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Report No: 61625-IN

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF
US$801 MILLION EQUIVALENT

AND

PROPOSED CREDIT

IN THE AMOUNT OF SDR 123.02 MILLION
(US$199 MILLION EQUIVALENT)

TO

INDIA

FOR A

NATIONAL GANGA RIVER BASIN PROJECT

May 4, 2011

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 30, 2011)

Currency Unit	=	Indian Rupee (Rs.)
Rs. 44.2	=	US$ 1
US$ 1.62	=	SDR 1

FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

BUIDCO	Bihar Urban Infrastructure Development Corporation
CAS	Country Assistance Strategy
CBA	Cost Benefit Analysis
CBO	Community Based Organization
CETP	Common Effluent Treatment Plant
CPCB	Central Pollution Control Board
CSP	City Sanitation Plan
DBO	Design Build Operate
DPR	Detailed Project Report
EA	Executing Agency
ESA	Environmental and Social Assessment
EIA	Environmental Impact Assessment
ESMF	Environment and Social Management Framework
FM	Financial Management
FR	Feasibility Report
GAAP	Governance and Accountability Action Plan
GBMP	Ganga Basin Management Plan
GIS	Geographical Information System
GKC	Ganga Knowledge Center
GOI	Government of India
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IDA	International Development Association
IEC	Information and Education Campaign
IGRS	Integrated Grievance Redressal System
IIT	Indian Institute of Technology
IUFR	Interim Unaudited Financial Reports
JNNURM	Jawaharlal Nehru National Urban Renewal Mission

KMDA	Kolkata Metropolitan Development Authority
MLD	Million Liters per Day
MOEF	Ministry of Environment and Forests
MOA	Memorandum of Agreement
MOUD	Ministry of Urban Development
NCB	National Competitive Bidding
NGO	Non Governmental Organization
NGRBA	National Ganga River Basin Authority
OP/BP	World Bank: Operational Policy / Bank Procedure
O&M	Operation and Maintenance
PAD	Project Appraisal Document
PDO	Project Development Objective
PIP	Project Implementation Plan
PMC	Project Management Consultancy
PMG	Project Management Group
PPF (PPA)	Project Preparation Facility (Advance)
PPP	Public Private Partnership
RAC	Research Advisory Committee
RFM	River Front Management
RTI	Right to Information
SEESA	Strategic Environmental, Economic, and Social Assessment
SGRCA	State Ganga River Conservation Authority
SOR	Schedule of Rates
SPCB	State Pollution Control Board
SPMG	State Project Management Group
SWM	Solid Waste Management
TOR	Terms of Reference
TSC	Technical Support Consultancy
TSDF	Treatment Storage and Disposal Facility
ULB	Urban Local Body
UPJN	Uttar Pradesh Jal Nigam
WTP	Willingness to Pay
WQMS	Water Quality Monitoring System
WWTP	Waste Water Treatment Plant

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Task Team Leader:	Sanjay Pahuja

INDIA
National Ganga River Basin Project

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INDIA

NATIONAL GANGA RIVER BASIN PROJECT

PROJECT APPRAISAL DOCUMENT

SOUTH ASIA

SASDI

Date: May 4, 2011	Team Leader: Sanjay Pahuja
Country Director: N. Roberto Zagha	Sectors: Public administration- Water, sanitation and flood protection (40%); General water, sanitation and flood protection sector (30%); Sewerage (30%)
Sector Manager/Director: Herbert Acquay/John Henry Stein	Themes: Water resource management (60%); Environmental policies and institutions (20%); Pollution management and environmental health (20%)
Project ID: P119085	Environmental category: A - Full Assessment
Lending Instrument: Specific Investment Loan	

Project Financing Data

[X] Loan [X] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Total Bank financing (US$m.): 1,000.00
Proposed terms: Standard IDA Credit with a total maturity of 35 years, including a grace period of 10 years; IBRD Loan with a variable spread option and total maturity of 18 years, including a 5 year grace period.

Financing Plan (US$m)

Source	Local	Foreign	Total
BORROWER/RECIPIENT	400	156	556
International Development Association (IDA)	149	50	199
International Bank for Reconstruction and Development (IBRD)	571	230	801
Total:	1120	436	1,556

Borrower:
Government of India
Responsible Agency:
Ministry of Environment and Forests, Government of India
Paryavaran Bhawan, Lodhi Road, New Delhi, India
Tel: (91-11) 2436-0634 Fax: (91-11) 2436-3577

Estimated disbursements (Bank FY/US$m)									
FY		12	13	14	15	16	17	18	19
Annual		16	87	127	198	201	154	124	93
Cumulative		16	103	230	428	629	783	907	1000

Project implementation period: Start: June 2011
Expected effectiveness date: 1 August 2011
Expected closing date: December 2019

Does the project depart from the CAS in content or other significant respects? [ ]Yes [X] No
Ref. PAD I.C.

Does the project require any exceptions from Bank policies?
Ref. PAD IV.G. [ ]Yes [X] No
Have these been approved by Bank management? [ ]Yes [ ] No
Is approval for any policy exception sought from the Board? [ ]Yes [ ] No

Does the project include any critical risks rated "substantial" or "high"?
Ref. PAD III.E. [X]Yes [ ] No

Does the project meet the Regional criteria for readiness for implementation?
Ref. PAD IV.G. [X]Yes [ ] No

Project development objective ***Ref. PAD II.C., Technical Annex 3***

The objectives of the project are to support the National Ganga River Basin Authority (NGRBA) in:

(a) building capacity of its nascent operational-level institutions, so that they can manage the long-term Ganga clean-up and conservation program; and
(b) implementing a diverse set of demonstrative investments for reducing point-source pollution loads in a sustainable manner, at priority locations on the Ganga.

Project description ***Ref. PAD II.D., Technical Annex 4***

There are two components, as follows:

Component One: Institutional Development (US$ 200 million) The objectives of this component are to build functional capacity of the NGRBA's operational institutions at both the central and state levels, and to provide support to associated institutions for implementing the NGRBA Program. Its sub-components include: (i) NGRBA Operationalization and Program Management, (ii) Technical Assistance for ULB Service Providers, and (iii) Technical Assistance for Environmental Regulators.

Component Two: Priority Infrastructure Investments (US$ 1,356 million) The objective of this component is to finance demonstrative infrastructure investments to reduce pollution loads in priority locations on the river. The four main sectors of investments are: municipal wastewater management, industrial pollution control, solid waste management and river front management. The investments are intended to exemplify, among other attributes, the high standards of technical preparation and implementation, sustainability of operations, and public participation envisaged in the NGRBA framework. This component will also support innovative pilots, for new and transformative technologies or implementation arrangements

Which safeguard policies are triggered, if any? ***Ref. PAD IV.F., Technical Annex 10***
The following safeguard policies are triggered:
Environmental Assessment (OP/BP 4.01)
Physical Cultural Resources (OP/BP 4.11)
Natural Habitats (OP/BP 4.04)
Involuntary Resettlement (OP/BP 4.12)
Indigenous Peoples (OP/BP 4.10)
Projects on International Waterways (OP/BP 7.50)

Significant, non-standard conditions, **if any**, for:
Ref. PAD III.F.
Board presentation: Nil
Loan/credit effectiveness: Nil

Covenants applicable to project implementation: The key covenants for the project include the following: MoEF and the participating states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal: (i) shall maintain throughout the project period the PMG and the SPMGs, respectively with suitably qualified personnel and with resources sufficient to carry out project management including technical and fiduciary supervisions, monitoring and evaluation, and public communication to achieve the Project Development Objectives in a timely and effective manner; (ii) will ensure continuity of the leadership of the PMG and the SPMGs, and will plan for replacement and/or succession of leadership, in such a manner that disturbance to project implementation is minimum and that institutional memory remains intact throughout the project period; (iii) will prepare, through PMG and SPMGs, and no later than December 31 of each year, the Annual Action Plan and procurement plans for implementation of the activities under each component of the project for the next Financial Year; and taking into account Bank's recommendations, finalize these plans no later than March 31 of each year; (iv) shall maintain a dedicated, multi-disciplinary team of suitably qualified personnel in each Executing Agency (EA) with resources sufficient to carry out their respective parts of the project; (v) will place in position, within six months from effectiveness, suitable external and internal auditors pursuant to terms of reference acceptable to the Bank; (vi) shall take all necessary measures, or cause others to take such measures, to ensure implementation of the project is in accordance with the provisions of, among others, the Financial Management Manual, the Procurement Manual, the Governance and Accountability Acton Plan (GAAP), and the Environmental and Social Management Framework (ESMF), which may be amended from time to time with prior approval of MOEF and the Bank; (vii) shall ensure that the expertise, including national and international experts, required for effective implementation of the project (as per the NGRBA Program Framework) are available to the PMG and the SPMGs at all times during the project period; (viii) through the PMG and the SPMGs, shall (a) undertake suitable baseline surveys such that each Annual Action Plan starting from Year Two of the project period have adequate baselines against which the performance of the specific investment can be monitored; (b) engage external consultants for detailed third-party monitoring and quality assurance services in a continuous manner throughout the project period; and (c) undertake third-party evaluation of the project twice during the project period - immediately before mid-term review and before closing of the project; and (ix) through the PMG and the SPMGs shall ensure, unless otherwise specifically provided by the Government of India, that all information in the project be made public, including reports on physical and financial progress, monitoring, evaluation, and external audits.

I. STRATEGIC CONTEXT AND RATIONALE

A. Country and sector issues

1. ***Economic growth and the macroeconomic outlook.*** In the past few years, India has emerged as one of the world's fastest growing economies. Since 1990, its economic growth rate has more than doubled, rising from 1.9 percent during 1961-1990 to 4.6 percent in 1991-2008. In 2008-09, real per capita income stood at US$1,040, more than double the level of 1993-94. India is now a $ 1.75 trillion economy[1], and its growth is fueled by a strong momentum in investment, reflecting rising productivity, robust exports, and high business confidence. This sustained economic growth, exceeding 7-8 percent a year over the last five years and projected to accelerate to 9 percent in 2011-12, has catapulted India onto the global stage and raised the prospect that it could eliminate extensive poverty within a generation. If this projected economic expansion is sustained, India is estimated to become the world's third largest economy by 2030

2. Despite having been buffeted by the twin shocks of the global financial crisis in 2007-09 and the negative domestic growth in agriculture and allied sectors in 2008-09, the Indian economy has shown remarkable resilience and strength. The effect of the global crisis on growth was relatively mild, and India's economy has since recovered relatively quickly. Even the continued high food inflation and temporary slowdown in industrial growth have not dampened the overall dynamism, which has since returned India to the high growth path it had achieved during 2005-08. Therefore, the recovery of Indian economy seems to be robust.

3. This resilience and continued growth is primarily the result of strong macroeconomic policies including the easing of monetary policy and tax reductions, fiscal consolidation at both the central and state levels resulting in buoyant revenues, social protection measures to protect the poor, and some luck in good weather and the slow but steady recovery of the global economy. On the expenditure side, a resurgence of investment contributed to the recovery, although private consumption growth has since also accelerated. On the production side, the agricultural sector surprised analysts with a positive growth rate in FY 2009-10 despite the monsoon failure of that year, with a strong rebound materializing in FY 2010-11 as expected. In recent quarters, the industrial sector has registered double-digit growth.

4. The recently presented budget for FY 2011-12 reinforces the inclusive growth orientation of the Government, and emphasizes restoration of GDP growth to 9 percent while making growth more broad based and ensuring supply-demand imbalances are better managed. The budget targets an ambitious consolidation of deficit as a percentage of government GDP. In addition, the onset of the benefits of a demographic transition and high savings rates augur well for a high-growth path over the medium to long term.

5. However, there are challenges, including risks from the uncertainties of global commodity prices, potential volatility in capital inflows, the need for further increases in real interest rates to reduce inflation, and reducing subsidies in order to meet ambitious targets for fiscal consolidation. Apart from reforms to subsidies and under-recoveries of costs of provision of services, improved efficiency in service delivery is also needed to free up resources for the "expansionary consolidation" envisaged by the 13th Finance Commission. Nonetheless, the

[1] The Economic Survey 2010-11, Ministry of Finance, Government of India.

Government is well aware of these challenges and has established a track record of reforms that will help to maintain the growth momentum.

6. ***Growth and the environment.*** However, India's recent remarkable growth has been clouded by a degrading environment and growing scarcity of natural resources. A rapidly growing population (provisionally estimated by the Census of India at 1.21 billion in 2011) and dynamic economic development have been accompanied by extensive and unplanned urbanization and industrialization, the expansion and intensification of agriculture, and the destruction of forests. A 2009 State of the Environment Report for India stressed the major concerns and costs associated with serious land degradation, loss of biodiversity, deteriorating air quality in cities, increasing water scarcity, and generation of large quantities of hazardous waste from industries. The share of the most polluting sectors in India's exports has increased dramatically during the last decade, and a growing pollution footprint is negatively impacting human health and development outcomes. The environmental sustainability of growth and the impact of ecosystem degradation have, therefore, emerged as serious issues.

7. At the same time, poverty remains both a cause and consequence of resource degradation with the problem being most acute in India's lagging states. For example, agricultural yields are lower on degraded land, and when forests are depleted, livelihood resources decline. To subsist, the poor are compelled to mine and overuse the limited resources available to them, creating a downward spiral of impoverishment and environmental degradation. Environmental sustainability could thus become the next major challenge as India surges along its growth trajectory.

8. In recent years, India has taken substantial steps to address these challenges and to ensure that development does not come at the cost of the environment. It has enacted stringent environmental legislation, and has tightened the enforcement of existing laws and regulations. There have been large scale efforts to stabilize the forest cover through afforestation programs, and considerable investments aimed at improving the water quality. Some very visible examples of recent policy initiatives include: the launch of the National Action Plan for Climate Change; the adoption of a National Environmental Policy that recognizes the value of harnessing market forces and incentives as part of the regulatory approach; the establishment of the National Green Tribunal to address and resolve environmental legal cases; a push to reform the system of environmental governance and regulation including the proposed establishment of a National Environmental Protection Agency; and a readiness to calculate and publish "Green GDP" from 2015 as a way to take cognizance of the environment impacts of economic growth. Actions to ensure environmental compliance on a number of large and high-profile industrial and infrastructure projects have brought the environment and growth debate into the mainstream of public discourse. In parallel, a vigorous civil society and media, judicial activism, and a rapidly expanding middle class have converged as a strong constituency for environmental conservation.

9. The scale of these responses needs to be further enhanced in order to address the environmental challenges facing the country. Policies for stronger growth can often complement those for environmental protection, for example through investments in clean water and sanitation or the more efficient use of shared water resources. There is a significant space for such innovations in policy, regulation, and the nature of investments, that would promote growth that respects the environment.

10. ***Significance of the Ganga basin for India.*** The Ganga basin is the most populous in the world, with more than 400 million people in India alone. It accounts for 25% of India's water resources, and the five states on its mainstem (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal) are home to more than 50% of the poor people in the country (see Annex 1). These basin states have a disproportionately high incidence of income poverty and, with the exception of West Bengal, have generally lagged in growth and poverty reduction. The Ganga basin exemplifies a typical "hydraulic civilization", where achieving water security to harness the river's productive potential and limit its destructive potential is critical for sustenance and economic growth. In addition to its physical resource value, the Ganga is culturally very significant for India. It is worshipped throughout the country as a goddess. On important Hindu holidays, millions of people converge on the river in select cities to pray and bathe in the waters, and for them a clean Ganga holds great value. More than 60 million people came to the city of Allahabad for pilgrimage in January 2007, making it the largest gathering in the world.

11. ***Ganga pollution and its multiple causes.*** Despite being highly revered and the primary water resource for the heartland of India, the Ganga river is today seriously polluted and under extreme environmental stress. The river suffers from high levels of organic and bacterial pollution, especially in its critical middle stretch (see Annex 1), resulting in a wide range of negative impacts, including on human health, agriculture, urban services, and the environment (see the following sections). The pollution in the Ganga is primarily a result of inadequate infrastructure, the weak capacity of local water and wastewater utilities in the basin, and the poor state of environmental monitoring and regulation:

(a) Inadequacy of municipal wastewater infrastructure and services: Increasing population and poor management of urbanization have led to a significant deficit of infrastructure and services. At present, only one-third of the sewage generated in the main-stem towns and cities is treated before being discharged into the river. Treatment capacity in large cities along the mainstem of the Ganga is only 44% of the requirement, and is much less in the smaller cities[2].

(b) Industrial pollution: Industrial sources account for about 20% of the total volume of wastewater inflows to the Ganga and also contribute toxic waste. Most of the pollution comes from untreated or poorly treated discharges from leather, paper, sugar, and brass industry clusters. While almost 70% of the significantly polluting industries have effluent treatment facilities, their performance is not satisfactory. Small-scale industrial units have little capacity to pre-treat wastewater prior to discharge to the Common Effluent Treatment Plants (CETP), which in turn are not able to meet discharge standards. Although judicial action due to non-compliance has led to closure of many polluting industries, it has not brought about any significant change owing to the systemic nature of the problem.

(c) Solid waste and non-point sources: Almost all of the Ganga mainstem cities lack comprehensive solid waste management, which directly exacerbates pollution in the Ganga and also chokes drainage networks. Non-urban non-point sources, particularly from agricultural and livestock, could also be significant contributors to the pollution in the Ganga, but little is known about their extent. Although some studies show negligible levels of pesticide in the river, there are no systematic studies or estimations of nutrient and waste loading from non-point sources.

[2] Status Paper on Ganga, Ministry of Environment and Forests, 2009

(d) Inadequate in-stream flows: Almost 90% of the Ganga flows are abstracted for irrigation. This high abstraction results in very low in-stream flows, exacerbating the water quality problems, especially in the dry season and in the middle stretch which has the largest number of holy cities on the riverbank.

12. ***Environmental regulators need to be strengthened.*** Water in India is primarily a subject under the states' jurisdiction. Although the Central Government has the powers for regulation and development of inter-state rivers (such as the Ganga), these have not been used in the recent decades for establishing any river basin organizations. The first legislation explicitly aimed at prevention and control of water pollution was introduced in 1974; however, it is under the more comprehensive and enabling Environment Protection Act of 1986 that the Central Government has exercised its powers to regulate and protect the environment, including for setting standards and planning and executing nation-wide programs (see Annex 1). The State Pollution Control Boards (SPCBs) are responsible for compliance with the water pollution regulations, under the overall technical and policy guidance of the Central Pollution Control Board (CPCB) at the national level. However, the SPCBs in almost all Ganga basin states are under-resourced and do not have adequate technical staff or equipment to carry out their assigned functions. The CPCB has the legal powers to instruct the SPCBs and even to take over their enforcement function. However, the capacity of the CPCB is also limited and not adequate compared to the challenges of cleaning the Ganga, especially for basin-level water quality monitoring, pollution inventorying, and enforcement.

13. ***Environmental data, information systems, and baseline knowledge are inadequate.*** The current water quality monitoring system for the Ganga relies on manual monitoring procedures at selected locations without any automatic water quality monitoring station. The frequency and quality of the data are inadequate for situation analysis and decision-making. There is no comprehensive inventory of municipal or industrial wastewater sources discharging into the Ganga - therefore the data on location, flows, and loadings for point-source discharges are not available for basin-level analysis, nor are the cumulative estimates available for net pollution loads entering the Ganga. Information is similarly scanty on the extent of solid waste and non-point source pollution. Addressing these gaps in the baseline information will be critical to developing an effective strategy for a long term river clean-up program. Establishing data collection and analysis systems for regular monitoring of pollution sources and river water quality is also required for impact evaluation and adaptive management in the basin.

14. ***Improving urban services provision is critical for a durable solution.*** The pollution of the Ganga is linked in large measure to the challenges of providing adequate sanitation and waste management at the local government level. Currently, the responsibilities for provision of these services overlap considerably across the state government and local agencies. The involvement of the Urban Local Bodies (ULBs) in the process of selection and planning of investments in these sectors has been very limited, leading to little local ownership and commitment to operate them sustainably. Meanwhile, service provision at local level remains poor, and possible improvements are hampered by an inability to recover even basic Operations and Maintenance (O&M) costs from users. In addition to the financial constraints, the ULBs also suffer from inadequate technical and management capacity required for effective service delivery.

15. ***The case for clean-up of the Ganga***. Inadequate wastewater infrastructure and sanitation service provision have a huge health cost. In the cities along the mainstem, as much as 25% of the population lives in slums, and a similar fraction of households are below the poverty level in

many of the large cities – often with inadequate access to basin sanitation services. In peri-urban areas, the use of untreated or partially treated wastewater for irrigation is widely prevalent among farmers, and responsible for a variety of occupational health hazards and food safety issues. The poor water quality of the river also affects the health and livelihoods of the many marginal communities directly depending on it, such as fishermen, washermen, and cremation grounds workers.

16. Recent studies have estimated the burden of water-borne diseases in the basin at 1.4 million DALYs per 100 million people[3], which amounts to health costs of almost $4 billion per year on a basin-wide level. Estimates of health costs for specific cities in the Ganga basin are similarly high. For example, the annual health costs related to inadequate water supply and sanitation in Kanpur (population 3.2 million) range from $111-279 million, with inadequate sanitation accounting for more than half of these costs in slum areas[4]. Nationwide, economic losses from inadequate sanitation are estimated at 6.4% of GDP and the benefits of safe management of wastewater amount to about $50 per person[5]. Alleviating the burden of disease associated with inadequate sanitation, especially for the large fraction of the urban poor, is therefore one of the primary drivers for the clean-up of the Ganga.

17. Managing the Ganga for water quality and environmental protection is also important from the perspective of water resources management, because the Ganga basin is expected to be the most seriously affected by imminent water scarcities. With supplies close to full utilization, water deficits are projected to reach 50% of the total implied demand by 2030[6], and effective water resources management remains the only way to address this challenge.

18. The Ganga's immense cultural and religious significance for India is also a powerful contributor to the strong grass-roots movement for its clean-up and conservation. This is supplemented by the growing recognition of the Ganga as an environmental resource, and the serious nature of the threats it is facing. One example is the campaign to save the threatened Gangetic dolphin, the river's flagship species, which has resulted in significant conservation efforts. Economic analyses consistently indicate a very high degree of willingness to pay for conservation of these aspects of the Ganga.

19. ***Previous efforts to clean the Ganga.*** There have been previous attempts to clean the river, with mixed results. The Ganga Action Plan (GAP) was launched in 1985 and extended to two phases over more than two decades. It focused primarily on urban wastewater and funded a large number of Wastewater Treatment Plants (WWTPs) and related urban wastewater infrastructure. Impact data show that, overall, the program was able to maintain or even improve water quality[7] in spite of significant increases in pollution loadings due to urban and industrial growth. An ex-post economic evaluation of the GAP showed that the benefits far exceeded the costs, with non-use benefits accounting for the majority (61%) of the total[8]. However, there were a number of weaknesses in implementation in the program - including insufficient investments, underutilization of created capacity, little ownership of local bodies, long delays, and poor communications - resulting in a public relations failure (see Annex 1). Moreover, the resources

[3] Climate Change Impact and Adaptation in Kolkata Metropolitan Area, World Bank, 2010
[4] India 2030: Vision for an Environmentally Sustainable Future, World Bank, 2011 (forthcoming)
[5] The Economic Impacts of Inadequate Sanitation in India, Water and Sanitation Program, 2010
[6] Charting our Water Future, 2030 Water Resources Group, 2010
[7] Shaw Lacy, University of Michigan, 2006
[8] Cost Benefit Analysis of the Ganga Action Plan, Oxford University Press, 2000

provided to the GAP amounted to a relatively modest sum of about $250 million over two decades, and even in real terms, this cumulative spending was very small compared to actual needs. Nonetheless, despite the moderate gains made in arresting the declines in water quality, the GAP remains widely perceived as unsuccessful.

20. ***River clean-up requires sustained investments over a long time***. Global experience shows that despite its benefits, river clean-up is always a lengthy and costly endeavor. The clean-up of the Rhine required investments of more than 40 billion euros from 1970 to 1990 for the construction of municipal and industrial wastewater treatment plants alone. In 2007, the Government in China's eastern Jiangsu Province pledged more than $14 billion to clean Lake Tai, the country's third largest freshwater lake. Clean-up of the Danube is still ongoing, 12 years after the Danube River Protection Convention entered into force in 1998. Given the scale of the river and current water quality status, it is clear that cleaning the Ganga is likely to take at least a few decades and will have a price tag of tens of billions of dollars. The cost of infrastructure required to collect and treat municipal wastewater on the mainstem cities alone is estimated to be $4 billion. Inclusion of the associated sewerage networks, as well as the full costs of comprehensive solid waste management, industrial pollution control, and river front management, would push this estimate much higher.

21. ***A renewed effort to clean the Ganga.*** Building on lessons from the past, the Government of India (GoI) has developed a new and more comprehensive vision for clean-up and conservation of the Ganga, led by the establishment of the National Ganga River Basin Authority (NGRBA) in 2009. The NGRBA has been given a mandate to develop a multi-sector program ("the NGRBA Program") for ensuring pollution abatement in the Ganga. The vision of the NGRBA Program marks a significant departure from the previous efforts, as follows:

(a) A comprehensive, basin-level, and multi-sectoral approach has been adopted, with support for investments in wastewater, solid waste and river front management, and efforts to address non-point source pollution and ecological flows. This is in contrast to a town-centric and "end-of-the-pipe" wastewater treatment focus of the previous efforts.
(b) Institutional development is recognized as a critical need, and the NGRBA Program aims to develop strong and dedicated operational-level institutions for planning, managing and implementing the program.
(c) The NGRBA Program will invest in strengthening the knowledge base for Ganga, to ensure that planning and management are based on adequate and sound information.
(d) The GoI acknowledges that the clean-up of the Ganga will require significant resources, in order to reach the threshold level of improvements in water quality. Accordingly, the NGRBA Program is being provided with enhanced budgetary allocations (see below).
(e) The NGRBA Program will emphasize the long-term sustainability of investments, through operational mechanisms and capacity-building of local service providers.
(f) Communications and public participation will be designed as integral elements of the NGRBA Program, at both national and local levels.
(g) The NGRBA Program will also support investments in improving the regulatory and enforcement capacity of environmental management institutions in the basin.

22. ***Structure and legal basis of the NGRBA.*** The NGRBA has been established as a collaborative institution of central and state governments. It is chaired by the Prime Minister, with membership comprising of key GoI ministers and the Chief Ministers of the five basin states. NGRBA also has nine members representing civil society. Each of the five states has also

constituted a State Ganga River Conservation Authority (SGRCA), to coordinate and implement the NGRBA Program at the state level (see Annex 1 for details). The central Ministry of Environment and Forests (MoEF) has been designated as the nodal agency for the program. The NGRBA is constituted under the Environment Protection Act of 1986, which gives it strong regulatory and enforcement powers.

23. ***Basin-level planning.*** The GoI has also initiated a process of basin-level planning for guiding clean-up and conservation of the Ganga. Led by a consortium of seven premier Indian technical institutions, the plans will be prepared on a dynamic basis to allow adaptive management of the continuously evolving challenges, and will underpin the development of the long-term strategy for cleaning the Ganga.

24. ***Support for Urban Local Bodies.*** Since ULB engagement is critical for long term sustainability of investments and given the current serious capacity constraints at the local level, the NGRBA Program has adopted a pragmatic and progressive approach to the role of the ULBs. It has introduced an important reform by empowering ULBs to participate in the planning, selection, and approval of local investments, as well as in the selection of the agencies which will execute the investments, thereby introducing participation and ownership into the process. The NGRBA Program will also provide technical assistance for the ULBs, so that they can progressively develop the capacity to take a greater role in planning, implementation, and operation of investments.

25. In parallel, and compounding these actions, additional resources will come from India's flagship urban reform program - the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) - which is supporting 15 cities in the Ganga basin and under which the GoI has allocated more than US$ 10 billion for investments, policy reform, and capacity building. Under this and other programs, ULBs are receiving significantly more funds to improve their infrastructure, report on service levels, prepare city development and sanitation plans, and increase their systems and human capacity. Simultaneously, the system of fiscal transfers from states to local bodies is also being strengthened in line with recommendations of the 13th Finance Commission and counterpart state commissions.

26. ***Phased Vision of the NGRBA Program.*** Recognizing that the Ganga clean-up will take a long time and significant resource commitments, the NGRBA intends to develop a program that balances institutional development and capacity building with an increasing scale of investments:

(a) Program launch and early phase: The goals in the early phase are to set up the NGRBA's operational-level institutions, address the critical knowledge needs, design the investments program and implement the obvious priority investments.

(b) Medium-term goal: The NGRBA has declared that by 2020 no untreated wastewater will be discharged into the mainstem of the river. This is a very ambitious goal, given the large number of point source discharge locations and the extent of network infrastructure needed to achieve full treatment. The GoI has committed $4 billion for achieving this goal, which is in line with the estimated costs of required wastewater network and treatment infrastructure.

(c) Long-term vision: Definitive clean-up of the Ganga will require addressing the multiple other sources of pollution in addition to wastewater, such as, solid waste and non-point sources. It would also require maintaining adequate in-stream flows and other measures for ecological restoration of the river. Comparative estimates based on the global

experience indicate that a clean-up and restoration of the Ganga to nominally acceptable standards is likely to take a few decades and tens of billions of dollars.

27. ***GoI allocations for the NGRBA program.*** Although the NGRBA was launched after the planning and budgeting for the 11th Five Year Plan (2007-2012), the Program has since been awarded significant funds through the annual budget. In the first year of the NGRBA Program (FY 2010-11), investments worth more than $600 million have been approved, with financing from central and state governments. This is a significant change in the expenditure levels from before (compared to a total of $250 million spent on GAP over two decades), and in line with the GoI's commitment to meet the NGRBA's medium term goals.

28. The $4 billion infrastructure program that would be required to meet NGRBA's medium-term goal, spread in five states over the next eight years, is considered fiscally sustainable, given the capital outlays at the central and state levels. For example, in Uttar Pradesh and Bihar, which are two major states in the basin, the 2010-11 expenditures on infrastructure are $4 billion and $2 billion, respectively. In the 11th Five Year plan (2007-2012) of India, the capital outlays on infrastructure alone amount to $567 billion, with about 70% contributed from public funding. The costs of the NGRBA Program will be shared in 70:30 ratio between the central and state governments. In that regard, the program follows the model of "centrally sponsored schemes", whereby the central government gives grants to states for achieving specific objectives, while requiring the states to share some of the costs. Such programs have recently grown in number, along with the volume of resources under them. The contributions of the state governments to these centrally sponsored schemes have remained reliable and, notably, there were never any issues concerning the state contributions to specific investments under the GAP.

29. ***World Bank engagement in the NGRBA Program*** The GoI has requested the World Bank to provide upstream support to the NGRBA, for institutional development, program design, and early investments. The proposed project responds to this request. The Bank is also expected to stay engaged in the long term. The Union Minister of Environment and Forests of India and the President of the World Bank released a Joint Statement in December 2009, outlining the Bank's intent to support the NGRBA initiative in the long term through provision of substantial financing, knowledge support, and assistance in building a consortium of financiers.

30. ***Project to provide strategic support for NGRBA Program design*** The World Bank-financed project would support India in development of the NGRBA Program design and launch of its early investments. The project would support the establishment of the NGRBA Program Framework and processes for the entire NGRBA Program, build capacity of the NGRBA's new operational-level institutions, and finance a relatively small set (about 10-20 major ones) of demonstrative infrastructure investments in order to establish good practice precedents. The project would form the basis for the institutional development of the entire NGRBA Program, which will be governed by one single Program Framework. The project investment is therefore leveraged into the design of the entire NGRBA Program (costing $4 billion in the medium term, and much more in the long term).

B. Rationale for Bank involvement

31. ***Access to expertise and experience.*** The Bank has significant experience in the water resources, urban services, and environmental management sectors around the world and India. In addition, the Bank is also uniquely placed to draw upon global knowledge and expertise in

strategic basin level planning and management, from successful major river clean-up efforts around the world. In particular, the Bank has a comparative advantage in bringing the knowledge, facilitation, and financial resources needed to design and operationalize a program of NGRBA's scale, complexity, and ambition.

32. ***Leveraging of Existing Investments in the Water and Urban Sectors.*** The Bank is currently supporting several of the Ganga basin states through multiple water sector projects[9]. These engagements will both facilitate and gain from the implementation of a multi-sectoral NGRBA Program. Engagement on the Ganga will also build on the Bank's growing urban portfolio and reform initiatives for service delivery in water and sanitation.

33. ***Alignment with World Bank Country and Sector Strategies.*** The NGRBA initiative is well aligned with: (i) the Bank's current Environment Strategy, which emphasizes improvements in people's quality of life, and protection of the regional and global commons. In addition, the project supports the areas of emphasis in the upcoming new Environment Strategy (2011), in particular strengthening capacity for environmental management; (ii) the Bank's Water Resources Strategy and the Bank report on India's water[10], which emphasize basin-level water management and conservation as key to addressing the water resources challenges; and (iii) the India Country Assistance Strategy for 2009-2012, which emphasizes the need to improve service delivery, focus on lagging states, and environmental sustainability.

C. Higher level objectives to which the project contributes

34. The project directly contributes to the NGRBA's broad mandate of comprehensive water quantity and quality management of the Ganga. The project objective is also aligned with the key objectives of India's National Water Policy (2002), which emphasizes the need to plan, develop, conserve, and manage India's scarce fresh water resources on an integrated and environmentally sound basis, and for creation of river basin organizations with multi-disciplinary units for the development and management of river basins.

35. With direct support for improving water resources management and sanitation in some of the poorest states of India, the project will also contribute to the country's goal of sustained economic growth and poverty reduction.

II. PROJECT DESCRIPTION

A. Lending instrument

36. The lending instrument is a Specific Investment Loan (SIL) blending US$ 180 million of IDA and US$ 820 million of IBRD resources, with total World Bank Group financing of US$ 1,000 million. This constitutes 64% of the total project cost of US$ 1,556 million, with counterpart funding including US$ 437 million from the state governments and US$ 119 million from the central government. The duration of the project is eight years. The project has developed and will support the institutional core of the NGRBA Program, estimated at US$ 4 billion in the medium-term. All investments under the NGRBA Program will follow a single consistent NGRBA Program Framework designed as part of project preparation.

[9] Key projects include Vishnugad Pipalkoti Hydroelectric Project, Uttar Pradesh Water Sector Restructuring Project, and Bihar Flood Management Information System (Phase I and II).
[10] The World Bank, India's Water Economy: Bracing for a Turbulent Future, 2005

B. Project development objective and key indicators

37. Acknowledging that the time and resource requirements for achieving a definitive clean-up of the Ganga are far beyond the possibilities of one operation, the project objectives are realistically framed in order to be achievable.

38. ***Project Objectives.*** The objectives are to support the National Ganga River Basin Authority (NGRBA) in:

(a) building capacity of its nascent operational-level institutions, so that they can manage the long-term Ganga clean-up and conservation program; and
(b) implementing a diverse set of demonstrative investments for reducing point-source pollution loads in a sustainable manner, at priority locations on the Ganga.

39. ***Indicators.*** The key outcome indicators for the project will be:

(a) Capacity of NGRBA's operational-level institutions to effectively manage the NGRBA Program
(b) Volume of untreated wastewater prevented from entering the Ganga
(c) Improvements in river water quality at targeted locations with significant investments.

In addition, the results framework for monitoring investment includes, among others, indicators on ULB contributions to O&M in order to ensure sustainability of investments, and on the implementation of dedicated investment-specific communications and public participation campaigns.

C. Project components

40. ***Two components.*** The project will have two components relating to institutional development and priority infrastructure investments. The first component seeks to build the institutional capacity to effectively implement the overall NGRBA Program, including infrastructure investments funded by the second component.

Component One: Institutional Development (US$ 200 million)

41. ***Objective.*** The objectives of this component are to: (i) build functional capacity of the NGRBA's operational institutions at both the central and state levels; and (ii) provide support to associated institutions for implementing the NGRBA Program. The activities financed under this component are grouped under the following sub-components:

(a) NGRBA Operationalization and Program Management
(b) Technical Assistance for ULB Service Providers
(c) Technical Assistance for Environmental Regulators

42. ***Sub-component A: NGRBA Operationalization and Program Management.*** This sub-component is aimed at supporting the nascent operational institutions established for implementing the NGRBA Program at the central and state levels on a full time basis. The operational institutions comprise the Program Management Group (PMG) at the central level, and State Program Management Groups (SPMGs) at the state level.

43. The following are the main NGRBA Program activities included under this sub-component:

(a) *Insititutional Support to the PMG and the SPMGs*. The sub-compoment will support the initial setup costs of office infrastructure and equipment, incremental professional

staffing, as well as provision of critical consultancies, training, and operation costs, for the PMG and the SPMGs. This support would therefore enable these institutions to manage the entire NGRBA Program, including the activities and investments not funded under the World Bank project.

(b) *Enhancing Ganga Knowledge Resources*: The sub-component will support the establishment of a state-of-the-art Ganga Knowledge Center (GKC) with the objectives of: (i) serving as the repository of knowledge resources and as the information clearing house for all matters pertaining to the conservation of the Ganga; (ii) addressing critical gaps in knowledge generation and management; and (iii) improving information access for the public and decision-makers, including through close coordination with the NGRBA communications program. The GKC will be an integral part of the PMG.

(c) *Communications and Public Outreach*: The sub-component will finance a dedicated communications and public outreach program, undertaken in partnership with community-based organizations, school and college student groups, and the media. The communications and outreach efforts will build upon the existing vibrant discourse and grassroots campaigns on the Ganga, including those led by some of the civil society members of the NGRBA.

44. ***Sub-component B: Technical Assistance for ULB Service Providers.*** This sub-component will support the ULBs, local-level water and wastewater service providers and any other relevant agency providing water and wastewater services in the sub-project area, through provision of modern and efficient information and planning systems, training, equipment for managing physical systems, and technical assistance for improving revenue/cost recovery to ensure sustainability of local investments.

45. ***Sub-component C: Technical Assistance for Environmental Regulators.*** This will support capacity building of the central and state pollution control boards, to address the key constraints related to their functions regarding the Ganga, focusing on improving information systems, staff skills, laboratory accreditation, and infrastructure facilities. Some of the key activities include:

(a) *Upgradation of the Water Quality Monitoring System (WQMS)* The sub-component will support a system of automatic collection of water quality data from priority monitoring locations along the mainstem and some important tributaries of the Ganga, addressing the needs for both technical and institutional modernization. The detailed design, including technical specifications, has been prepared in order to ensure that implementation of this crucial activity is initiated in the first year of the project, and that the information gaps in the water quality baseline can be addressed at the earliest.

(b) *Comprehensive inventorying of pollution sources* The location, flows and pollution loading characteristics of all large point source discharge locations on the mainstem of Ganga will be mapped to create a basin-level inventory. Studies will be supported to estimate the extent and relative contributions of the non-point source pollution of various origins. This work, to be implemented in the first year, will start addressing the baseline information needs on the sources of pollution in the Ganga.

(c) *Strengthening environmental compliance monitoring* Surveillance for regulation compliance will be strengthened for the Central and State Pollution Control Boards, by improving information systems and support for incremental staffing.

Component Two: Priority Infrastructure Investments (US$ 1,356 million)

46. ***Objective.*** The objective of this component is to finance demonstrative infrastructure investments[11] in key sectors to reduce pollution loads in priority locations on the river. The investments are intended to exemplify, among other attributes, the high standards of technical preparation and implementation, sustainability of operations, and public participation envisaged in the NGRBA framework. This component will also support innovative pilots, for new and transformative technologies or implementation arrangements.

47. ***Four Investment Sectors.*** This component will support demonstrative investments in all the main sectors that are key to addressing the pollution in the Ganga. The majority of investments are expected to be in the wastewater sector, particularly in WWTPs and sewerage networks. Investments will also be supported in industrial pollution control and prevention (e.g. common effluent treatment plants), solid waste management (e.g. collection, transport and disposal systems), and river front management (e.g. improvement of the built environment along river stretches, improvement of small *ghats* and crematoria, and the conservation and preservation of ecologically sensitive sites). Some investments may combine elements of more than one of these sectors.

48. ***The Framework Approach.*** In lieu of defining and appraising specific investments, the project preparation has focused on developing an investments framework covering all four key sectors of intervention under the NGRBA Program. This NGRBA Program Framework will apply to all investments under the NGRBA Program, including investments to be financed with the government's own resources. The objectives of the NGRBA Program Framework are to:

(a) provide a filter for all the NGRBA investments, for ensuring that the selected investments are well-prepared and amongst the most effective in reducing the pollution loads;
(b) make transparent the decision-making process on investments selection; and
(c) ensure that the investments are implemented in a sustainable manner.

Given the long-term nature of the NGRBA Program and the fact that the universe of potential investments is large, the adoption of the framework approach effectively sets the "rules of the game", and will allow infrastructure investments to be selected on a dynamic and ongoing basis.

49. ***Readiness and Selection of Early Investments.*** The Detailed Project Reports (DPRs) are ready for a large number of potential investments, although they require review and improvements in order to meet the NGRBA Program Framework standards. While the GoI has initiated the process of developing a basin-level approach to planning of the Ganga clean-up, the early investments of the NGRBA Program (which will include the investments supported by this project) will be limited to interventions which are in obvious priority locations and which can make a positive demonstration impact in terms of sustainable operations and water quality improvements. The investments will be selected to include potential early successes and support for strong local demand and ownership. Investments worth approximately US$ 150 million are currently undergoing technical review and environmental/social assessment, for approval and implementation in the first year of the project. Given the fact that the NGRBA Program Framework will be tested for the first time on the project's early investments, and that preparing or improving existing investment DPRs to the standards of the NGRBA Program Framework

[11] Given the generally large size of individual sub-projects that are needed in the priority locations on the Ganga, the available funding is expected to finance a small number of sub-projects (around 10-20 major investments in at most 10 towns/cities).

will require substantive work, it is expected that disbursement on infrastructure investments may be slow in the first one-two years of the project, picking up in the subsequent years. This is a feature of the project design, and is reflected in the disbursement profile of the project. Nonetheless, the project is proposed for immediate implementation, in order to ensure that (i) the NGRBA's pipeline of early investments can be prepared to the required standards, with the technical support provided by the project; and (ii) NGRBA's institutional development activities can be jump-started.

50. ***Framework Criteria.*** The NGRBA Program Framework includes investments selection criteria and quality assurance standards covering various aspects including eligibility, prioritization, planning, technical preparation, financial and economic analyses, environmental and social management, long term O&M sustainability, community participation, and local institutional capacity. Examples of key criteria and standards are presented below (see Annex 6 for details):

(a) Explicit Consent of ULBs No NGRBA investments will be appraised without explicit and informed consent of the relevant ULB. This consent will indicate a clear recognition of the nature, scale and cost of the investment, and the ULB's own roles and responsibilities with regards to asset ownership and long-term O&M.

(b) Technology Selection Technology selection for wastewater treatment will be made on lowest lifecycle cost basis, specified for the local conditions and required degree of treatment.

(c) Design-Build-Operate (DBO) and other Long Term Contracts All investments with significant O&M costs (such as WWTPs, pumping stations, landfills and waste processing) will be developed and managed under long term contracts (either Design-Build-Operate [DBO] or other kinds) including 15 years of O&M. This will bring enhanced accountability, adequate capacity and resources, and strong performance incentives to the sector.

(d) Capitalization of initial O&M Costs In the wastewater sector, the first 5 years of O&M costs, will be included in the total cost for each DPR, and will be financed on a shared basis by the central and state governments. For other sectors, O&M costs may be capitalized on a case-by-case basis, depending on needs and revenue generation potential.

(e) House Connections Plans and cost of providing house connections up to property line must be included in the DPRs for sewerage investments. The ULBs will implement outreach and other actions to encourage households to connect up to these points.

(f) Industry Commitment to O&M Industrial pollution DPRs must include appropriate affidavits from industries outlining commitment to ensure satisfactory operation of common facilities.

(g) Environemntal and Social Management All investments will comply with the Environmental and Social Management Framework (ESMF) developed for the NGRBA program, which requires identification of possible impacts and proactive management measures for addressing them.

(h) Area Development Wherever possible, river front management investments must take an area development approach, both to achieve spatial scale along wider and longer stretches of the river, and to integrate across sectors.

51. ***Innovative Pilots.*** The project will finance pilot investments in order to promote and demonstrate innovative technologies and implementation arrangements. The potential pilot areas identified so far include net-energy positive wastewater treatment technologies and innovative

Public-Private Participation (PPP) financing models which have not been used in the Ganga basin states.

52. ***Investment Execution.*** The investments program will be planned and managed by the PMG and SPMGs. Execution of the infrastructure investments will be done by the Executing Agencies (EAs), selected specifically for each investment. The five EAs proposed for early investments under the project include the existing state-level technical agencies which have the mandate of urban infrastructure (especially wastewater) management in their respective states. Most of these agencies have been working for a few decades, and have significant expertise and experience in preparation and implementation of infrastructure projects in the four key sectors of the NGRBA Program. Procurement and FM assessments have been conducted for these existing state-level agencies. The concerned SPMG and the World Bank will perform their respective due diligence on any new entity proposed as the EA for any investment funded under the project.

53. ***Rehabilitation of existing infrastructure.*** Investments involving rehabilitation of existing infrastructure will be included on a priority basis, due to their intrinsically higher returns in terms of reductions in pollution loads entering the Ganga.

D. Lessons learned and reflected in the project design

54. The project design is based on the lessons from important experiences that have been examined in detail, including: (i) previous efforts to clean the Ganga, and associated projects (including the Bank's Uttar Pradesh Urban Development Project, which supported the GAP); (ii) the Bank's global experience in relevant sectors, and with river clean-up and conservation in particular; (iii) the Bank's experience with urban projects in India, including in the water, wastewater, and solid waste sectors; (iv) previous international efforts to clean large international rivers, such as the Danube and the Rhine, and smaller national rivers, like the Singapore and Thames; and (v) previous local river clean-up efforts in India, such as the Sabarmati and the Kali Bein.

