titles and basic amenities. Unregistered settlements and pavement dwellers have no legal recognition by CMC and are, thus, not entitled to any security of tenure or basic services.

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<sup>1</sup> The "poverty line" in India is defined as income necessary to buy food to meet a daily intake of 2,400 calories of energy in rural areas (2,100 calories in urban areas), and certain basic nonfood items such as clothing and transportation. In monetary terms, this is about Rs300 (\$6.50) for urban areas.

<sup>2</sup> A bustee is a settlement of primarily low-income people.

4. Over 80 percent of the population in the Calcutta municipal area are Hindu, 14 percent are Muslim, and several other minority groups make up the balance. Muslims make up a larger percentage of slum-dwelling populations (20 percent) than in other areas (10 percent).

#### **B. Clientele Needs**

5. Urban population pressure is giving rise to serious concerns about environmental health in Calcutta, particularly among the poor and disadvantaged groups. In the target area, only 17 percent of the target population have a sewerage connection, less than 50 percent of the area is covered by a drainage system, and only 70 percent of the area is served by solid waste collection. Although infrastructure deficiencies impact on all sections of society, they particularly affect the urban poor—more than 90 percent share toilet facilities. Drainage systems are aging and inadequate, which gives rise to frequent flooding and environmental contamination of low-lying residential areas. Industrial wastes flow, largely untreated, into the surrounding environment, exposing the community to acids, toxic chemicals, paints and varnish, and other highly toxic compounds. Smoke from the burning of dung, woodfuel, coal and kerosene inside slum dwellings predisposes occupants, especially young children and women, to acute respiratory infections (ARIs). Some 77 percent of the survey sample reported having no separate and dedicated cooking area. Degradation of the environment is leading to increasing concern about morbidity and mortality rates. Although CMC's database on public health is very limited, it shows that mortality rates due to ARI and diarrhea account for around 29 percent of all infant deaths.<sup>3</sup>

6. Inadequate shelter is also aggravating health conditions in the slum areas. Of the total slum population, around 70 percent of the target population occupy a single room, nonpermanent structure, and around 80 percent occupy dwellings of 36 square meters or less. The population density typical of slum settlements remains a major public health concern with regard to the transmission of communicable diseases, especially tuberculosis. In addition, the limited ventilation in single room dwellings exposes all family members to the hazards of cooking smoke.

#### **C. Clientele Demands and Willingness to Pay**

7. The socioeconomic survey revealed a strong demand among the Project's target population for improved water supply, and sewerage and drainage systems, ranging from 66 to 100 percent. The demand was strongest among the poorer groups, indicating the high resource costs they perceive under existing circumstances. Over 90 percent of the respondents in standard residential dwellings, and almost 95 percent of respondents in registered bustees are willing to pay up to Rs50 (\$1.10) per month for improved services. Demand for improved solid waste collection was much lower, indicating a lack of awareness of its linkages with improved hygiene and sanitation. Only 5-24 percent of the sample expressed a willingness to pay for improved collection. This will need to be addressed through the proposed stakeholder consultation process (SCP) to raise awareness and willingness to pay.

#### **D. Affordability to Pay**

8. Based on the universally adopted guideline that the total cost of water supply and sanitation services should not exceed of 5 percent of monthly household income, affordability levels have been examined. Water tariffs will be increased over the next few years, but the exact level is not yet known. However, based on the general experience of the Asian

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<sup>3</sup> Based on a pilot area program—Calcutta Slum Improvement Project.

Development Bank's (ADB), water supply and sanitation are each likely to represent about 50 percent of the total. Therefore, sanitation should not exceed 2.5 percent of monthly household income. Based on this premise, two representative income levels are considered in the affordability analysis. The first is the median household income level of Rs3,700/month (\$80/month) in 1999, and the second is the income level below which community water standpipes and latrines are the affordable and appropriate option—Rs2,670/month (\$58/month) and below in 1999.

9. Indirect recovery of costs for the solid waste management (SWM) operations is proposed through the consolidated rate charge system, as is currently applied. The amount of consolidated rate charge to be paid by the individual will be proportional to the value of the property. Properties owned by low-income families will be assessed at an appropriately low and affordable rate. Evaluation of the consolidated rate charge (property tax) will be comprehensively addressed under the capacity building component of the Project.