55. Some of the key lessons incorporated in the project design from this rich global and Indian experience (see Annex 2 for details) include:

(a) Basin-level Approach NGRBA has moved away from the previous city/town based approach, and has adopted a basin-level and multi-sectoral framework.
(b) Crossing the Threshold level of Investments The response time of severely polluted hydrologic systems is high, and discernible changes cannot be effected unless a certain threshold level of interventions is reached. The NGRBA Program is recognizing the need for a long term horizon and funding support commitment, and is designed accordingly.
(c) Dedicated institutions The multi-sectoral and multi-tier agenda of river management requires empowered institutions with single-point accountability. The project has a dedicated component to support the nascent NGRBA institutions and build their capacity.
(d) Knowledge-based Decision-making Information on the sources and nature of pollution and the dynamics of the river is critical to designing an efficient and effective strategy for clean-up. The project will support numerous activities aimed at collection, analysis and use of information to support decision-making.
(e) Sustainability The project/NGRBA Program includes numerous measures to ensure long-term O&M of investments, to mitigate the risk from the poor technical, financial and management capacity of local institutions.

(f) Public Participation The NGRBA recognizes that investments and regulatory enforcement are necessary but not sufficient for success; sustaining the public pressure for a clean river is the vital ingredient. The project incorporates strategic and broad-based communications and community participation components, aimed at building support and also managing expectations to ensure consistency with achievable targets.

(g) Early Wins and Credibility Given the long-term and resource-intensive nature of river clean-up efforts, it is critical to establish credibility with demonstrated successes early on. This implies that the early NGRBA investments would need to be carefully selected, with potential for quick wins and capturing the public imagination.

E. Alternatives considered and reasons for rejection

56. ***Specific investments vs. Program design.*** Given the large scale and duration of the NGRBA Program, it was considered to limit the project to financing of specific infrastructure investments. However, the lessons from GAP (including the Bank-supported Uttar Pradesh Urban Development project, which was entirely focused on investments) point to the need for the institutional set-up, capacity building, and establishing the "rules-of-the-game" for the NGRBA Program. The project is therefore designed to facilitate effective implementation of the entire NGRBA Program (which is bigger than the Bank-funded project), and at comprehensive planning and management of the river in the long run.

57. ***Restricting investments to critical stretches.*** Limiting investments to the most-polluted stretch of the river was considered. However, the NGRBA Program entails investments across all five basin states, and involvement of all basin states and appropriate institutional arrangements in each of them was seen as critical to the success of the program. Accordingly, it was decided that investments on the main-stem across all states would be funded.

58. ***Limiting investments to wastewater treatment only.*** The option of limiting investments to wastewater treatment was considered to focus the project scope. However, it was recognized that pollution of the Ganga has multiple sources, and in many locations the most needed interventions may be in industrial pollution, solid waste or river front management instead. Also, since the project supports the institutional development of the NGRBA Program, these other sectors of importance to the Program have been included under the scope of the project.

59. ***Central versus state level project agencies.*** The approach of assigning all the major implementation responsibilities to a single central agency has been adopted in other sectors (e.g. national highways). However, engaging entities at the state and local levels was seen as critical based on the experience from the GAP project. It was felt that both central and state level agencies must be set-up and developed for effective planning and management of the river as well as for selection and implementation of project investments. In addition, ULBs and their local wastewater service providers have been recognized as crucial stakeholders who will eventually own the assets as well as operate and maintain them, and therefore must be engaged from the beginning of implementation.

60. ***SIL vs other lending instruments.*** A SIL is selected over alternative options such as an Adaptable Program Loan (APL) or a Development Policy Loan (DPL), for the following reasons: (a) the heavy focus of the project on new institutions and capacity building of weak institutions requires a significant attention to inputs and implementation; (b) the Government had already committed to major reforms in how the Ganga is managed; and (c) the intent to fund a

series of operations over the long term, thereby obtaining many of the same benefits of an APL. A potential series of operations would also provide the flexibility to dynamically adapt the long-term engagement on the basis of project performance and continually evolving challenges of managing the Ganga.

III. IMPLEMENTATION

A. Institutional and implementation arrangements

61. **Institutional arrangements:** The apex NGRBA council, with its multi-state, multi-sectoral membership and the Prime Minister as the chairperson, provides the high-level policy guidance and political support for the program. The NGRBA has constituted a Standing Committee, headed by the Union Finance Minister, to frequently review implementation; and an Empowered Steering Committee, headed by the Union Secretary of Environment and Forests, for investment clearances and program coordination.

62. The MoEF, being the nodal Ministry, has the overall responsibility for the NGRBA Program, including the World Bank-supported project. It is in the process of establishing the Program Management Group (PMG), a dedicated entity with suitable structure, staffing, powers and leadership, charged with effective implementation of the overall NGRBA Program, including this project. The implementing agencies at the state level are the SGRCA Program Management Groups (SPMGs), which are being established in the form of registered societies[12]. These implementing agencies will be responsible for managing this project and achievement of its PDOs; coordinating project activities on a full-time basis and directly executing some of the relevant project sub-components.

63. Each infrastruture investment will be executed by the EA selected specifically for that investment. As described earlier, the five EAs provisionally selected for early investments under the project are the existing state-level technical agencies which are in charge of the development of urban infrastructure in their respective states. Therefore this initial set of EAs has significant experience in preparation and management of infrastructure investments.

64. Procurement and FM assessments have been conducted for these existing state-level agencies. If entities other than these are proposed as EAs under this project, the World Bank (along with the PMG and concerned SPMG) will perform its due diligence to ensure that they have adequate capcity to manage the technical, project management, procurement, financial management and safeguards aspects of the investment. The requirements in this regard have been provided in the NGRBA Program Framework.

65. For all local infrastructure investments, the EA will be chosen by a committee comprising the SPMG and representatives of the relevant ULB. The PMG will select the EAs for centrally-implemented activities (e.g. the national communications strategy). The EA will be responsible for successfully executing the activity for which it has been commissioned.

66. The EAs will be responsible for all contract management, including procurement, signing of contracts, regular supervision, and contract payments, with necessary support from

[12] The Department of Urban Development in Jharkhand will serve as the SPMG for the NGRBA Program in the state. Given the small length of the Ganga stretch in the state, the quantum of investments expected under the NGRBA program is relatively small.

PMG/SPMGs. The PMG and SPMGs will be responsible for ensuring prudent planning, investments selection, quality assurance, procurement, contract management, monitoring and evaluation under the project/NGRBA Program. The sharing of roles and responsibilities, including administrative and fiduciary arrangements between the PMG/SPMG, EA and the relevant ULB will be documented in trilateral Memoranda of Agreement (MoAs).

67. The PMG and SPMGs will collaborate with and seek support and partnership with a range of other agencies, to draw upon their specialized expertise and supplement the capacity of main implementing agencies. These will include international, national and local knowledge institutions, private sector business houses and industries, and civil society groups.

68. During implementation the PMG will submit consolidated reimbursement requests for the entire project based on Interim Unaudited Financial Reports (IUFRs), whereby state level consolidation will be done by the SPMGs and forwarded to the PMG. There will be only one special account for this project.

69. Adequate provisions of staff, capacity and resources will be made within the PMG and SPMGs to ensure that they are able to efficiently discharge their responsibilities mentioned above. Two key consultancies are included to: (a) provide project management support to PMG for managing the entire NGRBA Program, including planning, technical support for investments review and appraisals, portfolio management, procurement, financial management, monitoring and evaluation, and reporting; and (b) technical support to SPMGs and EAs, for upgrading the process and practice of investments preparation and execution to global standards, for the entire NGRBA Program. The proposed institutional arrangements, powers, roles and responsibilities of the various actors and their organizational linkages are presented in Annex 6, with the complete details in the NGRBA Program Framework. A schematic is presented in Figure 1.

70. **Project implementation plan and guidelines.** The project will be implemented according to the following documents that have been prepared and agreed:

(a) The NGRBA Program Framework, which will apply to all investments under the NGRBA Program, regardless of the source of financing, and which comprises:
    i. Investments framework for selecting and implementing investments (all four sectors);
    ii. Detailed implementation process flow (step-by-step process covering planning, preparation, appraisal, implementation, initial operations, long term operations, monitoring and evaluation, along with roles and responsibilities of the entities involved);
    iii. Guidelines for infrastructure investments preparation;
    iv. Memoranda of Agreement (MoA) (There are two tripartite MoAs for ensuring clarity on roles and responsibilities of various parties regarding execution, O&M, and eventual transfer of investments to the ULB: one program-level MoA between PMG, SPMG, and the ULB; and one investment-specific MoA between SPMG, EA and the ULB);
    v. Environmental and Social Management Framework (ESMF);
    vi. Governance and Accountability Action Plan;
    vii. Communication Strategy and Action Plan; and
    viii. Financial Management Manual.
(b) Project Procurement Manual.

71. **Communications**. Given the strong emotive status of the Ganga in India, and the perceived failures of the GAP, there are a wide range of stakeholder views, concerns and sensitivities that need to be taken into account, and high quality communications will be an integral part of the NGRBA Program. The PMG will oversee the preparation of the Communications Strategy and of the Communications Needs Assessment. It will further ensure successful roll-out and implementation of components of the strategy, including: (i) mass communications campaigns; (ii) support for voluntary public participation; (iii) pro-active disclosure; and (iv) formal community participation. The PMG and SPMGs will also ensure that social intermediation and stakeholder engagement occurs around specific investments, including through city-level Citizen Monitoring Committees/Forums. Social audits will be conducted by the Citizen Monitoring Committees. Further details are available in Annex 12.

72. **Supervision.** The World Bank supervision will be limited to the activities and investments financed by this project. With focus on institutional development activities and a relatively small number of infrastructure investments, the supervision will seek to ensure that the needed capacity is built and that the project attains the demonstrative impact of well-prepared and sustainable investments which can be replicated across the basin to achieve the long-term goal of Ganga clean-up. Areas of specific attention will include technical preparation, social and environmental management, procurement, and communications. While the GoI will apply the NGRBA Program Framework to the entire NGRBA Program, the World Bank will neither supervise nor be responsible for the quality of application of the Program Framework to investments and activities that are not financed by this project.

73. Project supervision would be done by a team of World Bank specialists and expert consultants, specializing in specific dimensions of the project, including water and sanitation, sewerage, wastewater treatment, environmental management, water quality monitoring and modeling, basin planning, institutional development, water resources management, solid waste management, river front management, ecological conservation, social development, procurement, financial management, communications, private sector development, carbon finance, IT/MIS systems, GIS systems, municipal finance, etc. The supervision will specifically seek to provide support in areas that are new for the Ganga program, for example, social and environmental management and communications. Given the significant needs of the NGRBA Program, and in order to ensure that the project benefits from knowledge of local context as well as world-class expertise, the supervision team would seek to blend national and international staff/consultants. Bilateral support has also been sought and agreed for providing resources and expertise during project implementation.

B. Monitoring and evaluation of outcomes/results

74. **Monitoring and Evaluation (M&E) Framework.** The M&E Framework is designed to allow impact evaluation and enable a results-based management of the project, by (i) systematically monitoring the performance of project interventions; and (ii) ensuring that the lessons learned are fed back into program management. Given the inadequate baseline data on pollution sources and water quality, results indicators for the project have been structured in terms of incremental impact of project activities, in contrast to basin-level indicators (See Annex 3). Therefore the baseline values for most of the indicators appear as zero. The M&E system will be coordinated with the Ganga Knowledge Center, to ensure that the baseline information generated through investment activities of Component Two is integrated with the knowledge

activities supported under Component One, and that the critical knowledge gaps are closed at the earliest.

75. **Monitoring Indicators.** The M&E Indicators developed include (i) outcome indicators to assess the achievement of project objectives (e.g. to monitor physical progress in pollution load reduction in the Ganga); (ii) process indicators to monitor the quality of implementation and assess the efficacy of the systemic changes introduced by program (see Annex 3 for details). In addition to the indicators on execution and operation of investments, the M&E Framework includes indicators on ULB contributions to O&M in order to ensure sustainability of investments, and implementation of dedicated investment-specific communications and public participation campaigns.

76. **M&E Arrangements.** The M&E system is embedded in the institutional design of the NGRBA Program. The operational staffs of the PMG and the SPMGs include M&E Officers with the overall responsibility for planning and coordinating M&E activities. The PMG will prepare half-yearly progress reports for tracking progress of various activities, based on inputs from the SPMGs as well as the NGRBA MIS system. In addition, an independent M&E agency will be engaged to monitor project performance. The annual action plans prepared by the PMG and the SPMGs will include the achievements and lessons learned in the previous year, and the proposed implementation plans and budgets for the following year. These arrangements will ensure timely collection, analysis and reporting of information, and enable efficient use of the M&E system by managers, policy makers and other key stakeholders. An adequate computerized MIS will be designed and made operational during the first year of project implementation.

C. Sustainability

77. ***Ownership and commitment.*** The clean-up and conservation of the Ganga enjoys broad public and political support in India. The GoI is strongly committed to the NGRBA Program, as evidenced by: (i) establishment of the NGRBA under the enforceable legal authority of the Environment Protection Act; (ii) increasing fiscal support ($ 600 million of investments approved in the first year of the NGRBA); (iii) recent decisions on the Ganga, including suspension of 3 hydroelectric projects and intent to declare an eco-sensitive region in the upper reaches; and (iv) establishment of dedicated and permanent institutions for the NGRBA. The states have shown similar ownership, demonstrated by their commitment to establish and staff operational institutions, and provide their share of project costs and other resources.

78. ***Institutional sustainability***. The operational institutions being established and supported under the project are permanent and dedicated entities with single-point responsibility for long-term implementation of the NGRBA Program. The institutions are not coterminous with the project, but will remain and evolve to address the challenges of conserving the Ganga in the future.

79. ***Fiscal sustainability.*** The NGRBA Program is modeled as a centrally sponsored program, with 70:30 cost sharing between the central and state governments. The World Bank financing will constribute to the central share of costs in this project. The state's capacity to bear their 30% share is deemed adequate, based on the experience from other centrally sponsored schemes, and especially from the GAP, where there were never any issues concerning the state contributions. In addition, a fiscal space analysis conducted for the Ganga basin states indicates that there is space for additional capital expenditure in the states, and that current and fiscal

deficits are on a downward trend. In Bihar and UP, where the largest share of project investments is anticipated, predicted state spending will amount to approximately 0.75% and 0.37%, respectively, of the current annual plan size.

80. ***Sustainability of investments.*** The project/program design has incorporated several measures to ensure sustainability of assets financed by the NGRBA:

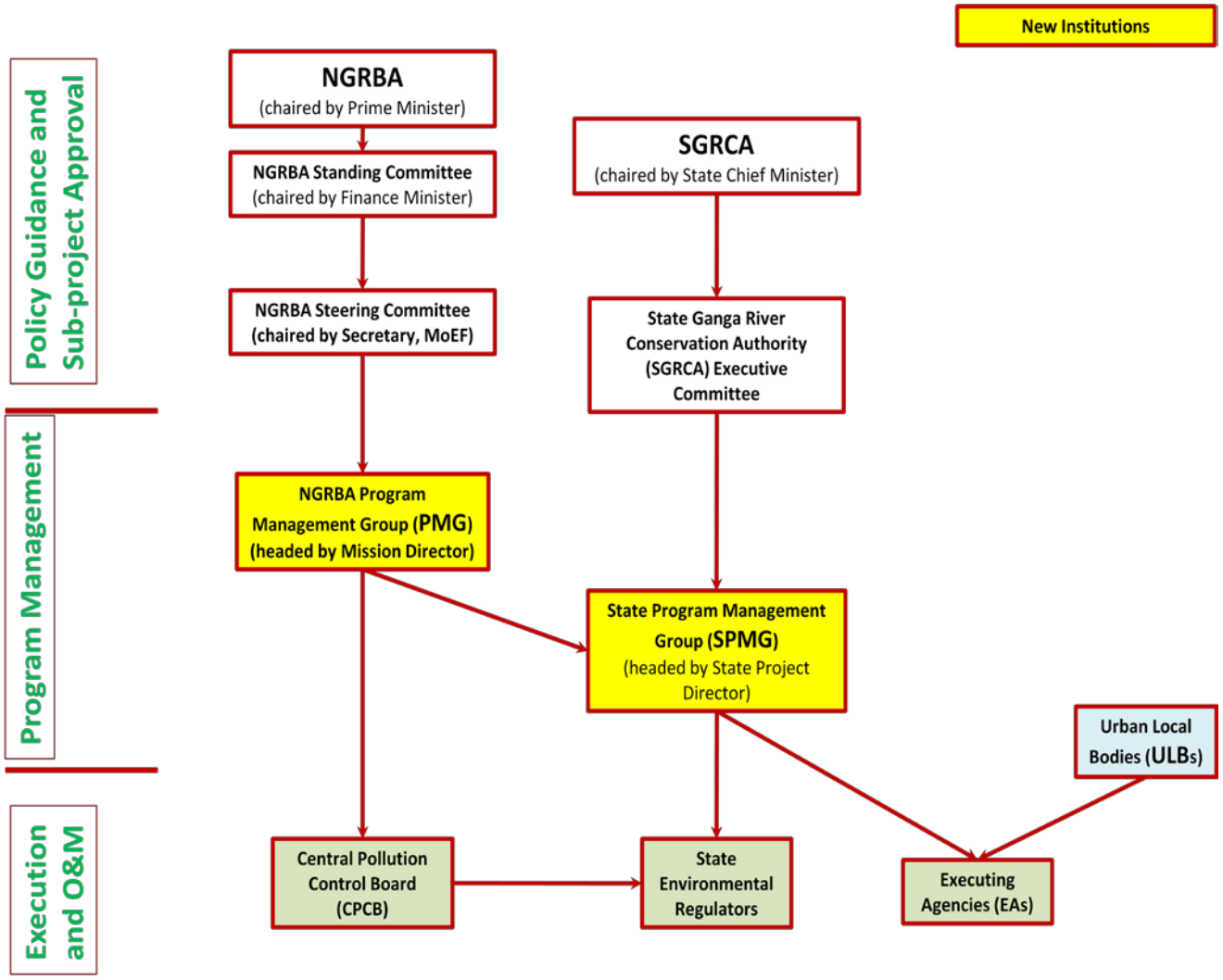
(a) For all investments with significant O&M needs, the O&M costs for 5 years will be capitalized and provided by the central and state governments. The ULBs commit to payment for O&M after the 5th year.
(b) For all investments with significant O&M needs, the project will require long term contracts, including 15 years of O&M, with private operators. The states have agreed to guarantee O&M payments to the contractor after the 5th year, in case of default from the ULBs.
(c) Technologies will be selected based on lifecycle cost analysis, in order to select the lowest cost feasible option. Technologies will not be prescribed at the bidding stage in order to encourage low life cycle costs (i.e. of capital, land, O&M, replacement).
(d) A sub-component of the project is dedicated to the institutional strengthening of local water and wastewater service providers, in order to increase their capacity and performance to operate and maintain new assets.

D. Critical risks and possible controversial aspects

81. The most significant risks stem from the fact that the pollution and clean-up of the Ganga is a subject with a very high degree of public visibility and involvement in India, a wide variety of stakeholders, and a pervasive perception that previous initiatives to clean the river have all failed. In the process of establishing the NGRBA, the GoI has held numerous consultations with the states and with civil society stakeholders, the results of which are reflected in the design and structure of NGRBA. Not only does the NGRBA have as its members the Chief Ministers of five Ganga mainstem states all representing different political parties, it is also the only national Authority in India that counts among its members nine reputed civil-society representatives. The broad-based stakeholder consultations have continued in the period following the May 2009 elections. Consultations have also been conducted regarding World Bank support to the NGRBA Program. The program is designed with plans and resources to ensure transparent decision-making and implementation, including mechanisms for redressing potential grievances. Most importantly, the reputational risk from the World Bank's association with the NGRBA Program is sought to be mitigated by ensuring that all investments are covered by the frameworks and implementation arrangements which are designed to ensure high quality and effectiveness of interventions.

82. Given the framework approach adopted for infrastructure investments, the proposed project has some high inherent risks, pertaining to the possibility of addition of new entities as EAs and to selection of investments during the implementation period. The project design includes strong fiduciary and safeguard measures to mitigate these risks. These include development of Procurement and Financial Management Manuals; dedicated procurement functionaries at PMG, SPMGs and EA levels; recruitment of a project management support consultancy; prior and post review arrangements; agreed disclosure policy and standards; social

Figure 1: Implementation Arrangements for the NGRBA Program



audits; third party technical audits; safeguard audits; and a grievance redressal mechanism. Given that the infrastructure investments contracts will be of large size and relatively few in number, most of the procurement for civil works is expected to be prior reviewed. Specific attention will also be paid to selection of supervision consultants where required.

83. While the infrastructure investments envisaged for funding under the NGRBA program (including this project) will bring long term benefits to the inhabitants of the targeted areas, their very nature entails construction stage impacts, with potential to cause public inconvenience. For example, given the concentration of the work envisaged and the high density of population in the urban areas, the laying of sewerage networks may cause significant public inconvenience and complaints in some locations. The NGRBA Program promotes a consultative process involving local communities during the design and preparation stages of the sub-project; adoption of better planning and construction practices which can reduce the potential disruptions; and strong local level communications and grievance redressal system to inform and respond to the affected people.

84. The major risks and corresponding risk management measures are described below. More information on risks and the measures to address them is also provided in the GAAP (see Annex 11). The procurement risk is rated as High (see Annex 7) and financial management risk rated as Substantial (see Annex 8). The overall project risk is "High".

Table 2: Major Risks, Mitigation Measures, and Rating of Residual Risks

Risk factors	***Description of risk***	***Rating[a] of risk***	***Mitigation measures***	***Rating[a] of residual risk***
I. Sector-specific Risks				
Sector Governance	Governance and financial accountability framework rest with multiple agencies. Issues include: (a) weak coordination, particularly at the state level, resulting in poor planning and implementation delays; (b) weak capacity at intermediate and lower levels which are responsible for service delivery; and inadequate performance management and accountability systems; (c) M&E systems (for both expenditure management and outcomes) are not very strong; and (d) despite a strong framework of sanctions, there remains patronage and direct theft of public money.	Substantial	(a) GoI and state govts are setting up dedicated institutions for implementing the NGRBA, with emphasis on empowerment structure and staff. (b) Sector governance and financial accountability assessments have been conducted at the executing agency level. (c) Various technical assistance activities have been initiated including capacity building of all associated agencies so that they have sufficient knowledge and resources to prepare and implement the project/NGRBA Program. (d) The design of the project/NGRBA Program includes better internal control systems, third party quality assurance, better systems for M&E and expenditure tracking; prudent systems for financial and procurement management; and process reforms supporting transparency and accountability.	Moderate

Sector Institutions and Policies	Basin-level management across three key sectors - water resources, environment, and urban development - will be challenging, with weak service delivery institutions, insufficient cross-sectoral coordination, and no proven models for river basin clean-up/ management in the country	Substantial	(a) Instead of working through sector policies, NGRBA derives its significant powers from a strong legal basis in the Environment Protection Act (1986). (b) GoI has launched a flagship national urban reform program (JNNURM), and similar efforts are underway to improve environment management at the national level. (c) Cross-sectoral coordination is built into the NGRBA institutional design, up to the apex council level. (d) The program will be supported by ongoing reforms in these sectors/states, including: (i) enabling water policies and legal frameworks, and adoption of inter-sectoral approaches; (ii) restructuring/ establishment of new institutions (e.g. regulatory authorities); (iii) improving financial sustainability of service delivery through rational charges and tariffs and improved financial management.	Moderate
II. Operation-specific Risks				
Political ownership at national and state levels	The current broad-based political support is transient and may dissolve, leading to future neglect and poor performance of the program	High	(a) The current political support is being used to institutionalize the program (unlike previous initiatives), by establishing permanent institutions responsible for Ganga conservation in the future. (b) Govt has committed and made allocations for NGRBA (including 5 year O&M needs) in the 11th Plan. (c) Communications and public mobilization aimed at creating a durable constituency to sustain public pressure on governments.	Substantial
Operational capacity and ownership at the ULB level	ULBs do not currently have adequate technical and financial capacity. Political ownership at the ULB level is not yet tested	High	(a) No investments will be considered without explicit consent of ULB. (b) Selection of lowest lifecycle cost options, long-term (incl 15 years O&M) contracts, and dedicated capacity-building (including training and maintenance systems) has brought the key ULBs on board. (c) ULBs are being sensitized through workshops and communications program.	Substantial
Operational Capacity of NGRBA institutions	Successful implementation requires competent and dedicated executive bodies at central and state levels.	Substantial	(a) The PMG at the central level and SPMGs at the state level are being set up as registered societies, with agreed structure and staffing plans, to enhance administrative and financial autonomy and promote single-point accountability. (b) Up-front support for capacity building being provided, including project management and technical support	Moderate

			consultancies.	
Investments Preparation and Execution	Technical quality of investment preparation (including city-level planning) is inadequate, and long-term sustainability is not addressed satisfactorily	Substantial	(a) Investments framework with criteria for selecting, appraising and implementing investments, has been developed to ensure technical quality, effectiveness and sustainability of investments. (b) A rigorous review process has been agreed, requiring feasibility and planning analyses and independent reviews (c) Project management and technical support consultancies are provided to bring best practice. Bilateral TA is being provided to rapidly support early phases.	Moderate
	Land acquisition delays the investment execution	Substantial	(a) NGRBA has agreed to initiate the land acquisition process at the time of approval of the Feasibility Report (instead of DPR), thereby giving more time.	Moderate
	Householders do not connect to sewer networks	Substantial	(a) NGRBA investments will cover the cost of connections up to house boundary. (b) ULBs will mandate plot connection, close back lane open drains, and conduct mobilization campaigns	Moderate
Transparency, accountability and grievance redressal	Lack of citizen voice in investment planning and implementation; inadequate disclosure measures; weak grievance redressal	Moderate	(a) Consultations, communication and disclosure are mandated by framework (b) All RTI Act provisions will apply (c) Project/NGRBA Program will undertake social audits and publicly disclose all M&E reports (d) Dedicated grievance redressal system will be in place at PMG/SPMG	Low
Social and environmental safeguards	Inadequate attention to social and environmental impacts of project/program interventions.	Moderate	(a) Environmental and Social Management Framework (ESMF) mainstreamed into the NGRBA Program (b) PMG and SPMGs staffed with competent social and environment specialists to ensure ESMF compliance (c) TA provided for systematic and long-term effort to track social and environmental issues in the basin	Low
Reputational risks	There is a risk of unrealistic public expectations that the river will become clean by the time the project is completed. There is reputational risk for the Bank, associated with the possibility that the NGRBA Program Framework may not be fully applied to the investments that are not funded and supervised under the project. Therefore, certain first year sub-projects approved by the Government outside of	High	(a) Design includes strong communications and outreach program, at 2 levels: (i) strategic, to involve key stakeholders; and (ii) broadbased, to build public awareness. (b) Communications will focus on managing expectations, including the fact that the Ganga clean-up will require longer time and more resources than possible in one project. (c) Central and state governments are leading the charge, and senior leaders perceived as champions of the program. (d) Support to NGRBA to develop institutional capacity to plan and manage the Program adequately and implement	Substantial

	the Project may not be in compliance with the Bank's safeguard policies. Reputational risks are also there given the high visibility, politically complex setting; and popular perception of failure on previous efforts to clean the river.		the NGRBA Program Framework in a reasonable timeframe.	
III. Overall Risk				
Overall Risk	The project is complex in scope, of high Bank corporate priority, and of high visibility in India. Many aspects of such a project are clearly high risk and have been highlighted above. Even though the PDO, components, and institutional arrangements have been designed to integrate the mitigation measures described above, the overall risk remains high.			High
[a] Rating of risks on a four-point scale – High, Substantial, Moderate, Low – according to the likelihood of occurrence and magnitude of potential adverse impact.				

E. Loan/credit conditions and covenants

85. There are no conditions for Board Presentation or effectiveness.

86. The key covenants for the project include the following: MoEF and the participating states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal:

(a) shall maintain throughout the project period the PMG and the SPMGs, respectively with suitably qualified personnel and with resources sufficient to carry out project management including technical and fiduciary supervisions, monitoring and evaluation, and public communication to achieve the Project Development Objectives in a timely and effective manner;

(b) will prepare, through PMG and SPMGs, and no later than December 31 of each year, the Annual Action Plan and procurement plans for implementation of the activities under each component of the project for the next Financial Year; and taking into account Bank's recommendations, finalize these plans no later than March 31 of each year;

(c) shall take all necessary measures, or cause others to take such measures, to ensure implementation of the project is in accordance with the provisions of, among others, the Financial Management Manual, the Procurement Manual, the Governance and Accountability Action Plan (GAAP), the Environmental and Social Management Framework (ESMF) and the Monitoring and Evaluation Framework. These documents may be amended from time to time with prior approval of MOEF and the Bank; and

(d) through the PMG and the SPMGs shall ensure, unless otherwise specifically provided by the Government of India, that all information on the project be made public, including the reports on physical and financial progress, monitoring, evaluation reports, and external audits.

IV. APPRAISAL SUMMARY

A. Economic and financial analyses

87. Although the focus of the NGRBA Program is on clean-up and conservation of the Ganga, it has wider implications for poverty and health. Provision of sanitation services, which

will constitute the largest propotion of NGRBA investments, has very significant benefits. A recent study[13] estimates that the benefits of the safe management of human excreta and associated hygiene behavior amount to US$ 48 per person in India. This value is not dissimilar to the value estimated of the benefits of implementing the EU directives related to the water sector in candidate countries[14]. The NGRBA Program includes major components which address the issues of sanitation including, but not limited to: wastewater treatment to improve discharge and river water quality, with direct benefits to communities depending on this water; provision of sewer networks and connections in previously unserved areas, with significant populations in slums and below the poverty line; solid waste management in towns and cities on the Ganga; and mobilization of local communities on issues of sanitation and health.

88. The financial and economic analysis for the project is carried out in two parts: (i) representative cost-benefit analyses of typical investments likely to be funded under the project; and (ii) a program level analysis of an assumed NGRBA Program, with estimated costs and water quality impacts derived from an extensive economic evaluation of previous efforts to clean the Ganga. In addition, the NGRBA Program Framework requires a cost-benefit analysis for each sub-project submitted for program funding, including a review of the financial sustainability.

89. One of the investments in advanced stages of preparation for the NGRBA Program pertains to connecting various neighborhoods of Kanpur to the existing sewage treatment plant (built under the GAP), through an extended network of sewers and related facilities. The investment of $45 million is for a service area population of approximately 300,000, which is expected to more than double in the next 30 years. The health benefits alone of this investment amount to $13 million per year on the current population basis, and will increase with time. A large fraction of the benefits accrues to the people living in slums and/or below the poverty level, who will get better sanitation as a result of this investment. The EIRR for this activity is estimated in the range of 82% (minimum assumed benefits) to more than 100% (maximum assumed benefits), and is typical of sewerage-focused investments in the Ganga basin. A green-field version of the Kanpur investment would yield an EIRR of 6% (min benfits) to 16% (max benefits). The generic-green field projects show somewhat better values. The results are most sensitive to benefit levels, but also to cost overruns with concurrent delays in implementation; a two year implementation delay coupled with a 10% cost over-run for such projects decreases EIRRs for green field projects to values below the discount rate. This underlines the need for cost effective designs and timely completion of projects.

90. Another typical investment for which economic analysis was conducted is aimed at industrial pollution management in Jajmau, which currently hosts more than 400 tanneries and is among the fastest growing leather complexes in India. The investment will provide infrastructure to collect and treat 64 mld of wastewater from the tanneries, along with separation, recovery and recycling of chromium, which is a toxic wastewater stream pollutant not managed in the current treatment system. In the base case, with recycling of chromium recovered from the treatment process, the resultant EIRR ranges from about 14% (min benefits) to 43% (max benefits). This leaves some, but not ample, room for institutional overheads, safeguards and cost overruns (up to 24% with no delay), while still maintaining an EIRR higher than the 10% discount rate.These

[13] The Economic Impacts of Inadequate Sanitation in India, Water and Sanitation Program, 2010
[14] For example, the report: “Benefits of Compliance with the Environmental Acquis” European Commission, 2001

returns are found to be typical of industrial pollution management interventions, and are not very sensitive to cost overruns and implementation delays.

91. Although no solid waste management investments have yet been proposed for funding under the NGRBA Program, a review of recent integrated solid waste management projects in India suggests that these yield returns of the order of 15% to 20%.

92. A program level economic analysis was also conducted to estimate the direct benefits of improved river quality (that is, without taking into consideration the benefits that follow from related improvements outside the river). While such an economic analysis cannot do justice to the full range of benefits and is therefore likely to underestimate the benefits of the NGRBA Program, such "sensu strictu" economic analysis is in line with the tradition of analysis of similar river clean-up projects around the world, such as those conducted for the Rhine and the Thames.

93. The program level analysis takes the ex-post analysis of the Ganga Action Plan as its starting point[15]. It maintains the methodology and updates this assessment to reflect the new NGRBA Program and to reflect changes in incomes, river quality etc. which have occurred during the last decade of rapid growth. The methodology used reflects the requirements of the World Bank O.P. 10.04. Benefits have been partly based on a willingness to pay survey, which elicits the subjective assessments of respondents (users as well as non-users of the river) of their willingness to pay for improved water quality and partly based on quantified assessments of economic use benefits such as health benefits accruing to river users, fishing benefits, benefits for farmers from replacing commercial fertilizer with sludge etc. The ex-post study found that the major benefit of river clean-up accrues to non-consumptive users of the river (e.g. ritual bathers) and to non-users who benefit from the knowledge that the river is cleaner as a result of program.

94. The analysis finds that basin wide interventions to improve water quality in the Ganga generally show benefits which exceed costs by a wide margin (net benefits at 10% discount rate). In particular there is a strong economic logic for a 60% to 80% reduction of BOD levels in the river, depending on whether current river quality is in the high or low range of current estimates. Depending on current river quality and the assessed unit costs of BOD removal, it is possible to achieve benefit cost ratios of up to 6.2 (high estimate for current quality, low estimate for unit cost) or up to 2.1 (low estimate for current quality and high estimate for unit cost). This illustrates that it may be important to have a program of a sufficiently large magnitude to reap the benefits and it will be important to secure low unit costs of the interventions to be implemented.

95. The program follows a framework approach for selection of investments. Under this approach, specific wastewater management proposals will be prioritized based on their relative effectiveness in reducing pollution loads entering the Ganga. This prioritization takes into account, inter alia, the quantum of wastewater treated by the sub-project, and its impact on the water quality of the Ganga during lean flow conditions at the location of discharge. These parameters are significant indicators of relative economic merit of various investment options. Proposals which feature high in the prioritized list would be subject to detailed financial and economic analysis as a part of the DPR.

[15] Cost Benefit Analysis of the Ganga Action Plan, Oxford University Press, 2000

96. The DPR would also include an options analysis to evaluate various technological and design choices for the sub-project including alternate locations, land requirement, capital costs and O&M costs. It also includes a calculation of the economic rate of return on the investment and an analysis of the financial viability of the investment based on O&M sustainability.

97. Financial analysis will be carried out for each investment as part of the DPR preparation, to ensure that there is a clear allocation of O&M resources. Analysis of FIRRs is hampered by sub-optimal tariff design in many of the preliminary DPRs. Existing tariff structures typically do not cover even basic operational costs. FIRRs are often negative and would discourage private sector investment unless the tariff design reformed. This suggests that sustainability of investments should also address cost recovery issues for new facilities or expansions to existing facilities.

B. Technical

98. Designs for the project investments will follow the current Indian standards for the wastewater, solid waste, industrial pollution and river front management sectors. Due diligence carried out during project preparation, and assessments of the earlier initiatives, highlighted the need for improved planning during investment preparation. These improvements have been captured in the project's implementation arrangements both in terms of the content and appraisal of sub-project design (Feasibility Reports and Detailed Project Reports) and the technical/institutional approaches to be adopted. These include:

(a) Enhanced field assessments to ensure the planned investments closely match the current and planned land uses in the service areas, and that planned treatment capacity, both in terms of the quantity and quality, realistically reflect those uses. This applies for all investments whether WWTPs, pump stations, solid waste collection facilities, or industrial pollution interventions.
(b) Assessment of the condition and performance of existing assets to ensure that these existing assets are rehabilitated and incorporated into the new systems wherever it is cost effective. This will also improve the separation between foul and surface water flows which currently get mixed up as a result of inadequate attention to cross connections in the existing networks.
(c) Criteria for investment prioritization have been developed which will select investments based on their effectiveness in reducing pollution loads from entering the river.
(d) In all categories of investment the Feasibility and Detailed Project Reports will identify technically feasible solutions and assess their lifecycle costs, before selecting the least cost solution.

99. The project design includes activities that will address the shortcomings of earlier efforts with respect to sustainability of investments:

(a) Proposed infrastructure investments are linked to parallel support activities, financed under Component One, to improve the operational and financial capacity of the ULB service providers. The support includes improved management systems, equipment and training of staff, and assistance in improving the commercial management of the participating service providers.
(b) For investments with significant O&M needs (e.g. solid waste management and wastewater collection & treatment), long term DBO or other PPP contracts will be used to design, build and operate the systems. The operations phase will be up to 15 years.

This approach has the benefit of allowing the client to identify the least lifecycle cost options through a competition process while transferring the long term performance risk to the contractor. This will result in significant cost savings and improvements in quality of service, and allow the optimal treatment processes to be selected.

(c) The project's investment strategy goes beyond the narrow approach of intercepting and diverting wastes for treatment. The project will support investments in treatment and networks up to the household level, leading to both a cleaner urban environment and a cleaner river. This approach will increase public awareness of the project, deliver benefits to the doorsteps of the households, and thus build broad support for the program.

C. Fiduciary

100. **Procurement**. Procurement of all goods, works and non-consulting services required for and to be financed from the project shall be in accordance with the requirements set forth or referred to in Section I of the "Guidelines: Procurement under IBRD Loans and IDA Credits" (dated January 2011). Procurement of consulting services shall be in accordance with "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" (January 2011) and the provisions stipulated in the Financing Agreement.

101. The PMG and SPMGs will be responsible for procurement planning, management and oversight, for the activities directly executed by them. They will be also responsible for coordinating, monitoring and reporting of the procurement done by the EAs. The EAs will be responsible for the procurement planning, management and oversight of the activities being executed by them. The framework approach adopted by the project for Component Two (Priority Infrastructure Investments) allows the investments to be selected on a dynamic and ongoing basis. Given the framework approach to investments, new EAs may be selected during implementation. In order to support the new EAs in the initial period, procurement support may be provided to them through the Project Management Consultancy, recruited by PMG/SPMG.

102. Since the investments under the project are not defined at the beginning but will be selected on an ongoing basis, advance procurement planning during the preparatory phase of the project is limited to Component One (Institutional Development). For Component Two, SPMGs and PMG will develop a consolidated Procurement Plan for all EAs state wise, as part of their Annual Action Plan to be submitted to the World Bank for review every year.

103. Following the World Bank guidelines for procurement, a Procurement Manual has been developed for the project, detailing the procurement process, procedures to be followed, methods, roles and responsibilities of PMG, SPMG and EAs, prior and post review arrangements etc. This Manual is reviewed and found in accordance with the Bank Guidelines; however, in the event of any conflict in interpretation of various provisions for procurement in case of items procured using the proceeds from the World Bank, interpretations of provisions of World Bank Procurement and Consultancy Guidelines will prevail. The Procurement Manual may be revised as more progress is achieved in the efforts on procurement harmonization beween the Bank and country systems.

104. Given the framework approach adopted for all infrastructure investments, the proposed project has some high inherent risks, pertaining to (i) the possibility of addition of new entities as EAs, and (ii) selection of investments during the implementation period. There is no procurement plan for the infrastructure sub-projects since they will be identified only during

implementation, and bidding documents for the initial investments are consequently not prepared. The procurement assessment carried out on three EAs indicate that a defined procurement management system and dedicated resources are needed at national, state and EA levels to carry out the procurement activities related to the proposed project. The risk is rated as High. Development of a Procurement Manual; dedicated procurement functionaries at PMG, SPMGs and EA levels; hiring the services of a Project Management Consultancy (to provide procurement support); prior and post review arrangements; and a disclosure and grievance redressal mechanism are the mitigation measures agreed for the project.

105. The Bank's standard supervision arrangements of prior and post review based on pre-agreed thresholds will be followed. A summary of the procurement capacity assessment of the implementing agencies and precise agreements on methods and arrangements for Goods, Works and Services are presented in Annex 8.

106. **Financial Management**. The financial management arrangements agreed for the project will be adequate to account for and report the sources and uses of project funds and meet the Bank's fiduciary requirements, subject to compliance with the financial management framework summarized below. Details of the framework are provided in Annex 7. The FM Risk rating of the project is Substantial.

107. FM Assessments have been carried out for the select potential EAs identified at this stage. Assessment of these EAs was done only from contract management perspective as the fund flow and accounting functions are centralized at the PMG (for central level) and SPMGs (for state level). To facilitate efficient management of funds, accounting, reporting and oversight, the fund flow arrangements have been designed to keep the number of accounting units to a minimum (i.e. the PMG, four SPMGs in the states of Uttar Pradesh, Uttarakhand, West Bengal and Bihar, and the State level Implementing Unit in Jharkhand).

108. The detailed financial management processes including budgeting, funds flow, internal control framework, accounting, financial reporting and audit arrangements of the project are described in the Financial Management Manual of the project

109. Based on the assessments carried out for the potential EAs, certain minimum criteria have been developed for FM aspects relating to contract management. Since more EAs may be selected during project implementation, the selection process will ensure that these criteria are complied with. These criteria are provided in Annex 7.

110. The PMG will receive project funds from the MoEF budget in an earmarked project bank account. The PMG will transfer funds to the SPMGs on half-yearly basis, for implementation of the agreed annual action plan. These transfers will be in May and November. The PMG will release the November installment to each SPMG only (i) after the SPMG has submitted its project Audit Report of the previous financial year to the PMG; and (ii) on reasonable utilization of the first installment of the reporting year. The State Government will release its share of funds to the SPMG within two months of the receipt of the installment from the PMG.

111. In order to streamline the arrangements, funds will flow only up to the level of SPMG, which will have a project bank account where funds received from the PMG along with the state contribution for the project will be held. Each EA in the state will have a sub-project specific zero balance child account, in the same bank. The EA will have the authority to issue payment instructions to pay contractors/ suppliers for undertaking project activities within the scope of the

approved annual action plan. Through a sub-project specific payment system, the SPMG Banker will ensure that the payments from an EA do not exceed the annual amount sanctioned for that EA for the particular sub-project. As soon as a payment instruction is issued by the EA to its banker, it will draw the required funds from the SPMG account and transfer the same to the suppliers'/ contractors' account on the same date. This transfer of funds from the SPMG account to the supplier/contractor/service provider account will happen through Real Time Gross Settlement (RTGS)[16]. Similar arrangements would be there for fund flow between the PMG and the EAs at the central level.

112. The above-mentioned fund flow arrangements will mitigate the risks of inadequate financial management capacities of EAs, which were likely to cause delays in accounting, financial reporting and auditing. The fund flow design will also make possible accounting of all central and state level expenditures by the PMG and SPMGs. Project accounts will be maintained by using an off-the shelf accounting package. All NGRBA Program activities will use double-entry accrual based accounting system.

113. Each SPMG will submit quarterly Interim Unaudited Financial Reports (IUFRs) to the PMG. The PMG will consolidate the IUFRs received from the five accounting units along with its own and submit a quarterly consolidated IUFR to the World Bank within 60 days from the end of each quarter.

114. The PMG will be responsible for submitting to the Bank a consolidated version of the annual audited project financial statements of the PMG and the SPMGs, along with the individual audited project financial statements and audit reports of the PMG and the SPMGs, by September 30 every year. Annual External audit will be conducted by a qualified firm of chartered accountants appointed by the PMG, under Terms of Reference and selection criteria agreed with the Bank. The annual entity audit report of the PMG will also be submited to the Bank.

115. The PMG and each SPMG will also have internal audits to assess effectiveness of internal controls and to provide independent assurance on the adequacy of internal controls to mitigate financial risks. Wherever the SPMG or the EA employs technical supervision or quality assurance consultants for sub-projects, the internal auditors will work in close coordination with these consultants to obtain assurance that the contract payments are made as per the terms of the contracts.

116. The Bank will provide an initial advance up to a fixed ceiling of US$ 80 million in a Designated Account (DA) with the Reserve Bank of India. Thereafter further advances of funds will be disbursed by the Bank to the DA every quarter based on amounts spent out of this advance, as documented by the consolidated quarterly IUFRs, subject to the DA fixed ceiling. The disbursement methods that may be used are (i) Advance (ii) Reimbursement and (iii) Direct Payment.

[16] RTGS is a funds transfer system where money is moved from one bank to another in 'real-time', and on gross basis. When using the banking method, RTGS is the fastest possible way to transfer money. 'Real-time' means that the payment transaction isn't subject to any waiting period. The transaction will be completed as soon as the processing is done, and gross settlement means that the money transfer is completed on a one to one basis without clustering with another transaction.

117. Expenditures incurred with the Bank's concurrence on or after January 1, 2011 and according to the Bank's procurement guidelines will be eligible for retroactive financing up to an overall ceiling of US$ 10 million.

118. The fiduciary obligation of the Bank will be restricted to the Bank financed operation only and will not extend to the entire NGRBA Program.

D. Social

119. ***Social Impacts.*** While the project is expected to benefit the Ganga basin communities, the implementation of specific project investments could lead to some adverse social impacts. An Environmental and Social Analysis (ESA) conducted for the project has identified potential adverse impacts, and proposed the requisite measures for avoiding or mitigating them, which have been incorporated in the project design. Potential adverse social impacts during the construction phase of investments include loss of land or structures, loss of access to areas for livelihood support, noise and other disruptions at sensitive receptors such as schools and health centers, and public safety issues. Site selection for major facilities such as WWTPs can be expected to be locally controversial among directly affected people and other stakeholders. The Environmental and Social Management Framework (ESMF, see below) prepared for and included in the NGRBA Program Framework acknowledges these issues and integrates the measures for addressing them in the project implementation process.