10. Costs of sewerage and drainage will be partly recovered through the consolidated rate charge and partly through a direct user charge. As with SWM, the affordability of the indirect charge will be considered in detail as part of the capacity building component. The monthly direct user charge is projected for the years FY2002 (year of introduction), FY2006, and FY2016, and expressed as a ratio of the projected median and lower bound income, respectively. In FY2002, the user charge will represent 1.1 percent and 1.6 percent of such incomes; in FY2006, it will represent 1.3 and 1.8 percent; and in 2016, it will represent 1.2 and 1.6 percent. All of these ratios are substantially below the affordability limit of 2.5 percent.

#### **E. Benefits of the Project**

11. The Project will improve the urban environment and enhance human capital, which will lead to improved health and increased productivity, particularly among the slum dwellers. In the longer term, improved health will, in turn, contribute to better educational standards and economic growth. The SCP will underpin the sustainability of the Project through improved representation. In addition, the SCP will empower communities, enabling them to participate more actively and constructively on all civic matters. Around 1.4-5.0 million people will benefit from the Project, of which some 50 percent reside in slum settlements.

12. Accessibility by the poor and underprivileged to basic services and improved shelter in the slum settlements will assist in mainstreaming them into society. This will alleviate their personal burden and provide considerable benefit to the people of Calcutta as a whole. About 190,000 slum dwellers will benefit from direct slum intervention under the Project. Many more will benefit indirectly from improved municipal services, and improved employment opportunities generated by the considerable labor requirement for the construction work.

#### **F. Gender Issues**

13. Although the Project is not specifically targeted at women, all components will help improve their quality of life. Women, as "caretakers" of the home environment, are affected by poor living conditions, particularly poor sanitation standards. In addition, their exposure to cooking smoke increases the risk of acute respiratory infection substantially. Improved environmental sanitation and the replacement of traditional internal cooking fires will enhance their quality of life.

## **G. Potential Adverse Impacts**

14. Land for sewage treatment plants and pump stations can not be located exactly until detailed engineering analysis has taken place, as part of the project implementation. Any resettlement required at that time will be handled under a resettlement framework that is in accordance with ADB's Resettlement Policy. This will be used to prepare a detailed resettlement plan prior to land acquisition, and will be subject to ADB's approval.

15. CMC's sewerage and drainage system discharges into a network of large canals or outfalls, which convey the combined effluent and stormwater to the Ganges River system. The canals are state property, maintained by the Irrigation and Waterways Department. Over many years, people have illegally established settlements along the banks of the canals. These settlements interfere with the flow of the canals, accelerating the natural siltation process of the canals and causing a severe environmental health hazard. The resulting loss of hydraulic capacity requires more frequent maintenance of the canals, the budget for which is already inadequate. Consequently, the flooding and environmental hazards are becoming more frequent and more severe.<sup>4</sup> To dredge the canals and maintain permanent access for future maintenance, the canal bank dwellers must be relocated.

16. The potentially affected persons along the canal banks have been surveyed and registered. All efforts were made to seek engineering solutions to minimize resettlement. The first priority was to minimize resettlement impacts on shopkeepers whose incomes are location-specific. The resettlement plan has been prepared in accordance with ADB's *Involuntary Resettlement Policy* (1995) and *Handbook on Resettlement, A Guide to Good Practice* (1998). A resettlement framework has also been prepared to guide CMC in the preparation of any further resettlement plans required under the Project.

## **H. Benefit Monitoring and Evaluation**

17. The project framework provides the Project's monitoring indicators by project component. A detailed benefit and monitoring evaluation plan, including impact evaluation and identification of positive changes in the urban environment, such as improved health and number and type of beneficiaries covered by new utilities and services, has been prepared. Specific social monitoring is further described under the SCP and the resettlement plans.

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<sup>4</sup> Loans were taken out by the government of West Bengal to dredge and desilt the canals in the early 1970s and in the early 1990s; they now need further rehabilitation.

## ECONOMIC AND FINANCIAL ANALYSES

### A. Economic Analysis

1. The analytical framework for determining whether resources are being used in an efficient and sustainable manner is based on the following Asian Development Bank's (ADB) publications: *Guidelines for the Economic Analysis of Projects (1997)* and *Framework for the Economic and Financial Appraisal of Urban Development Sector Projects (1994)*. A summary of the methodology and assumptions used, a description of the economic costs and benefits, and the result of the analysis follow.

2. An integral economic analysis has been made for the Project as a whole since the main economic benefits of all components are all related with an improvement in the health situation of the population of Calcutta through improvements in the sewerage, drainage, and canals systems of the city and the management of solid waste. The slum improvement component has also been included in the elaboration of the integrated economic analysis. The sewerage, drainage, and canals components will benefit approximately 1.4 million people in the outer areas of Calcutta (incremental population of 1.0 million). The solid waste management (SWM) component will benefit the whole of the Calcutta municipality with an estimated population of 5.0 million, and the slum improvement component will benefit 190,000 people. The capital costs and incremental operation and maintenance (O&M) costs of all components, except part A (stakeholder consultation process), have been considered. Per capita values for each economic benefit have been calculated and multiplied by the benefited population.

#### 1. Economic Costs and Benefits

3. The analysis derived economic costs from the financial project costs. All cost are expressed in constant (2000) prices. Physical contingencies of 10 percent have been added to the base costs, and taxes and duties have been discounted at the level of 15 percent for equipment and vehicles, 6 percent for civil works and 5 percent for O&M and implementation. Economic costs were valued using domestic currency and the domestic price numeraire. Tradable items were assigned a shadow exchange rate factor of 1.11, the reciprocal of the standard conversion factor of 0.9. A shadow wage rate of 0.7 for unskilled labor in India has been used to reflect its opportunity costs in the context of wide availability. An allowance has been made for replacement investment over the assumed 30 year life of the Project. Incremental O&M costs were taken into account and added to capital costs to obtain the total economic cost of the Project for each year.

4. The main economic benefit of all the components of the Project is improved human health. There will also be cost savings due to the different activities of the Project. The method used to calculate the health benefits due the project is to multiply disability-adjusted life years (DALYs) data by the median per capita income. DALYs are derived by estimating the value of life-years lost because of disability—using a scale from 0 (perfect health) to 1 (death). In 1992 an estimated 171 DALYs per thousand urban population were lost in West Bengal.<sup>1</sup> While the West Bengal data disagregates DALY by disease group, it does not disagregate by major risk factor. The Global Burden of Disease study<sup>2</sup> assessed the burden attributable to 10 major risk factors. The researchers concluded that 9.5 percent of DALY losses are attributable to poor

<sup>1</sup> Government of West Bengal. 1999. Health Indicators - West Bengal. State Health Systems Development Project. Health and Family Welfare Department.

<sup>2</sup> Murray, Christopher and Alam, Lopez. 1997. *The Global Burden of Disease*. A comprehensive assessment of mortality and disability from diseases, injuries and risks factors in 1990 and projected to 2020.

water and sanitation in India. For this economic analysis, DALY losses attributable to poor sewerage and drainage are assumed at 5 percent and the losses attributable to poor SWM at 3 percent of DALY losses. Additionally, for the slum improvement component, the loss attributable to poor housing is assumed to be 1 percent of DALY losses. The median household income at 1999 prices is Rs66,600 (\$1,517) yearly. This means that the average loss per capita due to illness is Rs1,881 (\$43.2).<sup>3</sup> Hence, the per capita loss due to poor sewerage and drainage is Rs118.3 (\$2.7) yearly, while the average loss per capita due to poor SWM is Rs56.5 (\$1.3) and due to poor housing is also Rs18.8 (\$0.4). The economic value of health benefits will increase in line with the increase in state domestic product (SDP) per capita. The value of a DALY loss relates directly to the value of per capita output. The SDP of West Bengal is likely to grow at an annual rate of 6.7 percent. The analysis has assumed that the per capita value of health benefits increases at an annual rate of 6 percent.