120. ***Resettlement and Land Acquisition.*** According to the environmental and social analysis, there will be need for private land acquisition which will result in involuntary displacement and loss of livelihoods. The scale of involuntary resettlement at the individual sub-project sites is likely to be small, given the nature of investments. However, since the NGRBA Program on the whole will support a large number of investments, the ESMF includes a Resettlement Policy and Land Acquisition Framework (RPLAF), which specifies the procedures, eligibility, grievance redressal and other measures to be followed in the event that resettlement or land acquisition is required for any sub-project.

121. ***Tribal People.*** Of the five Project states, Jharkhand has a significant tribal population (26%), followed by West Bengal (5%) and Uttarakhand (3%). As part of the ESMF, a Tribal Management Framework (TMF) has been prepared, with the objective of including tribal communities in the project in order to achieve the highest possible positive impact of the interventions to improve their quality of life.

122. ***Gender.*** Most of the women's status indicators (including those pertaining to health, literacy, work force participation, spousal abuse) show that gender equity and empowerment remain important issues in the Ganga basin states. As part of the ESMF, a gender development analysis will be carried out for the sub-projects at the screening stage, in order to analyze gender issues and to design interventions to address women's needs.

123. ***Poverty.*** The NGRBA states have had a disproportionately high incidence of income poverty for decades, and the efforts to reduce it have shown mixed results. As part of institutional support to the NGRBA (under Component One), a basin-wide social assessment will be carried out as a part of the Strategic Environmental, Economic and Social Assessment (SEESA), with the objective of optimizing long term design through social considerations in order to produce maximum social benefits, particularly to the poor, women, and other socially

disadvantaged groups. The scope of the assessment will cover the entire basin, including the poor and migrant workers (floating populations) residing in the Ganga basin.

124. ***Social Accountability and Grievance Redressal.*** A social accountability mechanism will be established for all sub projects. A key element of ensuring social accountability will be the use of social audits, conducted by the Citizen Monitoring Committees, to acquire feedback on performance of the sub projects and record citizens' recommendations for improvement. The social accountability mandate will be further strengthened through a strong grievance redress mechanism.

125. Given the quantum of infrastructure investments envisaged under the NGRBA Program, and their concentration in the densely populated urban areas, they may cause significant public inconvenience during the construction phase of sub-projects. In order to ensure that the potential for disruption to the normal life is minimized, and that the potentially affected populations are adequately consulted during the preparation stages and adequately informed during the implementation stages, the design of the NGRBA Program includes several mitigation measures which include: mandatory consultations with the local community during the design and preparation stages of the sub-project; adoption of better planning and construction practices to reduce the potential disruptions; and strong local level communications and grievance redressal system to inform and respond to the affected people.

126. An Integrated Grievance Redressal System (IGRS) will be established for the NGRBA Program. Grievance Redressal Cells (GRCs), with necessary officers and systems will be established at the EA, ULB, SPMG and PMG levels. Grievances of any kind may be submitted through various mediums (e.g. a dedicated toll free phone line, direct calls to concerned officials, online via a dedicated portal, in written form, etc.) and will be addressed. The project will also comply with the RTI Act of 2005 and will ensure proactive disclosure and sharing of information with the public. The mandate of the GRC will be to redress grievances of project affected persons (PAPs) in all respects, especially with regards to rehabilitation and resettlement assistance.

127. The project will have a communication strategy focusing on efficient and effective usage of print and electronic media, information boards, posters, and adoption of any other method suited to the local context, logistics, and human and financial resources available. The NGRBA communications plan includes dissemination of investment-specific information through suitable local media. Communities will be engaged through stakeholder consultations in planning and implementation of investments. The PMG and SPMGs will have specific communications and outreach units. Since the launch of the NGRBA Program communications plan, along with the local-level social intermediation for early investments, are amongst the first activities of the project, the World Bank team will ensure close and consistent support to the NGRBA to ensure their effective implementation.

128. ***Social Intermediation and Stakeholder Engagement.*** Sustainability of the priority investments will depend substantially on the meaningful participation and support of key stakeholders, especially local communities. Their responses, such as willingness to connect to sewers and pay for services, will be crucial for the long-term success of the project. A rapid assessment of stakeholder perceptions indicates a high-level of demand at the grassroots level for greater transparency and for active involvement in the proposed operations. Therefore, in addition to overall strategic communication efforts, all major investments will have tailor-made

interventions to engage with local communities and key stakeholders to ensure their inclusion and participation in the planning, implementation and subsequent management of the investments. These interventions will include: (i) Information, Education, and Communications (IEC) campaigns; (ii) mobilization of local communities (particularly women and youth) around issues of sanitation, health, and hygiene; (iii) transparent consultations; (iv) dissemination of project information; and (v) citizen oversight. Credible NGO partners will be deployed to implement these investment-level social intermediation and outreach programs.

E. Environment

129. ***Environmental Impacts.*** All interventions proposed under the project share the long term objective of improving the water quality of Ganga. By virtue of this objective, the long-term environmental impacts of the project are expected to be positive. However, if the interventions are not appropriately designed, executed or operated, they could lead to adverse environmental impacts. These impacts could be due to a variety of reasons, including: (i) improper site selection of physical investments; (ii) absence of sludge/waste disposal and management facilities in the proposed facilities; (iii) inadequate management of environmental issues during the construction phase; and (iv) inadequate maintenance of facilities, leading to deterioration of river water quality and other environmental issues. More details on possible impacts are presented in Annex 10. The ESMF prepared for the NGRBA Program acknowledges these issues and integrates the measures for addressing them in the Program/project implementation process.

130. ***Environmental and Social Management Framework (ESMF).*** Given the distributed nature of the proposed interventions across five basin states and the adoption of an overall framework approach in which specific investments are not known in advance, an Environmental and Social Management Framework (ESMF) has been developed for the NGRBA Program, and is included in the NGRBA Program Framework. The ESMF will apply to all investments sanctioned under the NGRBA Program, regardless of the source of financing. The ESMF is a technical guideline document that describes procedures and institutional responsibilities for assessing and managing the potential environmental and social risks and impacts that may come up during implementation and throughout the project cycle. The objectives of the ESMF are to: (i) ensure the social and environmental sustainability of investments; (ii) and ensure compliance with national environmental and social legislation. The ESMF as included in the NGRBA Program Framework also complies with the World Bank's Environmental and Social Safeguards Policies.

131. ***Sub-project Categories.*** The ESMF provides for the screening of project investments (referred to as "sub-projects") according to their likely environment and social impacts, and a determination of the level of Environment and Social Assessment (ESA) to be conducted for the sub-project. The "High Impact" category sub-projects require detailed ESA conducted by an independent agency, while "Low Impact" category sub-projects only require preparation of safeguard management plans, through environmental and social assessments (conducted as part of the DPR), aimed at identifying any adverse impacts and preparing mitigation plans. The ESMF provides detailed guidance, sample Terms of Reference and reporting structures for compliance with the ESA requirement. The ESA will determine the risk mitigation measures needed for the sub-project, including the preparation of detailed Environmental Management

Plans (EMP) and Social Impact Assessment and/or Rehabilitation Action Plan (RAP) as applicable. The ESMF is presented in detail in Annex 10.

132. ***Building Safeguards Management Capacity of NGRBA Institutions.*** The PMG and SPMGs are new entities requiring additional skills in management of social and environmental aspects, including safeguards. Most of the EAs are likely to be engineering oriented agencies with little capacity in safeguards. In order to build capacity in the NGRBA Program for management of social and environmental aspects, the project will support appointment of environmental and social specialists in the PMG and SPMGs, to monitor implementation of the ESMF and other social and environment related activities. At the sub-project level, the EAs will ensure that individual ESAs, EMPs, and RAPs are prepared and implemented, with possible support from qualified firms. The project will support safeguard training for all the engineering and safeguard specialists in the PMG, SPMGs, EAs and the contractors. While the World Bank will pay close attention to ensuring that the NGRBA Program's capacity for management of social and environmental issues is gradually strengthened, the Bank's supervision and responsibility for safeguards implementation in specific sub-projects will be limited to the investments financed by the project. It is also important to note that there are several investments in the project areas/cities, which are similar to those proposed under the current project. These projects are executed by local level entities either under the ongoing national programs such as JNNURM or through other funding agencies. Most of these investments are in the advanced stages of implementation. The ESMF prepared for the NGRBA programme will not be applicable on such investments, and these investments will not be supervised by the World Bank.

133. ***Strategic Environmental, Economic, and Social Assessment.*** Under the Institutional Development Component (Component One), the project will provide technical assistance to the NGRBA Program for systematic compilation and generation of knowledge on environment and social issues. The technical assistance will support a comprehensive and multi-disciplinary Strategic Environmental, Economic, and Social Assessment (SEESA) for the entire Ganga basin in India. The recommendations of SEESA will be available by the mid-term review of the project, and will be suitably integrated in various activities of the project and future initiatives of NGRBA.

F. Safeguard policies

134. Considering the distributed nature and significance of the interventions and anticipated impacts of the potential investments, the project is categorized as 'Category A', as per OP 4.01. In addition to OP 4.01, the project also triggers five other safeguard policies including OP 7.50 on International Waterways. In fulfillment of this policy, the other riparian countries of China, Nepal and Bangladesh have been notified, and no objections have been raised by these countries. Considering the proposed interventions in river front management and possible impacts on cultural properties, the project also triggers OP 4.11 on Physical Cultural Resources. Although the project will not have any direct or indirect impacts on natural habitats, considering the existence of a number of protected areas along the mainstem of the Ganga, OP 4.04 is triggered to accommodate future and third-party risks. Annex 10 provides a detailed description of safeguard management issues and proposed measures in the project.

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP 4.01)	[X]	[ ]
Natural Habitats (OP/BP 4.04)	[X]	[]
Pest Management (OP 4.09)	[ ]	[X]
Indigenous Peoples (OP/BP 4.10)	[X]	[]
Physical Cultural Resources (OP/BP 4.11)	[X]	[ ]
Involuntary Resettlement (OP/BP 4.12)	[X]	[ ]
Forests (OP/BP 4.36)	[ ]	[X]
Safety of Dams (OP/BP 4.37)	[ ]	[X]
Projects on International Waterways (OP/BP 7.50)	[X]	[ ]
Projects in Disputed Areas (OP/BP 7.60)*	[ ]	[X]

G. Policy Exceptions and Readiness

135. No policy exception has been sought.

136. **Readiness**: World Bank and Regional requirements for project implementation have been met.

* *By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas*

Annex 1: Country and Sector or Program Background

INDIA: National Ganga River Basin Project

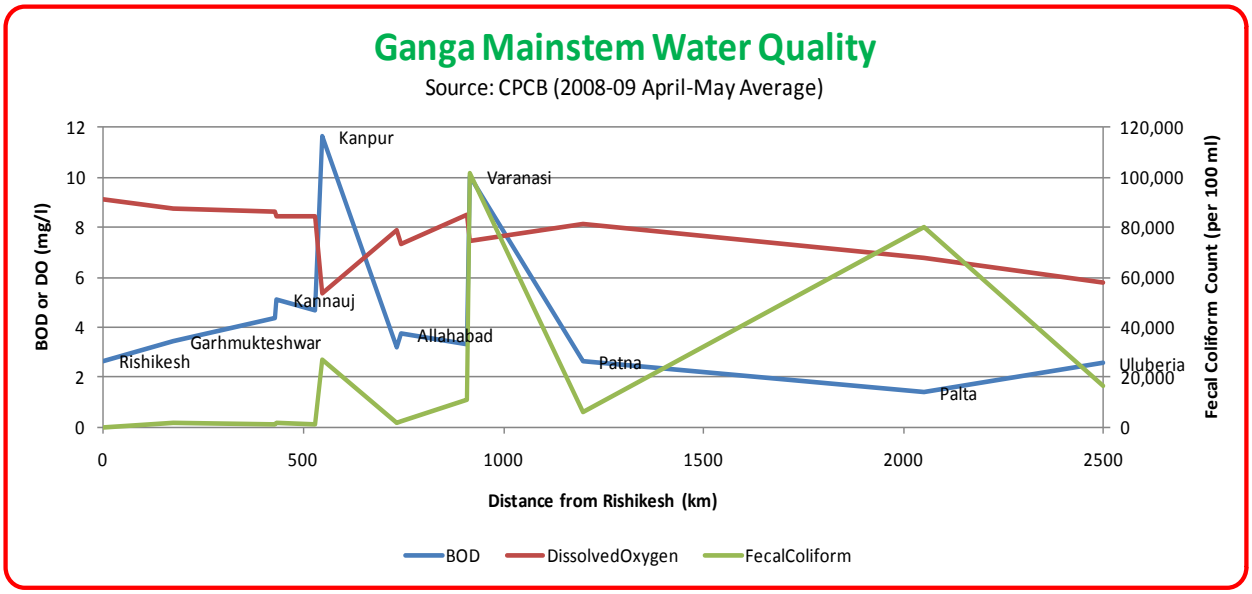
1. ***The Ganga Basin.*** The Ganga river has significant economic, environmental, and cultural value in India. Rising in the Himalayas from its source at Gomukh and flowing into the Bay of Bengal, the river traverses a course of more than 2,500 km through the plains of north and eastern India. The Ganga basin (which also extends into parts of Nepal, China and Bangladesh) covers over 861,404 square kilometers in India, accounting for about 26% of India's landmass, 25% of its water resources, and more than 40% of its population. There are more than 30 Class 1 cities (population more than 100,000) along the mainstem with a total population of more than 20 million people. There are also 14 Class 2 cities (population 50,000 to 100,000) on the mainstem, and an even greater urban population along tributaries in the basin. However, a majority of the basin population is in the rural areas. With a total population in India alone of approximately 400 million people, the Ganga basin is the most populated river basin in the world. Irrigation accounts for more than 90% of water consumption in the basin. Although the basin and all its tributaries cover 11 states, the mainstem runs through only five of these states: Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal.

2. ***Religious and iconic status.*** The Ganga is one of India's holiest rivers and has a cultural and spiritual significance that far transcends the boundaries of the basin. It has been deeply revered since time immemorial and many Indians view the river as a goddess and as *mokshadayini* (salvation giver) for departed souls. On important Hindu holidays, such as the *Kumbh Mela*, *Maghi Purnima*, and *Ganga Dussehra*, millions of people converge on the river in select cities to pray and bathe in the waters. The last *Maha Kumbh Mela*, held in 2001 in Allahabad, was attended by more than 60 million people, making it the largest gathering in the world anywhere in recorded history. Several of the basin towns, such as Haridwar, Allahabad, and Varanasi, are also extremely important both from a religious and a heritage point of view. For example, in Hindu mythology Varanasi is viewed as the centre of the universe and the first city created on earth. Varanasi is also one of India's most important heritage sites, with its world-famous *ghats* (the stepped riverfront) always alive with a mix of pilgrims and priests conducting religious rituals, local workers eking out a livelihood on the banks, and tourists in the boats that traverse the waters. Beyond the river's outlet into the sea in West Bengal, 150km south of Kolkata, lies the island of Ganga Sagar, which sees another annual pilgrimage of great scale. Finally, the basin itself is home to a myriad of iconic towns including Bodh Gaya in Bihar, where Buddha found enlightenment, and which remains a pilgrimage place for Buddhists from around the world.

3. ***Extreme Pollution Pressures.*** Despite this status and heritage, the Ganga is facing extreme pollution pressures and associated threats to its biodiversity and environmental sustainability. Due to increasing population in the basin and poor management of urbanization and industrial growth, river water quality has significantly deteriorated in recent decades, particularly in the dry season when low flows result in very poor water quality in the critical middle stretch of the river that runs from Kannauj to Varanasi in UP (Figure 1 shows a sample dry season water quality profile). In addition to these pressures, the problem is also linked to the weak capacity of local water and wastewater utilities in the basin, and to the poor state of environmental monitoring and regulation of point source pollution. These problems have been

further exacerbated by high levels of abstraction for irrigation limiting the assimilative capacity of the river for polluted discharge and leaving little water in the lean season for environmental benefits. The challenge of pollution in the Ganga is therefore predominantly linked to three key sectors: wastewater management; pollution monitoring and regulation; and water resources management in the river basin.

Figure 1: Ganga River Water Quality[17]



4. ***Point Source Pollution – Municipal Wastewater.*** The primary sources of pollution are untreated sewage and industrial wastewater. The total quantity of organic pollution load in terms of the Biochemical Oxygen Demand (BOD) produced by cities and industrial units is estimated to be in the order of 2.5 million kilograms per day. At present, only one-third of the sewage generated in the main-stem towns and cities is treated before being discharged into the river. According to CPCB, treatment capacity in Class 1 cities (population 100,000 and above) along the mainstem of the Ganga is only 1,174 MLD in comparison to 2,637 MLD of sewage generated (i.e. 44% treated). In Class 1 cities that dispose into tributaries of the basin, the shortfall is much worse with only 146 MLD in treatment capacity as compared to 907 MLD generated (i.e. only 16% treated). In Class 2 cities (population 50,000 - 100,000), the treatment shortfall is even worse, although absolute volumes of waste are also lower.

5. ***Point Source Pollution – Industrial Sources.*** Industrial sources account for about 20% of the total volume of wastewater inflows to the Ganga, with the contribution in terms of pollutant loading expected to be higher. Most of the pollution comes from untreated or poorly treated discharges from leather, pulp/paper, sugar, and brass industries, situated along the Ganga mainstem as well as two of its tributaries (Ramganga and Kali). About 50% of the total industrial pollution load emanates in UP. While almost 70% of the industries classified as "grossly polluting" (discharging a BOD load of more than 100 kg/day) have effluent treatment facilities,

[17] BOD (Biochemical Oxygen Demand) is a broadly used indicator of organic quality of water. DO (Dissolved Oxygen) indicates the Oxygen concentration in water, which is required for maintaining adequate water quality. Fecal Coliform Count indicates the level of water contamination by human or animal-origin fecal matter.

their performance is not satisfactory, and about 20% of the industries have been forced to close down. Many of the tanneries are small-scale enterprises with little capacity to pre-treat wastewater to requisite standards prior to discharge to the Common Effluent Treatment Plants (CETP). The CETPs in turn are also not able to meet discharge standards. The closure of industries under judicial orders has not brought about any significant change owing to the systemic nature of the problem.

6. ***Solid Waste Management.*** The water quality of Ganga is severely impacted by the poor state of solid waste management in almost all large and medium sized cities situated on the river. Indiscriminate dumping of solid waste along the banks of the river impacts water quality directly. Solid waste includes biodegradable waste, that increases BOD and SS levels, and non-degradable waste, like plastics that float. In both cases, river water quality is seriously affected making it unfit for drinking, bathing, or any other productive use. But poor solid waste management also affects water quality indirectly by using drains for disposal and storage, and thereby promoting anaerobic digestion in-situ and the discharge of highly polluted drain water into the river.

7. ***Non Point Source Pollution.*** Due to intensive agriculture and high densities of population and livestock, non-point sources could be significant contributors to the pollution in the Ganga; however, little is known about the loading, timing, or trends of pollutants from such sources. Although some studies are available showing negligible levels of pesticide in the river water, there are no systematic studies or estimations of nutrient and waste loading from non-point sources, or of bioaccumulation and benthic sediment concentrations density.

8. ***The Evolving Scenario on Ecological Flows.*** With almost 90% of the annual rainfall occurring during the short monsoon period of 3-4 months, the intra-annual variability of river flow is high, and the situation becomes critical during the lean period when different uses compete for limited volumes of water. India's National Water Policy currently lists Ecology as the 4th priority for planning and operation of systems. The Central Water Commission of India has suggested that minimum flow be maintained at not less than 10% of average virgin lean period flow (i.e. December to May). In addition to the existing irrigation abstractions, the issue of minimum flows is linked to hydropower development in the upper reaches of the Ganga, which holds approximately 12% of the total hydro potential of India at a time when increasing power generation to sustain economic growth is emerging as a national priority. In addition to environmental pressures, the religious and cultural importance of in-stream flows in the upper reaches of Ganga has also featured prominently in the civic discourse, and on November 1, 2010, the Government of India declared a significant stretch of the upper Ganga tributary as an eco-sensitive zone, aimed at the preservation of the virgin riverscape. The situation is continually evolving, and the Government of one Himalayan state (Himachal Pradesh) has laid down 15% of lean flow as the required minimum flow downstream of the diversion structures.

9. ***Legal and Regulatory Framework.*** The Constitution of India lists water as a subject primarily under the jurisdiction of the States. However, the Union Government is given jurisdiction in regulation and development of inter-state rivers (such as the Ganga) when the Parliament declares this by law to be in the public interest. Several inter-state river boards (e.g. the Brahmaputra Board in 1980, the Narmada Control Authority in 1980, the Upper Yamuna Board in 1985) have been created under this provision. The Parliament also passed the River

Boards Act in 1956, giving the Union Government the specific power to establish Boards for management and development of inter-state rivers.

10. ***Environmental Legislation***. The era of targeted environment legislation began in India in the 1970s, followed by a period of incremental strengthening. The Water (Prevention and Control of Pollution) Act, 1974 enabled the formation of new institutions, in particular Central and State Pollution Boards for the prevention and control of water pollution. Shortly after, the Water Cess Act (1977) was passed, requiring specific industries to pay a cess on their water consumption. The subsequent enactment of the Air Pollution Prevention and Control Act (in 1981) signaled the need for a more integrated approach to pollution control, with the Pollution Boards mandated to regulate air pollution as well. However, these Acts are mostly punitive in nature. The Environment Protection Act, passed in 1986, is a more comprehensive and enabling Act, giving the Central Government powers to regulate and protect the environment, including for setting standards and planning and executing nation-wide programs.

11. ***Central and State Environmental Regulators.*** The State Pollution Control Boards (SPCBs) are responsible for compliance with the water pollution regulations, through licensing of discharge permits, monitoring of wastewater discharges and water quality, and enforcement. However, the SPCBs in almost all Ganga-basin states are under-resourced and do not have adequate staff or equipment to carry out their assigned functions. Also, their focus remains primarily on industrial pollution and not on municipal wastewater sources. The main functions of the Central Pollution Control Board (CPCB) are to collect, collate, and publish technical and statistical data relating to water quality; coordinate activities of the SPCBs; prepare manuals, codes and guidelines relating to treatment and disposal of sewage and industrial effluents; and to set water quality standards. CPCB is also the nodal technical agency mandated to advise the Ministry of Environment and Forests (MOEF) in the prevention, control and abatement of water pollution. It has several divisions based in Delhi as well as zonal offices in the field, and maintains several of its own labs. Although the CPCB as an apex national agency has some very good technical staff, it too remains significantly under-resourced like the SPCBs.

12. ***Status of Urban Services Provision.*** The ULB service providers have the primary responsibility for wastewater, solid waste and river front management. The quality of urban governance and service provision is therefore an important determinant of pollution in the Ganga. While a Constitutional Amendment in 1993 gave ULBs the legal authority and greater functional powers in provision of local services, the local governments still have significant capacity and resource constraints, collectively accounting for only 5% share of the total consolidated public sector expenditure. Actual devolution of functions and responsibilities from states to ULBs has been limited, and the responsibilities for urban services overlap considerably across state and local agencies. In addition, most Municipal Acts do not provide appropriate incentives for accountability, and systemic institutional weaknesses continue. Urban services, such as water supply and wastewater management, and solid waste management, are usually provided by line departments within the city administration, with a strong bias towards the provision of outputs rather than outcomes. Improvements in service provision are hampered by an inability to recover basic O&M costs from users. Even services like water supply which do attract user fees are not financially independent, client-oriented, or professionally specialized.

13. ***ULB Finances.*** The ULBs suffer from a range of financial constraints, including: (i) a lack of buoyant revenue streams, with existing local sources being both inadequate and poorly mobilized (e.g. property tax, user charges) and fiscal transfer from higher levels being unpredictable; (ii) weak asset management; (iii) inadequate financial management, assurance and information systems; (iv) reluctance of elected municipal councils to charge for improved services even though some users are willing to pay; and (v) non-transparent subsidy mechanisms. These fosters a dependence on concessional or public finance, especially as access to market finance is limited.

14. ***The Urban Renewal Agenda and JNNURM.*** Realizing the contribution of urban areas to the economic output (an estimated 70% of GDP is produced in cities) and the massive urban transformation already underway (with an urban population estimated to increase from 282 million in 2000 to 590 million in 2030), the GoI has launched a concerted program of urban renewal. The situation on the ground is rapidly changing. ULBs are receiving significantly more funds to improve their infrastructure, report on service levels, prepare city development and sanitation plans, and increase their systems and human capacity. Overall progress is positive and although the rate of change is variable, the trend is very clearly towards ever greater responsibilities lying with the ULBs. The Government's flagship urban development program is the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), which was launched in 2005. The Mission targets 65 cities with million-plus population, 15 of which are in the Ganga Basin (some wastewater investments in sewer networks, pumping stations and WWTPs are being funded by JNNURM in Ganga basin cities like Kanpur and Allahabad). JNNURM is a policy and incentive based program: in return for a commitment to adopt obligatory reforms over a period of seven years, cities may access funds for investment and capacity building. To date, the GOI has allocated more than US$ 10 billion for qualifying ULBs. The kinds of reform related to urban management include: (i) levying reasonable user charges for municipal services; (ii) adoption of modern accrual-based double entry system of accounting; (iii) introduction of e-governance systems; and (iv) improving property tax collections with MIS. Furthermore, the National Urban Sanitation Policy, issued in 2009, requires the states to prepare State Sanitation Policies, and the cities to prepare City Sanitation Plans (CSPs).

15. ***Pro-poor Urban Development.*** The JNNURM has been designed incorporate and enable the provision of basic services to the poor and to support integrated development of slums. It provides for: (i) internal earmarking of funds within local body budgets for basic services to the urban poor, and (ii) reservation of at least 20-25% of developed land in all housing projects (both public and private agencies) for Economically Weaker Section/ Low Income Group category with a system of cross-subsidization. JNNURM also requires the states and the ULBs to formulate and adopt an overarching policy on the provision of Basic Services to the Urban Poor addressing the 7-point charter pertaining to: provision of security of tenure at affordable prices, improved housing, water supply, sanitation, education, health and social security. These reforms have been introduced to ensure that a dedicated budget is created at the city and state level for urban poverty alleviation and slum upgradation; the urban poor have access to land and are not squeezed out of the housing market due to mounting land prices; and that poor are systematically provided with basic services based on agreed milestones

16. ***Previous Efforts to Clean the Ganga – The Ganga Action Plan (GAP)***. In 1985, the Government of India launched the Ganga Action Plan (GAP) to clean up the river. The Central

Ganga Authority (CGA) was established as the apex body with the mandate to guide the program, develop policy, and monitor implementation. A Ganga Project Directorate was established within the MOEF to implement the program. Originally designed as a 5 year program and provided with 100% funding from the Central Government, the GAP was extended to a second phase and the objective of the program was subsequently recast from preventing pollution from reaching the river to restoring the river water quality to 'bathing class' (corresponding to the standard of BOD 30 mg/L, DO 5 mg/L, and Fecal Coliform 2,500 per 100 ml). The program has evolved significantly over two decades, and in 1995 it was extended to many more rivers across 20 states. The directorate was thereby renamed as the National River Conservation Directorate (NRCD).

17. GAP's primary strategy was to intercept and divert ("I&D") wastewater from open drains and sewers, and then treat it prior to discharge in the river. The goal was to treat about two-thirds of the sewage estimated to be generated in main cities and towns in three states (UP, Bihar and West Bengal). The second phase (GAP II) expanded investments to more cities, tributaries, and states. A similar program called the Yamuna Action Plan (YAP) was also launched for the Yamuna –the biggest tributary of the Ganga—again in two phases and with substantial development assistance from Japan.

18. A large number of WWTPs and related infrastructure (e.g. sewer networks, interceptor drains, and pumping stations) were built in the Ganga basin under GAP I and II. The focus was almost entirely on end-of-the-pipe treatment infrastructure, without adequate attention to ensuring comprehensive planning and without addressing the issues of long-term sustainability of investments. In initial years, industrial pollution was expected to be addressed through enforcement action and not allocated public funding. Ultimately, two CETPs were funded, in Kanpur and Kolkata.

19. ***GAP's Impact on Water Quality.*** CPCB data show that water quality in terms of BOD improved over baseline in many locations where significant investments were made by GAP, and the decline in water quality was arrested in most locations. A pre-and post-GAP water quality analysis using 15 pollution parameters also showed that although the overall basin mean water quality did not show a significant difference, key water quality parameters like BOD and DO had improved at numerous specific locations during twenty years of GAP. Bacterial pollution, however, registered an increase, as measured in Fecal Coliform counts. In brief, GAP interventions were able to maintain or even improve water quality in the face of significant increases in pollution loading due to urban and industrial growth of two decades. Though the pollution reduction impact of GAP was moderately positive, it was far less than needed to meet the stated objective of 'bathing class' water quality.

20. ***Weaknesses of GAP Implementation*** A number of reviews and evaluations conducted for the GAP highlighted the main weaknesses of the program: (i) *failure to adequately plan for urban population growth:* although GAP ultimately created 92% of the targeted WWTP capacity, the increase in the volume of generated wastewater exceeded the capacity by far; (ii) *underutilization of created WWTP capacity due to irregular power supply, inadequate household connections, and inadequate O&M*; (iii) *insufficient coordination*, leading to implementation delays; (iv) *inadequate water quality monitoring and insufficient investment in public participation;* and (v) *weak institutional management*, with the high-level CGA working without sufficient executive support needed for the professional day-to-day management of the program, and with the Urban Local Bodies (ULBs) only acting as recipients of funds without a genuine

involvement in the program. The reviews also reported financial management issues such as inflated expenditure reporting, large unutilized balances, and misuse or diversion of funds.

21. ***Economic Evaluation of GAP.*** A major study commissioned by Oxford University conducted the economic analysis of GAP based on its impacts on health, agricultural production, fisheries, ecosystems services, as well as intangible benefits from recreational and cultural impact of reducing pollution to the river. The study found that the combined benefits by far exceeded the cost of the program, with the largest fraction of benefits accruing from non-consumptive uses of the river.

22. ***Small Successes but a Big Failure in Public Relations.*** In addition to the shortcomings mentioned above, GAP has suffered from inadequacy of investments and weak public participation: (i) GAP's cumulative spending on the clean-up of this major river amounted to approximately $250 m over 25 years, which is a small sum relative to the scale of the problem and the unrealistic target that was set for it; (ii) GAP failed to effectively communicate to the public the challenges and the achievements of river clean-up. As a result, notwithstanding the moderate gains made in arresting the rate of water quality degradation, GAP remains widely perceived as an enormous failure with a huge cost to the public.

23. ***Current Status of GAP-funded Assets.*** Almost half of the wastewater treatment capacity created under GAP I was based on conventional aerobic systems, which have significant O&M costs. With insufficient resource allocations from the ULBs, a number of these WWTPs are operating below capacity and are sometimes unable to meet effluent quality standards. Many WWTPs are in need of rehabilitation to optimally utilize the installed capacity and to meet prescribed discharge standards. In contrast, technologies like Waste Stabilization Ponds and Up-flow Anaerobic Sludge Blanket (UASB), which were introduced on a pilot basis, have performed much better with lesser dependence on electricity and lower O&M costs. Wastewater collection systems also suffer from inadequate coverage and operational difficulties. Sewage pumping stations are often operated infrequently, and most I&D systems often discharge sewage directly into the river during the rain events.

24. ***Current Quality of Investments Preparation.*** A technical review was undertaken for a sample of key wastewater investments currently being proposed for funding in the Ganga basin cities. Reviews of the Detailed Project Reports (DPRs) indicate that investment planning is often undertaken without pre-feasibility or feasibility studies, optional analysis, economic analysis, or social and environmental assessments. In some cases, the technical quality of preparation is not good. Finally, the DPRs often miss a consideration of the post-execution issues, e.g. ownership of assets, resource allocation for long-term O&M, and sustained public participation. Links between asset creators and asset operators are weak or non-existent. As such, the process for investments selection, preparation and appraisal needs to be reformed in order to ensure quality and sustainability of investments.

The Renewed Effort to Clean the Ganga

25. ***Launch of NGRBA.*** The National Ganga River Basin Authority (NGRBA) was constituted in 2009 by notification under the Environment (Protection) Act of 1986. It was established with a multi-sector mandate to ensure pollution abatement in the Ganga, by addressing both water quantity and quality aspects, and by adopting a river basin approach. Its powers are significant and combine regulatory and developmental functions, including, for example, development of river basin management plans, and facilitation of their implementation.

Through its 'Mission Clean Ganga', the NGRBA has resolved that by year 2020 no untreated municipal sewage or industrial effluents will be discharged into the mainstem of the river. The Central Ministry of Environment and Forests (MoEF) has been designated as the nodal agency for the program. The notification stipulates that the NGRBA "may evolve an appropriate mechanism for implementation of its decisions".

26. ***Composition and Structure of the NGRBA.*** The NGRBA has been established as a collaborative institution of Central and state governments. It is chaired by the Prime Minister. Members include key GoI ministers (water resources, environment and forests, power, finance, urban development, science and technology, as well as the Planning Commission) and the Chief Ministers of the five primary basin states (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal). NGRBA also has representation of 9 non-official members from the civil society, and can "co-opt" members from the other six basin states.

27. ***NGRBA Committees.*** Two additional layers of governance have been established, namely:

(a) The NGRBA Standing Committee , headed by the Union Finance Minister and consisting of the Union Ministers of Urban Development, Water Resources, Environment and Forests, the Deputy Chairman of Planning Commission and the Chief Ministers of the 5 basin states. The Secretary, Union Ministry of Environment and Forests, is the Member Secretary of the Standing Committee. The Committee is tasked with holding regular reviews to assess the implementation status of the NGRBA program.

(b) The NGRBA Empowered Steering Committee, headed by the Secretary of the Ministry of Environment and Forests. Its members include Secretaries of the Ministry of Finance (Department of Expenditure), Urban Development, Water Resources, Power, Science and Technology and Secretary of Planning Commission, Chief Secretaries of the 5 states, Chairman of CPCB, and Additional Secretary and Finance Adviser of MOEF. The Mission Director of NGRBA is its Member Secretary. The mandate of the Empowered Steering Committee is to facilitate co-ordination with the Central and State Government departments and to prioritize and sanction projects on a fast track basis. This model is based on the approach adopted for JNNURM by the Ministry of Urban Development.

(c) In addition, a Research Advisory Committee (RAC) has been established to assist the NGRBA, with the mandate to identify and support areas of research pertinent to the challenge of cleaning and conserving the Ganga. RAC has ten members nominated from various fields of expertise and organizations, such as pollution control, eco-systems, hydrology, civil engineering and public health and environmental engineering.

28. ***State Ganga River Conservation Authorities***. Each of the five states has constituted a State Ganga River Conservation Authority (SGRCA), under the Environment Protection Act, to coordinate and implement the NGRBA program's river cleaning and conservation activities in the state. The SGRCA in each state is headed by the Chief Minister, and supported by a State Executive Committee to coordinate and monitor the implementation of the program activities.

29. ***The Ganga Basin Management Plan***. The NGRBA/MOEF has reached an agreement with a consortium of the seven Indian Institutes of Technology (IITs), to develop the basin-level planning process for Ganga. The dynamic basin planning process will guide the clean-up and conservation of the Ganga river system, by developing a list of investments prioritized at the

basin level. The plan will take into account the growing population, urbanization, industrialization, and agricultural growth, while ensuring the requirements of continuous flow (*Aviral Dhaara*), unpolluted flow (*Nirmal Dhaara*), longitudinal and lateral connectivity, adequate space for various river functions, and ecological flows, as articulated in the mission of the NGRBA. IIT Kanpur will coordinate the effort with outputs expected in phases over a 12-18 month period.

30. ***Key Differences from the Previous Approaches to Ganga Clean-Up and Conservation***. The design of the NGRBA program aims to address the shortcomings of the previous efforts and marks a concerted shift towards a long-term, multi-sectoral and river basin approach. It recognizes upfront the large scale of investments needed to deliver stated objectives; the need for ensuring the long-term sustainability of investments; and the importance of broad-based public awareness and strategic communications campaigns, along with visible improvements, to build mass support for conservation and clean-up of the Ganga. Even more importantly, while there exist a number of experienced state-level technical agencies which are qualified to execute infrastructure investments, it is acknowledged that dedicated professional entities are needed at both central and state levels for implementing the NGRBA program. The following table summarizes the key lessons from the previous efforts, as reflected in the design of the NGRBA program.

	Key Feature	**Ganga Action Plan (GAP)**	**NGRBA Program**
1.	Legal Basis	Central Ganga Authority (CGA) constituted in 1985 by a government order, but not under a legal act. CGA renamed as National Rivers Conservation Authority (NRCA).	NGRBA constituted in 2009 through a legal GoI notification under Section 3 of the Environment Protection Act (1986), giving it regulatory and enforcement powers. State Ganga River Conservation Authorities (SGRCAs) constituted in 5 states under the same Act.
2.	Implementation Arrangements	CGA/NRCA supported by Ganga Project Directorate (GPD), established as a wing of the Department of Environment. GPD later renamed as National Rivers Conservation Directorate (NRCD). No dedicated state level entities for planning and managing the program	At central and state levels, dedicated agencies being established as the operational arms of the NGRBA and SGRCAs, for leading the implementation of the NGRBA program on a full time basis. Agencies constituted formally with appropriate structure, staffing, powers and leadership.
3.	Program Planning and Management	Program planned and managed centrally.	Program planning and management functions shared between dedicated central and state agencies.
4.	Separation between Management and Execution	No separate state-level management entities distinct from the investment executing agencies.	Investments executed by Executing Agencies (EAs) which are accountable to the state-level entity dedicated to program planning and management.
4.	Resource needs	Combined allocation of approx. $ 350m over more than 20 years under GAP I and II	The significant resource needs are recognized upfront. $4bn allocations are planned for NGRBA investments upto 2020.
5.	Basin-wide Investments Planning	Town-based approach - No basin-wide planning or prioritization.	River basin-wide planning approach: River Basin Masterplan being prepared to guide investments
6.	Comprehensive	Primary focus on Interception and	Wastewater investments designed to

	wastewater management	Diversion (I&D) of wastewater	achieve maximum pollution load reductions while improving sanitation through sewerage expansion.
7.	Sustainability of investments	No resources or efforts devoted to post-construction and operational sustainability of investments	Operational sustainability of investments ensured through: (i) committed allocations for O&M expenses; (ii) long-term Design-Build-Operate (DBO) contracts; and (iii) building financial and technical capacity of ULBs
8.	Role of ULBs	ULBs not involved in planning or implementation of local investments and acted as passive recipients of infrastructure	ULB review and consent a prerequisite for appraisal of investments proposed for funding. ULBs are integral stakeholders in planning and implementation process.
9.	Sectors of Intervention	Investments focused primarily on 'core areas' of urban sewerage and sewage treatment.	Investments in four main sectors: municipal wastewater, industrial pollution, solid waste, and river front management
10.	Ecological Flows	No emphasis on establishing and maintaining minimum flows	Clear recognition of the need for meeting environmental flow needs, and mandate to work on it.
11.	Non-point source pollution	Non-point source pollution sources not recognized or addressed.	Emphasis on assessing the extent of non-point source pollution, and clear mandate to address it.
12.	Technology choices	Inadequate attention to cost-effectiveness of technologies selected for wastewater treatment, leading to costly choices.	Technology selection based on lowest life-cycle cost principle
13.	Water Quality Monitoring	Water quality monitoring initiated but discontinued after a few years	Complete upgrading and modernization of the Ganga water quality monitoring system .
14.	Knowledge	Little effort invested in technical, environmental and ecological knowledge consolidation, dissemination and its systematic use.	Establishment of Ganga Knowledge Center for compilation, analysis and use of information for decision-making and public dissemination.
15.	Environmental Regulation	No investment in addressing the capacity constraints of national and state-level environmental regulators	Dedicated resources for enhancing the capacities of central and state environmental regulators, for environmental compliance and monitoring.
16.	Communications and Public Participation	Absence of a strong communications and public participation component.	Communications and public participation integral elements of program design, through; (i) dedicated resources for national as well as local multi-media communication; (ii) civil society members of NGRBA; (iii) formal strategy of engaging local CSOs as partners in NGRBA investments.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

INDIA: National Ganga River Basin Project

1. This project will be the first Bank-financed project in the region on river clean-up and conservation in a basin context. Previous efforts by the Government of India (GoI) and others to clean the Ganga have been different in scope and the river basin context has not been considered.

2. ***Previous efforts to clean the Ganga.*** The lessons of these previous efforts are very significant for the current NGRBA initiative, and both GoI and the World Bank have conducted a comprehensive review of the various assessments of these previous efforts, which specifically include the following:

(a) The Ganga Action Plan (GAP) Phases I and II

(b) The Yamuna Action Plan (YAP), funded primarily by the Japanese International Cooperation Agency (JICA), to address pollution in the largest tributary of the Ganga

(c) The World Bank funded Uttar Pradesh Urban Development Project, which included a component to support the GAP.

3. ***Lessons from other efforts.*** The other Bank projects and initiatives reviewed in the preparation process include the following :

(a) the Bank's global experience with clean-up and conservation, basin management, and water quality improvement;

(b) the Bank's experience with urban projects in India, including in the water, wastewater, and solid waste sectors;

(c) previous international efforts to clean large international rivers, like the Danube and the Rhine, as well as smaller national rivers, like the Singapore and the Thames; and

(d) previous and ongoing Indian efforts to clean its own rivers, like the Sabarmati and the Cooum.