5. Other benefits from the Project include benefits from the recycled and compostable materials, the market value of which is initially considered to be Rs6.3 million (\$144,828), rising every 5 years; reduced cost of hospital and health services, equivalent to 5, 3, and 1 percent of the Rs7,768 million (\$178.6 million) spent annually on hospital and health services by the Calcutta Municipal Corporation (CMC); reduced household expenditure on medical expenses, representing about 1.9 percent of household expenditure in the CMC area; reduced expenditure on cleaning and maintenance of septic tanks, considering the average annual price per household for cleaning and rent of septic tank is Rs350 (\$8.0); reduced costs of removing solid waste that people dump in canals, representing Rs28.5million (\$0.7 million) yearly; reduced costs for repairing road and vehicle damage from flooding, assumed to be 20 percent of CMC expenditure on road maintenance plus an additional 50 percent of that amount for vehicles; reduced expenditure on repair of dwellings related to waterlogging, assumed that 5 percent of the total households expenditure on repairs is related to flooding; reduced travel delays due to waterlogging, with the average number of days lost due to flooding is assumed to be 2.5.

6. The analysis does not include some important benefits that are difficult to value or might incur double counting under some circumstances. These nonvalued benefits include increases in land values, reduction of flood impacts on economic activities, benefits that accrue to people resident outside the CMC area (e.g., benefits to nonresidents who work in Calcutta and benefits to visitors), and the emotional benefits of reductions in morbidity and mortality.

## 2. Results of the Economic Analysis

7. The economic internal rate of return (EIRR) is used as the measure to identify the extent to which the Project is economically viable. The EIRR obtained for the Project is 14.5 percent, which is higher than the economic opportunity cost of capital of 12 percent.

8. The sensitivity analysis demonstrates the consequences of changes in the values of cost and benefits or delays in benefits for 1 or 2 years on the economic viability of the Project, and a combination of both. The results of the analysis show that the EIRR is most sensitive to delays in benefits. Additional sensitivity analysis has been made to test the EIRR, when the number of people benefited by the Project is reduced by 10 percent. For all scenarios, the EIRR remains robust. Switching values have been calculated to test how much the benefits could be reduced and how much costs could increase before the EIRR reaches 12 percent. The results show a switching value of 18 percent in the case of cost increases and 15 percent in the case of

<sup>3</sup> The figure is obtained as the result of multiplying 171 disability years by the median per capita household income divided by the average number of persons in a household and divided by 1,000.

benefits reduction. Hence, while every effort has been made to measure the benefits, some have not been quantified due to measurement difficulties and the difficulties associated with tracing all the economic impacts.

## **B. Financial Position of the Government of West Bengal**

9. The government of West Bengal will provide financing to contribute to part B (sewerage and drainage), part E (canal improvements) and part F (incremental administration for the Irrigation and Waterways Department [IWD]). The proposed funding of about \$55 million equivalent (about Rs2,550 million) is to be provided by the state government over a six-year period. This would represent around 2.0 percent of annual current revenues as budgeted for FY2001.

10. The state government is conscious of the increasing difficulty in the state's public finances and is encouraging broader-based reforms to tackle the issue. In particular, enhancing efforts to improve the efficiency of the tax and non-tax systems to mobilize additional revenues, and reducing unnecessary government expenditures and efficient decentralization of administration are being considered. The contemplated improvement in fiscal management will further facilitate provision of the counterpart funding, which in any case, amounts to only one percent of the state's annual current revenue. Given the high priority accorded to the Project, the state government confirmed that, despite the present difficult fiscal situation, counterpart funding will be provided on a timely basis during implementation of the project.

## **C. Financial Sustainability Analysis of CMC**

11. Financial analysis and financial rates of return were determined in accordance with ADB's *Framework for the Economic and Financial Appraisal of Urban Development Sector Projects*. Financial analyses were conducted for the urban drainage and sewerage and the SWM components, following ADB's *Guidelines for the Financial Analysis of Projects*.