4. The following table summarizes the relevant World Bank projects:

Project Name	**Project Development Objective**	**Status**	**ISR Ratings for Projects in Implementation**		**OED Rating for Projects Completed**
			IP rating	**DO rating**	
INDIA URBAN SECTOR					
Uttar Pradesh Urban Development Project (Loan 2797/Credit 1780-IN; US$150 million)	To support improvements in urban sector management and institutional strengthening and to reduce deficits in urban shelter, infrastructure and services in the State; and to assist the Central Ganga Authority in its efforts to reduce pollution levels in the Ganga River.	Loan cancelled in 1991 Credit completed in 1996			U

Tamil Nadu Urban Development Project III (LN 47980; $300 million)	To improve the delivery of urban services through enhancing the quality of urban infrastructure and strengthening the institutional and financial framework.	Ongoing	MS	MS	
Karnataka Urban Water Supply Improvement Project (LN 47300; $39.5 million)	The main objectives are to: (a) launch the UWS reform process based on the new "Urban Drinking Water and Sanitation Policy"; and (b) improve UWS services in the participating ULBs and demonstrate that sustainable, efficient, and commercially-oriented service provision can be achieved.	Active, (expected closing 2011)	S	S	
Karnataka Municipal Reform Project (Loan 4818; $216 million)	To help improve the delivery of urban services through enhancing the quality of urban infrastructure, and strengthening the institutional and financial frameworks for urban services at the ULB and state levels.	Active (expected closing 2012)	S	MS	
Hyderabad Water Supply Project (LN 31810-IN Cr.21150-IN; US$81.9 million)	To improve the adequacy and reliability of the water supply, the collection, treatment and disposal of waste water and the provision of excreta disposal facilities; and strengthen the management and technical capacity of the concerned institutions.	Completed 1998			S
Bombay Sewerage Disposal Project (Cr.2763-IN Loan 3923-IN; US$156million)	To strengthen the capacity of the WSS Dept of the Municipal Corp of Greater Bombay in all aspects of the management of the provision of sewerage services; sustain the financial viability of the provision of water supply and sewerage services in Greater Bombay; and improve the health and environmental conditions.	Completed 2003			S
INDIA WATER RESOURCES SECTOR					
Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project (Cr. $150million; Loan $335million)	The project development objective is for selected sub-basin stakeholders to increase irrigated agriculture productivity in an integrated water resources management framework.	Active	S	S	
Maharashtra Water Sector Improvement Project (Ln.4796; $325 million)	The project development objectives are to strengthen the state's capacity for multi-sectoral planning, development and sustainable management of the water	Active	S	S	

	resources and improve irrigation service delivery.				
Madhya Pradesh Water Sector Restructuring Project (Ln.4750; $396 million)	The project development objective is to improve productivity of water for sustainable growth and poverty reduction in selected focus river basins of the state.	Active	MU	MS	
Hydrology Project Phase II (Loan 4749; $105 million)	The project development objective is to extend and promote the sustained and effective use of the Hydrologic Information System (HIS) by all potential users concerned with water resources planning and management, both public and private, thereby contributing to improved productivity and cost effectiveness of water related investments in 13 States and 8 central agencies.	Active	MS	MS	
UP Water Sector Restructuring Project (Cr. 3602-IN; $150 million)	To improve the productivity of water and irrigated agriculture through strengthening of institutional capacity for water resources management and irrigation and drainage services, and modernization of selected physical assets.	Active	MS	MS	
Rajasthan Water Sector Restructuring Project (Cr. 3603-IN; $140 million)	The project strengthens WR planning, development and management and increases irrigated agriculture productivity through institutional strengthening and improved irrigation systems.	Active	S	S	
Hydrology Project (Cr.2774-IN; $142 Million)	The project assisted GOI and nine states to develop comprehensive easily accessible hydrologic information systems using common standards, processes and procedures. The project financed improved hydrological and hydromet data networks and data processing systems, TA and institutional strengthening.	Closed			S
GLOBAL POLLUTION MANAGEMENT PROJECTS					
Argentina Matanza Riachuelo Basin Project (LN 77060; $840 million)	The PDO aims to: (i) improve sewerage services in the MR River Basin & other parts of the Province and City of Buenos Aires by expanding transport and treatment capacity; (ii) support a	Active	MU	MU	

	reduction of industrial discharges to the M-R River, through the provision of industrial conversion grants to small and medium enterprises; (iii) promote improved decision making for environmentally-sustainable land use and drainage, and (iv) strengthen the basin agency's institutional framework for ongoing and sustainable clean-up.				
Argentina Pollution Management Project (LN 42810; $18 million)	(i) To strengthen the institutional capacity of the Natural Resources and Sustainable Development Secretariat to pilot, demonstrate and coordinate the mainstreaming of innovative pollution management instruments, through technical assistance and selected investment activities to address priority pollution problems, and (ii) for the Secretariat to internalize the lessons learned from the pilots and strengthen its capacity to replicate the positive results.	Closed in 2003			MS
Brazil Water Quality and Pollution Control Project to the States of Sao Paulo and Parana (LN 35050, LN 35030, LN 35040 ; $245 million)	To: (i) abate current water pollution levels, and preserve water quality, in the cities of São Paulo (São Paulo State) and Curitiba (Paraná State); (ii) help establish a sound policy for water pollution control in the two project states including the creation of river basin management units; (iii) help develop the financial capacity for the provision of services under the jurisdiction of the river basin unit, based as much as possible on the "polluter-pays principle"; and (iv) help start water pollution control projects in some of the most congested urban areas of Brazil.	Closed in 1999			S
China Yunnan Urban Environment Project (LN 79370, LN 76920 ; $90 million)	To Yunnan Province in improving the effectiveness and coverage o f critical urban infrastructure services in selected counties and the effectiveness of lake-basin management in Dianchi, through investments in systems for the management o f wastewater, water supply, solid waste, river environment and cultural heritage.	Active	S	S	

China Liao River Basin Project (Ln 46170; $100 million)	The development objective is to assist the environmental recovery of the Liao River Basin in Liaoning Province and to enhance water quality management decision-making on the basis of an integrated river basin management approach.	Closed in 2008			S
China Huai River Pollution Control Project (LN 45970; $105 million)	To support Government efforts to upgrade water quality in the Huai River Basin (one of the most polluted river systems in China), in particular in the provinces of Anhui and Shandong. This objective would be achieved through improved collection and treatment of wastewater in a number of municipalities in the two provinces in a sustainable manner.	Closed in 2008			S
China Hai Basin Integrated Water and Environment Project (TF 53183; $17 million GEF grant)	To catalyze an integrated approach to water resource management and pollution control in the Hai Basin in order to improve the Bohai Sea environment. To improve integrated water and environment planning and management in the Hai Basin; support institutional aspects related to effective local, municipal, provincial, and basin-wide water and environment planning and management; enhance capacity building in water and environment knowledge management and implementation; reduce wastewater discharges from small cities along the rim of the Bohai Sea.	Closed in 2010			HS

HS-Highly Satisfactory; S-Satisfactory; MS-Moderately Satisfactory; MU- Moderately Unsatisfactory; U-Unsatisfactory; NA-Not Applicable

Annex 3: Results Framework and Monitoring

INDIA: National Ganga River Basin Project

Results Framework

PDO	Outcome Indicators	Use of Outcome Information
National Ganga River Basin Authority (NGRBA): (a) builds capacity of its nascent operational-level institutions for managing a comprehensive Ganga clean-up and conservation program; and (b) reduces point-source pollution loads through sustainable interventions at selected locations on the Ganga.	1. Average rating of NGRBA-related institutions[18] 2. Volume of untreated wastewater prevented from entering the Ganga due to project interventions (mld)[19] 3. Improvements in river water quality at targeted locations with significant investments	1. Adaptive project management 2. Assessing project impact 3. Lessons for future phases of NGRBA Program
Intermediate Results	**Result Indicators for Each Component**	**Use of Results Monitoring**
COMPONENT-1: Institutional Development		
Sub-Component 1: NGRBA Operationalization and Program Management Fully staffed and operational NGRBA institutions	1. Percent of planned professional staff positions filled in NGRBA institutions at central and state levels 2. PMG's capacity rating[20] 3. SPMGs' capacity rating[21]	1. Adaptive project management 2. Identification of additional staffing and training needs
Sub-Component 2: Technical Assistance for ULB Service Providers Enhanced ULB capacity to manage NGRBA-funded assets	1. ULB's capacity rating on project related aspects[22]	1. Adaptive project management 2. Identification of additional capacity-building requirements 3. Lessons for scaling-up to other ULBs
Sub-Component 3: Technical Assistance for Environmental Regulators Enhanced capacity of environmental regulators to monitor Ganga water quality and ensure regulatory compliance	1. Environmental regulator's capacity rating on project related aspects[23]	1. Adaptive project management 2. Identification of additional staffing, training, laboratory, and

[18]The institutional rating assesses the capacity and performance of various institutions involved with the implementation of the project. This indicator is calculated by taking weighted average of institutional ratings for PMG (30%), SPMGs (40%), ULBs (15%) and Environmental Regulators (15%). The institutional rating for each of these institutions would be calculated by scoring staffing (in terms of targeted key staff in place) and performance in key functional areas.

[19] Wastewater treated to applicable effluent discharge standards.

[20]Based on evaluation of staffing and performance in key functional areas relating to project activities (senior management, governance, administration, technical, procurement, financial management, planning, safeguards, knowledge management, training, and communications) for target year

[21]Based on evaluation of staffing and performance in key functional areas relating to project activities (senior management, governance, administration, technical, procurement, financial management, planning, safeguards, knowledge management, training, and communications) for target year

[22] Based on evaluation of staffing and performance in key functional areas relating to project activities (activity management, information systems, equipment performance, and consultancy progress) for target year

[23] Based on evaluation of staffing and performance in key functional areas relating to project activities (activity management, water quality monitoring, laboratory analysis, public access, and awareness building) for target year

		expertise needs
Component-2: Priority Infrastructure Investments		
Sector-1: Municipal Waste Water Management		
Effective and Efficient Implementation of Investments and Sustainable Operation of Municipal Waste-Water Management Facilities	1. Treatment Capacity Created (mld) 2. Treatment Capacity Utilization (% of created capacity) 3. Cumulative actual ULB contributions for O&M as a percentage of agreed ULB contributions 4. % investments implemented with dedicated stakeholder engagement and communication activities	1. Adaptive project management 2. Assessment of investment performance 3. Identification of additional technical assistance requirements
Sector-2: Industrial Waste Water Management		
Effective and Efficient Implementation of Investments and Sustainable Operation of Common Effluent Treatment and Hazardous Waste Disposal Facilities	1. % of Targeted Treatment Capacity Created (mld) 2. Treatment Capacity Utilization (% of created capacity) 3. % investments with agreed industry contributions to O&M	1. Adaptive project management 2. Assessment of investment performance 3. Identification of additional technical assistance requirements
Sector-3: Solid Waste Management		
Effective and Efficient Implementation of Investments and Sustainable Operation of Solid Waste Management Facilities	1. % of targeted tons of solid waste removed through project investments 2. Cumulative actual ULB contributions for O&M as a percentage of agreed ULB contributions 3. % investments implemented with dedicated stakeholder engagement and communication activities	1. Adaptive project management 2. Assessment of investment performance 3. Identification of additional technical assistance requirements
Sector-4: River Front Management		
Effective and Efficient Implementation of Investments and Sustainable Operation of River Front Management Projects	1. % of targeted river front management investments completed 2. Cumulative number of fully developed proposals conforming to the framework standards that are taken up for funding by NGRBA 3. % investments implemented with dedicated communications and public participation components	1. Adaptive project management 2. Assessment of investment performance 3. Identification of additional technical assistance requirements

Results Framework

Indicators	Baseline Value	Target value								Data Collection and Reporting		
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Frequency and Reports	Data Collection Instrument	Responsibility
		PDO Indicators										
Average rating of NGRBA-related institutions	0	1	2	3	4	5	6	7	8	Annual	M&E System, Periodic progress reports	PMG
Volume of untreated wastewater prevented from entering the Ganga due to project interventions (mld)	0	0	0	16	50	100	165	220	270	Annual	M&E System, Periodic progress reports	PMG
% of targeted locations that observe improvements in river water quality[24]	0%	0%	0%	0%	10%	20%	30%	40%	50%	Annual	M&E System, Periodic progress reports	CPCB
		Component-1: Institutional Development										
		Sub-Component 1: NGRBA Operationalization and Program Management *(Fully staffed and operational NGRBA institutions)*										
Percent of planned professional staff positions filled in NGRBA institutions at central and state levels	5%	30%	75%	90%	100%	100%	100%	100%	100%	Annual	M&E System, Periodic progress reports	PMG & SPMGs
PMG's capacity rating	0	3	5	6	7	8	8	9	9	Annual	M&E System, Periodic progress reports	PMG
SPMGs' capacity rating – by State	0	3	5	6	7	8	8	9	9	Annual	M&E System, Periodic progress reports	SPMG
		Sub-Component 2: Technical Assistance for ULB Service Providers *(Enhanced ULB capacity to manage NGRBA-funded assets)*										
ULB's project performance rating	0	n/a	2	4	5	6	6	7	7	Annual	M&E System, Periodic progress reports	SPMG
		Sub-Component 3: Technical Assistance for Environmental Regulators *(Enhanced capacity of regulators to monitor water quality and ensure regulatory compliance)*										
Environmental regulator's project performance rating - CPCB	0	4	5	6	7	8	8	9	9	Annual	M&E System, Periodic progress	PMG

[24] Based on % change in BOD concentrations (in April-May) in the Ganga, between stations upstream and downstream of targeted investment locations

											reports	
Environmental regulator's project performance rating – by SPCB	0	4	5	6	7	8	8	9	9	Annual	M&E System, Periodic progress reports	SPMG
		Component-2: Priority Infrastructure Investments										
		Type-1: Municipal Wastewater Management										
Treatment Capacity Created (mld)	0	0	0	40	100	200	300	400	450	Annual	M&E System, Periodic progress reports	SPMGs and EAs
Treatment Capacity Utilization (% of created capacity)	n/a	n/a	n/a	40%	50%	50%	55%	55%	60%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
Cumulative actual ULB contributions for O&M as a percentage of agreed ULB contributions	n/a	n/a	n/a	10%	15%	20%	25%	30%	40%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs
% investments approved with dedicated stakeholder engagement and communication activities	0%	100%	100%	100%	100%	100%	100%	100%	100%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs
		Type-2: Industrial Wastewater Management										
% of targeted treatment capacity created	0%	0%	0%	0%	20%	40%	50%	75%	100%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
Treatment Capacity Utilization (% of created capacity)	n/a	n/a	n/a	n/a	70%	75%	75%	75%	80%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
% investments with agreed industry contributions to O&M	0%	100%	100%	100%	100%	100%	100%	100%	100%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
		Type-3: Solid Waste Management										
% of targeted tons of solid waste removed	0%	0%	0%	10%	30%	50%	60%	75%	100%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
Cumulative actual ULB contributions for O&M as a percentage of agreed ULB contributions	n/a	n/a	n/a	60%	70%	80%	85%	90%	100%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs
% investments approved with dedicated stakeholder engagement and communication activities	0%	100%	100%	100%	100%	100%	100%	100%	100%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs

		Type-4: River Front Management										
% of targeted river front management investments completed	0%	0%	0%	0%	25%	30%	50%	75%	100%	Annual	M&E System, Periodic progress reports	SPMGs and EAs
Cumulative actual O&M contributions/earnings as a percentage of expected contributions/ earnings	n/a	n/a	n/a	n/a	60%	70%	80%	90%	100%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs
% investments approved with dedicated stakeholder engagement and communication activities	0%	100%	100%	100%	100%	100%	100%	100%	100%	Annual	M&E System, Periodic progress reports	SPMGs and ULBs

In addition, the NGRBA will monitor internal processes to keep track of the additional indicators as described in the table below:

NGRBA Internal Process Monitoring Indicators
% of projects with >50% cost overrun
% of planned Social Audits conducted
Stakeholder satisfaction survey rating
% grievances satisfactorily resolved
Length of sewerage network added (km)
Number of households sewerage connections achieved

NOTES:

(i) Given the inadequate baseline data on pollution sources and water quality, results indicators for the project have been structured in terms of incremental impact of project activities, in contrast to basin-level indicators. Therefore the baseline values for most of the indicators appear as zero.

(ii) Given the inadequate baseline data on pollution sources and water quality, the M&E system will be coordinated with the Ganga Knowledge Center, to ensure that the baseline information generated through investment activities of Component Two is integrated with the knowledge activities supported under Component One, and that the critical knowledge gaps are closed at the earliest.

Annex 4: Detailed Project Description

INDIA: National Ganga River Basin Project

1. The project is designed to assist the National Ganga River Basin Authority (NGRBA) in building the capacity of its operational-level institutions, and to start implementing its investments program in the five states on the mainstem of the Ganga. At the national level, the role of the project is to create enabling capacity, mechanisms and knowledge institutions for the NGRBA. At the state and local level, the role of the project is to finance demonstrative investments at selected priority locations, for reducing in a sustainable manner the pollution loads entering the Ganga. The following sections present the context and a description of the project components.

2. ***NGRBA Program Context*** Based on the experience of previous efforts, the GoI has adopted a transformed approach to the challenge of clean-up and conservation of the Ganga. The establishment of the NGRBA underpins India's intent to address the shortcomings of the previous efforts, and to commit the required resources for the long term. In particular, the NGRBA program's approach embodies the following key guiding principles:

(a) Adoption of a *multi-sector and basin-oriented approach* is required for addressing the challenges to the environmental sustainability of the Ganga;
(b) Addressing multi-sectoral challenges on a large inter-state river like the Ganga is a long term effort that requires a *threshold level of investments* to make a difference;
(c) The current high-level political support is necessary but not sufficient to guarantee the viability of the initiative in the long term, and therefore the program must have an *institutional basis*;
(d) *Dedicated operational-level institutions at both central and state levels* are needed, with appropriate structure, powers, staffing and leadership;
(e) The institutions must have an *adequate legal basis* in order to successfully implement their mandate in the three-tiered federal governance structure of India;
(f) *Program management needs to be distinct from investment execution*, and cannot be done by the same institutions;
(g) *Investment in Knowledge* are required to ensure good planning and decision-making;
(h) *Comprehensive city-level planning* is needed, to ensure improvements in the urban environment, instead of exclusive focus on the river;
(i) *Long-term operational sustainability* of infrastructure investments needs to be assured;
(j) *Appropriate and low lifecycle cost technologies* should be selected to enhance operational sustainability;
(k) *Ownership and capacity-building of the Urban local Bodies (ULBs)* is crucial to the success of the program, especially for ensuring sustainable operations of the funded investments;
(l) *Ecological flows are needed*, and therefore the program must focus on both water quality and quantity;
(m) *Strengthening of Environmental Regulators* to enhance monitoring and compliance is required in conjunction with infrastructure investments;
(n) *Communications and public participation* must be a priority and integral to the program, to build mass support for conservation and clean-up of the Ganga.

3. ***World Bank Assistance and Long term Support to the NGRBA*** The GoI has sought programmatic assistance from the World Bank to support the NGRBA in the long term. This project is the first operation under this agreement, and aims to support the NGRBA in establishing its operational-level institutions and implementing priority investments.

4. ***Project Development Objectives*** The objectives of the proposed project to support the National Ganga River Basin Authority (NGRBA) in:

(a) building capacity of its nascent operational-level institutions, so that they can manage the long-term Ganga clean-up and conservation program; and
(b) implementing a diverse set of demonstrative investments for reducing point-source pollution loads in a sustainable manner, at priority locations on the Ganga.

5. ***Components*** The project will have two components relating to institutional development and priority infrastructure investments. The first component would seek to build the institutional capacity to effectively implement the overall NGRBA program, including infrastructure investments funded by the second component. The total project cost is estimated at about US$1.55 billion including counterpart funding from the center and the state governments.

6. ***Project Area*** The project area is the Ganga river basin in the five states of India which are targeted under the NGRBA program. These states, located on the mainstem of the Ganga, are Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. Other states in the Ganga basin, which are not located on the mainstem of the Ganga and therefore not a part of the NGRBA program, are not included in the project area. Given the framework approach adopted for the NGRBA program, the exact locations of infrastructure investments are not known in advance. All project investments will be along the mainstem of the Ganga or along two of its most polluted tributaries (Ramganga and Kali). Since the NGRBA framework emphasizes investments according to their effectiveness in reducing pollution in the Ganga, it is expected that the critically polluted middle stretch of the river will get a significant share of infrastructure investments. The activities pertaining to institutional development and capacity-building aspects of the project will be basin-wide across the five specified states.

Component One: Institutional Development (US$ 200 million)

7. ***Objective.*** The objectives of this component are to: (i) build functional capacity of the NGRBA's operational institutions at both the central and state levels; and (ii) provide support to associated institutions for implementing the NGRBA program. The activities financed under this component are grouped under the following sub-components:

(a) Sub-component A: NGRBA Operationalization and Program Management
(b) Sub-component B: Technical Assistance for ULB Service Providers
(c) Sub-component C: Technical Assistance for Environmental Regulators

8. ***Sub-component A: NGRBA Operationalization and Program Management*** This sub-component is aimed at supporting the nascent operational institutions established for implementing the NGRBA program at the central and state levels on a full time basis.

9. The NGRBA's operational institutions comprise the Program Management Group (PMG) at the central level, and State Program Management Groups (SPMGs) at the state level. The PMG is being established as a fully owned society of the Government of India, with suitable

structure, staff, powers and leadership, to lead the planning and program management of the NGRBA program at the national level. It is supported and housed by the MOEF as the nodal Ministry. Similarly, the SPMGs are being established in the form of registered societies[25], to ensure effective planning and program management at the state level.

10. ***Separating Program Management from Investment Execution*** The rationale for establishing the PMG and SPMGs is to have institutions with single point responsibility for the NGRBA's program planning, management and long-term sustainability. These aspects are neglected in the previous efforts, which were focused on investments and suffered from absence of a dedicated program management agency at the state level. The SPMGs are in contrast with the number of existing and suitably qualified technical agencies in the states, which will be selected as Executing Agencies (EAs) for specific investments.

11. ***Program Management for the Entire NGRBA Program*** The sub-component will provide for initial setup costs of office infrastructure and equipment, as well as provision of critical consultancies, incremental staffing, training, and operation costs. This sub-component would therefore cover all aspects of program management for the entire NGRBA program, including financial and procurement systems; consultancies (e.g. project management and technical support); M&E and third party audits; social and environmental management; compliance with the Bank's fiduciary and safeguards requirements for Bank-funded activities; communications; and special studies, evaluations and expert inputs as needed. Key NGRBA program management activities included under this sub-component are described below:

(a) *Enhancing Ganga Knowledge Resources*: The sub-component will support the establishment of a state-of-the-art Ganga Knowledge Center (GKC) with the objectives of: (i) serving as the repository of knowledge resources pertaining to the conservation of the Ganga; (ii) addressing critical gaps in knowledge; and (iii) improving information access for the public and decision-makers. The GKC's functions will include: (i) inventorying and compiling all knowledge on the Ganga river and basin, with specific focus on data on water quality as well as on pollution sources; (ii) developing a modern suite of data analysis, visualization, and modeling tools to support NGRBA program planning, implementation, monitoring and evaluation; (iii) housing the Ganga Basin Master Plan (GBMP) being developed by a consortium of leading Indian engineering institutions, and continuing the adaptive evolution and development of the GBMP; (iv) managing and funding a targeted research program, including but not limited to water quality modeling, ecological flows, assessment of environmental, social, cultural and economic resources of the basin, and development of decision support systems for investment planning; (v) creating and disseminating knowledge products through an active outreach program, including through development of a comprehensive and interactive web portal, and through publications such as a *State of the Ganga Environment*; and (vi) provide decision-making support to the PMG and the SPMGs on as needed basis. The GKC will be staffed by competent and professionally-recruited staff. It will be integrated in the structure of the PMG, and will collaborate with the relevant institutions and agencies. The flow data for the river Ganga, if required, will be requested

[25] With exception of Jharkhand, where instead of establishing a regsisterd society, the nodal state department (Department of Urban Development) will serve as the SPMG for implementing the NGRBA program.

from and will be processed by the Ministry of Water Resources / Central Water Comission as per existing guidelines subject to availability.

(b) *Communications and Public Participation*: The sub-component will finance a dedicated communications and public participation program, undertaken in partnership with community-based organizations, school and college student groups, and the media. Public participation, stakeholder engagement, and strategic communications are critical for the success of the NGRBA program. Accordingly, the project will: (i) directly integrate these aspects into the planning, design, and operationalization of specific investments through a social intermediation program, and (ii) fund a dedicated basin-wide strategic communications program to be managed by the PMG, working in close consultation with dedicated specialists from each SPMG. Communications in the Ganga Basin is particularly important given the iconic status the river holds in India's popular imagination and discourse; the wide range of views and concerns with regards to the river's use; the high levels of public skepticism given previous efforts; and the presence of ongoing grassroots campaigns to rejuvenate the river, especially those led by some of the non-official members of the NGRBA. A specialized firm is being appointed to develop and implement the communications strategy and action plan, building on formal and informal mechanisms for participation and inclusion, proactive disclosure, and active consultations (see Annex 13).

(c) *Program of Action for Carbon Credits:* The project is supporting the preparation and registration of a Program of Action (POA) under the Clean Development Mechanism (CDM), whereby carbon credits could be accessed by all eligible investments under the NGRBA Program. This would be the first POA for wastewater investments in the world.

12. ***Sub-component B: Technical Assistance for ULB Service Providers.*** The long term operation and maintenance of the NGRBA-funded assets is the responsibility of the ULBs and local service providers, and this sub-component is aimed at providing assistance that can gradually enable them to take on their role. Specific activities will include: (i) training, including for both operator and executive skills; (ii) modern and efficient information and planning systems, including MIS (e.g. for budgets, costs, progress reporting, and maintenance management), GIS (e.g. for base maps, pipe routes, and asset database), planning tools (e.g. for hydraulic modeling and financial management), commercial systems (e.g. for meter management, reading, billing and collection), and customer service systems (e.g. processes and systems to handle complaints); and (iii) equipment, including sewer cleaning machines and testing equipment. The precise scope of support activities will be determined through Capacity Enhancement Plans which will be prepared for ULBs with significant NGRBA investments. The activities will be executed by the selected ULBs.

13. ***Sub-component C: Technical Assistance for Environmental Regulators.*** This sub-component is aimed at addressing the key constraints faced by the CPCB and SPCBs related to their functions regarding the Ganga. The subcomponent will support:

(a) *Capacity building of the CPCB and SPCBs* Support will be provided for improvements in: (i) infrastructure, including the upgradation of buildings, laboratories, transportation facilities for sample collection, R&D facilities, etc; (ii) information, including IT infrastructure, MIS and GIS systems, legacy data computerization, website development, laboratory information management systems etc; and (iii) institutions, including, training,

staffing for new skills, and accreditation of labs etc. Capacity building packages for individual SPCBs have been customized according to need and demand, and phased across the duration of the project to ensure a pragmatic approach and realistic results. The activities will be executed by the CPCB and SPCBs.

(b) *Upgradation of Ganga Water Quality Monitoring System* The objective of this activity is to establish a comprehensive and reliable Ganga Water Quality Monitoring System (WQMS) addressing the needs for both technical and institutional modernization, since the current WQMS is inadequate and there is a tremendous need and demand for water quality information. This sub-component will support investments in modern and comprehensive water quality instrumentation, including real time monitoring systems; upgrading data collection and testing protocols, systems and infrastructure; improving information flow between various agencies; strengthening data use, analysis and quality assurance; introducing community monitoring; and benchmarking performance. The outcome will be a greatly improved Ganga WQMS in terms of efficacy, utility and relevance for NGRBA. This activity will be centrally coordinated by CPCB and executed by the SPCBs in their respective states.

(c) *Inventory of Point and Non-point Pollution Sources* The objective of this activity is to address the critical gap in the basin-level knowledge of the sources of pollution which affect the Ganga water quality. This will entail a detailed data collection effort on location, flows and pollutant concentration for all point sources discharging into the Ganga, as well as an assessment of the non-point pollution sources and their impact on water quality of the Ganga. This activity will be coordinated by the CPCB, with implementation support from the SPCBs.

(d) *Strengthening environmental compliance monitoring* Surveillance for regulation compliance will be strengthened for the Central and State Pollution Control Boards, by improving information systems and support for incremental staffing.

Component Two: Priority Infrastructure Investments (US$ 1,356 million)

14. ***Objective.*** The objective of this component is to finance demonstrative infrastructure investments to reduce pollution loads in priority locations on the river. These investments would be among the first funded by the NGRBA program, and would therefore exemplify the new and comprehensive approach adopted to improve planning, preparation, implementation and operation of investments.

15. This component will also finance pilots for new and transformative technologies or implementation arrangements, which could be game-changing if successful and replicated on scale. While some key ideas have already been identified for piloting, the pilot window will be open to new proposals during project implementation. Key areas include: (a) technologies that tap the energy potential of wastewater resulting in net-energy positive wastewater treatment; and (b) innovative financing and implementation models, especially concessions, leases, and other forms of public-private participation (PPP).

16. ***Four Investment Sectors.*** The majority of investments are expected to be in the wastewater sector, particularly in WWTPs and sewerage networks. Investments will also be supported in industrial pollution control and prevention (e.g. common effluent treatment plants), solid waste management (e.g. collection, transport and disposal systems), and river front

management (e.g. improvement of the built environment along river stretches, improvement of small *ghats* and crematoria, and the conservation and preservation of ecologically sensitive sites). Many investments are likely to combine elements of more than one of these sectors.

17. ***The Framework Approach.*** In lieu of defining and appraising specific investments, the project preparation has focused on developing investments framework covering all four key sectors of intervention under the NGRBA program. The NGRBA Program Framework will apply to all investments under the NGRBA program. The objectives of the investments framework are to:

(a) provide a filter for all the NGRBA investments, for ensuring that the selected investments are well-prepared and amongst the most effective in reducing the pollution loads;
(b) make transparent the decision-making process on investments selection; and
(c) ensure that the investments are implemented in a sustainable manner.

18. ***Framework Criteria.*** The investments framework prescribes the criteria and quality assurance standards covering various aspects including eligibility, prioritization, planning, technical preparation, financial and economic analyses, environmental and social management, long term O&M sustainability, community participation, and local institutional capacity.

19. Some examples of the key framework criteria are presented below (see Annex 6 for details):

(a) Explicit Consent of ULBs No NGRBA investments will be appraised without explicit and informed consent of the relevant ULB. This consent will indicate a clear recognition of the nature, scale and cost of the investment, and the ULB's own roles and responsibilities with regards to asset ownership and long-term O&M
(b) Technology Selection Technology selection for wastewater treatment will be based on lifecycle cost analysis to select the lowest cost feasible option, given the local conditions and required degree of treatment.
(c) Inclusion of O&M Costs The first 5 years of O&M costs, based on specific calculations for each investment, will be included in the total cost for each DPR.
(d) Design-Build-Operate (DBO) and other Long Term Contracts All investments with significant O&M costs (such as WWTPs, pumping stations, landfills and waste processing) will be developed and managed under Design-Build-Operate (DBO) or other long term (15 years) contracts. This will bring enhanced accountability, adequate capacity and resources, and strong performance incentives to the sector.
(e) House Connections Plans and cost of providing house connections up to property line must be included in the DPRs for sewerage investments.
(f) Industry Commitment to O&M Industrial pollution DPRs must include a firm commitment from industries to ensure satisfactory operation of common facilities.
(g) Area Development Wherever possible, river front management investments must take an area development approach, both to achieve spatial scale along wider and longer stretches of the river, and to integrate across sectors.

20. ***Quality Assurance.*** One of the main objectives of adopting the framework approach is to provide standards for planning, preparation, implementation and operation of the infrastructure investments. The framework criteria for investments preparation require, amongst other things,

that: (i) the planning for investments be conducted in the comprehensive context of city/zone and its existing infrastructure; and (ii) the solutions be based on a feasibility analysis and good quality baseline data. Investment proposals are required to include economic analysis, as well as assessments of social and environmental impacts, and local institutional capacity. For implementation phase, the framework criteria require the selection of only suitably qualified Executing Agency (EA). To enhance the long term operational sustainability of investments, the framework requires, among other measures: (i) ULB's consent before the Feasibility Report (FR) or the Detailed Project Report (DPR) can be submitted to the NGRBA; (ii) long-term contracts including O&M for all investments with significant O&M needs; (iii) selection of lowest lifecycle cost technologies; and (iv) financial plan showing dedicated O&M resources.

21. ***Investment Execution.*** The investments program will be planned and managed by the PMG and SPMGs, while the execution of specific infrastructure investments will be done by the selected existing and qualified state-level technical agencies. To foster competition and tap private sector efficiencies, the state governments with significant infrastructure investments are setting up a public-private joint venture infrastructure company, to execute NGRBA and other similar investments in the respective states in the medium to long term.

22. ***Long List of Possible Investments.*** Given the long-term nature of the NGRBA program and the fact that universe of potential investments is large, the adoption of the framework approach effectively sets the "rules of the game", and will allow infrastructure investments to be selected on a dynamic and ongoing basis. A state-wise summary of investments which are at various stages of preparation is presented below.

State	INR, crores	USD, millions
Uttar Pradesh	6262	1361
Uttarakhand	374	81
West Bengal	5032	1094
Bihar	2121	461
Jharkhand	101	22
Total	**13890**	**3020**

23. ***Selection of Early Investments.*** While the basin-level approach to planning the long-term program of Ganga clean-up is being developed, early investments would comprise the obvious priority interventions to address the critical needs at hotspot locations along the river. The selection would also aim to demonstrate early successes, support strong local demand and ownership, and achieve an acceptable geographic distribution of investments.

24. ***Rehabilitation of existing infrastructure.*** Investments involving rehabilitation of existing infrastructure will be included on priority, due to their intrinsically higher returns in terms of reductions in pollution loads entering the Ganga.

Annex 5: Project Costs

INDIA: National Ganga River Basin Project

Project Cost By Component and/or Activity	Local US $million	Foreign US $million	Total US $million
Component One: Institutional Development	130.05	65.68	195.73
Component Two: Priority Infrastructure Investments	883.05	343.45	1226.50
Total Baseline Cost	1013.10	409.13	1422.23
Physical Contingencies	46.66	19.45	66.11
Price Contingencies	45.55	18.98	64.53
Total Project Costs	1105.31	447.56	1552.87
Project Preparation Advance	2.96	0.00	2.96
Front-end Fee	0.00	0.00	0.00
Total Financing Required	1108.27	447.56	1555.83

Annex 6: Implementation Arrangements

INDIA: National Ganga River Basin Project

Institutional Arrangements

1. ***Political Support and Policy Guidance.*** The NGRBA's apex policy and decision-making structure has been established by the Government of India, per the Notification under Environment Protection Act (1986). Under the same Act, the five NGRBA program states have notified the State Ganga River Conservation Authorities (SGRCAs) thereby defining the apex policy and decision-making structure at the state level. The Union Ministry of Environment and Forests (MOEF) is the nodal agency for the NGRBA program, and will have the lead responsibility for project implementation and ensuring that the project development objectives are met. Similarly, the SGRCA's state level nodal departments will have the responsibility for project implementation in the respective states.

2. ***Program Management Institutions*** The Program Management Group (PMG) is being established as a registered society, with suitable structure, staffing, powers and leadership, and the objective of ensuring effective implementation of the overall NGRBA program at the national level. Each of the NGRBA states[26] is similarly setting up the State Program Management Group (SPMG) as a registered society, to ensure effective implementation at state level.

3. ***Executing Agencies.*** Execution of the infrastructure investments will be done by the Executing Agencies (EAs), selected specifically for each investment. The current choice of EAs includes the existing state-level technical agencies which have the mandate of urban infrastructure (especially wastewater) management in their respective states. Most of these agencies have been working for a few decades, and have significant expertise and experience in preparation and implementation of infrastructure projects in the four key sectors of the NGRBA program. Procurement and FM assessments have been conducted for these existing state-level agencies. In the medium to long term, the NGRBA Program intends to promote competition among the EAs by facilitating the establishment of new ones in each state, including public-private joint venture infrastructure companies. In future, if a new entity (in addition to the currently defined EAs) is proposed as an EA for a specific investment, it will need to undergo assessments by the PMG/SPMGs to ascertain its capacity to manage the technical, project management, procurement, financial management and safeguards aspects of the investment. The requirements in this regard have been provided in the NGRBA Program Framwork. The World Bank will perform its due diligence on any new entity proposed as the EA for any investment funded under the project.

4. The PMG will select EAs for national-level activities. In case of local infrastructure investments, the EA will be chosen by the SPMG and representatives of the relevant ULB. The EA will be responsible for successfully executing the activity for which it has been commissioned. The national-level EAs will be answerable to the PMG, and the state-level EAs will be answerable to the respective SPMG/ULB.

[26] With the exception of Jharkhand, which has a very small stretch of the Ganga mainstem passing through the state

5. ***Tiered Implementation Structure.*** The project implementation at various levels is therefore envisaged as follows: (a) National Level: PMG, (b) State level: SPMG, and (c) Activity level: Executing Agencies (EAs) selected for specific activities, with local coordination for planning and implementation provided by Urban Local Bodies (ULBs) where needed. Further details of the proposed implementation arrangements, along with the roles and responsibilities of various actors are provided in Annex 6b on Investment Frameworks and Implementation Process. A brief description of the key actors and their implementation responsibilities is in the following sections.

6. The NGRBA program will be a multi-disciplinary initiative involving multiple dimensions of Ganga clean-up and conservation, and therefore will span across many sectors, including but not limited to environment, urban development, water resources, agriculture, industries, and energy. Program planning and implementation would therefore require working across ministerial/state/departmental boundaries and also across levels of government: central, state and local. The program activities would include both broad-based as well as locally targeted communications and community participation campaigns, and research to address the critical knowledge gaps. Keeping this in mind, the NGRBA operational institutions at central and state levels are envisaged to have the requisite operational flexibility and multi-sectoral skills.

7. ***National Level – PMG.*** The PMG is being established as a registered society of the GoI, with the provision of (i) adequate and formal devolution of powers to the PMG, consistent with the NGRBA Notification, to ensure appropriate level of operational autonomy; (ii) single-point responsibility for planning and execution of the NGRBA program; (iii) powers to manage its human resources, with the objective of attracting and retaining well-qualified staff; and (iv) institutional sustainability as the permanent entity responsible for the conservation and health of the river Ganga in the long term.

8. ***PMG Role and Responsibilities.*** The PMG will have the exclusive mandate of national-level management of the entire NGRBA program, including the World Bank-funded National Ganga River Basin Project. The PMG will ensure that the objectives of the NGRBA program (and the PDOs of the National Ganga River Basin Project) are fully achieved in a timely manner. The main functions of the PMG with regard to the NGRBA Project include:

(a) overall project planning and management; direct implementation of the national level activities; ensuring satisfactory implementation of the state-level investments and activities in accordance with the agreed NGRBA program framework and implementation arrangements; providing guidance, support and approvals to the SPMGs where needed; and monitoring implementation performance;
(b) ensuring compliance with agreed financial management policies and procedures including management of project funds, timely release of advance project funds to the states, conducting external audits for all project components and ensuing compliance with audit observations, submitting to the Bank a consolidated annual statutory audit report for the project, and seeking reimbursements from the Bank;
(c) capacity building of all project partners; managing national IEC campaigns, stakeholder consultations and community participation; and other activities in Component One (Institutional Development) of the project;

(d) ensuring compliance with the agreed procurement policies procedures; quality assurance of physical infrastructure investments; and ensuring compliance with the project's (same as NGRBA program's) safeguard policies;
(e) implementing Governance and Accountability Action Plan - see Annex 11;
(f) regular monitoring and evaluation of project performance, including regular review of the NGRBA investments framework and implementation arrangements, and ensuring requisite course corrections as needed; and
(g) liaising with the World Bank including sending quarterly progress reports to the MOEF and the Bank.

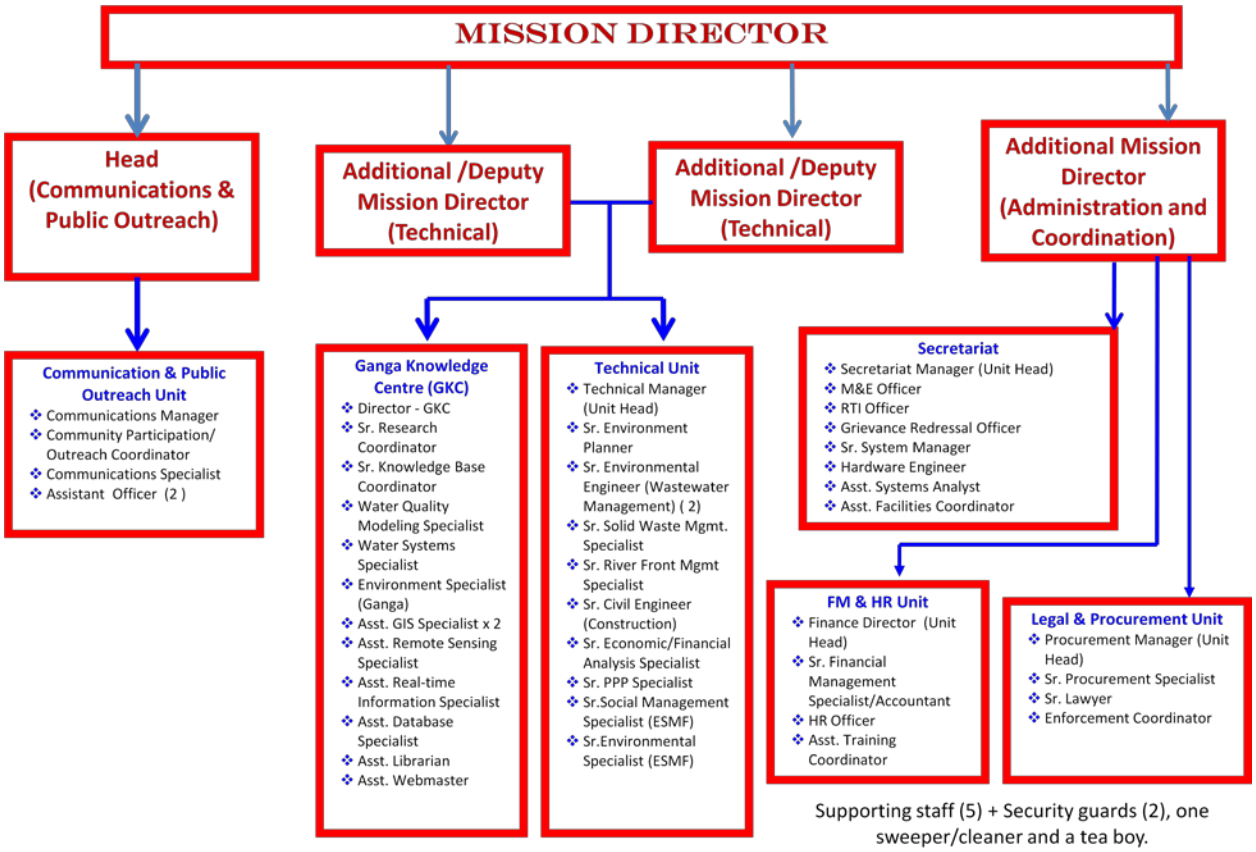
9. ***PMG Structure and Staffing.*** The process of setting up the PMG as a registered society is currently underway. The relevant details of its constitution (MoA/registration, bylaws, mandate, composition, functions, powers and operational procedures) are being finalized.

(a) The PMG is headed by the NGRBA Mission Director, who will be a full-time senior official vested with the financial and administrative powers equivalent to those of a Joint Secretary (or higher) of the GoI. The Mission Director will have assured tenure.
(b) The PMG structure is presented in Figure 1. It will comprise 6 units and about 35 multi-disciplinary staff, including specialists in basin planning, wastewater engineering and management, ecology, environmental and social management, finance, operations, procurement, knowledge management, IT, communications, human resources management, economics, and monitoring and evaluation. The professional staff may be assigned from within the central/state government agencies or recruited from private sector on contract basis.
(c) The PMG will be supported by a Project Management Consultancy (PMC), which will provide assistance in key areas of investment preparation quality review, portfolio management, procurement, and financial management. In addition the PMG may from time to time recruit consultants (individuals, institutions or firms) as necessary to strengthen program planning and management.

10. ***State Level – SPMG.*** The SPMGs are being constituted in each of the five states[27], with the objective of serving as the dedicated institution for effective implementation of the NGRBA program activities at the state level, and as the permanent state-level entity responsible in the long term for the conservation and health of the state's stretch of the river Ganga.

[27] Most states have set up their SPMGs as a registered society, under the Societies Act. In Jharkhand, the state government may nominate an existing state agency to perform the functions of the SPMG.

Figure 1: Indicative Organizational Structure of PMG



11. ***SPMG Role and Responsibilities.*** The SPMGs are the respective state level counterparts of the PMG, with similar responsibilities at the state level. They have the exclusive mandate of management of all NGRBA program activities in their respective states, including the activities and investments under the World Bank funded National Ganga River Basin Project. The SPMGs will be accountable to the SGRCA and the PMG for the achievement of the project/program objectives. They will adopt the NGRBA program framework and implementation guidelines and will regularly report to the PMG on project implementation. The main functions of the SPMGs with regard to the National Ganga River Basin Project include:

(a) overall project planning and management at state level, ensuring satisfactory implementation of the state-level investments and activities in accordance with the agreed NGRBA program framework and implementation arrangements; direct implementation of some of the state-level activities; providing guidance, support and approvals to the state EAs where needed; and monitoring implementation performance of the EAs;

(b) ensuring compliance with agreed financial management policies and procedures including management of project funds, timely release of advance project funds to the EAs, conducting concurrent internal audits for all state level activities and ensuing compliance with audit observations, and submitting reimbursement claims to the PMG;

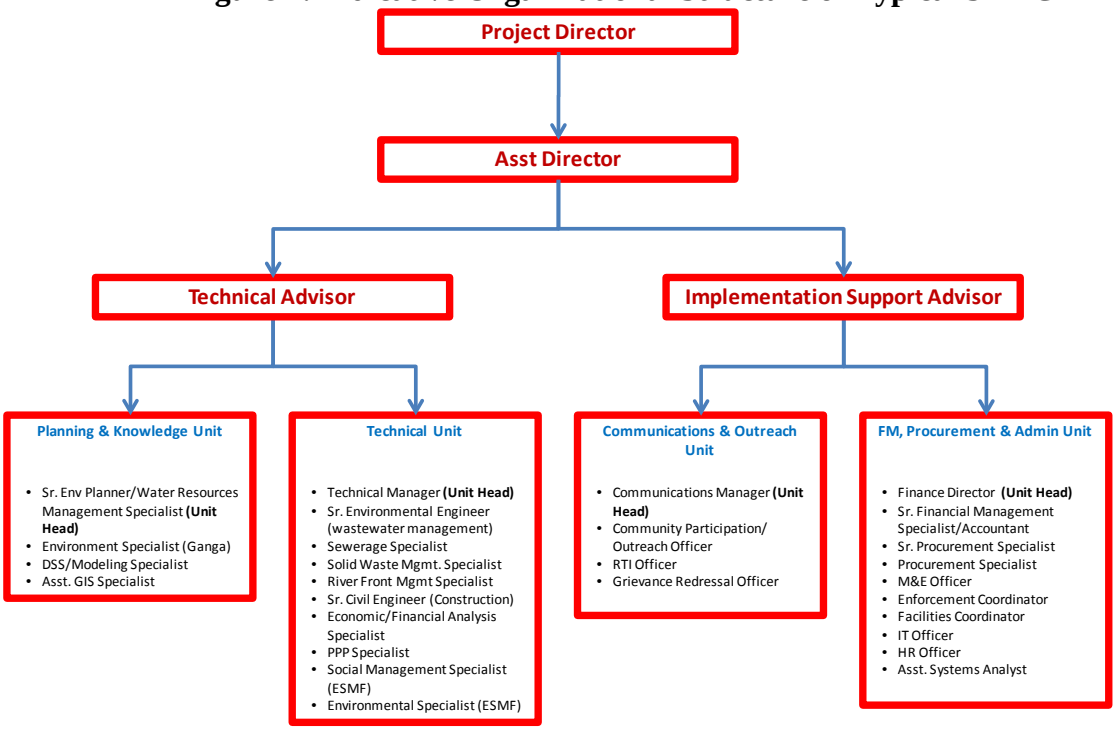
(c) capacity building of EAs; managing state level IEC campaigns, stakeholder consultations and community participation; and other state level activities in the Institutional Development Component (Component One) of the project;

(d) ensuring compliance with the agreed procurement policies procedures; quality assurance of physical infrastructure investments; and ensuring compliance with the project's safeguard policies;
(e) implementing Governance and Accountability Action Plan (see Annex 11);
(f) regular monitoring and evaluation of project performance, including regular review of strategies and implementation arrangements in the context of implementation experiences and for ensuring requisite course corrections as needed; and
(g) liaising with the PMG and the World Bank, including sending quarterly progress reports to the SGRCA and the PMG.

12. ***SPMG Structure and Staffing.*** The SPMGs are in the process of being set up by the respective state governments. Relevant details of constitution (MoA/registration, bylaws, mandate, composition, functions, powers and operational procedures) are being finalized.

(a) The SPMG will be headed by a senior officer of the State Government with an assured tenure of 3 years, assisted by a full-time Assistant Project Director.
(b) The indicative SPMG structure for a typical state is presented in Figure 2. It will comprise 4 units and 25-30 multi-disciplinary staff, including specialists in basin planning, wastewater engineering and management, ecology, environmental and social management, finance, operations, procurement, knowledge management, IT, communications, human resources management, economics, and monitoring and evaluation. The professional staff may be assigned from within the state government agencies or recruited from private sector on contract basis.

Figure 2: Indicative Organizational Structure of Typical SPMG



13. ***Executing Agencies (EAs).*** Suitable EAs will be selected by the PMG and SPMGs for implementation of various NGRBA program activities. The EAs are pre-designated for the activities identified for support under the Institutional Development component (Component One) of the National Ganga River Basin Project. The states have also provisionally designated the EAs for implementing the early infrastructure investments under the Component Two of the Project. As described earlier, the choice of EAs for early investments selected under the project includes the existing state-level technical agencies which are in charge of the development of urban infrastructure in their respective states. Therefore this initial set of EAs has significant experience in preparation and management of infrastructure investments. The selection of additional EAs for infrastructure investments under the NGRBA program will be on an on-going basis, whereby the EA for each activity would be selected on the basis of its experience and the capacity requirements for implementing the activity/sector for which it is being considered. The role of the EA will be as follows:

(a) The main function of the EA would be to prepare and implement the specific activity/investment and put in place institutional arrangements and other resources needed for satisfactory and sustainable operation and maintenance of the assets created.

(b) This will include: (i) preparing Feasibility Reports and Detailed Project Reports (DPRs) as per the requirements of the NGRBA framework and nationally accepted technical standards and specifications; seeking appropriate technical and administrative approvals from within their own departments and the SPMG; (ii) collaboration and coordination with other relevant government departments/agencies, ULBs, civil society organizations and affected communities; (iii) procurement of works and goods with support from the SPMG; (iv) construction/installation of facilities including contract management and day to day supervision; ensuring compliance with project's safeguard policies; certifying works, making payments and preparing completion reports; and (v) managing project funds including compliance with agreed FM policies and procedures.

(c) The EA will report to the respective SPMG (or to the PMG in case of national-level activities coordinated by the PMG) in regard to implementation progress and performance of the investments, and will provide technical, administrative, accounting, audit and other progress reports required by the SPMG. The division of roles and responsibilities, including administrative and fiduciary arrangements, between the SPMG and the EAs has been agreed and will be documented in the signed MoUs.

14. ***Project Management Support and Technical Support Consultancies.*** Two key consultancies are planned to: (a) provide project management support to PMG for managing the entire NGRBA program, including planning, technical support for investments review and appraisals, portfolio management, procurement, financial management, monitoring and evaluation, and reporting; and (b) technical support to SPMGs and EAs, for upgrading the process and practice of investments preparation and execution to global standards, for the entire NGRBA program.

15. ***Other Partner Agencies.*** The PMG and SPMGs will collaborate with and seek support and partnership with a range of other agencies, to draw upon their specialized expertise and supplement the capacity of main implementing agencies. These will include international, national and local knowledge institutions, private sector business houses and industries, and civil society groups.

Key Elements of the NGRBA Program Implementation Process

16. The detailed implementation process is presented in Annex 6B "Investment Frameworks and Implementation Arrangements." NGRBA and the state nodal departments have prepared and agreed the NGRBA Program Framework, which includes detailed investment frameworks, implementation process flow (including planning, preparation, appraisal, implementation and monitoring and evaluation), Environment and Social Management Framework (ESMF), Governance and Accountability Action Plan, and Communication Strategy and Action Plan. These collectively define and form the basis of program implementation and performance monitoring. The main features of these are summarized below.

17. ***Investment Frameworks***. Investment frameworks have been developed for selecting and implementing infrastructure investments in the four key sectors of intervention under the NGRBA program - municipal wastewater, industrial pollution, solid waste management and river front management.

(a) The frameworks prescribe criteria and quality assurance standards covering various aspects including eligibility, prioritization, planning, technical preparation, financial and economic analyses, environmental and social management, long term O&M sustainability, community participation, and local institutional capacity. The objective is to ensure that the investments are well-prepared and amongst the most effective in reducing the pollution loads, and implemented in a manner that makes them sustainable.
(b) Given the long-term nature of the NGRBA program and the fact that universe of potential investments is large, the adoption of the framework approach effectively sets the "rules of the game", and will allow infrastructure investments to be selected on a dynamic and ongoing basis.

18. ***Implementation Process Flow.*** The step-by-step process along with roles and responsibilities of the entities involved in implementation of NGRBA program have been agreed and documented. The implementation process covers the various aspects including annual planning, investment prioritization, a two-stage (feasibility and detailed project report) preparation and appraisal process, execution, O&M, eventual assets transfer to local bodies, financial management, procurement, community engagement, social and environmental management, governance and monitoring and evaluation. In addition to the infrastructure investments (under Component Two of the project), the implementation process has also been agreed for pre-identified activities related to NGRBA Institutional Development (Component One of the project), innovative pilots, communications, and research and knowledge management.

19. ***Guidelines for Infrastructure Investments Preparation.*** A two-step process has been agreed for preparation and appraisal of investments, whereby investments would be appraised at both concept and detailed project report stage. Guidelines have been prepared and disseminated for preparation of feasibility stage and detailed project reports, including requisite contents, methodologies, and standards to be followed.

20. ***Model Agreements/MoAs***. These have been prepared to operationalize the agreed institutional model and implementation arrangements, and include: (i) Memorandum of Association and bylaws, including functions and powers of the PMG and the SPMGs and the

division of roles and responsibilities; and (ii) two tripartite Memoranda of Agreement (MoAs), one at the Program-level between the PMG, the SPMG, and the ULB; and one at the investment-level, between the SPMG, the ULB and the EA; for ensuring commitment and clarity on roles and responsibilities of various parties regarding execution, O&M, and eventual transfer of assets to local bodies.

21. ***Powers of Approvals.*** Powers and procedures for technical and administrative approvals of investments, for award of contracts for works/goods and services, and for making payments have all been well defined for each implementing agency and documented in the FM and procurement manuals. To ensure efficiency in implementation most of the powers have been delegated to the lowest appropriate levels, adopting the principle of subsidiarity. Thus, once the annual action plan is cleared by the NGRBA, most implementation related powers are vested with the PMG, SPMGs and EAs for their respective components. The only exceptions are the award of the high cost consultancy and works/goods contracts, which have been defined in the fiduciary manuals.

22. Other important documents guiding project implementation are:

(a) FM Manual: providing the details of funds flow, accounting, auditing and reporting, and the related control and accountability mechanisms (details in Annex 7), and
(b) Procurement Manual: containing the procurement strategy, methods and procedures to be adopted, along with draft documents to be used for bidding of typical works and goods and procurement of consultant services, along with powers of actors to award these works and consultancies (details in Annex 8).

23. The specific annexes provide the details on Environmental and Social Management Assessment and Framework (Annex 10), Governance and Accountability Action Plan (Annex 11) and Communication Strategy and Action plan (Annex 12).

24. ***Institutional Development.*** Detailed and costed implementation plans have been completed for the activities comprising the Institutional Development component of the project.

25. ***Post-Implementation Management of Assets Created.*** The frameworks and implementation arrangements require that each DPR includes a detailed plan for operation and maintenance of assets that will be created under the NGRBA program. These plans must identify the institutional responsibilities as well as funding and other resources that would be required for their long term sustainable operations.

ANNEX 6B

Detailed Investment Frameworks and Implementation Process

A. NGRBA Investments Framework

1. General Criteria for All Sub-projects

1.1 Sub-projects should be from the five NGRBA states, namely: Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

1.2 Sub-projects must serve the areas falling under ULBs on the banks of the main stem of Ganga, or industrial areas on the banks of main branch of Ganga (including both distributaries of Ganga after Farakka).

1.3 Sub-projects must directly result in water quality improvements in the main stem of the Ganga, or on selected identified stretches of tributaries. In cases where water quality in the main stem of the Ganga is significantly affected by poor water quality of tributaries, then the sub-projects directly leading to improvements in the water quality of these tributaries may be eligible (For this, the water quality parameters may be considered for (i) the relevant tributary before joining the main stem of Ganga, and (ii) the Ganga after the confluence with the tributary.

1.4 Sub-projects which may *indirectly* lead to improvements in water quality in Ganga may be eligible if the linkages with improvement in the water quality are convincingly demonstrated.

1.5 Sub-projects must follow all social, environment and financial management requirements of the NGRBA Program.

1.6 Sub-projects must adhere to the Guidelines for Preparation of Project Reports under NGRBA / NRCP.

2. Criteria for Municipal Wastewater Sub-projects

2.1 Eligibility Criteria

2.1.1 Till such time as the Ganga Basin Master Plan (GBMP) is fully prepared, a prioritization method will be adopted for selecting wastewater investments according to their relative effectiveness in reducing the pollution loads entering the Ganga. Such prioritization method is based on the quantum of wastewater treated by the sub-project, and its impact on the water quality of Ganga during lean flow conditions at the location of discharge. All the project in the pipeline would be sorted in descending order depending on their impact. In order to be considered for NGRBA funding, a wastewater sub-project would need to be in the top half of sub-projects in the pipeline. In any given year, not more than 70% of the portfolio of wastewater sub-projects (by value) should consist of these high priority investments. However, additional projects may also be

considered (outside of these criteria) in order to accomplish the Mission Clean Ganga.

2.1.2 Explicit and informed consent of ULB through general body's resolution, as per the municipal laws, is required at the time of submission of Feasibility Report as well as of DPR. The consent should indicate recognition of the nature, scale, and cost of the investment, especially the projected O&M costs; and the roles and responsibilities of the ULB including an undertaking to operate the asset after the contract period. FRs or DPRs without this consent would not be considered eligible.

2.1.3 The proposed Executing Agency (EA) for the sub-project should be selected by SPMG in consultation and coordination with the relevant ULB.

2.1.4 DPRs must be based on approved Feasibility Reports (FR) which include appropriate macro-planning, and options scoping and analyses.

2.1.5 All sub-projects with significant O&M needs (such as solid waste management, WWTPs, and pumping stations) would need to be implemented with contracts that include long-term (15 years) O&M. Design-Build-Operate (DBO) or other long-term PPP arrangements may be considered.

2.1.6 O&M costs must be estimated based on specific calculations for each sub-project (as opposed to using thumb-rule percentages).

2.1.7 O&M of the complete sewerage system (including sewer networks and pumping stations) should be combined in the DBO contract for the new facility, wherever possible.

2.1.8 Performance Bank guarantees would need to be provided by the selected operator for the specified period of O&M.

2.1.9 Technology selection for wastewater treatment must be on lowest lifecycle cost basis, specified for the local conditions and required degree of treatment. The 15-years O&M cost would be used as the measure of lifecycle cost. The values of the key parameters (e.g. characteristics of influent wastewater, if available; required water quality parameters of effluent; energy price; land price; manpower price, etc) for this calculation must be provided for the local conditions by the EA in the bid documents.

2.1.10 For sewerage investments, house connections strategy must be developed and included in the FR/DPR. The cost of providing house connections up to property line will be eligible for funding under the NGRBA program, and the DPR must include the costs and plans for the same.

2.1.11 As part of its consent/approval of the DPR submitted to NGRBA program for funding, the relevant ULB will commit to undertaking awareness campaigns to encourage house connections in the areas served by the funded sewerage investments.

2.1.12 As part of their consent/approval of the DPR submitted to NGRBA program for funding, the relevant ULBs may engage in the ULB capacity building program, aimed at strengthening the technical, financial and management capacity of the

ULB. ULB will undertake to provide requisite staff, office space, logistics support, for successful implementation of the agreed capacity-building activities.

2.1.13 The ULB should provide an undertaking to allow monitoring of the sub-project facilities/performance by third party for quality assurance as required by the NGRBA program.

2.1.14 The DPR preparation would include environmental and social assessment as per the Environment & Social Management Framework.

2.1.15 Sub-projects during the construction and operation phases will be subject to monitoring by State Pollution Control Boards, as part of consent mechanism.

2.1.16 Sub-projects comprising component of land acquisition will be accorded sanction at two stages. "In Principle" approval will be obtained first, on the basis of the FR, and will be followed by DPR approval once the required steps in the land acquisition process are completed.

2.1.17 Immediately after FR approval and in parallel with DPR preparation, the EA along with the ULB would initiate land acquisition process for the project. This would facilitate identification of the land, its survey and preliminary cost estimation so that the State Govt. is in readiness to issue the appropriate notification under prevalent LA Act upon approval of DPR for speedy acquisition of the land.

2.1.18 The FR should assess whether the sub-project has the potential for greenhouse gas (GHG) reduction. The DPR should provide an estimate of this reduction and its design implications.

2.2 Appraisal Criteria

2.2.1 *Technical Standards of Preparation*

2.2.1.1 Preparation should be based on a suitable design period for each kind of asset (e.g.: civil works: 30 years, E&M equipment: 15 years; WWTPs: 10 years) based on forecasts of: population, water use/supply, and wastewater quantity and quality. These assumptions must be suitably validated.

2.2.1.2 Sub-project formulation must be based on detailed field surveys, including comprehensive house connection survey; site investigations and data collection.

2.2.1.3 Field surveys and investigations must be conducted as per prescribed guidelines.

2.2.1.4 All sewer design and construction should be in accordance with the standard literature, such as the CPHEEO Manual, Guidelines for Preparation of Project Reports under NGRBA / NRCP, and international best practice. Standard software should be used for design to optimize sewer size and slope. Existing sewer networks should be examined for synchronization with proposed network. Measures should be included for addressing the problem of solids deposited in sewers, and for ensuring the effective separation of storm water and water supply systems from wastewater systems.

2.2.1.5 For pumping stations, whether wet well only or combination of wet well and dry well design is used must be based on techno-economic considerations. Size/capacity of pumps and sumps should be worked out as per the Guidelines for Preparation of Project Reports under NGRBA / NRCP.

2.2.1.6 Technology selection for WWTPs must be based on lifecycle cost analysis, to choose the lowest cost feasible option, given the local conditions and required degree of treatment. The bids for long term contracts (including capital costs plus 15 years O&M cost) would be used as the measure of lifecycle cost. The values of the key parameters (e.g. characteristics of influent wastewater, if available; required water quality parameters of effluent; energy price; land price; manpower price, etc) for this calculation must be provided for the local conditions by the EA in the bid documents. Detailed analysis of sewage must be carried out to determine influent design parameters for WWTP. Automation should be encouraged in the operation of WWTPs in order to ensure efficiency to be encouraged.

2.2.1.7 Sludge management strategy must be developed in conjunction with wastewater treatment strategy.

2.2.1.8 Possibility of covering isolated residential pockets and slums through decentralized conveyance and treatment systems must be explored.

2.2.1.9 Pumping stations and WWTP facilities must have the provision of diesel generating sets as alternate source of power supply.

2.2.2 *Sub-Project Planning*

2.2.2.1 Planning and design must be consistent with the City Sanitation Plan/master plan/wastewater master plan and any other investment plans.

2.2.2.2 Selection of locations for major facilities such as Pumping stations and WWTPs must be done carefully to avoid likely litigation.

2.2.2.3 Wastewater system designs should be consistent with the water supply situation (to ensure adequate flows in the sewers).

2.2.2.4 Status of existing assets (e.g. sewerage networks) must be accounted for in planning and up-gradation, and must be included in the DPR if needed for proper functioning of the system.

2.2.2.5 Realistic timelines for each stage of preparation and implementation must be provided.

2.2.2.6 Linkages between different elements (house connections to sewers; sewers to pump stations and WWTP) must be examined to ensure that the system will function correctly and with adequate capacities at each stage.

2.2.2.7 A detailed Project Implementation Plan should be prepared for each DPR, appropriately supported by GANTT/CPM and/or PERT charts.

2.2.3 ***Sub-Project Costing***

2.2.3.1 Updated and current Schedule of Rates should be used for rate analysis; market rates may be used for the items not available in the SoR.

2.2.3.2 Price and Physical contingencies should be considered as appropriate.

2.2.3.3 Allocations by categories such as Civil Works, Goods and Equipment, Consulting Services, Training, incremental operating costs etc. should be provided, in conformity with procurement guidelines.

2.2.3.4 O&M cost for the first 5 years will be capitalized, and approved for funding by the NGRBA Program as part of the project cost. The O&M cost of subsequent 10 years must be estimated and presented in the DPR, which is to be funded by the State Govt. / ULB from its own resources.

2.2.4 ***Financial Analysis***

2.2.4.1 Sub-project capital cost will be shared as per agreed ratio between GoI and States including first 5 years O&M cost.

2.2.4.2 Adequate budget provisions from the State Government must be confirmed.

2.2.4.3 ULBs must present detailed O&M plan indicating likely revenue earning vis-à-vis O&M costs of assets for perspective years.

2.2.4.4 The first 5 years O&M costs are included in the project cost. The State Government will guarantee payment of the next 10 years O&M costs in case the ULB fails to do so.

2.2.5 ***Economic Analysis***

2.2.5.1 Economic analysis must be conducted for all subprojects proposed to NGRBA for funding. The economic benefits must take into account benefits from both the river and the improved urban environment.

2.2.6 ***Social Assessments and Communications***

2.2.6.1 Social assessments must be undertaken integrally with planning, technical and financial assessments.

2.2.6.2 Stakeholder engagement, outreach and communications must be undertaken in conjunction with each sub-project and in relation to specific issues (e.g. connecting to sewers, paying bills, reducing trash, etc.).

3 Criteria for Industrial Pollution Sub-projects

3.1 Eligibility Criteria

3.1.1 The sub-projects shall directly result in the reduction of industrial pollution load on the main stem of Ganga or its main tributaries. The reduction in industrial pollution load shall be measured in terms of reduction in BOD, COD and TDS levels in the main stem of the Ganga, before and after the discharge of industrial effluents in the river.

3.1.2 The sub-projects may consist of: (a) Common Effluent Treatment Plants (CETP); (b) Treatment, Storage and/or Disposal Facilities (TSDF) especially for common hazardous waste; (c) Innovative pilot projects on industrial pollution control technologies; and/or (d) Technical Assistance for the formation of Waste Minimization Circles and/or Clean Technologies.

3.1.3 The sub-project, including all its associated facilities, shall be fully owned and operated by member industries or private operators. The member industries or the private operator shall form a company under the Company's Act for implementing and operating the sub-projects.

3.1.4 The sub-projects shall be prioritized based on the pollution load of industrial effluents, number of participating industries, river flow, river water quality, specific site conditions and financial sustainability.

3.1.5 The capital cost of the sub-project shall include the cost of the associated facilities, including the cost of land, for setting up the facility. Financing pattern for the sub-projects shall be as follows: 25% as a grant from NGRBA, 25% as a grant from the State Government, and the remaining 50% to be borne by the participating industries and / or the private operator (either through own contribution or as loans through financial institutions). Financing is subject to satisfactory assessment of the cost estimates during appraisal stage.

3.1.6 Sub-projects proposed by member industries shall be commissioned on a DBO model with O&M costs capitalized for at least 5 years (or more) from the date of commissioning. O&M cost is the responsibility of the member industries.

3.1.7 The member industries should provide an undertaking to allow monitoring of the sub-project facilities/performance by third party for quality assurance as required by the NGRBA program.

3.1.8 Sub-projects proposed by private operators shall ensure commitment by the operator for the satisfactory operation of the facility.

3.1.9 To ensure good performance, the State Government shall provide its share of the finance (25%) as a loan, which may be converted to a grant if the sub-project performs satisfactorily for a period of 5 years.

3.1.10 The proposal should be based on informed consent of the member industries and the same shall be substantiated through suitable affidavit as well as the members' commitment to ensure satisfactory operation of the facility.

3.1.11 The sub-project should include a multi-party performance monitoring program comprising the designated citizen / professional groups, SPCB, member industries and CETP company representatives.

3.1.12 Sub-projects involving land acquisition will be sanctioned in two stages. "In Principle" approval based on the FR, to be followed by DPR approval once the required steps in land acquisition process are completed.

3.1.13 Immediately after FR approval and in parallel with DPR preparation, the Industries Association would initiate land acquisition process for the project. This

would facilitate identification of the land, its survey and preliminary cost estimation so that the State Govt. is in readiness to issue the appropriate notification under prevalent LA Act upon approval of DPR for speedy acquisition of the land.

3.1.14 The sub-projects, wherever feasible, should explore the option of tapping carbon credits with suitable mechanisms for minimizing green house gas emissions. The DPRs must present (in the required format) the potential for carbon credits generation.

3.2 Appraisal Criteria

3.2.1 *Technical standards of preparation*

3.2.1.1 The sub-projects shall be designed based on available guidelines/manuals/rules of national and international agencies, including MoEF, CPCB, and USEPA, and the treated effluent shall comply with the relevant disposal standards in India.

3.2.1.2 Sub-projects shall be designed for a period of 30 years for civil works and 15 years for E&M equipment. The designs shall also consider future scenarios including expansion of existing industries.

3.2.1.3 All the designs shall be based on inventory of participating industries, detailed engineering surveys (topographic surveys, etc.), site investigations (soil sampling, etc.), and shall comply with the requirements of relevant codes / standards (BIS, IRC, etc.).

3.2.1.4 The DPR should consider the overall industrial waste generated by the member units and shall be based on individual industry specific waste quantification and characterization studies and waste minimization studies / audits aimed at implementing cleaner production practices.

3.2.1.5 The technology chosen for the sub-project shall be the one with lowest lifecycle cost, that is proven to be suitable for local conditions and which provides required degree of treatment. The DPR and the bid documents shall provide the key parameters adopted for the arriving the life cycle cost.

3.2.1.6 The technologies to be adopted in the sub-projects shall have all regulatory and environmental clearances.

3.2.1.7 The design should include adequate and reliable alternate power supply arrangements to ensure satisfactory performance of the facility.

3.2.1.8 The sub-project should include a suitable sludge/residue management strategy which ensures in situ treatment of sludge and subsequent safe disposal either at the site or at an approved TSDF facility.

3.2.1.9 The CETPs shall be designed based on detailed studies on the quantity and characteristics of the industrial effluents, as well as on waste minimization studies and audits.

3.2.1.10 The technology proposed by the sub-project should consider the: (i) mixed and variable characteristics of the industrial effluents of the respective member industries, (ii) life cycle cost (capital and O&M), (iii) land requirements, (iv) power requirements, (v) sludge / residue management, (vi) ease of operation, (vii) flexibility for future expansion / upgradation, and (viii) Net GHG emissions, etc.

3.2.1.11 The CETP sub-projects should include facilities for common recovery units (chrome recovery, etc) and/or treated effluent reuse and management of sludge/residue management (including collection, transportation, treatment and disposal of sludge generated from the pre-treatment facilities of the member industries) from the facilities.

3.2.2 *Sub-Project Planning*

3.2.2.1 The sub-project planning and design shall be consistent with the industrial and environmental policies/directives of GoI and the respective states.

3.2.2.2 The location of CETPs shall be based on environmental and social considerations and shall comply with the site selection guide lines of CPCB or the State PCB.

3.2.2.3 The experience of similar projects (CETPs) in the region/country shall be considered while designing the sub-project.

3.2.2.4 The sub-project preparation and implementation time lines shall be realistic and shall consider all the aspects of mobilization of participating industries, initial assessment studies, and technological limitations during construction, etc. and shall provide clear implementation plan through suitable CPM / PERT Charts.

3.2.2.5 The sub-projects shall include the provisions for future expansion and also developments on a modular basis.

3.2.2.6 The sub-projects should include detailed costs for the collection and transportation of waste from the participating industries to the CETP.

3.2.2.7 Proposals should provide details on critical aspects, such as: (i) details of member industries, (ii) pre-treatment requirements for member industries (not to be included in the capital cost of the sub-project, but borne by member industries), (iii) commitment by the member industries for setting up pre-treatment facilities, (iv) proposed facilities for the conveyance of effluent to the CETP, (v) details of user charges, etc.

3.2.3 *Sub-Project Costing*

3.2.3.1 Updated and current Schedule of Rates (SoR) to be used for rate analysis and market rates may be used for the items not available in the SoR.

3.2.3.2 Inflation and contingencies shall be considered as normally followed by the respective state governments, in similar projects.

3.2.3.3 Various items of the sub-projects shall be categorized as Civil works, Good and Equipment, Consulting Services, Training, incremental operating costs etc, as per the NGRBA Procurement Manual.

3.2.3.4 Proposals should provide the details of cost apportionment among the participating industries, for contribution, recurring and O&M costs of the proposed facilities. The mechanism for this cost apportionment along with provisions for cost escalation shall also be provided.

3.2.3.5 The sub-project contract document shall be structured suitably to ensure that the O&M costs are capitalized into the cost and a minimum of 5 years O&M is ensured by the contractor.

3.2.4 *Financial Analysis*

3.2.4.1 The sub-project capital cost shall be shared as per the ratios indicated in section 3.1.5 of this frame work.

3.2.4.2 Adequate budget provisions by GoI, State Government and the agency developing the sub-project shall be ensured and confirmed, prior to approval of the sub-project.

3.2.4.3 The project development agency shall provide a detailed O&M plan indicating likely revenue earning vis-à-vis O&M costs of assets for lifetime operation (or at least 15 years).

3.2.4.4 The sub-project should also present the agreed strategy to ensure financial sustainability of the facility.

3.2.5 *Economic Analysis*

3.2.5.1 The sub-project should include a detailed economic analysis that provides information of the benefits of the project to the community at large and the river in particular. The analysis shall consider factors such as positive health impacts as a result of environmental improvement of the city/town, economic benefit in terms of employment generation, higher productivity, etc.

3.2.6 *Social Assessments and Communications*

3.2.6.1 This aspect shall be integrated with planning, technical and financial assessments of the sub-project.

3.2.6.2 The sub-project shall include an assessment of 'willingness to pay' by the participating industries for developing the CETP and its regular operation.

4 Criteria for Solid Waste Management Sub-projects

4.1 Eligibility Criteria

4.1.1 Sub projects would be selected and prioritized on the basis of the following factors: (i) unorganized waste disposal sites on the river banks; (ii) religious, historical and archeological sites of importance with poor solid waste management; (iii) slums and small settlements along the river without formal waste collection and transportation; (iv) small towns along the river without

adequate solid waste management systems; and (v) rehabilitation and remediation of existing disposal sites along the river.

4.1.2 Any new facility/sub-project should be fully integrated with the existing components of the city-level solid waste management system (including primary collection, secondary collection points, segregation at source and pre-processing stage, transfer stations, landfills, recycling and reuse, treatment and processing, rehabilitation and remediation of existing landfill sites).

4.1.3 All sub-projects addressing the above issues and with significant O&M needs, such as collection & transportation, landfill, and waste processing, should be commissioned with long-term (at least 15 years) O&M contracts (DBO or other models).

4.1.4 Performance Bank guarantees should be provided by the selected operator for the specified period of O&M. Or else, a suitable Terms of Payment for the overall package should be worked out covering payments during the entire O&M period.

4.1.5 Technology selection will be on lowest lifecycle cost basis, calculated for local conditions and required degree of recycling, treatment and processing. The bid documents will provide the key parameters for this calculation, including specific details, such as physico-chemical characteristics of waste, equipment and energy prices, and land and manpower prices.

4.1.6 Informed consent of the ULB will be required, in the form of council resolution for providing O&M for sub-project as well as its eventual ownership, if applicable.

4.1.7 DPRs should be based on existing city solid waste management plans or a City Sanitation Plan.

4.1.8 The ULB should provide an undertaking to allow monitoring of the sub-project facilities/performance by third party for quality assurance as required by the NGRBA program.

4.1.9 As part of their consent/approval of the DPR submitted to NGRBA program for funding, the relevant ULBs may engage in the ULB capacity building program, aimed at strengthening the technical, financial and management capacity of the ULB. ULB will undertake to provide requisite staff, office space, logistics support, for successful implementation of the agreed capacity-building activities.

4.1.10 Community participation and consultations should be ensured in the process of FR/DPR preparation.

4.1.11 Sub-projects comprising component of land acquisition will be accorded sanction at two stages. “In Principle” approval will be obtained first, on the basis of the FR, and will be followed by DPR approval once the required steps in the land acquisition process are completed.

4.1.12 Immediately after FR approval and in parallel with DPR preparation, the EA along with the ULB would initiate land acquisition process for the project. This would facilitate identification of the land, its survey and preliminary cost

estimation so that the State Govt. is in readiness to issue the appropriate notification under prevalent LA Act upon approval of DPR for speedy acquisition of the land.

4.1.13 The FR should assess whether the sub-project has the potential for greenhouse gas (GHG) reduction. The DPR should provide an estimate of this reduction and its design implications.

4.2 Appraisal Criteria

4.2.1 *Technical Standards of Preparation*

4.2.1.1 Preparation should be based on a suitable design period for each kind of asset based on forecasts of: population, water use/supply, and wastewater quantity and quality. These assumptions must be suitably validated.

4.2.1.2 Project formulation should be based on detailed field surveys as appropriate, including comprehensive waste quantification surveys, site investigations, and proximity analysis.

4.2.1.3 Sub-projects should be in conformity with the Municipal Solid Waste Management (Rules) 2000, and the SWM Manual published by CPHEEO, MoUD.

4.2.1.4 Technology selection for waste treatment should be on lowest lifecycle cost basis, calculated for local conditions and required degree and type of treatment. The bid documents should provide the key parameters for this calculation, including site specific details, e.g. waste physico-chemical characteristics, equipment and energy prices, and land and manpower prices. Detailed analysis of type of waste and its physico-chemical characterization should be carried out in order to identify the choice of processing technology (such as composting, waste-to-energy).

4.2.1.5 Integrated waste management strategy should be developed for small towns and for augmentation in cities, if required.

4.2.1.6 The possibility of covering isolated residential pockets and slums through decentralized transportation system should be explored based on techno-economic considerations.

4.2.1.7 Sub-projects should include suitable provisions for improving the working conditions and/or rehabilitation of local community workers (e.g. scavengers, rag pickers, and recyclers).

4.2.2 *Sub-Project Planning*

4.2.2.1 Sub-project planning and design should be consistent with the City Sanitation Plan or other master/investment plan being provided.

4.2.2.2 A detailed Project Implementation Plan supported by GANNT/CPM and/or PERT Charts should be included.

4.2.3 *Sub-Project Costing*

4.2.3.1 Updated and current Schedule of Rates should be used for rate analysis and market rates may be used for the items not available in the SoR.

4.2.3.2 Price inflation and physical contingencies should be considered as applicable.

4.2.4 Financial Analysis

4.2.4.1 The ULB will need to draw up detailed O&M plan indicating likely revenue earning vis-à-vis O&M costs of assets for lifetime operation (or at least 15 years).

4.2.4.2 The sub-project should also present a strategy to ensure financial sustainability of the facility.

4.2.5 Economic Analysis

4.2.5.1 The sub-project should include a detailed economic analysis that provides information of the benefits of the project to the community at large and the river in particular. The analysis shall consider factors such as positive health impacts as a result of environmental improvement of the city/town, economic benefit in terms of employment generation, higher productivity, etc.

4.2.6 Social Assessments and Communications

4.2.6.1 Social assessments should be undertaken integrally with planning, technical and financial assessments. Stakeholder engagement, outreach and communications should be undertaken in conjunction with each sub-project and in relation to specific issues (e.g. paying bills, reducing waste, total sanitation, etc.).

4.2.6.2 Contingent Valuation Method (CVM) may be adopted for beneficiary assessments.

5 Criteria for River Front Management Sub-projects

5.1 Eligibility Criteria

5.1.1 Three types of sub-projects will be considered eligible for funding under the riverfront management (RFM) sector: (i) comprehensive and integrated Area Development Plans (ADPs); (ii) the construction or improvement of crematoria; and (iii) the conservation and preservation of ecologically sensitive areas. ADP sub-projects are expected to be in the majority under the NGRBA Program.

5.1.2 ADP sub-projects should be taken up in reasonably long stretch of ghats. However, the ghats portion may be limited in length to the optimal and historical use of the river. in case of smaller ghats, the sub-project may still be eligible if a justifiable case is made for its cultural, historical, religious, economic or recreational importance.

5.1.3 ADP sub-projects should be reasonably comprehensive and integrated, and should consider all facets of area development, including urban planning, architecture and the built environment, culture and heritage, religious practices, historical and archeological sites, social and environmental improvements like properly managed public toilets and solid waste management, development of ghats for bathing and religious rites, recreational uses, and local economic development, including the impact of proposed activities on the livelihoods of local residents/users of the river.

5.1.4 Crematoria sub-projects should propose either the construction of one or more new facilities, or the improvement of existing ones. Proposals should clearly justify the local need and demand for these facilities and include a plan for their sustainability.

5.1.5 Conservation and preservation sub-projects should: (i) focus solely on ecologically sensitive stretches of the river prone to resource degradation; (ii) demonstrate how conservation and preservation of the stretch's ecology and biodiversity will be achieved; and (iii) include specific knowledge generation, communications, and public awareness activities.

5.1.6 All sub-projects should: (i) show adequate demand for the proposed improvements; (ii) explain the social, environmental and economic impacts of the works and activities proposed; and (iii) demonstrate sustainability, including for operations and maintenance.

5.1.7 Sustainable revenue generating activities are encouraged, including activities which can generate revenue from sustainable tourism. Revenue generation can be through ring-fenced activities in the sub-project (e.g. user charges for a walkway or park, or rent from kiosks) or through other schemes in the city (e.g. local tourism charges or city luxury tax). Public Private Partnership (PPP) models for design, construction, and operation of facilities are to be encouraged.

5.1.8 Sub-projects with engineering works - such as embankment development for river channeling - that affect the hydraulics of the river are not eligible. Engineering works are eligible provided the proposal demonstrates they will not interfere with the hydraulics of the river.

5.1.9 Sub-projects should be prepared in consultation with local stakeholders, including elected members of the ULB, citizens groups, businesses, religious leaders, temple trusts, CBOs and NGOs. Stakeholders should be encouraged to participate in the design and planning process, and their views should be reflected in the FR and DPR.

5.1.10 Priority will be given to ADP sub-projects, and to those located in areas of greatest need, defined as: (i) places of mass congregation; (ii) places of point source pollution, including solid waste dumping; (iii) places of cultural, historical, religious, economic or recreational importance; (iv) places that have become derelict and where their enhancement would improve the quality of life and economic activity in the area; and (v) places of high environmental and ecological value.

5.1.11 Proposals should avoid areas of disputed land tenure, although such areas will be considered with clear proposals for early resolution. Priority will be given to sub-projects that avoid land acquisition altogether and/or can obtain land through donation. In case land acquisition is unavoidable, immediately after FR approval and in parallel with DPR preparation, the EA along with the ULB would initiate land acquisition process for the project. This would facilitate identification of the land, its survey and preliminary cost estimation so that the State Govt. is in readiness to issue the appropriate notification under prevalent LA Act upon approval of DPR for speedy acquisition of the land.

5.1.12 Explicit and informed consent of ULB, as per the municipal laws, is required at the time of submission of FR as well as of DPR. The consent should indicate recognition of the nature, scale, and cost of the investment, especially the projected O&M costs; and the roles and responsibilities of the ULB including an undertaking to own and manage the facilities and assets. FRs or DPRs without this consent will not be considered eligible.

5.1.13 The ULB should provide an undertaking to allow monitoring of the sub-project facilities/performance by third party for quality assurance as required by the NGRBA program.

5.1.14 As part of their consent/approval of the DPR submitted to NGRBA program for funding, the relevant ULBs may engage in the ULB capacity building program, aimed at strengthening the technical, financial and management capacity of the ULB. ULB will undertake to provide requisite staff, office space, logistics support, for successful implementation of the agreed capacity-building activities.

5.1.15 All legal and statutory approvals needed should be obtained and submitted with the DPR, including from Port Authorities, Waterways Departments, and Irrigation Departments as may be required.

5.2 Appraisal Criteria

5.2.1 The DPR should examine and consider all existing plans that have a bearing on the sub-project, such as City Sanitation Plans, master plans, development plans, cultural site development plans, and regional development plans. Plans previously prepared by local citizens groups should also be consulted.

5.2.2 The DPR should be prepared in accordance with the NGRBA Program framework, and include explicit assessments of the social, economic, environmental, cultural, historical and religious aspects of the project. The DPR should also carefully assess the particular physical and safety issues associated with RFM sub-projects, such as river flow, flooding risks, drowning risks, and crowd management.

5.2.3 The DPR should include a detailed economic analysis that provides information on the benefits of the sub-project to the community at large and to the river in particular.

5.2.4 The DPR should demonstrate that the design does not disturb the natural ecology, habitats, forests, mud-flats, river hydraulics and flows due to any construction or sub-project activity. In sub-projects where the river front includes undisturbed environmentally sensitive habitats, forests, or natural landscapes, these should be preserved or conserved appropriately.

5.2.5 The O&M costs for the first 5 years may be included in the project cost. The O&M costs for the subsequent 10 years should also be estimated and presented in the DPR. The O&M costs should include basic cleaning and waste management for the proposed area.

5.2.6 The DPR should present an O&M plan, including the institutional and financial arrangements to manage and finance sub-project activities. The DPR should also include details of any proposed revenue generation, where applicable, and of the post-implementation management of the sub-project, including the roles and responsibilities of the State Government, the ULB, the Executing Agency, religious trusts, the private sector, and/or any other government or non-government stakeholder as appropriate.

B. Detailed Implementation Process for NGRBA Infrastructure Investments

Stage 1: Annual Planning

1. A state level annual planning meeting would be organized by the SPMG in early September every year, with all relevant ULBs and EAs participating, to prepare the draft annual activities plan for the state and approved by the State Executive Committee (SEC) of SRCA. The SPMGs would submit to PMG the annual action plans by the end of September for the next Financial Year.
2. For finalization of the state annual action plans, the PMG would organize an annual planning meeting in October every year, with the 5 basin states participating. These interactions between the SPMGs and the PMG would inform the preparation of the state annual action plans to ensure that the planning meets the overall program objectives as well as the states' needs and priorities. The World Bank would provide relevant inputs in the consultations at both the SPMG and PMG levels.
3. The PMG would prepare the NGRBA Annual Action Plan including a list of proposed sub-projects, by November every year, for the next financial year incorporating the World Bank's considerations. This would be based on the annual action plan and supported Concept Notes, prioritized according to the broad agreed prioritization and selection criteria, and submitted by SPMGs, together with proposed centrally managed activities to be implemented directly by the PMG or through national level EAs.
4. The Annual Plan would be submitted to the World Bank for comments, review and no objection by December each year. The Plan would be finalized after incorporating World Bank comments and receipt of an NOL from the World Bank to PMG. The Annual Plan would be submitted to the Empowered Steering Committee (ESC) of NGRBA for concurrence by end January.
5. The Action Plan would be submitted to the Empowered Steering Committee (ESC) of NGRBA for concurrence by end January every year. Revision of the annual Action Plan during the year would follow GoI's normal budget revision timetable (this is to ensure revised budget estimates are available for the remainder of the financial year).

Stage 2: Feasibility Report (FR) Preparation and Evaluation

6. The SPMG will coordinate the preparation of FRs for the sub-projects included in the annual plan, by the respective EAs. The FR should include inter alia macro-planning, and options scoping and analysis.
7. The ULB would enter into a Memorandum of Agreement (MoA) with the SPMG and the EA to proceed with and accept the sub-project as well as related O&M obligations, subject to the eventual implementation of the proposed investment.
8. The ULB and the EA with support of the SPMG, conduct consultations with the local community on all aspects of the proposed sub-project, while making available all relevant information to the public.
9. The SPMG may also take up for consideration concepts proposed by entities other than the EAs; if a concept is approved the SPMG along with the concerned ULB would need to identify an EA.
10. Investments for which the DPRs already exist but for which feasibility-stage analysis has not been carried out would also require FRs.

11. The cost of preparation of the FR would be borne by the EA, and will be reimbursed at the stage of final DPR approval.
12. For all infrastructure investments which would become ULB assets, the consent of the relevant ULB (from appropriate ULB authority) should be attached in the FR. Without this consent, the FR will not be accepted. It is intended that all infrastructure and assets created and/or supported by the project would become ULB assets, hereby consolidating the commitment to ownership, and sustained operations and maintenance, and emphasizing community involvement. In no case the SPMG should forward an FR to the PMG without a general body resolution of the ULB.
13. The SPMG would consider the FRs only for those investments which are included in the approved long-list of investments in the annual plan.
14. The SPMG would not clear any FR which does not have identification of estimated land parcels required for implementing the activity, along with tenure details of the land parcels.
15. The SPMG would evaluate the FR to ensure that it meets the requirements of the NGRBA investments framework and the Guidelines for Preparation of Project Reports under NGRBA / NRCP. The evaluation process should be carried out in coordination with the relevant ULB. The SPMG would make a decision in maximum one month. It can either (i) forward the approved FR to the PMG, or (ii) send it back to the sub-project Executing agency for modification.
16. The PMG would evaluate the FR to ensure that it meets the requirements of the NGRBA investments framework and the Guidelines for Preparation of Project Reports under NGRBA / NRCP. The PMG would convey its decision on the FR within a maximum of one month. It can either (i) approve the FR, or (ii) send it back to the SPMG for modification. The FRs does not require approval from the Empowered Steering Committee (ESC) of the NGRBA.
17. Approval of FR means that DPR preparation can be commenced. Approval of FR in no case indicates commitment or approval to finance the proposed investment.
18. For FRs with pre-existing DPRs: if the DPR is in-line with the findings of the FR, then that DPR may be accepted for review after suitable modifications; if the DPR is not in line with the findings of the FR, that DPR may need to be reinvestigated, designs to be readjusted, and cost estimates to be prepared using current rates, or a new DPR may be prepared.

Stage 3: DPR Preparation and Evaluation

19. The SPMG would communicate FR approvals (by the PMG) to the relevant EA. The SPMG has the right to designate a different EA for DPR preparation, if found expedient.
20. DPR preparation would include environment and social assessment as per the Environment & Social Management Framework.
21. The cost of preparation of the DPR would be borne by the EA, and will be reimbursed at the stage of final DPR approval.
22. Immediately after FR approval and in parallel with DPR preparation, the EA along with the ULB would initiate land acquisition process for the project. This would facilitate identification of the land, its survey and preliminary cost estimation so that the State Govt. is in readiness to issue the appropriate notification under prevalent LA Act upon approval of DPR for speedy acquisition of the land.
23. The DPR would be approved by the SPMG in consultation and coordination with ULB. The evaluations would include site visits as required. The SPMG would communicate its

decision, with appropriate state-level consent as needed, in a maximum of 30 days. It can either (i) forward the approved DPR to the PMG, or (ii) send it back for modification.

24. The Memorandum of Agreement (MoA) previously entered into amongst the ULB, the EA and the SPMG will be updated. The respective ULB (or prospective long term sub-project owner) would undertake, based on the updated DPR proposals and cost implications, to proceed with and accept the sub-project investments and all related operational and maintenance obligations, subject to the eventual implementation of the proposed investment.

Stage 4: Appraisal and Approval of Sub-projects

25. PMG would evaluate the DPR to ensure that it meets the requirements of the NGRBA investments framework and the Guidelines for Preparation of Project Reports under NGRBA / NRCP within maximum of 60 days. The evaluations would include third party appraisal site visits and public consultations as required. The possible decisions are either (i) recommend approval of DPR, (ii) send back to the SPMG for modifications.

26. In either case the appropriate DPR appraisal note would be prepared by the third party appraisal agency in line with the "Guidelines for Preparation of Project Reports under NGRBA / NRCP".

Stage 5: Confirmation of Appraisal of Sub-projects and Approval to Finance

27. The sub-projects (together with supporting documentation, including the recommended DPRs) would be placed, following clearance by the PMG, to the Empowered Steering Committee (ESC) of the NGRBA or to the Secretary (MOEF) for consideration. Formal approvals would be based on the respective levels of authorization and estimated sub-project costs. Sub-projects with estimated costs up to about Rs 25 crores ($US 5.5 million) could be approved for implementation by the Secretary (MOEF) based on recommendations of the PMG. Sub-projects costing more than this amount would be submitted for ESC for its consideration.

Stage 6: Execution - Bid Documents and Bidding

28. Wherever land acquisition is involved, after DPR approval, the State Govt. would move immediately to disburse the award amount and assistance as per the Environment and Social Management Framework so as to expedite the possession of the land prior to bids issuance.

29. The EA would be responsible for the preparation of bidding documents and implementation of procurement.

30. The EA committee for evaluation and award of bids would have at least one member of SPMG and one representative of the local ULB.

Stage 7: Construction Supervision, Quality Assurance, Monitoring and Evaluation

31. The EA would be responsible for putting in place arrangements for supervision of all contracts. All civil and mechanical works investments would require comprehensive on-site construction supervision, in accordance with international best practice. If required, the EAs may procure and manage supervision consultants to address any capacity gap in the EA for effective construction supervision.

32. The "Engineer to the Contract" would in each case be clearly set out in the Contract documents, and would generally be a representative of the supervision consultants wherever employed.
33. The SPMG would appoint independent/third-party inspection (TPI) consultants, to supervise the execution of infrastructure investments under the NGRBA program, including timely progress, quality of works and proper documentation and reporting as delineated in the Guidelines for Preparation of Project Reports under NGRBA / NRCP.
34. M&E / Result Framework Document (RFD) would be the responsibility of SPMG/PMG and 6-monthly M&E / RFD reports will be prepared.
35. A city level Monitoring Committee in each ULB would also help monitor the implementation of investments
36. Works would be handed over to the sub-project owner (generally the ULB) on completion of the designated period of maintenance (generally 6 months to 1 year, depending on sub-project complexity) and following final acceptance of completion of works arising during the defects liability period, if required.
37. Contracts would include provision for 15 years O&M of the sub-project, including all subsystems. The sub-project contractor would therefore operate and maintain for a fee the completed works constructed under the sub-project for a 15 year period.

IV. Detailed Implementation Process for Non-Infrastructure Investments

38. For the World Bank-supported project, the pre-agreed non-infrastructure related activities defined in Component One would be implemented as follows:

	Activities under Component One (Institutional Development)	**Implementing Institution**	**EA**
Sub-Component A: NGRBA Operationalization and Program Management	Institutional Support to the PMG and the SPMGs	PMG and SPMGs	Self
	Enhancing Ganga Knowledge Resources	PMG	Self
	Communications and Public Participation (central level)	PMG	Self or EA to be selected
	Communications and Public Participation (state level)	SPMG	Self or EA to be selected
Sub-Component B: Technical Assistance for ULBs	Capacity-building of ULB Service Providers	SPMG	ULB
Sub-Component C: Technical Assistance for Environmental Regulators	Upgradation of Water Quality Monitoring System	PMG	CPCB
	Capacity-building of Environmental Regulators (central level)	PMG	CPCB
	Capacity-building of Environmental Regulators (state level)	SPMG	SPCB
	Comprehensive Inventorying of Pollution Sources	PMG	CPCB

39. Proposals for innovative pilots and for communications and social outreach would include funding windows managed by the PMG, which would evaluate the proposals submitted in these areas twice a year (October and April) and make awards.