### **1. Financial Practices and Position of CMC**

12. While CMC follows generally accepted accounting principles, because CMC lacks computerized accounting systems, it must rely on cash-based accounting information rather than accrual accounting procedures. The delayed preparation and audit of accounts means that proper financial information is not available on a timely basis. Although the general ledger and trial balance (cash) are computerized, with all receipts and payments computerized, most other accounting functions are done manually. Under the CMC 1980, the accounts of the corporation are to be audited by the state government or by auditors appointed on their behalf. However, there is no time limit on preparing financial accounts by the CMC and completing the audit. The audit of the accounts by an international auditor for FY1991 year ended 31 March 1991 has just been completed. At the same time the CMC provides to the examiner of local accounts, West Bengal, unaudited copies of its income statement (cash basis) within 12 months of the end of the financial year. Given the lack of up-to-date financial data it has been necessary to rely on the CMC annual budgetary statements of receipts and expenses (both capital and operational) when reviewing CMC's past financial performance.

13. CMC's financial performance for the last three years shows that for FY1997 (year ended 31 March 1997), FY1998, and FY1999, CMC achieved a cash surplus on its operations. From FY1997 to FY1999 revenues generated by CMC in Calcutta have amounted to around 60 percent of total receipts and are estimated to be 51 percent in FY2000. Of the amount

generated by CMC, the consolidated rate charge has been the major source, representing approximately 60 percent of revenues over this period. User fees for water, sewerage, and SWM represented only 5 percent of the revenues in FY1999. The balance of revenue generated by CMC relates to other taxes and services provided by CMC such as crematoria, slaughterhouses, car parking, etc.

14. The other major source of recurrent revenues is annual transfers from the state of West Bengal to CMC. The most important transfers include cost-of-living adjustments and increased cost of pay for annual incremental increases in salary and wage increases. In FY2000, these are estimated at 63 percent of total entitlements. The other main entitlement is the development grant, which is paid in lieu of the collection of the octroi tax on goods and services by CMC; this represented 26 percent of entitlements from the state government. All these entitlements represented 89 percent of state transfers in FY2000. The sum of all transfers from the state to CMC for FY1999 represented 53 percent of all CMC receipts and is estimated at 49 percent in FY2000.

## **2. Assumptions for the Financial Projections**

15. Financial projections prepared for CMC consist of projected receipts and expenditures. This includes receipts generated from all locally applied taxes, such as the consolidated rate charge; all nontax receipts, such as sewerage and drainage service charges and water tariffs; and all regular transfers from the state. Expenditures include all recurrent and capital expenditures met from revenues. In addition, capital expenditures for the proposed Project are included in the projections, together with project funding from the state and the Government of India in the form of debt and grants to support the Project. The balance of the funding is met by CMC from improved consolidated rate charge collections, property tax reform and the introduction of user charges.

16. The financial projections are presented on a fiscal year basis with the fiscal year being the 12-month period ending 31 March. The projections are prepared for the 12 year period from FY2001 to FY2012. Estimated project costs, projected revenues, and expenses are presented in Rupees and US dollars and expressed in current prices incorporating projected general inflation over the forecast period. Growth in SDP for West Bengal is estimated at 6.7 percent per annum. However, this level of growth may not be sustained over the 12 year forecast period. Therefore, it is assumed that revenue and expenses will increase in real terms by half the growth in SDP as a central assumption, with either zero real growth or growth at 6.7 percent applied in specific cases. The CMC population is estimated to be 5.0 million and is assumed to increase by 0.5 percent annually, while project area population of 1.4 million is assumed to grow at 2.5 percent per annum through to FY2011 and then 1.5 percent thereafter.

17. Under the Project, CMC, in conjunction with the state, will implement property tax reforms that will build on recent improvements in computerization of master files and collection procedures. Over the shorter term (FY2001-2003), collections will continue increasing at the same level as in previous years. Over the medium term (FY2003-2007), the existing ratable value methodology is to be replaced by an area-based valuation methodology based on capital values. Property tax receipts are assumed to increase in real terms by 8-9 percent per annum to 2006, and 3.35 percent per annum (the midrange growth forecast) thereafter. Collection efficiency levels are assumed to increase from the current 60% level to 80% in FY2005.