40. The process and format for infrastructure pilot proposals would be same as that for infrastructure investments under the framework (i.e. FRs and DPRs would be needed); however the pilots need not comply with all requirements of the investment framework and the Guidelines for Preparation of Project Reports under NGRBA / NRCP.

41. The proposals for research and communication initiatives can be provided in a general concept note format.

Annex 7: Financial Management and Disbursement Arrangements

INDIA: National Ganga River Basin Project

1. This Annex describes the financial management (FM) and disbursement arrangements for the project. These arrangements are designed to account for and report the sources and uses of project funds and to meet the Bank's fiduciary requirements. The FM risk rating of the project is 'Substantial'[28].

2. Financial Assessments of Project Executing Agencies. FM Assessments have been carried out for provisional EAs identified at this stage. Assessment of these EAs was done only from a contract management perspective as the fund flow and accounting functions are centralized at the PMG (for central level) and SPMGs (for state level). To facilitate efficient management of funds, accounting, reporting and oversight, the fund flow arrangements have been designed to keep the number of accounting units to a minimum (i.e. the PMG, four SPMGs in the states of Uttar Pradesh, Uttarakhand, West Bengal and Bihar, and the State-level Implementing Unit in Jharkhand). See Figure 1.

3. Project Accounts. Project accounts will be maintained by these units using an off-the shelf accounting package. Accounting for all NGRBA program activities will be done using a double-entry accrual based accounting system.

4. Criteria for new EAs. Based on the assessments conducted for the potential EAs, certain minimum criteria have been developed on FM aspects relating to contract management. Since more EAs will be selected during project implementation, it will need to be ensured that these specific minimum criteria are complied with, prior to confirmation of any new EA. These criteria are listed in this Annex, under the section "Internal Controls and Audit Framework".

5. Internal and External Audits. Quarterly internal audits will be conducted at the PMG and the SPMGs, which will assist the management in identifying and addressing internal control weaknesses. An Annual External audit will be conducted at the PMG and each SPMG by a Private Firm of Chartered Accountants appointed by the PMG, under Terms of Reference and selection criteria agreed with the Bank. A consolidation of the audited financial statements of the PMG and SPMGs, together with the individual audited project financial statements, will be submitted to the Bank annually.

6. Financial Reporting. PMG will submit consolidated interim unaudited financial reports (IUFRs) to the Bank on a quarterly basis. The Bank will disburse funds to the GoI based on expenditures documented by the IUFRs.

7. FM Manual. Details on the financial management processes of the project – including budgeting, fund flow, internal control framework, accounting, financial reporting and audit arrangements –are described in the Financial Management Manual.

[28] A detailed risk matrix is provided at the end of the Annex.

Fund Flow Design

8. The PMG will receive NGRBA funds from the MoEF budget in an earmarked project bank account. The PMG will have its own NGRBA budget line, and a separate budget classification for the specific Bank financed project. The PMG will transfer funds to the SPMGs on half-yearly basis, for implementation of the agreed annual action plan. These transfers will be made in May and November. The PMG will release the November installment to each SPMG (i) after the SPMG has submitted its project Audit Report of the previous financial year to the PMG; and (ii) on reasonable utilization of the first installment of the reporting year. The State Government will release its share of funds to the SPMG within two months of the receipt of the installment from the PMG.

9. In order to streamline the arrangements, funds will flow only up to the level of the SPMG, which will have a project bank account (the "mother account") where project funds received from the PMG, and from the states[29], will be held (see Figure 1). Each EA will have a sub-project specific zero balance bank account (the "child account") in the same bank. The EA will have the authority to issue payment instructions to pay contractors/ suppliers/service providers for undertaking project activities within the scope of the approved annual action plan. Through a sub-project specific payment system, the SPMG Banker will ensure that the payments from an EA bank account do not exceed the annual amount sanctioned for that EA for the particular sub-project. As soon as a payment instruction is issued by the EA to its banker, the banker will check compliance with the ceiling as mentioned above and then draw the required funds from the SPMG mother account and transfer the same to the suppliers'/contractors' account on the same date. This transfer of funds from the mother account to the supplier/contractor/service provider account will happen through Real Time Gross Settlement (RTGS)[30]. Thus at the end of any given day, the EA child account will always have a zero balance. Similar arrangements will also be made for fund flows between the PMG and the EAs at the central level.

Accounting and Financial Reporting

10. The above-mentioned fund flow arrangements will significantly mitigate the risks of inadequate financial management capacities of EAs, which were likely to cause delays in accounting, financial reporting and auditing. The fund flow design will also make possible accounting of all central and state level expenditures by the PMG and SPMGs. Project accounts will be maintained by using an off-the shelf accounting package. All NGRBA program activities will use double-entry accrual based accounting system.

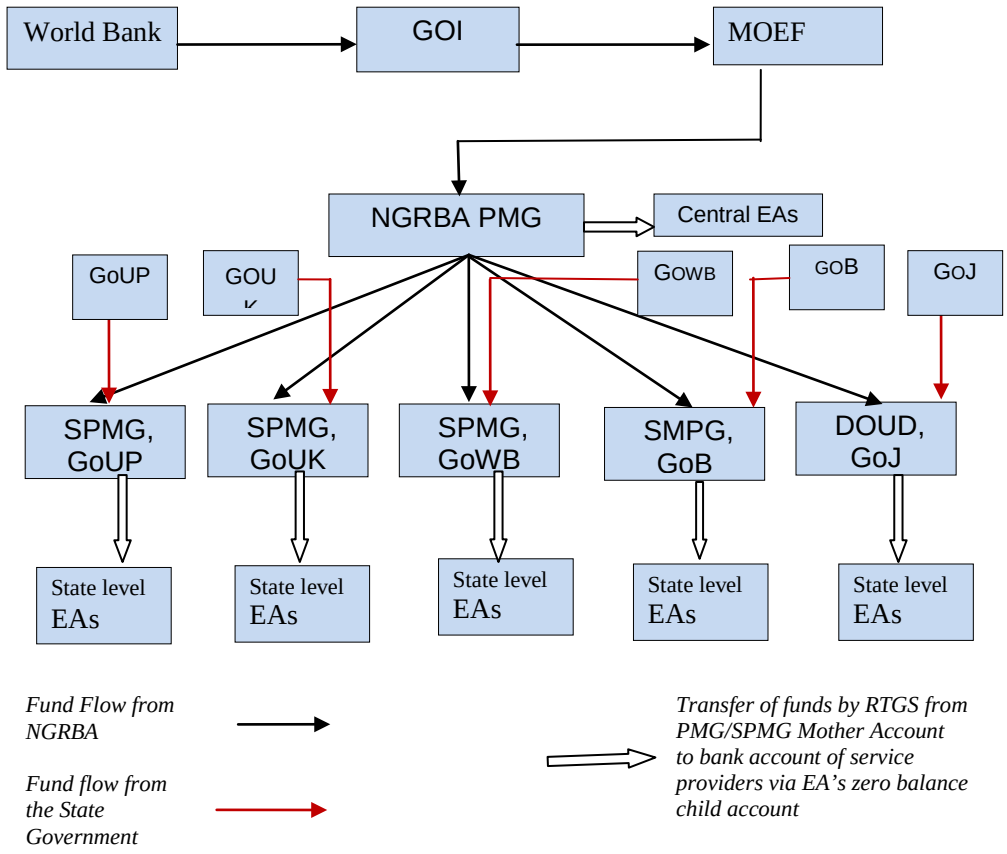
11. Each SPMG will submit quarterly Interim Unaudited Financial Reports (IUFRs) to the PMG. The PMG will consolidate the IUFRs received from the five accounting units along with

[29] State Government's contribution

[30] RTGS is a funds transfer system where money is moved from one bank to another in 'real-time', and on gross basis. When using the banking method, RTGS is the fastest possible way to transfer money. 'Real-time' means that the payment transaction isn't subject to any waiting period. The transaction will be completed as soon as the processing is done, and gross settlement means that the money transfer is completed on a one to one basis without clustering with another transaction.

its own, and submit a quarterly consolidated IUFR to the World Bank within 60 days from the end of each quarter. The IUFR formats and detailed instructions for preparation of IUFRs are provided in the FM Manual.

Figure 1: Fund Flow Diagram



Disbursements and Eligible Expenditures

12. The total project cost is USD 1,556 million. The Bank will finance 89% of the central share of the project costs excuding land costs. The Bank will not finance the cost of purchase or acquisition of any land under the project.

13. The World Bank will provide an initial advance up to a fixed ceiling[31] of US$ 80 million in a Designated Account (DA) with the Reserve Bank of India (RBI). Thereafter further advances of funds will be disbursed by the Bank to the DA every quarter based on amounts spent out of this advance as documented by the consolidated quarterly IUFRs subject to the DA fixed ceiling. The PMG will submit consolidated withdrawal application requests for advances and reimbursement to the Bank through CAAA for the entire project based on expenditures incurred

[31] This is usually equivalent to the estimated expenditure for the first six months. A fixed ceiling would mean that the PMG can draw up to that amount initially, but can also draw less if required. This fixed ceiling may be increased later during project implementation based on the requirements of the project. This is more flexible and saves the Government service charges.

during the quarter and documented in the consolidated IUFRs as well as the project's future financing needs.The disbursement methods that may be used are (i) Advance (ii) Reimbursement and (iii) Direct Payment. Funds will be disbursed by the Bank under the following disbursement categories:

Category	**Amount of the Financing Allocated (US$)**			**Percentage of Expenditures to be Financed (Inclusive of Taxes)**
	IDA	IBRD	Total	
Institutional Development	154,806,536	0	154,806,536	89% of central share
Priority Infrastructure Investments	41,249,390	798,997,500	840,246,890	89% of central share of eligible expenditures
Project Preparation Advance Refinancing	2,944,074	0	2,944,074	
Front-End Fee	0	2,002,500	2,002,500	
Total Amount	199,000,000	801,000,000	**1,000,000,000**	

14. Under Component One, the sharing of costs between the central and state governments will be as follows:

Components	Central %	State %
A. Institutional Development		
A. NGRBA Operationalization and Program Management		
Ganga Knowledge Center	100%	0%
NGRBA PMG	100%	0%
Uttarakhand SPMG	70%	30%
Uttar Pradesh SPMG	70%	30%
Bihar SPMG	70%	30%
Jharkhand SPMG	70%	30%
West Bengal SPMG	70%	30%
B. Technical Assistance for ULB Service Providers	70%	30%
C. Technical Assistance for Environmental Regulators		
CPCB (incl. Water Quality Monitoring System)	100%	0%
Uttarakhand SPCB	70%	30%
Uttar Pradesh SPCB	70%	30%
Bihar SPCB	70%	30%
Jharkhand SPCB	70%	30%
West Bengal SPCB	70%	30%
Research studies and training	100%	0%

The Bank will finance 89% of the central share of the project costs paid and reported in the consolidated Quarterly IUFR.

15. Under Component Two, the central and state governments will be financing all investments in the 70:30 ratio except for those in industrial pollution control, where the center and state governments will each contribute 25% of the cost and the remainder 50% will be borne by the industry. The Bank will finance 89% of the central government's share of eligible expenditure.

16. Eligible expenditure for each investment under Component Two is the actual paid expenditures excluding land costs incurred for a particular investment and reported to the Bank in the quarterly consolidated IUFRs, subject to an overall ceiling of the amount sanctioned by the PMG for that particular investment based on the DPR excluding land costs. This sanctioned amount will include the estimated costs of works, goods and services required for that investment including costs for preparing FR, DPR, RAP, and other estimated incremental operating costs of the EA for executing that particular investment and contingencies.

17. In other words, if the amount sanctioned by the PMG for investment Y based on the DPR is INR 10 million,which includes estimated cost of land, works, goods, services, prep costs of FR, DPR, RAP, and other estimated incremental operating costs of the PEA for executing the specific investment and contingencies, then the eligible expenditure for that particular investment will be actual paid expenditures excluding land costs for the above-mentioned items reported in the IUFRs subject to a ceiling of INR 10 million excluding land costs. So, the Bank will finance (lesser of actual costs excluding land costs or sanctioned amount excluding land costs) x 70% x 89%. However, if the investment pertains to the industrial pollution management sector, then the Bank will finance (lesser of actual costs excluding land costs or sanctioned amount excluding land costs) x 25% x 89%.

Internal Controls & Audit Framework

18. The Consolidated Annual Action Plan of the Project approved by the PMG will form the basis of implementation. The World Bank will also review this Plan before finalisation. The Memoranda of Association of the PMG and the SPMGs lay down the framework for delegation of the administrative and financial powers mandated for the Project. Under Component Two, no subproject can be undertaken unless sanctioned by the PMG. All variations in contracts awarded by EAs under the Project will have to be approved by the SPMGs and beyond a certain threshold these will have to be approved by the PMG as provided in the MOAs of the PMG and SPMGs. In case of prior review contracts variation orders are also required to be approved by the World Bank as per the Bank's Procurement guidelines. These controls will ensure transparency in contract management.

19. The fund flow arrangements are designed to simplify procedures and mitigate risks, including the diversion of funds, use of funds for unintended purposes, and delays in accounting, financial reporting and auditing.

20. Potential EAs identified at this stage were assessed from the perspective of contract management. The contract management processes and record keeping systems were reviewed

and found adequate. The audit reports of the EAs were also reviewed to see if there are any significant issues relating to contract management.

21. Since additional EAs may be selected during project implementation, the selection process will ensure that specific minimum criteria on fiduciary aspects relating to contract management are complied with before an EA selection is finalized. Compliance with these criteria will be ensured by the SPMG. A responsible official from the SPMG will check these criteria, record the status against each criteria and sign off. The Bank will do a prior review of the selection process followed for the first one or two EAs in each state to ensure that the minimum criteria are adhered to.These criteria are:

(a) Updated and current Schedule of Rates (SOR) should be used by the EAs for sub-project costing; market rates may be used for the items not available in the SORs.
(b) Last three external and internal audit reports (if the EA has an Internal audit system) should be shared with the SPMG. If there are any significant unresolved internal control weaknesses reported in these audit reports with regard to contract management processes, a time-bound action plan to resolve these will need to be agreed with SPMG before the EA is approved.
(c) The EAs should have adequate autonomy and financial powers to implement the subprojects including the ability to sign contracts and take liability for failure/underperformance of contracts. The EAs delegation of financial powers should be clearly documented and made available to the SPMG.
(d) The EA should have an adequate system of checks and measurement/inspections of works, which should be clearly documented and made available to the SPMG.

22. Payments should be made to contractors/consultants/suppliers within the time limit stipulated in the contract documents. The standard contract documents lay down such timelines for payment of acceptable invoices. If the invoice is not acceptable, the reasons of non-acceptance should normally be communicated to the contractor/supplier/consultant within two weeks of the receipt of the invoice. The standard contract documents also lay down norms for penalties for non-payment within the prescribed timeline as well as penalties for failure of delivery of goods/ works of agreed standards within prescribed timeline.

23. All implementing agencies, including the PMG, SPMGs and the EAs, should have an information system for tracking and monitoring timeliness of payments to suppliers/contractors. The system will be able to generate exception reports for the management for monitoring and taking necessary actions.

24. The PMG and each SPMG will also hire private firms of chartered accountants as internal auditors to assess effectiveness of internal controls and to provide independent assurance on the adequacy of internal controls to mitigate financial risks. The internal auditors will be appointed no later than 6 months of the date of effectiveness under Trems of reference[32] and selection criteria agreed with the Bank. However, the PMG plans to set up its own internal audit unit within two years of the project start. Once the internal audit unit of the PMG has been

[32] The agreed terms of references of the Internal and External Auditors are provided in the FM Manual

established with adequate numbers of appropriately qualified staff to conduct quarterly internal audits in the PMG and SPMGs, the project's internal audit function will be entrusted to this unit. The internal auditors will work in close coordination with the technical supervision consultants to obtain assurance that contract payments are made as per the terms of the contracts. The PMG will ensure that the work of internal auditors is duly considered by the external auditors when planning the scope of their audit examination. The PMG will share with the Bank a report on actions taken in response to the internal audit.

External Audit

25. Each SPMG and the PMG will prepare annual financial statements and have them audited by an independent external auditor appointed by the PMG under terms of reference and selection criteria agreed with the Bank. Each SPMG will submit its annual audited financial statements together with the audit report to the PMG. The PMG will prepare a consolidation of the annual audited financial statements of the five SPMGs together with its own, and submit the same along with the individual audit reports and audited financial statements to the Bank by September 30 every year. The PMG will ensure that the auditors follow the agreed terms of engagement and the audit observations are satisfactorily dealt with in a timely manner. If the annual audited financial statements together with the audit report of the PMG or any SPMG is not submitted to the Bank within four months of the due date of submission (i.e. January 31 of the following calendar year), remedies will be applied to the defaulting entity as per the Bank's Operational / Business Policy (10.02) – namely that project disbursements to the defaulting entity based on IUFRs will be discontinued.

26. The annual entity report of the PMG will also be provided to the Bank.

27. Pursuant to the World Bank Policy on Access to Information, Bank will require that the PMG disclose the audited financial statements on the project website. Following the Bank's formal receipt of these statements from the borrower, the Bank will make them available to the public in accordance with the World Bank Policy on Access to Information. The Bank normally makes these statements available to the public through its external website.

Staffing

28. The PMG at the central level and SPMGs at the state level are being set up as registered societies, with agreed structure and staffing plans. A chartered accountant has been appointed for the PMG. The staffing structure of the finance unit of each SPMG has been agreed. A chartered Accountant will support the finance function in each SPMG. Both PMG and SPMG will be supported by Project Management Consultants who will also cover financial management functions.

Retroactive Financing

29. Expenditures incurred with the Bank's concurrence on or after January 1, 2011 and according to the Bank's procurement guidelines are eligible for retroactive financing up to an overall ceiling of US$ 10 million.

Risk Assessment

30. Based on a risk assessment summarized in the matrix below, the FM risk rating of the project is 'Substantial' (see Table 1).

FM Supervision Strategy

31. The project will need very close supervision by the Bank in the initial years of implemention. Considering the size and the geographical spread of the project, two Senior Financial Management Specialists have been allocated to this project. FM supervision will be done through field visits every six months, review of the Annual External Audit Reports together with review of the the actions taken by the mangement on the audit findings. The Bank will also receive quarterly Interim Unaudited Financial Reports which will inform the Bank of the financial progress. In addition to the financial reports and external audit results, the Bank will also use the relevant findings emanating from the clients' M&E systems and internal controls such as technical audits and internal audits, for FM supervision and assurance. The fiduciary obligation of the Bank will be restricted to the Bank financed operation only and will not extend to the entire NGRBA Program.

Table 1: Risk Matrix

Risk	Risk Rating before mitigation	Mitigation Measures	Expected Rating after mitigation
1. Inherent Risk			
Country Level	M		M
Entity Level: NGRBA is a newly formed entity. The PMG and SPMGs are being established.	S	Various technical assistance activities have been initiated including capacity building of all associated agencies so that they have sufficient knowledge and resources to prepare and implement the Project/NGRBA Program. However these mitigation measures are not yet fully implemented	S
Project Level: The project involves multiple EAs in different sectors having varying FM capacities. This together with the geographical scatter may result in poor financial management	S	Stream-lined fund flow design through zero balance child accounts and consequent centralization of the accounting function will simplify the FM design of the project. However these are new arrangements to be implemented by newly formed entities.	S
Overall Inherent Risk	S		S
2. Control Risks			
Budget: Variations between budget and	S	Budget to be based on proper	S [Based on track

actuals for government sector projects are usually high.		work plan and procurement plan. Training in preparation of budgets.	record of donor funded projects, risk may continue to be substantial, especially in initial years.]
Funds Flow The Fund flow arrangements designed for the Project is different compared to the existing fund flow arrangements in place in MOEF and NRCD. Fund releases by the Centre are predicated on timely release of funds by the State Government.	S	Similar fund flow arrangements are being implemented successfully by scheduled Banks in the public and private sectors.	M
Accounting and Financial Reporting Multiple agencies with varying capacities. Newly formed implementing entities. Delay in submission of claims based on quarterly IUFRs.	S	At the Central and State levels, the accounting and financial reporting functions have been centralized at PMG and SPMGs respectively. Off the shelf accounting software will be used. Professional accountants to support finance functions at PMG and SPMGs.	M
Internal control: New EAs may be selected during the course of the Project. EAs where actual execution of work will be done will be large in number spread across five states. Approval of payments for expenses incurred and contract management will be done at multiple levels.	H	Prior to confirmation of any new EA, specific minimum criteria on FM aspects must be complied with. These criteria are laid down in the implementation arrangements section of the NGRBA Program Framework. Each State will have an Internal audit system to ensure that adequate internal controls are in place and working effectively. ToRs will be agreed with the Bank. The framework approach will ensure that there are adequate financial controls.	S.

Audit (i) Submission of audit Report by September 30 every year may be a challenge (ii)Quality of audit	S	(i)There will be a single external auditor for the Project. PMG will plan and coordinate the annual external audit. (ii) Auditors satisfactory to the Bank will conduct audit based on agreed TORs.	M
Overall Control Risk	S		S
Overall Risk Rating	S		S

Annex 8: Procurement Arrangements

INDIA: National Ganga River Basin Project

1. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011, and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011; and the provisions stipulated in the Legal Agreement. Following the World Bank guidelines for procurement, a Procurement Manual has been developed, detailing the procurement process, procedures to be followed, methods, roles and responsibilities of NPMG, SPMG and PEAs, prior and post review arrangements etc. This Manual is reviewed and found in accordance with the Bank Guidelines and in the event of any conflict in interpretation of various provisions for procurement in case of items procured using the proceeds from the World Bank, interpretations of provisions of World Bank Procurement and Consultancy Guidelines will prevail.

2. **Prior-Review Thresholds**. Prior-review and procurement method thresholds agreed with NGRBA for the project based on the risk assessed at the appraisal stage are detailed in Tables 1, 2 and 3 below. These thresholds shall be reviewed periodically during the life of the project to bring in any changes as demanded by further risk assessments.

Table 1: Procurement Thresholds/Methods and Value thresholds for Civil Works are:

Expenditure Category	Value* (Threshold per contract)	Procurement Method	Contracts subjected to Prior Review/Post Review[#]
Civil Works including Works that involve supply and installation components for STPs.	(a) Civil Works estimated to cost equivalent to US$ 100,000 or less per contract.	National Shopping Force Account	Post review only Post review only
	(b) Civil Works estimated to cost more than the equivalent to US$ 100,000 per contract and less than USS 20 Million[@].	National Competitive Bidding (NCB)	First two works contract by each institution under the project NCB regardless of value and all contracts above US$ 5 Million equivalent each will be prior reviewed by the Bank All other contracts by the post review.
	(b) Civil Works estimated to cost more than US$ 20 Million	International Competitive Bidding (ICB)	All ICB contracts will be subject to

* If a transaction comprises several packages, lots or slices, the aggregate estimated value of contracts determines the applicable threshold amount.

Irrespective of the prior review thresholds, first NCB contract for goods and works from all procurement entities will be subjected to prior review by Bank.

@ Under Works category, NCB method limit of up to $20 Million to be used for STPs under Component 2 of the project, for items/packages identified in prior approved procurement plans. Irrespective of this upper limit, the decision to proceed on NCB or ICB terms above the value of $10 Million will be based on: (i) a capacity assessment of the local contracting industry and ability of potential bidders to respond to the tender requirements; and (ii) the scope for reduction of the geographical dispersion of the contracts (whenever possible) through a careful packaging strategy to be applied during the feasibility DPR stage and while finalizing the annual plans and procurement plans.

Table 2: Methods and Value thresholds for Goods

Goods	Value Threshold*	Methods	Review Arrangements
Equipment, Machinery, Vehicles, Furniture, Learning Materials etc.	(i) US$ 50,000 equivalent or less per contract	National Shopping Framework Contracts as per the provisions of Procurement Guidelines DGS&D rate contracts (State Rate Contracts cannot be used at par with Shopping. If state rate contract exists for an item, the same can be considered as one of the 3 quotations to be sought under shopping procedures)	Post review only
	(ii) Proprietary equipment; software; print, audio or visual educational publications; and other learning resources irrespective of value	Direct Contracting	Prior review with justifications as per Guidelines
	(iii) Contracts of more than US$ 50,000 equivalent but less than US$ 1 Million equivalent.	National Competitive Bidding (NCB) Framework Contracts as per the provisions of Procurement Guidelines	First bidding document and first contract of all PEAs, SPMGs and NPMG will be subject by Prior review by the Bank
	(iv) Contracts of more than US$ I Million equivalent	International Competitive Bidding	all ICB contracts are subject to Prior review by the Bank

* If a transaction comprises several packages, lots or slices, the aggregate estimated value of contracts determines the applicable threshold amount.

Table 3: Methods and Value thresholds for Consultancy Services

Goods	Value Threshold*	Methods	Review Arrangements
Consultancy Services (Firms)	(a) More than US$200,000 equivalent per contract.	Quality and Cost Based Selection (QCBS) Would comprise entirely of national consultants for all contracts below US$500,000	Prior Review. First two Contracts irrespective of value and all subsequent contracts valued above $ 200,000.
	(b) More than US$100,000 and up to US$200,000 equivalent	Quality and Cost Based Selection (QCBS) Or Selection based on a Fixed Budget (FBS) Or Selection Based on Least Cost Basis (LBS)	
	(c) US$100,000 equivalent or less per contract.	Selection Based on Least Cost Basis (LBS) Or Selection based on Consultant's Qualification (CQ) Or Selection based on a Fixed Budget (SFB)	
Individual Consultants		Competitive Selection based on review of 3 shortlisted Consultants	Prior Review of all contracts valued above $50,000.All others post review

* If a transaction comprises several packages, lots or slices, the aggregate estimated value of contracts determines the applicable threshold amount.

3. National Competitive Bidding (NCB) method for procurement and goods and works as per the above value thresholds will be conducted in accordance with paragraph 3.3 and 3.4 of the World Bank Procurement Guidelines and the following provisions:

(i) Only the model bidding documents for NCB agreed with the GOI Task Force (and as amended for time to time), shall be used for bidding;

(ii) Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or in the official gazette, or on a widely used website or electronic portal with free national and international access, in English, at least 30 days prior to the deadline for the submission of bids;

(iii) No special preferences will be accorded to any bidder either for price or for other terms and conditions when competing with foreign bidders, state owned enterprises, small scale enterprises or enterprises from any given state;
(iv) Extension of validity shall not be allowed without the prior concurrence of the World Bank (i) for the first request for extension if it is longer than four weeks; and (ii) for all subsequent requests for extension irrespective of the period (such concurrence will be considered by the Bank only in case of Force Majeure and circumstances beyond the control of the Purchaser/Employer).
(v) Re-bidding shall not be carried out without the prior concurrence of the World Bank. The system of rejecting bids outside a pre-determined margin or "bracket" of prices shall not be used in the project;
(vi) Rate contracts entered into by Directorate General of Supplies and Disposals will not be acceptable as a substitute for NCB procedures;
(vii) Two or three envelope system will not be used;
(viii) No negotiations are conducted even with the lowest evaluated responsive bidders.

4. **Procurement Plan and Procurement Arrangements**. Given the long-term nature of the NGRBA program and the fact that universe of potential investments is large, the project implementation process has adopted an investment framework approach setting the "rules of the game" for criteria and quality assurance standards covering various aspects including eligibility, prioritization, planning, technical preparation, financial and economic analyses, environmental and social management, long term O&M sustainability, etc. This approach allows infrastructure investments under Component 2 of the project to be selected on a dynamic and ongoing basis. The PMG and SPMG of each state shall prepare procurement plan and procurement activity schedule for the project life as part of the Annual Planning process agreed for the project. The Consolidated Annual Action Plan to be submitted by PMG to the Bank for prior review and agreement would include the Procurement Plan for these investments falling under Component 2. Under this component, procurement actions by EAs will be initiated only after Bank's no-objection to Procurement Plan and Procurement Activity Schedule. The procurement plan shall be disclosed in the PMG/SPMG website, notice boards and Bank's website.

5. Thus, procurement planning during the preparatory phase of the project is limited to the first component on Institutional Development. The Procurement Plan for this Component 1 has been prepared by NGRBA, reviewed by the Bank, and agreed. This plan will be updated annually to reflect any changes.

6. **Use of Agreed Bidding Documents**: It is agreed with NGRBA that only Model Bidding documents agreed with the Bank will be used for procurement of goods, works and services under the project and accordingly for ICB contracts for goods and works, World Bank Standard Bidding Documents will be used. For NCB contracts, Standard Bidding Documents (SBDs) will be used as agreed between the Task Force of GoI and the World Bank and incorporating any amendments and/or special conditions as applicable. NGRBA Procurement Manual Part II has included the various documents required for procurement management, including model bidding documents to be used for NCB, Shopping, various types of consultancy contracts, bid evaluation forms, etc.

7. For selection of institutional and individual Consultants for providing services, the project will use QCBS, QBS, Selection based on Consultants' Qualification, Fixed Budget

Selection, Least Cost Selection, Single Source Selection, and Selection of Individual Consultants as appropriate, subject to approval by the Bank. For service contracts, Bank SBDs will be used.

8. For Procurement under PPP Concessions and Similar Private Sector Arrangements, the selection will be carried out under the provisions of paragraph 13 (a) of Bank Procurement Guidelines for Goods and Works. Draft RFQ/RFP and Concession documents to be used for PPP selection shall be subjected to prior review and No Objection by the Bank.

9. Eligibility conditions as detailed in the World Bank Procurement Guidelines shall be followed by the PMG, SPMG and EAs. Goods and services procured from any Government department or undertaking in a manner that does not fulfill provisions of paragraph 1.10 (b) of Bank's Guidelines for Goods and Works will not be eligible for Bank financing. This includes, but is not limited to, centage charges paid to EAs from the project costs financed by the Bank.Such costs and charges, if any, will be met by the Government from its own resources.

10. Pursuant to the provisions of Consultancy Guidelines 1.13 (c) service for providing satellite imagery for project activities by Government entities like Survey of India (SoI) and National Remote Sensing Agency (NRSA) are considered unique and exceptional nature including because of the regulatory framework for this purpose existing in the country and absence of a suitable private sector alternative, and their participation is critical to project implementation. Hence reimbursement of claims for their services, for the project purposes, as proposed in the Procurement Plan will be eligible.

Risks and Mitigation Measures

11. Given the framework approach adopted for all infrastructure investments proposed under the project, this project has certain high inherent risks: (i) additional Executing agencies may be selected during implementation- based on agreed criteria, (ii) there is no procurement plan as the infrastructure sub projects will also be only identified during implementation, (iii) bidding documents for the initial period have not been prepared (given the design of the project). Hence there will be no procurement plan or preparation and issue of bids for early investments under this component during the preparation stage. This is unlike other infrastructure projects, where the readiness filter includes issuing bids for the first lot of investments during the preparations. So, there is the inherent risk with possible delays in start-up.

12. As an assessment of all EAs are not feasible during the preparation phase, procurement capacity of three provisional EAs identified in Uttar Pradesh, Bihar, and West Bengal was carried out for arriving at the procurement risks as part of preparation. Summaries of risks identified for each of these EAs is given below:

a. Uttar Pradesh Jal Nigam (UPJN): Lack of clarity or accountability on decisions as procurement decision makers not empowered. Incorrect or ad hoc application of procurement process results in delays. Poor record keeping. Work environment does not promote openness. Inadequate demand estimation and planning of procurement results in overstocking or insufficient quantities of supplies. Non standardized SBDs used for NCB, known to only to local bidders. Disincentive to competition due to lack of system to resolve complaints.
b. Kolkata Metropolitan Development Authority (KMDA): There is no procurement

manual. West Bengal State Financial Rules and Treasury Rules are followed. At present significant procurement is being carried out by Kolkata Metropolitan Development Authority (KMDA). It is expected that the investments will be executed by the many Executing Agencies (EAs), to be selected by the SPMG. These EAs are yet to be decided. Tender documents used at present do not include any qualification criteria. There is no disclosure policy in the department. There is no formal system of monitoring the completion date of civil works or delivery date of goods ordered.

c. Bihar Urban Infrastructure Development Corporation (BUIDCO): A Procurement Manual has been developed, but it does not have a section on procurement planning. Procurement procedures allow two-envelope system that is not practiced by Bank on account of safe keeping of 2nd bid and frivolous reasons for rejection of technical offers. No goods bid document was ready, hence quality of bidding document including that of technical specifications could not be judged. There is no system in place to allow the complaints to be disposed off administratively than judicial review. Physical inspection and compliance checks are not part of internal/external audit.

13. Based on the above and given that a number of new EAs will be joining the project during implementation and that the overall procurement capacity and risk cannot therefore be assessed in advance, the procurement risk for the project is rated as "High". Subsequent to the nomination of EAs and their procurement assessment, revision of risk rating if required will be carried out within the first year of the project.

14. The following measures were agreed to mitigate the risks:

(a) A Procurement Manual following Bank Procurement Guidelines is developed with formats to guide procurement and thresholds based methods for goods, works and services. The manual details the proposed systems, delegated authorities along with capacity development needs and Bidding Documents, various protocols and formats to be used.

(b) A Procurement Unit is being established in the national PMG headed by a Procurement Specialist, and dedicated Procurement Officers will be hired at each SPMG with overall responsibility for procurement planning, implementation monitoring, and oversight.

(c) Selecting a Procurement Support Consultant for hand holding and building capacity of newer PAs as they enter the project. This is also intended to manage possible delays in procurement and project management due to procurement capacity constraints in new EAs.

(d) Prior and post review arrangements, as mentioned above, are put in place with enhanced monitoring arrangements. About 20% of all contracts below the prior review threshold will be post reviewed by the Bank, or Bank appointed Consultants, on an annual basis.

(e) A Grievance Redressal and Dispute Resolution Mechanism will be implemented as part of the GAAP.

(f) As part of the technical assistance for procurement management, the project will also

support NGRBA in the migration to e-procurement solutions that meet all requirements and conditions of funding support.

Annex 9: Economic and Financial Analysis

INDIA: National Ganga River Basin Project

A. Overview and Methodology

1. The economic analysis directly relates to the second project development objective: "That the NGRBA reduces point source pollution loads through sustainable interventions at selected locations on the Ganga." Consequently, the economic analysis quantifies neither the health benefits (other than those that follow from better ambient river quality) nor the capacity building of the NGRBA. While the economic analysis for NGRBA cannot do justice to the full range of benefits and the dynamic interactions between social development and policy that will result from the project, and therefore is likely to underestimate the benefits of the NGRB project; the choice of an economic analysis in a stricter sense is consistent with analyses of similar projects.

2. The financial and economic analysis for the project has been carried out in three parts: (i) a program level analysis of the economic benefits; (ii) a representative cost-effectiveness analysis (CEA) and cost benefit analysis (CBA) of typical investments; and (iii) an economic analysis to be required for each of the sub-projects to be submitted under the framework approach. In turn, the economic analysis required for each sub-project to be implemented under the NGRBA Program will consist of three parts: (i) an analysis of cost-effectiveness to assist in selection of best process design; (ii) a CBA to ensure overall economic efficiency and identify sensitive parameters requiring greater attention during sub-project implementation; and, (iii) a financial sustainability analysis of the investments (e.g. for O&M) and of the financial viability of the local service providers.

3. The program level analysis takes the ex-post analysis of the Ganga Action Plan (Markandya 2000) as its starting point. It maintains the methodology and updates this assessment to reflect the new NGRBA program and to reflect changes in incomes, river quality, and population levels that have occurred during the last decade of rapid growth. The methodology used reflects the requirements of the World Bank O.P. 10.04. Benefits have been partly based on a willingness to pay survey, which elicits the subjective assessments of respondents (users as well as non-users of the river) of their willingness to pay for improved water quality and partly based on quantified assessments of economic use benefits such as health benefits accruing to river users, fishing benefits, and benefits for farmers from replacing commercial fertilizer with sludge inter alia. The ex-post study found that the major benefit of river cleanup accrues to non-consumptive users of the river (e.g. ritual bathers) and to non-users who benefit from the knowledge that the river is cleaner as a result of program. In comparison, use benefits of the river, such as health, agriculture and fisheries, were found to be lower.

4. While a comprehensive framework has been developed to facilitate undertaking CBA of each selected intervention in NGRBA, specific analyses of a few typical investments (in municipal wastewater management, industrial pollution management, and solid waste management) have been carried out to assess the contributions of such interventions to the overall goal. These specific analyses are based on sub-project DPRs within the basin or on projects that have been recently completed. The analyses use standard methods of CEA and CBA

adapted to local conditions through a partial equilibrium analysis that captures local quantifiable benefits and impacts but necessarily neglects more complex basin wide cumulative and non-linear impacts. Sensitivity analyses rely on a range of unit values for benefits derived from the program level analysis. The sub-project analyses are intended as a model for CEA and CBA to be carried out throughout project implementation in accordance with the NGRBA investment framework.

5. This Annex summarizes the key results of these analyses, and then elaborates on these through further discussions of assumptions, methods and findings.

B. Summary and Implication of Key Results

6. The program analysis finds that basin wide interventions to improve water quality in the Ganges generally show benefits which exceed costs by a wide margin (net benefits at 10% discount rate). In particular there is a strong economic logic for a 60% to 80% reduction of BOD levels in the river, depending on whether current river quality is in the high or low range of current estimates. This "optimal reduction" arises because of non-linearities in the benefit function: in effect users and non-users are WTP the maximum amount for a given improvement once a certain quality threshold is reached, and see diminishing marginal benefits thereafter. This threshold will vary from one individual to the next (and may have to do with what they regard as adequate bathing quality or some subjective assessment), but is reflected in any aggregated analysis as a benefit function that shows increasing marginal benefits only up to a certain threshold. Depending on current river quality and the assessed unit costs of BOD removal, it is possible to achieve benefit cost ratios of up to 6.2 (high estimate for current quality, low estimate for unit cost) or up to 2.1 (low estimate for current quality and high estimate for unit cost). This illustrates that it may be important to have a program of a sufficiently large magnitude to reap the benefits and it will be important to secure low unit costs of the interventions to be implemented.

7. The individual sub-project analyses focused on case studies of: (i) wastewater treatment in Kanpur; (ii) industrial effluent treatment at the tannery complex in Jajmau (Kanpur); and, (iii) an integrated solid waste management complex based on that recently commissioned in Okhla (New Delhi). The findings generally show that all of these activities are economically justifiable at a 10% discount rate, and that EIRRs in excess of 20% are not unusual especially if the sub-projects can take advantage of existing underutilized capacity or existing sites. Even greenfield investments can generate benefits adequate to cover anticipated costs plus those necessary for a pro-rata share of government institutional costs and mitigation of any project-specific negative environmental and social impacts. A pervasive concern for most sub-project investments, however, is that FIRRs are at times negative and routinely less than 10% based on tariff structures proposed in preliminary DPRs. This is largely because tariff design focuses on recovery of O&M costs only, and suggests that sustainability of investments should also address cost recovery issues for new facilities or expansions to existing facilities.

C. Elaboration of Assumptions and Results of Program Level Benefits and Costs

8. Valuation of Benefits. A decade ago a major study of the economic value of the Ganga Action Plan (GAP) was carried out and published by Anil Markandya and M.N Murty[33]. The study was based on analysis of the economic values of use and non-use values of reducing pollution to the river. The use values include impacts on health, agricultural production, fisheries, ecosystems services as well as aesthetic benefits from recreational activities, while the non-use values include stewardship values such as preserving remote wetlands, preserving the river for future generations, and protecting the intrinsic religious value of the river as clean. The sum of benefits accruing to urban households was estimated through a contingent valuation survey. This provided an indicative value of the quantifiable benefit of a range of river water qualities. The Markandya and Murty (2000) study found that the combined benefits by far exceed the cost incurred in GAP I and GAP II. The study found that the major benefits accrued to persons reflected the general user benefits or the non-consumptive use of the river (for ritual bathing etc.) as well as the benefits to persons who did not use the river, but valued the knowledge that the river was cleaner due to the project because it held significant religious sentiments for Hindus. In addition, the values of specific uses for health, agriculture, fisheries and eco-system services were calculated. However, the benefits from improvements in health, agriculture, fisheries and eco-systems were found to be smaller than the general user and non-use benefits. This is in accordance with findings of river cleanup projects in other parts of the world.

9. For the present project, the former study has been updated as follows[34]: The non-use benefits and the general user benefits, other than those related to health, agriculture and fisheries have been updated compared to the year 2000 study. The benefits related to health, agriculture, fisheries and eco-system services have not been updated as such an update would have been complex and these were previously found to be much smaller relative to the other benefits[35]. The update reflects the following changes: (a) the change in river quality, which provides a different starting point today than for the former study; (b) the change in population; (c) the change in the average household income from 1995 to 2009[36]; and (d) the resulting change in willingness to pay.

10. Table 1 provides a range of benefit values that can be used for the purposes of this analysis. Valuations are most sensitive to the income elasticity, hence lower and upper bounds are presented on the basis of an elasticity range of 0.28 to 1.00 both of which seem probable based on various studies. Table 1 reflects an extension of the benefits to all Hindu households (taken as 80.5% of all households) on the grounds that other religions would not have a special value attached to the non-use value of Ganga. Allowing for the fact that the average income of

[33] A. Markandya, M.N. Murty (2000): Cleaning up the Ganges. A Cost-Benefit Analysis of the Ganga Action Plan. Oxford University Press, New Delhi, 2000.

[34] The update was carried out by Prof. Anil Markandya. The report as well as the spreadsheet, which documents the methodology and findings, is available on file.

[35] A recent study by the World Bank "The Economics of Sanitation Improvements in India" show very substantial benefits due to improvements in basic sanitation and hygiene. These data are not directly comparable with the improvements in water quality considered here. It is possible that certain components of basic sanitation and hygiene in wastewater projects will show very high benefit/cost ratios.

[36] The study was published in the year 2000, but the contingent valuation survey – which was the basis of non-use and general use values – was carried out in 1995. Therefore, incomes have been updated to 2009, which is the baseline year for the present cost benefit analysis.

all households is lower than that of the urban literate households, non-user benefits increase by between 32 and 50 percent. User benefits also increase by a similar factor. Pilgrims have the same estimate as before, as the original survey did not separate them out on the grounds of urban or rural or literate or illiterate.

11. The range of figures given in Table 1 has been used to construct the benefit cost analyses presented in subsequent sections: the basin-wide improvements and project-specific CBA. We note that the unit estimates of the value of a cleaner Ganga taken in this update are broadly supported by other studies on other rivers in India. For example Basu and Rao (2008) found a WTP of 759 Rs/hh/yr from survey work in 2005 for a quality improvement on the Yamuna River in Delhi. Nallathiga and Paravastu (2010) found a WTP of 84.90 Rs/*cap*/yr for improved water quality from survey work done in 1995, again on the Yamuna River.

Table 1: Range of Benefit Estimate for All Indian Households for 2009

	Non-Use Benefits	**Use Benefits**	**Use Benefits (Pilgrims)**	**Total**
Households (hh) or Persons (p) (Mn)	191.2 hh	0.5708 hh	5.0 p	
Mean WTP (Rs/y)	431/hh – 890/hh	449/hh – 907/hh	5,015/p – 16,174/p	
Total WTP (Rs 10^3 Mn/y)	82.40 – 170.17	0.26 – 0.52	25.10 – 80.87	107.74 – 251.56
Total WTP (USD Mn/y)				$2,208 – $5,155

Source: Markandya (2011); conversion taken at INR48.8/USD.
Note: The range is bounded by differences in the estimate of income elasticity (from 0.28 to 1.0) used to transfer the original benefit estimates for 1995 urban literate population to 2009 all hindu households in basin. Since the incomes for the 1995 urban literate population were *higher* than the 2009 incomes for all, a higher elasticity leads to a higher reduction in benefits thus to lower benefits.

12. Assessment of Basin-Wide Benefit-Cost Ratios. The NGRB project is a multi-sectoral effort with a large and very important capacity building component. A wide range of health benefits, improved living conditions for the poor, and economic use benefits will accrue as a result of the project. Many of these are linked to second order effects of the project such as the improved understanding of hygiene that follows from the social components of sewer extension programs, or the dynamic regional development effects along the banks of the Ganga that follow from a cleaner river with more biodiversity and productive activities. In addition, successful improvements of the river quality will require a multi-sectoral, long and sustained effort addressing point source and non-point source pollution as well as issues such as solid waste management, which impacts effectiveness of sewers and point source pollution. While all of

these effects are very important, the economic analysis at this stage restricts itself to first order effects for which data are available.

13. The costs of avoided discharges of untreated municipal sewerage into the Ganga basin (both the main stem and the tributaries) are based on assessments of (average) unit capital costs and operational costs reflected in recent data from India. In addition, the assessments use average assumptions for water use and return flows for population served with sewer networks. In India, capital costs range from US$1,038,000 to US$3,541,000 per Ml/d, with an average estimated cost of US$1,873,000 per Ml/d. Treatment and network costs are taken as Rs 1.6/M^3 and Rs 1/M^3 respectively. The analysis evaluates the benefit cost ratios for the period 2013-2033, and is summarized in Tables 2 and 3 (at a 10% discount rate). The main findings are:

a. The ratios are greater than unity with the low cost variant for both elasticities and levels of treatment which reduce ambient BOD by more than 20%. With the average cost variant the ratios exceed unity for levels of treatment which reduce ambient BOD by more than 40%. With the high cost variant they exceed unity for reductions of ambient BOD in excess of 60%.
b. The ratios peak at between 70 and 80 percent reductions in ambient BOD. With the CPCB data they peak at an 80% reduction of ambient BOD, indicating that further treatment incurs costs greater than the benefits. With the MOEF data they peak at 70%.

Table 2: Benefit Cost Ratios at alternative levels of reduction of ambient BOD in Ganga. Lower Income Elasticity

Income Elasticity = 0.28	Low Cost		Average Cost		High Cost	
Level of reduction in ambient BOD in the Ganga	Higher initial BOD level	Lower initial BOD level	Higher initial BOD level	Lower initial BOD level	Higher initial BOD level	Lower initial BOD level
10%	1.06	2.16	0.64	1.29	0.35	0.72
20%	1.24	2.51	0.74	1.50	0.41	0.83
30%	1.47	2.98	0.88	1.78	0.49	0.99
40%	1.79	3.64	1.07	2.17	0.59	1.20
50%	2.27	4.62	1.36	2.76	0.75	1.53
60%	3.05	6.21	1.83	3.71	1.01	2.06
70%	4.51	5.34	2.69	3.19	1.49	1.77
80%	5.47	4.67	3.27	2.79	1.81	1.55
90%	4.87	4.15	2.91	2.48	1.61	1.38
100%	4.38	3.74	2.62	2.23	1.45	1.24

Table 3: Benefit Cost Ratios at alternative levels of reduction of ambient BOD in Ganga. Higher Income Elasticity

Income Elasticity = 1.00	Low Cost		Average Cost		High Cost	
Level of reduction in ambient BOD in the Ganga	Higher initial BOD level	Lower initial BOD level	Higher initial BOD level	Lower initial BOD level	Higher initial BOD level	Lower initial BOD level
10%	0.84	1.77	0.50	1.06	0.28	0.59
20%	0.99	2.08	0.59	1.24	0.33	0.69
30%	1.18	2.48	0.71	1.48	0.39	0.82
40%	1.45	3.04	0.87	1.82	0.48	1.01
50%	1.86	3.89	1.11	2.32	0.61	1.29
60%	2.52	5.29	1.51	3.16	0.84	1.75
70%	3.77	4.54	2.25	2.71	1.25	1.50
80%	4.62	3.97	2.76	2.37	1.53	1.32
90%	4.11	3.53	2.46	2.11	1.36	1.17
100%	3.70	3.18	2.21	1.90	1.23	1.05

*Note: *There are two estimates of the BOD levels at the monitoring stations: one provided by CPCB and the other by MOEF. The two give quite different results in terms of initial water quality, with CPCB generally showing much lower values for the ambient water quality index both before and after operations from the sewerage plants. As a result there is a major difference in benefits (those for improvements from a higher base being higher) and thus the Benefit/cost ratios depending on whether we take the CPCB data or the MOEF data. For reductions in ambient BOD levels of up to 60% the MOEF data gives ratios twice as high as those obtained with the CPCB data.*

***Yellow cells indicate that the B/C ratio is less than 1 and thus that economic analysis cannot on its own justify these (low) levels of reduction of pollution. Green cells indicate that the B/C ratio is higher than 1 and thus that economic analysis can justify these levels of reduction of pollution. Finally, red cells indicate B/C ratios that are falling as a result of increased reduction of pollution. This level of pollution reduction is not economically justifiable. This reflects that pollution reduction above 60%/80% is equivalent to reduction beyond bathing water quality and we are not able to assign benefits to this additional pollution reduction (due to the survey methodology).*

14. Tables 2 and 3 reflect reductions in ambient BOD in the river Ganga rather than treatment efficiencies at individual wastewater treatment plants for different assumptions. They therefore do not provide information about whether a large number of treatment plants with a smaller treatment efficiency or a smaller number with a larger treatment efficiency is most cost-effective; and also do not provide information about location. To assess such issues it is necessary to assess the impact of a specific plant on the ambient BOD. This is the rationale behind the framework approach which gives priority to plants which reduce ambient BOD relatively more and thus to plants with large BOD reductions in stretches with low flows.

15. The data illustrate that there are levels of pollution reduction that are economically justified for all assumptions. They further illustrate that higher costs require larger cleanup efforts. While this may be somewhat counterintuitive, it reflects that the benefits are non-linear and there is a higher willingness to pay for the last improvements towards bathing water quality than to pay for the first small reduction in pollution. Similarly, the data illustrate that higher initial levels of pollution will require a larger cleaning effort to be worthwhile (and for the same reason). Finally, the data show some, but not very large, variation according to the assumed level of income elasticity.

16. The program level analysis illustrates that results are sensitive to the current river quality and that our knowledge of the current river quality is limited. Similarly, our knowledge of point and non-point pollution sources is also limited. A consortium of leading Indian engineering institutions is developing the Ganga Basin Master Plan, which is intended to enhance information with regard to current river quality and pollution sources. It is planned to complement the Ganga Basin Master Plan with a survey on the value of river quality characteristics in the Ganga Basin. A Ganga Knowledge Center will take on this work more systematically during project implementation.

17. Previous work has highlighted the need to update information about economic use benefits to reflect the current situation and latest results on sanitation etc. While the economic analysis has quantified the importance of non-use benefits of a clean Ganga, we do not (at the moment) have a very good understanding of which precise characteristics of a clean Ganga are important to stakeholders. For example, what is the relative importance of visual contamination vs. fecal coliform pollution vs. BOD and impacts on fishery, biodiversity, or other characteristics. The project includes a survey intended to contribute a better understanding hereof, which will then be combined with the communications strategy and the master plan to improve both the quality and the public perception of the NGRBA program.

D. Elaboration of Assumptions and Results of Investment Level Economic Analysis

18. Methodology and Assumptions. The CBA of individual sub-projects raises methodological issues at both the aggregate and individual sub-project levels. At the aggregate level (for the entire River Basin or even a major stretch of the Ganga), a series of individual sub-project CBAs is generally inadequate to arrive at an optimal solution that captures key biophysical attributes of the receiving medium. Issues such as non-linear thresholds, assimilative capacity of the river, differential and cumulative impacts of different pollutants, general equilibrium impacts associated with scale, and impacts on downstream users all potentially invalidate the assumptions under which a CBA can be meaningfully applied. The work presented in the previous section (Markandya 2011) moreover shows that individual preferences can also introduce non-linearities into the overall optimization process; the very timing of a project in relation to other activities in the basin can affect its economic desirability, even with no changes in its technical specifications or costs.

19. The nature of the benefit function showed that the first adopters of pollution reduction faced a rather flat benefit function (because it had little impact on overall water quality that was of interest to users and non-users) and that, similarly, the last adopters of pollution reduction contributed little to the marginal benefits of users and non-users (because water quality was by then more than adequate for all derived benefits). Adopters in the "middle" – through making noticeable gains in water quality that approach or cross selected preference thresholds – generally have the greatest impact on benefits. The net benefit of a single project is thus dependent on the timing and scale of other available projects in the basin. CBA assumptions normally require *ceteris paribus* – or "all other things equal" – and in a planning context of this nature such an assumption is not necessarily valid.

20. While this makes aggregated analyses problematic, CBAs at an individual sub-project level can provide important insights into the overall desirability of these investments in a local

context. As part of the project preparation, the approach taken here is to identify, for any given investment, both the cost-effectiveness of a project in terms of cost of pollution reduction (to permit comparison of alternative configurations) and its net benefits using conventional CBA.

21. The analyses rely on preliminary DPRs or recently commissioned projects in the Ganga basin. Cost streams include capital and operating costs and an allowance for "institutional overheads" and safeguard mitigation measures to reflect additional burdens associated with state responsibilities. Shadow wage rates for unskilled labor are imputed at the minimum agricultural wage by State that is site specific and reflects revealed social value of the labor from a policy perspective. A time horizon of 30 years has been selected to reflect the long economic life of many of the typically large structures. Benefit streams capture financial returns: these include applicable tariff revenue, cost savings from recycling of outputs, or – in the case of solid waste composting – benefits associated with avoidance of greenhouse gas emissions using methodologies consistent with the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC). In addition, to show the *expected* contribution of a single small project to overall River basin water quality, we rely on the basin wide benefit range and derive an average value range of $790/million liters to $1,845/million liters of wastewater treated.[37] Results for a generic sewage treatment plant show EIRRs between 13% and 32% for this value range in the Reference Case; this generic plant and three specific case studies are summarized in Table 4 and Table 5 and are elaborated below.

22. Sewage Treatment Plant – Kanpur.[38] The first specific case study evaluated is in Sewerage District 1 of the city of Kanpur. Adequate treatment capacity already exists in the region hence the project focuses on connecting various neighborhoods and enterprises to the plants through an extended complex of sewers and related facilities. The final investment of Rs 205 crore will serve a current population of approximately 300,000 thousand, which is expected to more than double the next 30 years. A key feature of this project is that the investment is incremental to existing treatment capacity, which was installed during GAP-1. As a result the economics is better than a green-field reference case. In the reference case for a green-field facility (i.e. with an appropriately designed WWTP for these volumes) using the minimum / maximum benefit unit value respectively the resultant economic internal rate of return (EIRR) would only be 6% (min benefit) / 16% (max benefit). However, because the WWTP costs are sunk the incremental EIRR for this activity is 82% (min benefit) / >100 % (max benefit) for this

[37] The benefit to users and non-users relies on the benefit function for the overall Ganga Basin (Table 1 shows user groups), which shows a valuation of an improvement in water quality of $2,208 to $5,155 million annually (depending on elasticity assumptions) if, in effect, the maximum water is treated. The maximum to be treated is taken from World Bank estimates (2009) to be 6,579 million litres/d from towns and 1,076 million litres/d from villages, equating to 7,655 million litres/d for the basin as a whole. The contribution of Kanpur is about 5.3% of this. Note this assumes that the benefit function is linear, which it is not: first adopters and last adopters will have lower benefits while those pushing water quality beyond certain critical thresholds will enjoy the largest benefit. Nonetheless, the average value range of $790/million liters to $1,845/million liters is valid for a generic case where we evaluate the "mean" expected value for one project among many that will be conducted during the same period.

[38] The values in the case studies relating to STPs rely *inter alia* on: (i) "Laying of Branch Sewers and Allied Works in Sewerage District - I of Kanpur City" (Volume I). Est Cost Rs409.32 Crores (Year 2009-10); Construction Unit II; U.P. Jal Nigam, Kanpur; and, (ii) "Revised DPRs Framed for Implementation of Priority Projects Identified in JICA Sponsored Feasibility Study Report in Allahabad City" (Revised Summary Report). Est Cost Rs323.01 Crores (Year 2009-10); Ganga Pollution Control Unit; Allahabad.

activity. This leaves ample room for institutional overheads, safeguards, cost overruns and implementation delays while still retaining an EIRR larger than the discount rate.

Table 4: Summary of Investment Level Economic Analyses

Investment Type	Case/Sensitivity	Levelized Cost ($/million liters)	EIRR @ Min WTP	EIRR @ Max WTP
Sewage Treatment Plant Generic Greenfield 400 MLD	Unadjusted Greenfield Reference Case (RG)	602.12	14.0%	34.8%
	RG + Shadow Pricing (SP)	578.04	14.7%	36.3%
	RG + SP + Institutional Overheads/Safeguards (IOS)	*656.43*	*12.6%*	*31.6%*
	RG+ SP + IOS + 10% Cost Over-run	716.52	11.3%	28.7%
	RG+ SP + IOS + "High Design Cost Case"	1,191.61	5.5%	16.5%
	RG+ SP + IOS + 2 year implementation delay	804.54	9.8%	21.1%
	RG+ SP + IOS + 10% Cost Over-run + 2 year delay	878.20	8.9%	19.7%
Sewage Treatment Plant Incremental Kanpur 300,000 population service area	Reference (RG-Greenfield)	1,145.58	6.4%	16.0%
	Reference (RI-Incremental)	132.82	82.4%	>100%
	RI + Shadow Pricing (SP)	127.50	85.9%	>100%
	RI + SP + Institutional Overheads/Safeguards (IOS)	*138.31*	*75.1%*	*>100%*
	RI+ SP + IOS + 10% Cost Over-run	146.59	68.6%	>100%
	RI+ SP + IOS + 2 year implementation delay	161.41	39.7%	66.7%
Industrial Tannery Waste Treatment Kanpur 64 MLD wastes serving 410 tanneries	Reference excluding recycling credit (R)	682.42	13.2%	42.3%
	Reference including recycling values (R')	656.04	14.0%	43.0%
	R' + Shadow Pricing (SP)	629.80	14.9%	45.1%
	R' + SP + Institutional Overheads/Safeguards (IOS)	*685.87*	*12.8%*	*39.2%*
	R'+ SP + IOS + 10% Cost Over-run	728.86	11.5%	35.6%
	R'+ SP + IOS + 2 year implementation delay	840.64	9.1%	23.5%
Investment	**Case/Sensitivity**	**Levelized Cost ($/tMSW)**	**EIRR @ Min WTP (MSW tariff)***	**EIRR @ Max WTP (incl CO_2e credit)**
Municipal Solid Waste Management Generic 200 TPD	Reference design: no compost sales (R)	13.76	<0%	<0%
	Reference design: with compost sales (R')	13.76	15.7%	31.0%
	R' + Shadow Pricing (SP)	13.38	17.0%	32.4%
	R' + SP + Institutional Overheads/Safeguards (IOS)	*13.78*	*15.2%*	*29.5%*
	R'+ SP + IOS + 10% Cost Over-run	14.09	14.0%	27.7%
	R'+ SP + IOS + 2 year implementation delay	16.89	7.9%	16.7%

Note: Reference Case for discussion purposes includes shadow pricing and costs associated with institutional overheads and safeguards.

These cases are highlighted in *italics*.

* EIRR sensitivity analyses show two benefit scenarios: the minimum includes only revenues from the MSW tariff and the maximum also includes imputed value of greenhouse gas emission reduction credits.

23. Industrial Treatment Plant – Kanpur.[39] The second case study relates to the treatment of industrial effluents from an existing tannery complex at Jajmau, Kanpur. Jajmau currently hosts some 400 tanneries and is among the fastest growing complex in India. The proposed design of this activity includes adequate infrastructure to address effluent from 410 tanneries within this complex, including piping, sewerage networks, pumping stations, and upgrading or new construction of CETP capacity capable of eventually addressing 64 MLD of waste water. Chromium separation, recovery and recycling is integral to the activity, both because it is a toxic pollutant that can interfere with normal sewage treatment process, and because it is a potentially valuable byproduct that can be reused in some applications. Technical designs suggest a total investment of about Rs 2,000 million. Significant cost efficiencies are already achieved as it will be constructed on an existing CETP site. In the reference case using the minimum benefit unit value / maximum benefit unit value, the resultant EIRR when recycling values are included would be about 13% (min benefit) / 39% (max benefit). This leaves some, but not ample room for institutional overheads, safeguards and cost overruns (up to 24% with no delay) while still maintaining an EIRR higher than the 10% discount rate.

24. Municipal Solid Waste Management (Generic based on Okhla). In the absence of a formal DPR, a generic case study is evaluated that includes best practices currently being followed in India, at a scale appropriate for many of the towns and areas within the Ganga Basin. The best practice focuses on MSW (i.e., it excludes toxic and hazardous wastes that might be generated by selected industries or hospitals) and captures some basic waste separation, transport, and composting of organic components for generation of saleable compost (and ultimately the capture of carbon credits). Such facilities have been designed and commissioned in the past five years;[40] the facility in Okhla commenced earning carbon credits under the UNFCCC in 2009. The UN's CDM seeks to decrease greenhouse gas (GHG) emissions, and this case study incorporates composting to demonstrate the role of values derived from GHG emission reduction.

25. This generic case is modeled after the design and waste attributes at Okhla (Delhi) waste management project that involves composting at a scale of up to 200 TPD of MSW, as described in 2007 with the base design reducing GHG emissions by 33,461 metric tonnes CO_2 equivalent (tCO_2e) per annum. The scale reflects a serviced population of close to half a million people, and has facility and equipment costs of Rs85 million in today's terms. The case study also reflects monitoring of the facility through about one year of activities commencing in 2009.[41] The "generic" case modeled here thus assumes a 200 TPD plant with a 2 year investment phase. Yields of compost are assumed to be 25% per MT of MSW, with market values of compost

[39] IL&FS Clusters (October 2010). "DPR: Upgradation of Tanneries CETP at Jajmau to 32 MLD Combined Wastewater (Effluent and Sewage) including Effluence Conveyance System, Common Chrome Recovery System, Secured Land Fill Facility." Report Submitted to MOEF, Government of India by Kanpur Tanneries Environmental Protection Association.

[40] The existing projects of this variety in India are typically capable of generating internal rates of return of 15% to 20%. This is based on UNFCCC calculations for the India Wide MSW bundle registered with CDM in June 2010 for Jalandhar (Punjab) is 15.65%; for Mysore (Karnataka) is 18.22%; and for Kozhikode (Kerala) is 20.79%. The composting activity at Okhla has an IRR of 14.48% according to CDM documentation.

[41] The reference project is "Upgradation, Operation and Maintenance of 200 TPD Composting Facility at Okhla, Delhi – UNFCCC Reference N^{o} 2470". Project Description Documents and Monitoring Reports are available at: http://cdm.unfccc.int/Projects/DB/RWTUV1238763879.05/view .

being Rs2,000/MT and all compost sold. A tariff of Rs250 per MT is attributed as an illustrative potentially recoverable tariff, acknowledging that it may in fact be recovered through other administrative instruments within the scope of any given ULB[42]. This level can also be regarded as a benchmark for a minimum WTP that would be recoverable under the NGBR principle of applying an "affordable cost recovery" tariff – it translates to about Rs45 annually per capita. The other economic value stream of relevance is that associated with GHG reduction: the case study values this at US$15/tCO$_2$e and shows it within the "maximum WTP" scenarios reported below as it reflects potentially captured revenues from a global service (that reduces GHG emissions).

26. In the reference case using the minimum benefit values, the resultant EIRR when compost sales are included would be about 15% before adjusting for shadow prices of inputs, and before taking into account institutional overheads; at the higher benefit level reflecting capture of carbon credits this increases to 29%.

27. Break-even Analyses. While sensitivity analyses are reflected in Table 4, selected break-even analyses were also undertaken of the above projects to demonstrate their robustness to changes in capital costs. As summarized in Table 5, the analyses demonstrate that the economics of such projects are relatively robust to any such over-runs.

Table 5: Break-even Analysis

Case and Scenario	@ Min WTP	@ Max WTP
Sewage Treatment Greenfield		
Reference Case*	EIRR = 12.6%	EIRR = 31.6%
Maximum Cost Over-run for EIRR=10.0%	22%	197%
Sewage Treatment Incremental Kanpur		
Reference Case*	EIRR = 75.1%	EIRR = >100%
Maximum Cost Over-run for EIRR=10.0%	790%	2050%
Tannery Waste Treatment - Kanpur		
Reference Case*	EIRR = 12.8%	EIRR = 39.2%
Maximum Cost Over-run for EIRR=10.0%	24.0%	270.0%
Solid Waste Management		
Reference Case*	EIRR = 15.2%	EIRR = 29.5%
Maximum Cost Over-run for EIRR=10.0%	59%	287%
Minimum Compost Value as proportion of Reference Case for EIRR=10.0%	82% (18% drop)	12% (88% drop)

* Reference Case includes adjustments for shadow prices, institutional overheads and safeguards

[42] See for example, Appasamy P, Nelliyat P (2007). Financing solid waste management: Issues and options. *Proceedings of the International Conference for Sustainable Waste Management, Chennai*: 537-542. The authors note that typical full cost recovery would require tariffs of the order of Rs1,000-1,200 per MT of MSW excluding land costs, but that such tariffs have not taken hold.

Annex 10: Safeguard Policy Issues

INDIA: National Ganga River Basin Project

Background

1. The River Ganga in India has significant economic and environmental values, and is one of India's holiest rivers and has a cultural and spiritual significance that far transcends the boundaries of the basin. With a population of nearly 400 million people in India, the basin is the most populated river basin in the world. Although the basin and all its tributaries cover 11 states, the mainstem runs through only 5 of these states: Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal. Addressing pollution in the Ganga became a issue of national importance in the mid-1980s, and is continued to seen as the test case that will determine the success of the national program for reducing pollution loading and conservation of the surface freshwater systems in India.

2. **Managing river water quality is in focus of national policies.** The National Water Policy (2003) and the National Environment Policy (2006) focus on the importance of water security for India. Given the relative shortage of water, which could further be aggravated by climate change induced impacts; the ever increasing demand for domestic, irrigation and industrial water requirements poses a major challenge to the governments. Pollution is clearly seen to be a major threat to the water security in India. Almost 70% of the 314,400 km^2 of surface freshwater in India suffers from degraded water quality. The major sources of such pollution include: sewage (92 billion l/day); toxic industrial effluent (13.5 billion l/day); agricultural run-off containing nutrients and pesticides; and leaching from urban, industrial and mining waste dumps. The National Policies, therefore, prescribed abatement and treatment of water pollution, and reuse and recycling of wastewater in addition to undertaking actions to improve efficiencies and minimize losses; and to recharge groundwater aquifers.

3. The policies also suggested a review the relevant pricing policy regimes and regulatory mechanisms linked to tariff policies for irrigation, municipal and industrial use, and inefficient use of agricultural chemicals which influence degradation of water quality. However, this review will follow substantial implementation of the enhanced national river conservation program.

4. **The National River Conservation Program (NRCP).** This program, starting in 1995, grew from the Ganga Action Plan to cover 39 major rivers across the country, and aimed to reduce pollution loads in all these 39 rivers by means of a variety of interventions including location specific interventions as well as area based treatment. In parallel, during the 10^{th} Five Year Plan period, the National Lake Conservation Program (NLCP) started with an aim to restore water quality and ecology of major lakes in different parts of the country. Given that these programs substantially complement each other, both are implemented by the National River Conservation Directorate (NRCD) in MoEF.

5. Under the NRCP financing has been made available to 172 towns in 20 states in which the targeted 38 rivers are located. The total number of schemes sanctioned was 1105 (with a total sewage treatment capacity of 4,339 MLD), and among these 842 schemes (with capacity of 3,196 MLD) had been completed. Even if these numbers are not startling, it is noteworthy that the total sewage treatment capacity in the country was only about 7,650 MLD in 2008, and about 50 per cent of this capacity had been created by the NRCP. It is also notable that the NRCP

(which included GAP Phase II) is already 5 times larger than the sewage treatment capacity created by GAP Phase I (869 MLD).

6. The GoI outlay for the NRCP was approximately US$878 million (US$353 million during the 10th Five Year Plan period, 2002-2007; and US$525 million during the 11th Five Year Plan period, 2007-12). Of this, a total of US$653 million (US$ 298 million during the 10th Plan, and US$355 million during the first 4 years of the 11th Plan period) has been spent by the GoI contribution of 70 per cent of the cost of interventions. The states have financed the remaining 30 per cent of the costs, and are responsible for operation and maintenance of the assets created.

7. A mid-term appraisal of the 11th Five Year Plan implementation noted that (i) the achievements under NRCP were small compared to the target set by the Plan, (ii) implementation of NRCP had been piecemeal, focused more on municipal sewage, and neglected industrial waste, and (iii) the issue of inadequate flows had not been addressed. The mid-term appraisal recommended that (a) a comprehensive response is necessary covering water quality and flow, sustainable access, prevention and control of pollution; (b) a systematic revision to the NRCP is required, (c) additional efforts should be made to enhance the capacity of urban local bodies to operate and maintain facilities already built; and (d) the NRCP monitoring process should be strengthened by upfront identification of quantified deliverables and regular reporting on performance. Given that conservation of the Ganga is a major part of the national river conservation program, and lessons learnt from the Project may greatly influence the larger longer-term national river conservation program, these recommendations apply to the design of the Project.

Environmental Context of the Project

8. **The Ganga Basin.** The Ganga rises as Bhagirathi, in the Garhwal Himalaya from the ice-cave of Gaumukh at the snout of the Gangotri glacier. The river cuts through the Himalayas until another head stream, the Alaknanda, joins at Devaprayag. It is below this confluence that the united stream of Bhagirathi and Alaknanda is known as the River Ganga. The Ganga does not receive any major tributary until the Ramganga joins at Kannauj in Uttar Pradesh. At Allahabad (1020 km from the source), the Ganga is joined on the right by the River Yamuna and several major tributaries after that, such as Tons, Son, Gomati, Ghaghara, Gandak, Burhi Gandak and Kosi. These tributaries are major rivers in their own right. The Ganga eventually reaches the head of its delta at Farakka, beyond Rajmahal. Within India, the Ganga basin includes ten states (Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Delhi, Haryana, Himachal Pradesh, Madhya Pradesh, Rajasthan and West Bengal), and 1949 urban areas with a total urban population of 125 million. Population density in the Ganga basin is 520 persons per square km as compared to 312 for India. The major cities of Delhi, Kolkata, Kanpur, Lucknow, Patna, Agra, Meerut, Varanasi and Allahabad are situated in the basin. Among these states, Uttar Pradesh accounts for a population of 80 million (64% if the basin population) spread over 17 districts within the state.

9. **The Ganga basin** is divided into the eight physiographic divisions, and is characterized by a wide variety of soils. The soils of the high Himalayas in the north are subject to continued erosion and the Gangetic trough provides a huge receptacle into which thousands of meters of thick sediment layers are deposited to form a wide valley plain. The plateau on the south has a mantle of residual soils of varying thickness arising due to the weathering of the ancient rocks of

the peninsular shield. The Ganga basin is extensively cultivated over an estimated 509,994 square km (62.4 per cent of the total area of the basin). About 14.3 per cent of the basin area (189,646 square km) is under forest cover, and another 14.3 per cent is under various non-agricultural uses. The basin experiences land degradation problems such as erosion, chemical deterioration due to salinization, and physical deterioration due to water logging. While soil erosion is dominant in Madhya Pradesh, water logging is dominant in Bihar, Jharkhand and West Bengal. The salinity problems are dominant in intensely cultivated areas of Uttar Pradesh.

10. **Forests** in the Ganga Basin are characterized by the tropical and subtropical temperature zones, and consist of five following vegetation categories: (i) tropical moist deciduous vegetation comprising *saal*, teak, sandal wood, *arjun*, *jarul*, ebony mulberry, *kusum siris*, *palas*, *mahua*, *simul* and *dhup*; (ii) tropical dry deciduous vegetation *bijasal*, *laurel*, *palas*, *khair* and *kendu*; (iii) sub-tropical coniferous vegetation associations of *chir pine* without underwood and with a few shrubs; (iv) Himalayan dry temperature vegetation comprising *chilgoza*, *deodar*, oak, maple, *ash*, *celtis*, *parrotia*, *olive*, etc.; and (v) Himalayan moist temperate vegetation comprising *deodar*, *spruce*, *maple*, *walnut*, *poplar*, *cedar*, *chestnut*, *birch*, *oak* etc. Overall, most of the forests in the basin are located on the periphery of the basin; with very little sizable forests in Uttar Pradesh and the plains of Bihar and West Bengal. A **number of environmentally sensitive** areas such as Biosphere Reserves, Wildlife Sanctuaries, National Parks and Tiger Reserves are located in the Basin. These include (i) two Biosphere reserves (Nanda Devi Biosphere Reserve in Uttarakhand, and the *Sundarban* National Park in West Bengal); (ii) 27 National Parks in the basin of which 12 (5 of these include tiger reserves) are in the five states where the project will be implemented; (iii) 75 wildlife sanctuaries in the basin of which 18 are in the five Project states; and (iv) the mangroves of the *Sundarban* in West Bengal.

11. Water of the Ganga is widely used for a variety of domestic, industrial and irrigation on its course; but irrigation use dominates. The irrigation water is channeled through Upper Ganga Canal network, located near *Hardwar* for irrigating a major portion of the Ganga-Yamuna plains in Uttar Pradesh, and the Lower Ganga Canal, located near Narora, also in Uttar Pradesh.

12. **Pollution load in the Ganga.** Despite the status and heritage as India's iconic river, the Ganga is facing extreme pollution pressures and associated threats to its biodiversity and environmental sustainability. Due to increasing population in the basin and poor management of urbanization and industrial growth, river water quality has significantly deteriorated in recent decades, particularly in the dry season when low flows result in very poor water quality in the critical middle stretch of the river. The challenge of pollution in the Ganga is predominantly linked to three key sectors: wastewater management; pollution monitoring and regulation; and water resources management in the river basin. The primary sources of pollution are untreated sewage and industrial wastewater. At present, only one-third of the approximately 12,000 MLD of sewage generated in the main-stem towns and cities is treated before being discharged into the river. Even if the large industries are reported to be compliant with effluent discharge norms, estimates from CPCB indicate that significant volumes of industrial effluent are discharged into the Ganga, with about 50% of the load attributed to industries in UP alone, mostly from small and medium scale industries. Non-point sources from agriculture and livestock as well as poor solid waste management also contribute to pollution (see Annex 1 for a fuller description pollution issues in the Ganga basin).

13. **The Past Projects – Ganga Action Plan Phase I & Phase II.** The Ganga Action Plan (GAP) was launched in 1985 and extended to two phases over more than two decades, with the objective of cleaning up the Ganga. GAP focused primarily on municipal wastewater, and funded a large number of Wastewater Treatment Plants (WWTPs) and related infrastructure. In addition, two 2 CETPs were funded. The program cost was approximately $250 million over 25 years. As evaluated by the Planning Commission (2008), the Ganga Action Plan (GAP) Phase-I created sewage treatment capacity of 869 MLD in 25 towns in Uttar Pradesh, Bihar, and West Bengal, equal to about 35 per cent of the total sewage treatment capacity that was needed. As targeted in GAP Phase II (included under the National River Conservation Program), an additional 20 per cent of the pollution load would be taken care of; leaving a gap of nearly 45 per cent of the pollution load to be addressed (see Annex 1 and Annex 2 for a fuller description of GAP).

14. The GAP has been evaluated in depth, but remains an important precedent for the NGRBA Program. As a result of the implementation of GAP I, the length of the critically polluted stretch of the river was reduced from 740km to 437km. Impact Data show that water quality (in terms of BOD) improved over baseline in many locations, and water quality decline was arrested in most locations. Overall, GAP interventions were able to maintain or even improve water quality in spite of significant increases in pollution loadings due to urban and industrial growth. Economic Evaluation GAP's benefits (based on its impacts on health, agricultural production, fisheries, ecosystems services, plus non-use benefits) exceeded by far the costs, with the largest benefits accruing from non-consumptive uses.

15. A number of reviews and evaluations have highlighted the main weaknesses of GAP: (i) inadequate attention to institutional dimensions, including absence of a long-term river-basin planning and implementation framework; (ii) little effort made to address systemic weaknesses in the critical sectors of urban wastewater and solid waste management, environmental monitoring and regulation, and water resources management; (iii) inadequate scale, coordination, and prioritization of investments, with little emphasis on ensuring their sustainability; and (iv) insufficient attention to the social dimensions of river clean-up, including the importance of consultation, public participation, and awareness-raising around individual investments and a well-funded, serious campaign of strategic communications for the program as a whole. The GAP suffered from inadequacy of investments and weak public participation: (a) the cumulative spending was very small compared to the needs, as judged by comparable efforts around the world; and (b) the challenges and achievements of river clean-up were not effectively communicated. As a result, notwithstanding the moderate gains made in arresting the declines in water quality, GAP remains widely perceived as a failure.

16. **The Renewed Effort to Clean the Ganga.** Given the results of implementation of the earlier projects, and in particular the need to address the increasing public demand for a cleaner Ganga, the GOI in 2009 declared that concerted actions would be undertaken to reduce the pollution in the Ganga, to be led by The National Ganga River Basin Authority (NGRBA) headed by the Prime Minister of India. The NGRBA was constituted in 2009, under the Environment Protection Act. It was given a multi-sector mandate to ensure pollution abatement in the Ganga, by addressing both water quantity and quality aspects, and by adopting a river basin approach. Its powers are significant and combine regulatory and developmental functions. The NGRBA has resolved that by year 2020 no untreated municipal sewage or industrial effluents will be

discharged into the mainstem of the river. The central Ministry of Environment and Forests (MoEF) has been designated as the nodal agency for the program (see Annex 1 for a fuller description of the NGRBA).

17. The NGRBA initiative marks a concerted shift towards a long-term and multi-sectoral approach to river clean-up, focusing on sustainability of institutions and investments. Some key lessons from the past, especially from the experience of implementation of the GAP are reflected in the design of the NGRBA program. These include: (i) a strong mandate to NGRBA, including regulatory and enforcement powers; (ii) dedicated operational agencies at central and state levels to implement the program; (iii) GOI recognition of the large scale of investments needed to deliver on the stated objectives, with current commitment of $4 billion for the program till 2020; (iv) mandate and aim to ensure sustainability of investments and ownership of the assets and processes created by state governments and urban local governments; (v) recognition of a comprehensive approach to river clean-up and conservation including investments in municipal and industrial wastewater, solid waste and river front management, as well as non-point source pollution and ecological flows; and (vi) full recognition of the importance of and the need for substantial investment public awareness and communications.

18. **Lessons reflected in the design of the current project.** The project design is based on the lessons from important experiences that have been examined in detail, including: (i) previous efforts to clean the Ganga, and associated projects; (ii) the Bank's global experience in relevant sectors, and with river clean-up and conservation in particular; (iii) the Bank's experience with urban projects in India, including in the water, wastewater, and solid waste sectors; (iv) previous international efforts to clean large international rivers, such as the Danube and the Rhine, and smaller national rivers, like the Singapore and Thames; and (v) previous local river clean-up efforts in India, such as the *Sabarmati* and the *Kali Bein*. Some of the key lessons incorporated in the project design include: (a) moving away from the previous city/town based approach, and adopting a basin-level and multi-sectoral framework in order to develop the optimal plan of interventions; (b) crossing the threshold level of investments, including recognizing and committing the long-term funding support needed to make the project successful; (c) dedicated institutions empowered with single-point accountability for delivering on the multi-sectoral and multi-tier agenda of river management, and dedicated financing to continually enhance long-term program management capabilities; (d) dedicated financing and activities aimed at collection, analysis and use of information to support knowledge-based decision-making; (e) including measures to ensure long-term sustainability of investments, and to mitigate the risk from the poor technical, financial and management capacity of local institutions; (f) incorporating strategic and broad-based communications and community participation components, aimed at building support and also managing expectations to ensure consistency with achievable targets; and (g) the careful selection of early NGRBA investments with potential for early credible wins and capturing the imagination of stakeholders.

19. **The Project area** is the Ganga River Basin in India in the five states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. Other states in the basin are currently not included in the NGRBA program and are therefore not included in the Project area. Given the proposed framework approach, exact locations of infrastructure investments are not yet known. However, given the emphasis on investment prioritization according to greatest pollution reduction impact, it is expected that a significant portion will be in the critical stretch from Kannauj to Varanasi in Uttar Pradesh. All project investments will be along the mainstem of the river and along the

tributaries that have significant pollution impacts on the mainstem (e.g. the Ramganga River in Uttarakhand and UP). Institutional strengthening and capacity building aspects of the proposed Project will be basin-wide across the five specified states.

20. **Interventions proposed in the Project.** Other than the institutional capacity building activities proposed in Component 1 of the project, which are not expected to give rise to any substantial environmental and social issues, interventions in the Project will target the primary sources of pollution and will comprise specific investments in the following areas: (i) wastewater management – collection, treatment and disposal facilities; (b) industrial pollution control – common effluent and hazardous waste management facilities; (c) solid waste management – integrated waste management and waste disposal facilities; and (d) riverfront management – conservation, restoration and improvement of the riverfront in select locations. Investments in each of the above areas will be prioritized based on the specific frameworks agreed; and detailed plans and designs for each of the interventions will be prepared in compliance with the detailed guidance notes for the respective thematic areas (see Annex 4 and 6 for a detailed description of the proposed interventions in the Project, and the relevant guidelines).

21. **Applicable regulatory framework.** The country regulatory framework for managing the environmental and social issues is comprehensive. It is however important to note that the wastewater subprojects will be subjected to environmental assessment even if such assessments are not mandated as per applicable country regulations. In addition to the country laws and regulations, the World Bank safeguards Policies will apply to the project.

Environmental and Social Assessment Process in the Project

22. A comprehensive environmental and social assessment was conducted by MoEF through a specific consultancy, supported by a wide spectrum of stakeholder consultations, and additional case specific reviews (of earlier investments and currently proposed investments). The ESA followed a robust methodology and identified the potential environmental and social risks arising out of the proposed interventions of the NGRBA Program (including this project), recommended the management measures and incorporated these measures in the design of the Program/project, especially in the program guidelines prepared for the thematic areas. The environmental and social assessment also appraised the a sample of site specific investments, and a sample of past projects to identify potential gaps in implementation of the site interventions which could potential give rise to environmental and social issues and stakeholder concerns, and ensured that specific management measures are incorporated in the design of these sample investments, which will additionally help incorporation of similar measures in all the investments that would be financed by the project. Based on the above, an Environmental and Social Management Framework (ESMF) was developed for the NGRBA Program, which will guide preparation and implementation of all interventions in the project, by describing the environmental and social due diligence processes required in each of these interventions, including incorporation of relevant management measures in feasibility studies, detailed project reports and bid documents. Further, the ESMF prescribes the staffing and capacity building plans in the PMG, SPMGs and EAs to manage social and environmental issues.

23. The assessments included specific stakeholder consultation during the design and finalization of the ESMF. It had also benefitted from (a) the various other stakeholder consultation at national and state levels organized to inform the project design as a whole, and the consultation undertaken as part of the social analysis and the communication needs assessment; (b) the

several evaluation reports of the GAP undertaken since 2000; (c) the brief reviews of the past and proposed interventions undertaken during preparation of this project; and (d) the preliminary and/or intermediate results and stakeholder opinions from various other studies which were taken up in parallel and continuing, such as the Ganga Basin Plan; the study on ecological flows; and the study on cumulative impact analyses for the upper reaches of the Ganga.

Stakeholder Communications and Consultations

24. The project in general, and the ESMF befitted from inputs derived from a wide spectrum of stakeholder consultations and opinions, some of which were carried out during preparation of the project, and some others which in the last several years opined on the evaluation of the GAP and the national river conservation program, as well as which were conducted by the GoI to finalize the program and the notification for the NGRBA.

25. **Specific consultations undertaken as part of environmental and social assessment.** The ESMF was developed based on a consultation process that sought feedback from key stakeholders. Disclosure of and consultation on the ESMF, including the Resettlement and Land Acquisition Policy Framework, the Tribal Management Framework, and Gender Assessment and Development, was done at national, state and local/city levels.

26. To initiate the process of preparation of ESMF, a first round of consultations were held with the state level stakeholders in April, September and October, 2010. The objective was to obtain consent from the states on ESMF in general and specifically on the land acquisition processes and the resettlement framework. The next round of consultations at local levels were held during the months of December 2010 and January 2011 in all the five participating states to get feedback and suggestions from the stakeholders included the potentially affected communities on the ESMF, the resettlement policy framework and the gender framework. Separate and specific consultations were held in Jharkhand to discuss the tribal management framework. The dates of local level consultations were published in local newspapers enabling all interested stakeholders to participate and provide suggestions.

27. The local consultations focused on specific issues related to the potential subprojects and environmental and social issues associated with such subprojects. About 50 officials from across 11 agencies of NGRBP states/cities and 226 participants from potential project cities participated in these consultations and provided inputs to the preparation of ESMF. The draft ESMF and a summary of ESMF was translated in local language and disclosed on the websites of the PMG and the SPMGs for public review and comments, prior to the local consultations. The draft ESMF received substantial review by wider public, had been commented positively in the media at national and state levels, and overall received positive feedback. The ESMF has also been disclosed in the Bank's Info shop.

28. The ESMF and its specific instruments provide guidelines and procedures for further consultations during project implementation, in particular in defining and designing subprojects and specific works. It provides systematic guidance to address potential risks and to enhance quality, targeting, and benefits to the communities. Dialogue and disclosure actions during the assessment and execution process of a subproject are designed to ensure that those stakeholders, irrespective of whether they benefit from or are adversely affected by the project interventions, are well informed and are able to participate in the decision-making process. The ESMF procedures consider the level of environmental and social risk of each type of investments in allocating time and resources to be dedicated for stakeholder consultation.

29. Consultation being a continuous process, the ESMF's disclosure on the websites of the SPMGs and PMG will continue during project implementation. The Environmental Management Plan (EMPs) and Resettlement Action Plans (RAPs) for individual investments will also be disclosed as per the principles and procedures of described in the ESMF. The draft EMPs and RAPs will be disclosed, followed by discussion with the affected community (including any individual adversely impacted by such intervention); and final EMP and RAP will be prepared and disclosed only after incorporating reasonable and relevant suggestions from the communities in the design of the investments. The copies of the EMPs and RAPs will be placed at the offices of executing agencies, district magistrate and contractors' offices, enabling easy access of any community or individual. The executive summary of EIAs and RAPs for all particular investments will be translated in local language and will be placed in the office of local self-government body (village *Panchayat* or municipality) of the town/village where the investment is located. The list of affected persons, if any, will be pasted on the conspicuous place in all the affected towns/villages, usually at the prominent roadside entry to the investment site.

Potential Impacts, Avoidance and Mitigation

30. The environment and social Assessment process adopted for the project took a holistic approach, assessed environmental and social issues at a macro and micro level, identified associated risks, potential impacts and recommended management measures. All interventions proposed under the project share the long term objective of improving the water quality of Ganga. By virtue of this very objective, the environmental impacts of the project are expected to be positive, beneficial, and aimed towards long term sustainability. Analysis of the past projects, such as the GAP or the various schemes under the NRCP clearly indicated that, at an overall level, there had not been any substantial adverse affects from these programs, and there had not been any adverse commentary or stakeholder opinion about negative social or environmental impacts. In fact the majority of the stakeholder opinion around these programs had been about the need to scale up these, and about the potential negative environmental and public health impacts due to (i) the delay or partial completion of the activities under the scheme, (ii) the lack of additional capacity and resources hampering operation of the assets created by the programs, and (iii) the lack of expansion of these programs. Clearly in the eye of the experts and the wide variety of the stakeholders, negative impacts will arise only if the proposed interventions are not taken up.

31. **Basin level issues**: During stakeholder consultations during April-December, 2010, a number of suggestions came to the fore. These mainly pointed out the ways the proposed program can be augmented; but also pointed out a few issues that may arise at specific locations of subproject interventions. The stakeholders pointed out the need for (i) involvement of local communities and agencies in planning and monitoring the activities of the Project; (ii) ensuring the construction stage safeguards to avoid impacts on neighboring communities and the construction workers; (iii) safeguarding and minimizing impacts on social and cultural practices; (iv) promotion of awareness of pollution load in the Ganga among the local religious institutions and their involvement in various stages; (v) ensuring minimum ecological flows in the river for various critical activities including for the sustenance of the aquatic life; (vi) inclusion of solid waste management activities in addition to wastewater treatment facilities as possible subprojects; (vii) ensuring selection of suitable selection sites for the subproject to minimize impacts on communities and local environmental impacts; and (viii) creation of 'Ganga Heritage Zone' and preparation of specialized master plan for Ganga Basin Area. Most of these were

suggestions that were expected, and the project design was already in the process of incorporating most of these ideas.

32. **Site level potential environmental issues.** A further analysis of a sample of past interventions suggests that environmental impacts may arise if the subproject interventions are not designed, executed or operated appropriately. These impacts could be due to a variety of reasons, such as (a) potential siting of subprojects such as sewage treatment facilities, common effluent treatment plants, solid waste disposal facilities in environmentally sensitive locations such as flood plains, drainage paths, natural water bodies or close to wildlife sanctuaries or other natural habitats, leading to long-term impacts; to be addressed through careful screening and analysis of alternatives sites early during the feasibility study; (b) potential absence of sludge/waste disposal and management and leachate facilities in the proposed subprojects, particularly in the industrial pollution control and solid waste management subprojects wherein the treatment methods use various chemicals and polyelectrolytes, and consequent disposal of untreated sludge and other organic waste into the Ganga and other nearby sensitive habitats in the basin; to be carefully considered during selection of appropriate treatment technologies and design of these various facilities; (c) inadequate management of environmental issues such as disposal of construction wastes during the construction of the subprojects, including inadequate precautions to avoid contamination of the Ganga and all nearby water bodies; air pollution, excessive noise and other nuisance to the nearby communities; vibration and pollution impacts on nearby physical cultural resources; inadequate attention to the occupational health and workers' safety issues; all of such issues to be addressed by specific provision of generic environmental, health and safety provisions in all work contracts; (d) inadequate maintenance of the facilities created by subprojects, depending on their locations, leading to continuation and or further deterioration of river water quality, deterioration of ambient environmental quality, negative impacts on the aquatic and other habitats, and possible degradation soil or contamination of groundwater, and associated health impacts on the communities in the subproject surrounding; all of which would need to be addressed in subproject level environmental and social assessments and mitigation measures to be included in the operation and maintenance management plans of the subprojects. In most cases direct environmental impacts will be negligible, but preparation and implementation of the subprojects may overlook the indirect impacts on-site and at the periphery of the construction sites. In cases where the possibilities of indirect impacts cannot be fully discounted (e.g., as related to sourcing of construction materials), management actions are proposed in the ESMF and as part of the preparation and implementation requirements of the subprojects which include specific environmental and social examination of options and due diligence.

33. **Site level potential social issues**: While the Project is expected to benefit the Ganga basin communities, the inadequate or inappropriate implementation of the proposed subprojects might lead to adverse impacts on people and local land resources. Such potential social impacts during the construction phase of subprojects include loss of land or structures, loss of access to areas for livelihood support, deteriorated public safety, noise and other disruptions at sensitive receptors such as schools and health facilities. Site selection for major facilities such as the wastewater treatment plant could become locally controversial among people if land acquisition process is unacceptable, or if neighboring communities are adversely affected by stench from inappropriately maintained sewage treatment plans. Based on examination of a sample of possible subproject areas and discussion with the potential executing agencies, the typical adverse impacts associated with the project would include: (i) potential loss of land due to

acquisition of private holdings; (ii) full or partial loss of residential/commercial/mixed use buildings associated with potential land acquisition; (iii) possible displacement of non-titleholders living on the road edges and on sewer alignment areas; (iv) potential loss of livelihood or distancing from sources of livelihood if displacement takes place; and (v) temporary loss of access to private and common properties or public infrastructure during construction. Avoidance and minimization of each of these potential direct and indirect impacts is the basis on which the ESMF and the program guidelines had been prepared.

34. At a cumulative level, the impacts are beneficial, and the NGRBA program guidelines and the regular monitoring processes will ensure that these beneficial impacts are enhanced.