18. As part of its overall reform program, CMC is to implement flat rate user charges for all premises with a 20 mm diameter water supply connection or larger, and progressively introduce

structured water tariffs in conjunction with a metering program. Introduction of computerized billing and accounting systems should improve collection procedures and collection efficiency for the consolidated rate charge. Water tariffs are assumed to increase in nominal terms by 15 percent every two years with increases in connections reaching 1 million people in the project area in FY2007. Receipts generated from the provision of sewerage and drainage services over the forecast period are those projected under the Project from a surcharge equivalent to 50 percent of the water supply charge. Receipts generated from the SWM services over the forecast period are those projected under the Project from users fees for commercial customers.

19. The State Finance Commission reforms will increase of the percentage of collected taxes transferred from the state to local governments. The reforms will result in 16 percent of the tax revenue collected by the state, net of the entertainment tax, being transferred to urban and local bodies. On the basis of the formula proposed by the commission, CMC's share will be 3.8 percent. In addition the state has agreed to meet 100 percent of the cost-of-living allowance, and increase CMC's share of entertainment tax from 50 percent to 90 percent. Over the forecast period, the grant is assumed to increase in real terms at 1.0 percent per annum and in line with the projected annual local inflation rate. The development grant transfer is received by CMC in lieu of the past octroi tax on goods and services imported into Calcutta municipality. Over the forecast period, the grant is assumed to increase at an annual rate of 3.35 percent, expressed in constant prices, plus the projected local inflation rate. It is assumed that CMC contracts out the management of markets and devolves some of its responsibilities for health and education to nongovernment organizations and the state.

20. The capital cost of the Project is financed in accordance with the proposed financing plan under the Project. The rehabilitation of canals is undertaken by the IWD. CMC will meet the sewerage connection costs under the Project and then recover these costs through the consolidated rate charge system over 2-3 years.

21. Sewerage and wastewater services are regarded as revenue generating, therefore, these components are financed by loans from the Government at a 13 percent interest rate and a 25 year repayment period, with a 6 year grace period. The annual cost of debt service of the Project is financed according to the proposed financing plan.

### **3. Cost Recovery Mechanisms**

#### **a. Sewerage and Drainage**

22. The drainage and wastewater collection system is under the management of CMC. The water supply, sewerage, and drainage account of the municipal fund accounts for income, transfers, and expenditures directly relating to the provision of water supply, sewerage, and drainage services. At present, CMC's sewerage and drainage services depend almost entirely on CMC's general revenue sources from consolidated rate charge allocations, and state government grants. Since revenue generation from consolidated rate charges and other sources has been extremely poor, CMC has been unable to provide satisfactory sewerage and drainage services, with insufficient funds for O&M or capital investment. Users contribute little toward drainage and sewerage costs. User fees for sewerage and drainage services are applied only to industrial, commercial, and institutional (ICI) customers.

23. The proposed cost recovery mechanism for Calcutta's sewerage and drainage subsector is the implementation of a two-part fee structure. The system is based on a water user surcharge charge and the allocation of 15 percent of the consolidated rate charge collections to cover all recurrent operating costs and a proportion of debt service as well as future capital expenditure for sewerage and drainage. Current direct user fees are to be reviewed, new tariffs established, property tax reformed and collection mechanisms improved. The reforms will provide for the long-term financial sustainability of the sector.

24. Under the Project, user fees for water supply will be established for all ICI and domestic consumers having a water connection, 20 mm diameter or greater. All such consumers will pay a flat rate charge. Increases in tariffs will be slightly higher than the inflation rate during the implementation period. As meters are installed, premises will pay in accordance with a structured tariff.

25. The consolidated rate charge allocated to sewerage and drainage constitutes an indirect cost recovery mechanism. Consolidated rate charge collection will increase significantly due to the introduction of improved systems for tax billing and collection. This will substantially increase the amounts dedicated to sewerage and drainage service maintenance and improvement. Direct and indirect user fees together will be sufficient to cover all O&M costs and debt service.

26. The initial connection charge to the sewerage system will be about Rs6,000, depending on the location of the house or premise. CMC is to initially shoulder this cost, and then recover it from users over a 2-3 year period. This financing mechanism will help to avoid delays in the connections to the sewerage system.

27. At present, in many cases each water or sewerage connection serves the needs of several households in a single premise. The available data shows that each water connection is serving approximately 10 people. Socioeconomic surveys show that each household has about 4 people. This means that each connection is serving an average of 2.5 households. Assuming the same ratio of 1 water connection and 1 sewerage connection for every 10 people, the Project will expand the number of sewerage connections to reach 100,000 in order to cover 60 percent of the total population of the project area by FY2007.

#### **b. Solid Waste**

28. Cost recovery mechanisms will be established to assure long-term sustainability. An indirect cost recovery mechanism will be established through the consolidated rate charge system. CMC will establish a dedicated account for SWM. An amount equivalent to 15 percent of the consolidated rate charge collections will be transferred to this account and will be used exclusively for SWM. Fees will be charged to medical facilities and industries for the collection, transportation, and treatment of biomedical and hazardous wastes. Additional revenues will also be obtained from recycling of compostable materials and charges for particular services.

29. At the proposed level of fees and considering the expected increase in consolidated rate charge collections, CMC will be able to recover all current and incremental O&M costs and meet its debt service after project completion. Because the main source of recovery from domestic consumers will be the consolidated rate charge, the poorest sections of the population will not be seriously affected, as they do not pay this charge.

#### **4. Affordability and Willingness to Pay**

30. An analysis was undertaken to ensure that households, particularly those in the lower income groups can afford the proposed sewerage and drainage charges. The generally accepted guidelines are that the combined fees charged for water and sanitation, and SWM should not exceed 6 percent of the household income. On this basis, the charge for sewerage and drainage should not be greater than 2.5 percent. The direct user fees proposed for domestic consumers will represent 1.3 percent of the median household income (Rs3,700 per month in 1999) and 1.9 percent for the low-income household (Rs2,670 per month) in the year FY2002. Projections indicate that the direct user fees will not exceed more than 2 percent to FY2010. The consolidated rate charge is also used as an indirect cost recovery mechanism. The average consolidated rate charge payment is around Rs4000 per year (based on Rs1.5 billion estimate of current assessments for the whole CMC). From this amount, 15 percent is to be allocated to sewerage and drainage services. This represents Rs600 yearly or Rs50 monthly for the average household. This is equivalent to 1.3 percent of the median household income and 1.9 percent of income for the low-income households.

31. The sum of both direct and indirect user charges represents 2.6 percent of the median household income and 3.8 percent of the low-income households. On this basis, the proposed fee levels are considered to be affordable for the median income households. Most low-income households will not pay the consolidated rate charge, or will pay an amount much lower than Rs4,000 per year. This will represent a cross-subsidy mechanism from the wealthier to the poorer segments of the population. The socioeconomic analysis found that 90 percent of the households were willing to pay Rs50 per month for these services.

32. For SWM the indirect fees collected through the 15 percent allocation of the consolidated rate charge will also represent 1.3 percent of the income of median income households. Poor households will not be affected by the tariff for the same reasons as in the sewerage and drainage component.

#### **5. Financial Evaluation of CMC**

33. Detailed financial projections are prepared for the FY2000-2012 period on the basis of the assumptions set out above, the proposed cost recovery mechanisms, the proposed operational requirements, and the population forecast and planning targets. The projections show that CMC's financial position improves over the forecast period. CMC is able to make a capital contribution to funding the Project, meet its ongoing operating costs, and also meet the debt servicing of the funds relented from the state government. Loan relending terms assume a 25 year repayment period, including a 6 year grace period, at a 13 percent interest rate. By the completion of the Project in FY2007, property taxes will represent 30 percent of CMC's revenue base, user fees for water supply and sewerage 18 percent, and state entitlements 44 percent. While projections result in deficits in FY2000, 2001, and 2002, CMC will generate overall surpluses from FY2003 due to increases in property tax and user charges and reforms to state taxes transferred to CMC. These improvements allow CMC to meet its capital contribution to the Project and meet the debt service on the ADB loan (from FY2008).