Environmental and Social Management Framework

35. Given the distributed nature of the proposed interventions and the overall frame work approach being followed for the NGRBA Program (of which the project is a part), an Environmental and Social Management Framework (ESMF) has been developed to ensure management of environmental and social issues. The purpose of the ESMF is: (a) to ensure the social and environmental sustainability of the subprojects, and (b) to comply with the national environmental and social legislation. The ESMF developed for the NGRBA Program and included in the NGRBA Program Framework is consistent with and meets the requirements of the World Bank Environmental and Social Safeguards Policies. The ESMF details out the policies, procedures and institutional responsibilities for assessing and managing the potential environmental and social risks and impacts that may come up throughout the project cycle of NGRBA sub-projects, and is intended for use and application by the agencies responsible for the execution of the investment subprojects under each component.

36. The ESMF has been prepared based on: (a) an assessment of the existing environmental and social features of Ganga Basin in all the five project states and potential subproject cities; (b) careful examination of a sample of interventions previously executed under the Ganga Action Plan; (c) review of possible subprojects; and (c) detailed consultations with key stakeholders in what are expected to be the key cities.

37. The objective of the ESMF is to provide a management instrument that provides technical guidance on applicable legal and regulatory requirements, institutional responsibilities, methodologies, instruments, and procedures in order to ensure adequate analysis, mitigation, and management of social and environmental risks and impacts during the entire project cycle. The ESMF provides for (i) description of project, subprojects and variations possible in subprojects; (ii) a description of an easy and efficient process to categorize subprojects according to the level of social and environmental risks and commensurate assessments required to comply with national environmental legislation, and with the Bank Safeguard Policies.

38. **Categorization and environmental/social due diligence of potential subprojects.** The potential subprojects will have varying impacts on environment depending on its location, size and nature of interventions. The extent of environmental and social assessment required to identify and mitigate the impacts, largely depends upon the complexities of subproject activities. To facilitate this, the portfolio of projects to be implemented under NGRBP, ESMF categorizes the subprojects into the two categories, based on the severity of its potential impacts, assessed through a screening exercise. Overall, the two categories are: (i) projects requiring detailed Environmental and Social Assessment (ESA) and (ii) projects requiring implementation of generic safeguard management plans.

39. **High Impact category subprojects** requiring detailed Environmental and Social Assessment, including preparation of a RAP. A proposed subproject will be classified as High Impact category if it is likely to impact (adversely or moderately) the environmental and social aspects of the project influence area, as determined by the screening criteria provided in the ESMF. These will also include all those projects which require the mandatory environmental clearance as per the EIA notification published by MoEF. The subprojects categorized as High Impact will require preparation a detailed Environmental and Social Assessment (Detailed Subproject ESA) by an independent consultant (other than the consultants involved in preparation of either feasibility study or detailed project reports for the subproject). Scope of the assessment will be decided based on the nature of the project and the environmental sensitivity of the project area. This ESA shall examine all the potential negative and positive environmental and social impacts of the project, compare them with those of feasible alternatives (including the "without project" scenario), and recommend all measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The ESA shall include all the suggested mitigation measures in the form of a project specific environmental management plan (EMP), Rehabilitation Action Plan (RAP) and Social Management Plan (SMP) along with bill of quantities and cost estimates. The bill of quantities of shall be included in the bid/contract document, as relevant, and shall be implemented accordingly.

40. **Low Impact category subprojects** requiring implementation of generic environmental and social management measures, identified and described in the stand-alone DPRs of these subprojects. Low Impact category subprojects are those, which are likely to cause minimal or no adverse environmental and social impacts on human populations. The impacts, if at all, are likely to be localized and temporary in nature. In most of these cases mitigation measures are readily available from the ESMF and the program guidelines. These subprojects will require preparation of an environmental and social analysis as part of the Detailed Project Report, and implementation of the relevant Safeguards Management Plan. The recommended safeguard management measures will be included in the bid/contract documents, and the executing agency will ensure that these measures are duly implemented.

41. Based on examination of a sample of past interventions in similar projects and programs, an indicative categorization of the expected types of subprojects has been prepared, and will be provided by the PMG as guidance to the SPMGs and the EAs. The categorization is indicative and not binding, and the final determination of the impact category for each sub-project will be made after the screening of the specific environmental and social issues at the feasibility report preparation stage.

42. For each subproject identified as High Impact Category, detailed ESA by independent consultants will be undertaken. In extreme cases, where investing in a detailed ESA is obviously unnecessary, such detailed ESA can be avoided only in agreement with NGRBA and the World Bank.

43. The ESMF includes (i) a sample terms of reference for carrying out detailed ESA for High Impact Category subprojects, which could be customized specific to the subproject requirements; and (ii) the Environmental Management Plan (EMP) for Low Impact Category subprojects.

44. The ESMF complements the Project Guidelines, and includes the following specific frameworks and processes. The ESMF, including the following specific frameworks and processes will be applicable to the NGRBA program.

- Resettlement Policy and Land Acquisition Framework (RPLAF);
- Tribal Management Framework (TMF);
- Gender Analysis;
- Integrated Grievance Redressal System (IGRS);
- Specific procedures on public consultation and disclosure;
- Environmental and Social Monitoring Arrangements covering selection, appraisal and implementation of subprojects;
- A plan to augment institutional capacity to manage environmental and social issues in the project.

45. **Integration of environmental and social issues into project design**: Based on the specific recommendations from the detailed ESA for the High Impact category sub-projects, and the relevant portions of social and environmental management plans for the Low Impact category sub-projects, the SPMGs and the executing agencies will ensure that all required measures are included clearly and distinctly in the detailed project reports and the bid documents of the subprojects. Further, the SPMGs and the executing agencies will, as part of the annual action plans, will endeavor to select and design subprojects with an aim to maximize the long-term benefits and promote environmentally sustainable actions for the basin. All investments will be expressly designed to preserve the natural and cultural heritage of the riverfront communities.

46. **Natural Habitats, National Parks, Wildlife and Bird Sanctuaries.** Nothing included or potentially included in the project involves degradation or conversion of natural habitats. No project activity will involve any (significant or insignificant) conversion or degradation of natural habitats (whether legally protected or not). No activity in the project will include anything to affect (i) the integrity of the natural habitats (by land use or water use), (ii) land clearing or replacement of natural vegetation, (iv) permanent or temporary flooding of natural habitats or any (v) drainage, dredging, filling or channelization of wetlands. The project interventions by way of reducing the pollution load in the river will protect and enhance sustenance of these sensitive habitats. This is best illustrated by the NGRBA's vision to revive *Gangetic* Dolphins in the river as an indicator of success in the Project. Activities in Component 1 of the Project are also designed to enhance capacities required to manage long-term conservation needs.

47. However, it is important to note that there are number of environmentally sensitive areas in the Project States including 2 biosphere reserves, 27 national parks (5 of which are tiger reserves also) and 75 wild life sanctuaries. Almost all of the sensitive areas are away from the mainstem of the river or from the key cities where most of the subprojects are expected to be implemented, and all of these protected areas are intricately dependent on the tributaries of the Ganga for sustenance of the quality of the habitats. However, a part if the riverfront in Varanasi (from Ghat No. 1 to Road Over Bridge) is notified as a Turtle Sanctuary. The environmental assessment/analysis of each sub-project will, therefore ensure that the sub-projects do not (i) involve any construction activities, or (ii) cause any direct or indirect impacts on wildlife and

associated vegetations during construction or operation phase. The project will monitor chances of any accidental impacts on ecological resources adjacent to the mainstem of the river through third party audits, and in the event of any such impacts, will implement necessary actions, including mobilizing resources, to avoid or mitigate such impacts.

48. **Riparian issues**. The Ganga is an international waterway, and sustenance and conservation of this river is of interest to all riparian countries. The Bank, on behalf of India, notified the riparian countries - China, Nepal and Bangladesh on August 20, 2010. All countries responded - Nepal (November 28, 2010); China (September 21, 2010); Bangladesh (November 08, 2010), and no objection was raised about the Project. An examination of the possible interventions in the Project also indicate that there will be no adverse impact on any riparian community, and it is possible that most riparian communities will be benefitted by the expected improvement in the river water quality.

49. **Forests, flora and fauna.** The project will not (i) include any logging, (ii) impact the health or quality of any forest, (iii) either increase or decrease access or rights of communities to forests or minor forest produce; or (iv) propose to bring about any changes in management, protection and utilization of forests in the basin. Overall impact of the project on forests, flora and fauna of the basin will be beneficial from the reduced pollution load and the potential for improved ecological flows in the medium and longer term. As far as possible, trees if any present in the in the sites for subproject investments, such as for sewage treatment plants will be saved by careful site planning.

50. The project will not use, or directly/indirectly promote use of any chemical or synthetic pesticides or herbicides, including in site clearance for subprojects.

51. **Involuntary resettlement and land acquisition**. According to an examination of the preliminary list of potential subproject investment works, there will be need for private land acquisition both in urban areas and urban fringes, which might result in involuntary resettlement and potential loss of livelihood. Nonetheless, such land acquisition and resultant involuntary resettlement is likely be small scale, and unlikely to trigger any need for a full-scale resettlement action plan. The program guidelines, including processes and review of the subproject feasibility studies will ensure that acquisition of private landholding is absolutely minimized. Since there is a possibility that the land parcels earmarked for public use are already encroached in some of the urban areas where sub-projects will be taken up, provisions have been made for non-titleholders in the Resettlement Policy and Land Acquisition Framework (RPLAF), included in the ESMF.

52. The social and environmental categorization of the subprojects and the subsequent procedures for scoping of the social issues described in the ESMF will identify the nature of examination and analyses to be included during the feasibility studies and the preparation of the detailed project reports for the subprojects. Wherever possibilities of land acquisition and chances of displacement of any individual or group of individuals are found, the RPLAF will be fully applied.

53. The RPLAF specifies procedures to be followed in the event that resettlement or land acquisition is required for any subproject, including procedures for identification of persons entitled, their entitlement for compensation and/or resettlement assistance, and the consultation and grievance redress mechanisms. Once the sites of the sub-project works are known during the project implementation period, individual resettlement and/or land acquisition plans will be prepared, in the event that any person is displaced or is likely to suffer adverse livelihood

impacts after a detailed site level assessment. These resettlement action plans will be reviewed and accepted by the SPMG, the PMG and the Bank in advance of the commencement of subproject works in each specific site. The RPLAF will apply to parallel activities undertaken by the executing agencies if these activities are found to be (a) directly and significantly related to the Bank-assisted project or subprojects, (b) necessary to achieve its objectives as set forth in the project documents; and (c) carried out, or planned to be carried out, contemporaneously with the project.

54. The subprojects will have two stages of clearances – first for the feasibility study and thereafter for the detailed project report. The candidate sites for any subproject will be identified, and an analysis of alternatives will be carried out in the feasibility study to avoid or minimize involuntary resettlement, as far as possible without impacting the subproject objectives. This will be supported by ESA for the High Impact category sub-projects. Once the best suitable site is finalized (incorporating the need to avoid or minimize involuntary resettlement), and all requirements of land acquisition are identified, a detailed plan and schedule for land acquisition will be prepared. The process of land acquisition will be initiated as soon as the feasibility report is cleared by SPMG and PMG, so that the initial processes for land acquisition (under the applicable country land acquisition laws) could be initiated before finalization and clearance of the detailed project report or financial closure wherever DBO contracts are used.

55. Once the feasibility report is cleared, each EA will initiate the land acquisition process ("notifications under 6, 9 and 11" will be issued) so that so that entire land required for the sub-project is acquired before the mobilization of contractors. In parallel a subproject resettlement action plan will be prepared, and will be reviewed and cleared as part of the process of clearance of the detailed project report and sanction for the work to commence. The resettlement action plan will include detailed description of the compensation if any and resettlement assistance to be paid to each entitled person, family or community, with special additional provision for persons and families belonging to vulnerable communities. In Jharkhand private land acquisition owned by a tribal family will additionally comply with the Santhal Pargana Tenancy Act of 1949.

56. **Tribal Peoples**. In India the indigenous peoples are defined as tribal people, per Article 432(1) of the Constitution. The scheduled tribes are recognized as a vulnerable community, accepted to have endured disadvantages in terms of social indicators of quality of life, economic status and sometimes as subject of social exclusion. In the five states through which the mainstem of the Ganga flows, Jharkhand (26.4 per cent) has a significant proportion of scheduled tribe population followed by West Bengal (5.5 per cent) and Uttarakhand (3 per cent), whereas in Uttar Pradesh and in Bihar, the scheduled tribes are less than 1 per cent of the total population. Scheduled tribes are present in all districts along the mainstem of the Ganga, except in two districts of Uttar Pradesh (*Jyotiba Phule Nagar* and *Kannauj*). The only district where the scheduled tribe population is substantial (31 per cent of total population) is *Sahebganj* in Jharkhand. Otherwise, the scheduled tribe population is small in the districts along the Ganga – varying from 0.1 per cent in *Tehri Garhwal* to 0.9 per cent in *Uttarkashi* within Uttarakhand; from 0.1 per cent in *Ghazipur, Bullandshahr* and *Ballia* to 0.9 per cent in *Allahabad* within Uttar Pradesh; from 0.03 per cent in *Khagaria* to 5.9 per cent in *Katihar* within Bihar; and from 0.2 per cent in Kolkata to 8.3 per cent in *Paschim Medinipur* district within West Bengal. Given that all subproject interventions will be in urban areas and urban fringes, it is unlikely that any tribal

habitat will be found on or adjacent to any of the subproject sites. The project will avoid, to the extent possible, acquisition of any land owned by a tribal family.

57. As part of the ESMF a Tribal Management Framework (TMF) has been prepared by the Project. Implementation of the TMF will ensure that (a) participation of the scheduled tribes will be effectively promoted in preparation and construction and operation of the subprojects; (b) inclusion of the neighboring scheduled tribe communities in the design process, as and when they are located in close proximity of the subprojects to achieve the maximum possible positive impact of such communities; (c) the design, execution and operation of the subprojects, such as the riverfront management activities are culturally appropriate; (d) the subprojects including the works and services associated with these do not inadvertently induce inequality by limiting subproject benefits to the elites of the community; (e) that all executing agencies engage with communities through a consultation process appropriate to the local cultural context and local decision-making processes; and (f) the subproject activities including the resettlement action plans, wherever relevant, establish appropriate information, communication, and inclusion measures targeted at the scheduled tribe and other vulnerable sections of the communities.

58. **Mainstreaming gender equity and empowerment.** This is a focus area in the project. In sub-projects, the activities included in resettlement action plans and related to livelihood restoration will address women's needs. Gender analysis will be an integral part of the initial social assessment at the screening stage. The identified issues can be assessed during the feasibility stage, and detailed analysis can be carried out during the DPR stage. The specific processes and guidance are described in Gender Assessment and Development section of the ESMF. The sub-project gender analysis will based on primary data collection and available secondary data, and will identify issues related to gender disparity, needs, constraints, priorities, and an understanding as to whether these sub-projects would have any scope to address inequitable risks, benefits and opportunities for women. Based on this analysis, specific interventions will be designed and incorporated in the design of sub-projects. The overall social impact monitoring plan for the Project will relevant indicators for measuring impacts on and participation of women in the Project.

59. **Mainstreaming strategies for poorer and vulnerable section of the population.** As part of the project preparation an analysis of the poverty situation in the five Project states and in the districts along the mainstem of the Ganga was undertaken based mainly on available secondary information and current literature. The project states have had a disproportionately high incidence of income poverty for decades. Their efforts to increase the income their residents have shown mixed results. In most cases, they have lagged the average for the country as a whole. The lowest average Monthly Per Capita Expenditure (MPCE) in the rural areas is for Bihar while the highest is in Uttarakhand. Uttarakhand is also the most unequal and Bihar has the lowest Lorenz ratio highlighting a more equitable society (or more uniformly poor), at least in terms of expenses incurred. In urban areas, West Bengal has the highest MPCE and highest inequality as measured by the Lorenz Ratio (LR). Improved provision of drainage from houses and uniform urban sanitation can have beneficial impacts for the households and also help to achieving the project goal of reduction/elimination of untreated waste going into the river. This analysis points to the relative advantage the districts directly abutting the main Ganga river have compared to others in the respective states. For the project, three distinct situations (and many in the continuum that connects these), each requiring a different approach to handle the potential impacts can be: (a) where the objectives of project activity yield direct benefits to the poor and/or

vulnerable communities, such as enhancing farm produce and farmers' benefits in urban fringes; (b) some adjustment in the design of the project activity would lead to direct benefit/ positive impact for the vulnerable section, for instance engaging marginalized fisherpersons in conservation of flagship species such as the *Gangetic Dolphin*; and (c) where the project activities, if implemented without any regard for the local and current vulnerabilities could result in negative impacts and would therefore require planning for specific mitigation measures in advance; these situations might include cases of reduction/elimination of open burning of human bodies, which is the source of livelihood of 'Doms' one of the most vulnerable and disadvantaged social groups along the mainstem of the Ganga.

60. As part of the Strategic Environmental, Economic, and Social Assessment (SEESA), a basin wide social assessment will be carried out. The objectives of this assessment will be to (a) optimize benefits of the Project, as far as practicable, for the poor and the other socially disadvantaged groups, such as migrant workers; and (b) enhance the contribution of the project to poverty reduction efforts of the state governments in general.

61. **Social accountability and the grievance redress mechanism in the Project.** The social accountability mechanism for the Project will cover all subprojects. The key process for ensuring social accountability would be social audits, in order to acquire feedback on performance of the sub-projects and of the agencies involved in planning, execution and operation of the sub-projects. Summaries of these will be prepared at the SPMG and PMG levels, and the correction or improvement measures will be incorporated as part of the succeeding annual action plans. These accountability mechanisms will be further strengthened by implementation of a strong and uniform grievance redressal system.

62. The project will abide by the Right to Information Act of 2005 and under provisions of Section 4 of this Act it will commit itself for proactive disclosure and sharing of information with the key stakeholders, including the communities/beneficiaries. The project will have a communication strategy focusing on efficient and effective usage of print and electronic media, bill boards, posters, wall writing, and adoption of any other method suiting local contexts

63. As part of the Integrated Grievance Redressal System (IGRS), Grievance Redress Cells (GRCs) will be set up at the local EA, ULB, SPMG and PMG levels.Grievances may be submitted through various media (including in person, in writing, by phone, and online), and all local contact information and options for complaints submission will be displayed on local information boards. The function of the GRCs will be to adress grievances of project affected persons (PAPs), including rehabilitation and resettlement assistance and related activities.

64. **Monitoring and reporting on implementation of the ESMF**. The PMG and the SPMGs will monitor all the approved subprojects to ensure conformity to the requirements of the ESMF. The monitoring will cover all stages of construction, operation and maintenance. Regular monitoring will be through the environmental and social compliance reports that will form a part of quarterly progress reports submitted by the executing agencies and consolidated at the state level by the SPMGs, and at overall level by the PMG. These reports will be based on regular site visits and investigations by environmental officers and social development officers of the executing agencies and the SPMGs. In addition, the PMG will undertake an annual environmental and social audit of all subprojects through third party inspection agencies, to measure compliance to the ESMF. The terms of reference for this annual environmental and social audit are already included in the ESMF. Based on these audit reports, the PMG will

identify all technical, managerial, policy or procedural improvements that would be required to be incorporated in the annual action plans, and subprojects included in these plans. The SPMGs and the executing agencies, on the other hand will implement all required corrective measures, if any in the subprojects audited and similar other subprojects.

65. **Augmenting capacities of the implementing agencies for management of environmental and social issues in the Project**. The project will be implemented by the Ministry of Environment & Forests (through the PMG) and will prominently include the Central Pollution Control Board, and the State Pollution Control Boards. The mandate and primary function of these agencies is to protect and conserve the environment, through a mix of regulatory, institutional and financial tools. These agencies employ the best environmental professionals in the country, and have invested for a long time in specialized institutes, such as the Botanical Survey of India and the Zoological Survey of India and the Wildlife Institute of India for research and development of application tools on environmental conservation and pollution management. There is no obvious skill gap, particularly with respect to institutional arrangements for addressing environmental safeguard issues that may arise in relation to the project in general; even if these institutions admittedly face considerable resource gaps to fulfil the needs of a rapidly emerging economy. On social safeguard issues though (which are the domain of separate ministries in GoI and separate departments in state governments) the PMG and the SPMGs and their associated organizations do not have adequate capacity, and will depend on the relevant state departments, particularly those that address issues of land acquisition and consequent resettlement and rehabilitation. The PMG and the SPMGs will also be able to draw on other institutions, such as the National Environmental Engineering Research Institute or the National productivity Council for resolving issues related to environmental and social safeguards. The Project includes sufficient resources for involving expert institutions to advise on the adaptive management of both known and unforeseen issues.

66. The Project has identified areas and opportunities for augmenting the capacity to manage the social and environmental issues; specifically as the PMG and SPMGs are expected to be full-fledged implementation entities with clear mandates and accountabilities. Staffing plan for the PMG and the SPMGs include adequate number of specialists in the area of environmental management and social development. These staffing, training and continuing skill development programs, other resources that will be required for effective management of the environmental issues, and the required budget had been recommended and described in the ESMF; and have already been included in the design of the implementation arrangements and institutional design for the Project. Several staff with expertise in managing the environmental and social assessment processes had been recruited, and they were involved in reviewing and finalizing the ESMF.

67. **Disclosure**: National and state level in-country disclosure of the draft ESMF Report, including its executive summary in English and Hindi was completed in November 2010, ahead of the district and city level consultations. Over and above the stakeholder opinions received at the consultation workshops, the MoEF have received public comments on the ESMF. None of these comments pointed out any gap in the ESMF Report (while pointing out possible interventions to be added in future to expand the project), and as such the revised draft final version of ESMF is no different in content from the draft disclosed. The ESMF Report has been finalized and will be duly disclosed on the website of the MoEF (www.moef.nic.in) and on the websites of the nodal agencies of the project states by May 16, 2011.

Annex 11: Governance and Accountability Action Plan

INDIA: National Ganga River Basin Project

1. The need for a Governance and Accountability Action Plan (GAAP) is based on the recognition by the Government of India, the State Governments of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, and the World Bank that there are governance and accountability risks to the NGRBA Program, and that specific arrangements must be made to mitigate these risks and to ensure that funds are used effectively and efficiently. The main aim of the GAAP, therefore, is to ensure that the project development objectives are achieved.

2. This GAAP summarizes the main identified risks to the project, and the mitigation measures being taken as a part of project design. The mitigation measures are grouped into four categories: (i) implementation arrangements; (ii) transparency and citizen voice; (iii) grievance redressal; and (iv) procurement, contract management, and financial management.

Main Identified Risks

3. ***Institutional capacity.*** The NGRBA is a new apex authority which was constituted in February 2009. It derives its powers from the Environment Protection Act (1986), has a multi-sectoral mandate to address water quantity and quality aspects, and has significant regulatory and development powers. However, it faces several challenges. It is a new entity which must be fully operationalized as it assumes a very large task. It has to work in a complex environment in which water is a state subject under the Constitution, and in which multiple ministries and agencies operate. Basin-level management across three key sectors – water resources, environment, and urban development – will be challenging. This institutional challenge is compounded by the fact that equally new authorities (the State Ganga River Conservation Authorities) have been created at the state level.

4. ***A weak regulatory environment.*** The fact that many of the Ganga basin states are relatively less developed compounds the challenge. This risk manifests itself primarily in two areas: (1) weak regulation of the environment by state pollution control boards (SPCBs), and (2) financially weak urban local bodies (ULBs) with serious capacity constraints. The SPCBs are responsible for the enforcement and compliance of the Water Act through licensing of discharge permits, monitoring of wastewater discharges and water quality, and enforcement. However, the SPCBs are under-resourced and do not have adequate staff or equipment to carry out their assigned functions. Also, their focus remains primarily on industrial pollution and not on municipal wastewater sources. Local ULB service providers have the primary responsibility for wastewater, solid waste and river front management. However, despite the passing of the 74th Constitutional Amendment (1993), devolution of functions and responsibilities from states to ULBs has been limited, and ULBs remain the weakest tier in India's governance structure. The ULBs suffer from a range of constraints, including lack of buoyant revenue streams and weak asset management. Although national programs, like JNNURM, are working to reduce these risks and injecting funds and reforms, and the system of fiscal transfers from states to ULBs is being strengthened under the recommendations of the 13th Finance Commission and counterpart state finance commissions, these governance risks remain significant for NGRBA.

5. ***Potential weaknesses in sub-project level design.*** This larger set of risks includes problems that might arise during implementation as a result of loose arrangements or weak sub-project design. These potential risks include, for example: lack of clarity in roles (particularly between the PMG and the SPMGs, and between the SPMG and the EAs); poor operations and maintenance of assets created under the NGRBA Program; problems with procurement and contract management; lack of citizen voice in project selection and monitoring; and poorly managed grievance redressal systems.

6. ***Mitigation measures for potential weaknesses.*** Although these sets of governance and accountability risks are substantial, and the overall risk is rated as high, mitigation measures have been taken as a part of project design with regards to: (i) implementation arrangements; (ii) transparency and citizen voice; (iii) grievance redressal; and (iv) procurement, contract management, and financial management.

Mitigation Measures: Implementation Arrangements

7. ***Mitigating institutional ineffectiveness through strong apex and operational entities.*** The challenge of institutional effectiveness has been addressed at both the apex and operational levels. At the apex level, cross-sectoral coordination has been built into the NGRBA through the composition of the Authority. The NGRBA has been established as a collaborative institution of Central and state governments. It is chaired by the Prime Minister, and members include key GoI ministers and the Chief Ministers of the five basin states. NGRBA also has representation of nine non-official members from civil society and academia, and from a range of expertise. The NGRBA has been created under the Environment Protection Act, with a strong legal mandate and powers for effective abatement of pollution and conservation of the Ganga.

8. ***Strong and empowered operational entities at the Central and State level.*** At the operational level, the NGRBA "may evolve an appropriate mechanism for implementation of its decisions" (as per the NGRBA Notification), and to that effect the PMG and SPMGs are being created as dedicated institutions for operationalization and implementation of the NGRBA Program. They will have the requisite powers, functions, capacity, and staff needed to coordinate effectively across a large basin area, improve the quality of investment preparation, and deliver the program. They are currently being established as registered societies with the structures, staffing plans, financial autonomy, and single-point accountability required.

9. ***Clear delineation of roles, relationships, functions, and powers.*** Details and clarifications on the roles and responsibilities of the PMG and SPMGs –and the relationships between them – are provided in the registration documents of the new societies and in the NGRBA Program Framework.

10. ***Strengthening the ULBs and the environmental regulators.*** The risk of weak ULBs and environmental regulators hampering project effectiveness is being mitigated through a combination of capacity building measures and protection of assets created. With regards to ULBs, measures include: (i) ULB involvement from the beginning in individual investment selection and implementation, including a commitment to own and maintain assets in the long run; (ii) a capacity building sub-component to provide training, planning systems, and equipment to local-level water and wastewater service providers; (iii) technical assistance, for example, for

a close examination of urban finances to assist specific ULBs in boosting revenue streams for long-term asset maintenance; and (iv) the use of PPP contracts to protect new assets, including 15 year Design Build Operate (DBO) contracts for all appropriate investments in wastewater treatment plants, and options for the use of PPP contracts elsewhere, such as in upstream sewage networks or in riverfront management. Environmental regulators are also being specifically targeted through customized capacity building packages to improve: (i) infrastructure, including the upgradation of buildings, laboratories, and transportation facilities for sample collection etc; (ii) information, including IT infrastructure, MIS and GIS systems, legacy data computerization, website development, laboratory information management systems etc; and (iii) institutions, including, training, staffing for additional skills, and accreditation of labs etc.

11. ***Ensuring the long term sustainability of assets.*** The sustainability of investments is a particularly important issue. Apart from the deliberate and consistent use of PPPs for all wastewater treatment plants, the project's implementation arrangements are structured in such a way as to ensure that all assets are designed, built and operated for long term sustainability. The investments frameworks across the four sectors sets the minimum eligibility and appraisal criteria (technical, economic, financial, and social) for high quality investments, including, for example, the need for technical options analysis and full details on financing arrangements and minimum O&M plans prior to investment approval. Detailed implementation arrangements ensure that no investment can be approved without specific commitments of the ULB, and the MoAs will be signed by the ULBs – both at the program-level with the PMG and the SPMG; and at the investment-level with the SPMG and the EA – to ensure asset ownership and commitment to O&M over the long term. In addition, since the system of federal fiscal transfers from Center to States in India is established and reliable, states can guarantee support.

Mitigation Measures: Transparency & Citizen Voice

12. ***Disclosure and dissemination of information.*** The Municipality Disclosure Act, the Right to Information Act, and the NGRBA Guidelines on stakeholder consultation will be adhered to for the purpose of information dissemination. Citizen voice is strongly supported through the project principles of (i) disclosure of information on a regular basis to the public, and (ii) genuine stakeholder consultation and engagement on specific investments. This is particularly important given that lack of transparency, inadequate supervision, and construction deficiencies are the main risks associated with the execution of civil works. NGRBA program websites are being designed for information disclosure and dissemination, on all aspects of the program. Relevant information will also be available in the state language. The project will ensure an efficient and effective usage of print and electronic media, bill boards, posters, and adoption of any other method suited to the local context.

13. ***Use of Social Audits.*** Social audits provide a succinct view of performance relative to the objective of a project, and provide insight and learning from a third party without vested interests. They are known to increase accountability to beneficiaries and other stakeholders, and can enhance democratic practices if conducted well. In the NGRBA program, social audits will be conducted through the Citizen Monitoring Committees, on a sample basis of 10% of investments. The SPMG will provide the required resources to the Citizens Monitoring Committees for conducting the social audits and for ensuring that community meetings, focus group discussions, and social audit record keeping are carried out. The number of social audits

conducted per year will be used as an indicator of overall program success. Key lessons from this process will be fed back into overall NGRBA program design and the processes currently in place for investment selection and implementation.

14. ***Adherence to the RTI Act.*** In addition, in compliance with the requirements of the Right to Information (RTI) Act (2005), the project shall provide information voluntarily and on demand as prescribed by law. The RTI Act guarantees citizens the right to secure information controlled by public authorities as a means to promote transparency and accountability within the public sector. Under the RTI Act, public authorities are bound to provide *suo moto* information and timely response to public enquiries. The project will ensure proactive disclosure and sharing of information with key stakeholders, including with communities and beneficiaries. Disclosure applies to all public project related documents, including, but not limited to project components and sub-components, cost estimates, procurement plans, details of tender notices, details of award of contracts and contract amounts, selection of consultants, and details of officials implementing the project.

Mitigation Measures: Grievance Redressal

15. ***Purpose of grievance redressal.*** The purpose of a robust and responsive grievance redressal is to ensure that any query or complaint with regard to any aspect of project implementation is fairly heard and promptly addressed. The development of an integrated system will enable the seamless integration of feedback from the public, effective handling of complaints, and immediate automatic updates on the status of response. It will also ensure the coordination of Center and State so that one system exists for the entire NGRBA program.

16. ***An Integrated Grievance Redressal System (IGRS).*** Grievance Redressal Cells (GRCs) will be established, with necessary officers and systems, at the local EAs, ULBs, SPMGs and the PMG levels. Grievances may be submitted through various mediums, including in person, in written form to a noted address, through a toll free phone line or through direct calls to concerned officials, and online. All local contact information and options for complaint submission will be available on site on local information boards.

17. ***Dedicated specialists with targets.*** Specific persons will be put in place at both the PMG and SPMG level who will be entrusted with the responsibility of examining and handling all incoming queries and complaints, and with tracking and monitoring their redressal. In order to conduct a fair and impartial enquiry into complaints received, these specialists will not be staff associated directly with project implementation.

Mitigation Measures: Procurement, Contract Management & Financial Management

18. ***Overcoming low capacity and weak systems.*** The project is designed to promote transparency and accountability and overcome the problems of low capacity and weak systems in the areas of procurement, contract management and financial management. Dedicated specialists in these fields are being appointed to work in both the PMG and SPMGs, with specific training being provided on World Bank procedures.

19. ***Efficient, fair, and transparent procurement.*** To ensure efficient, fair and transparent procurement procedures are followed by all entities, the NGRBA Program has developed a Procurement Manual that explains the procurement process in detail, and includes: procedures to

be followed and methods of procurement; model bidding documents and other documents to be used for procurement management; roles and responsibilities of the PMG, the SPMGs and the EAs; and prior and post review arrangements. Procurement professionals trained in the processes and procedures to be followed will be staffed in the national PMG and in each SPMG with overall responsibility for procurement planning, implementation monitoring, and oversight. The World Bank will provide capacity building support and supervision through prior and post review to ensure adequacy of the procurement system. Through careful procurement design, such as advanced annual planning of procurement to be undertaken and set time lines for various activities, the Manual ensures: that contracting opportunities are widely disseminated internationally, nationally and locally depending on the value of the contract; that open and transparent evaluation processes are followed through a participatory committee of key stakeholders; and award decisions are made public. The use of innovative practices, like e-procurement, will be piloted, and transparency will be increased through computerization of all record keeping and procurement data, and the disclosure of all tender notices, bid documents and status of contracts on the project website and in the local print media. Contract management in its entirety will be as much a focus of attention as initial procurement.

20. ***Long term contract management.*** Beyond initial award, contracts need to be managed throughout their duration. This is particularly true for contracts of long duration when revisions may occur (e.g. cost increases, or changes in scope) and for contracts between weak government agencies and strong private players. Because 5 years of O&M costs are being included as a part of project costs in some cases, and because all wastewater treatment plants are being contracted on a 15-year DBO or other PPP basis, contract management is particularly important in this project. In addition to the Procurement and Financial Management Manuals, which also address contract implementation, other tools and risk mitigation measures have been included as part of project design. These include:

- The capacity of EAs, which will manage the great majority of goods and works, will be carefully assessed upfront. They will be selected by the SPMG on the basis of an agreed set of minimum criteria for fiduciary capacity to undertake contract management. The criteria include: that the EA have sufficient technical expertise, institutional capacity and financial powers to adequately plan for, design, implement and maintain investments, and that a review of past performance (including through internal control reports, third party quality assurance reports, and third party statutory financial audits) be undertaken to avoid a history of weaknesses with regard to contract management. The World Bank will review the selection of EAs, for the sub-projects to be financed by this project, to ensure this selection process is adhered to.

- Financial audits, internal and external, will be conducted throughout the project to ensure high quality of all project-financed activities and investments. Third party inspection agencies will carry out quality assurance audits of the entire program. The NGRBA Program will also remain liable to statutory audit by the Comptroller and Auditor General (CAG) of India. These audit pressures will support good contract management throughout the sub-project cycle.

- The project will provide technical assistance and advisory services involving government agencies to ensure contracts are well managed from the initial procurement to final

completion. This TA includes consultancies for PPP advisory services, project management, monitoring and evaluation, and technical support, all of which are built into Component 1. The PPP consultancy will produce model contract documents and advise on options for deal structuring and risk allocation, based on international best practice, the Indian national experience in the wastewater sector, and market testing.

21. ***Ensuring clarity in financial management and auditing.*** In financial management, weak capacity and systems will be mitigated through staff training, and clear specification of powers and procedures, including fund flow and disbursement arrangements. Internal quarterly audits will be supplemented by a statutory annual audit by a third party to be approved by the World Bank.

22. ***Standard fiduciary controls apply.*** Standard World Bank fiduciary controls with respect to Financial Management and Procurement apply, and are described in Annexes 7 and 8 respectively.

23. ***Performance Indicators.*** The GAAP will be monitored based on the following performance indicators:

- The quality and timeliness of voluntary disclosure of public information and of grievance redress by relevant agencies; and
- The extent of social audits of planned investments against the set benchmark of 10%.

Annex 12: Communications Strategy and Action Plan

INDIA: National Ganga River Basin Project

1. ***Wide range of views, concerns, sensitivities.*** Given the emotive status of the Ganga in India, there are a wide range of stakeholder views, concerns and sensitivities that need to be taken into account. Stakeholders include religious opinion leaders and Hindu clergy; state governments and government officials; local industry; environment-focused NGOs and community-based organizations; academics and research scholars; the media; youth; local communities that depend on the river; and millions living elsewhere in India for whom the river is an iconic religious and cultural symbol. While most stakeholder concerns and sensitivities are long abiding, they are currently in prominent play as concerns over the deteriorating quality and quantity of water in the Ganga have come to the forefront of attention in the media and in civil society. A rapid assessment of stakeholder perceptions has shown that there is a high level of concern, across stakeholder groups, about the levels of pollution in the river and its deleterious effects on people's lives and livelihoods.

2. ***Importance of public participation.*** There is widespread recognition that the success and sustainability of the NGRBA Program hinge on high levels of public participation. The scope of the Program calls for broad-based public support and real behavioral change among stakeholder groups. The involvement of various stakeholders will be especially crucial in the case of specific investments, where the speed of implementation and long term sustainability will depend significantly on the support and participation of local stakeholder groups, including affected communities, elected representatives, and community leaders. The rapid assessment of stakeholder perceptions has also revealed an unequivocal demand from local stakeholders, both rural and urban, that public participation in Ganga clean-up activities be written into the Program. A strategic communications and outreach plan will thus be crucial for generating public awareness about the Program and mobilizing widespread participation.

3. ***Public skepticism, but Government commitment to change.*** The NGRBA Program also faces skepticism from the public as a result of previous efforts to clean the Ganga, which are widely perceived to have been less than successful. The rapid assessment of perceptions showed a high level of demand for enhanced transparency in proposed activities, with responses, across stakeholder groups, indicating dissatisfaction with existing levels of accountability in public programs. Efforts are thus clearly needed to create and maintain public confidence and interest in the new program through sustained communication and public disclosure efforts. The government, at both national and state levels, is aware of the need to take stakeholder concerns into account and has already consulted widely, and at the highest level, with civil society during the process of formation of the NGRBA apex authority, which has been conceived as a body representing a range of stakeholders, including state governments and civil society, and has a statutory provision for further involving experts and civil society members in its structure.

4. ***Development of a Communication Strategy.*** The Ministry of Environment and Forests (MoEF) has commissioned the formulation of a Communications Strategy aimed at: (i) creating an enabling environment for the program; (ii) strengthening public support by actively communicating activities, impacts and benefits; and (iii) setting up two-way channels of

communications with key stakeholder groups to help in the design, implementation and monitoring of the Program.

5. ***Communications Needs Assessment.*** The development of the Communications Strategy is envisaged as a phased initiative, with the first exercise being in the form of a detailed Communications Needs Assessment. This Assessment is expected to identify all relevant stakeholder groups and provide insight into their concerns about, expectations of, and relationship with the NGRBA program. In the second phase, this exercise will enable the formulation of a strategic communications approach to reach out to these stakeholder groups with messages, campaigns and programmes, and through media best expected to resonate with them and ensure their active involvement and participation at different levels.

6. ***Components of Communications Strategy.*** It is envisaged that the communications strategy and general approach for a program of this scale and profile will require an effective mix of mass communications, general and targeted advocacy, community mobilization, and social messaging. The tools will range from mass media to social advertising, direct interaction, media engagement and the development of platforms and champions, especially at the state and local levels. While the detailed communications strategy is still being developed, there is recognition that it will likely include:

(a) Mass communication campaigns: These campaigns will be focused on pollution control messages, (especially 'Dos & Don'ts' of human interactions with the river) and sensitization of the general public. This will need to take in traditional material (television films, radio spots, print materials, etc) as well as innovative information dissemination media like the use of local folk media, as well as persuasion/ outreach/ activities through NGOs, schools and colleges, temples and fairs etc..

(b) Support for voluntary public participation: The special space the Ganga occupies in the cultural and religious psyche of people in India provides a tremendous opportunity for tapping this reverence and harnessing it into a people's movement. Mobilising the masses will not only generate a continuing demand for clean-up and conservation activities but will also enhance wide participation in the planning, design, implementation and, especially, monitoring of activities proposed under the Program. Community mobilisation will thus form an essential part of the Communication Strategy and it is expected that the voluntary program will be guided by the Governing Council of the PMG, with the advice from the NGRBA expert members, and with funding available under the project to support specific voluntary initiatives. Some expert members have already, in their private capacities as leading civil society activists, launched public awareness programs. The interest generated by initiatives, such as the *Ganga Yatra* (or 'walk' down the length of the river from Gangotri to Gangasagar) indicates a real demand for NGRBA Program support for voluntary grassroots initiatives. The Project will train volunteers and also fund small public participation initiatives, which will be eligible for funding under the Ganga Innovation Projects *(see details below).*

(c) Proactive Disclosure, such as:

i. Mandatory Right to Information (RTI) compliance.
ii. Websites at both the national PMG and SPMG levels.
iii. Public Information Cells at the EA level (e.g. to house all relevant documents, etc).
iv. Information Boards/Walls at the level of the individual works.

(d) Formal Community Participation, such as:

i. Open, pro-active and ongoing consultations – including provisions for conferences, workshops, seminars at the national, state and ULB level to bring stakeholders together for discussion, dialogue and information dissemination.
ii. Civil Society representatives to be included as part of the SGCRAs.
iii. Participation of community and citizen groups, through the ULB-level Citizens Monitoring Committees, to conduct social audits and provide feedback on outcomes.

7. ***Social Intermediation and Outreach around Specific Investments.*** The involvement of stakeholders will be especially crucial in the context of individual investments, where the speed of implementation and long term sustainability depend in large measure on the support and participation of local stakeholder groups, including directly-affected communities, elected representatives, and community leaders. The responsiveness of local communities, such as willingness to connect to sewers and pay for services, will be crucial for the long-term success of the Program. A rapid assessment of stakeholder perceptions indicates a high-level of demand at the grassroots level for greater transparency and for active involvement in the proposed operations. Therefore, in addition to overall strategic communication efforts, all major investments will have tailor-made social intermediation interventions to engage with local communities and key stakeholders to ensure their inclusion and participation in the planning, implementation and subsequent management of the investments.

8. The social intermediation activities (which may be stand-alone activities or a part of the Environmental and Social Assessment) will be carried out in two parts. The first part will focus on developing an intermediation strategy and action plan for the city where the major Bank investments are planned. The second part will (based on key inputs from the first consultancy) implement the social intermediation processes in the concerned ULBs utilizing the services of local NGOs or other community based organizations (CBOs). The consultants/NGOs/CBOs are expected to work in close liaison with the EAs, ULBs, Citizens Monitoring Committees *(see below)* and local communities. They will undertake door-to-door and street level IEC campaigns, facilitate connection processes and ensure that relevant and timely information is made available to the citizens on the project. Initially, this exercise will be launched in the cities of Allahabad & Kanpur. At the end of year one of the project (when the Bank funded investments and associated cities are clearly identified), the exercise will be launched in the remaining cities. In addition to addressing intermediation needs of project-supported investments, the consultant/NGO/CBO will identify other prevailing major polluting behaviours and undertake IEC campaigns in collaboration with local institutions and other stakeholders.

9. ***ULB-level Citizens Monitoring Committees***. These Committees are intended to serve as a transparency mechanism on flow of project-related information to citizens and key stakeholders and to garner their feedback on the project processes. These voluntary bodies, to be constituted by the District Magistrate/Collector would include officials from the state government as well as the EAs; local elected members of the ULB; representatives of prominent local institutions (academic, research); other prominent citizens; as well as representatives from industry, voluntary organizations, media, etc. The Committee will function as a platform for the authorities to interact with civil society and will meet at least once in six months to provide updates on the progress of the project and to hear suggestions, issues and problems put forward by citizens and civil society. It will also undertake social audits. Reports pertaining to assessments/studies and other information relating to specific investments will be made available to these Committees.

10. ***Ganga Innovation Projects.*** Funding will be available for financing small-scale innovative proposals aimed at reducing and preventing pollution in the river. These proposals may cover a wide range of activities from innovative pollution-prevention methods, awareness campaigns, community driven initiatives, data collection/analysis/exercises, etc. Large infrastructure projects will not be eligible for these grants. Specific guidelines, criteria and other operational modalities for this activity will be worked out by the PMG. The proposals received would be scrutinized by a committee constituted by PMG

11. ***Social Audits.*** NGRBA will carry out Social Audits covering a number of ongoing investments. These audits will be conducted through the Citizens Monitoring Committees, which will be provided with the requisite support/resources by the SPMGs.

12. ***The Appointment of Communications and Outreach Specialists.*** MoEF has hired a Communications Coordinator as part of the PMG. This professional will oversee the development and implementation of the Communications and Outreach Strategy, and will coordinate and interact with state governments, ULBs, implementing agencies, and other interest groups around shared communications initiatives and activities relevant to the program. The Communications Coordinator will also handle the communication and outreach activities of the Ganga Knowledge Center, as its Chief Public Relation Officer to achieve the objectives of the NGRBA program. Each SPMG will also include a dedicated Communications Specialist responsible for planning, implementing and monitoring communication and outreach programs in that state, and liaising with the NGRBA and the PMG.

Annex 13: Project Preparation and Supervision

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	Planned	Actual
PCN review	02/18/2010	02/18/2010
Initial PID to PIC	09/02/2010	10/01/2010
Initial ISDS to PIC	08/15/2010	09/15/2010
Appraisal	February 2011	February 2011
Negotiations	March 2011	April 2011
Board/RVP approval	May 2011	
Planned date of effectiveness	08/31/11	
Planned date of mid-term review	08/31/15	
Planned closing date	08/31/19	

Key institutions responsible for preparation of the project:

Borrower
Government of India
Ministry of Finance, New Delhi

Responsible Agency
Ministry of Environment and Forests, Government of India
Department of Urban Development, Government of Uttarakhand
Department of Urban Development, Government of Uttar Pradesh
Department of Urban Development, Government of Bihar
Department of Urban Development, Government of Jharkhand
Department of Urban Development, Government of West Bengal

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Sanjay Pahuja	TTL, Senior Water Resources Specialist	SASDI
Genevieve Connors	Co-TTL, Water Resources Specialist	SASDI
William Kingdom	Lead Water and Sanitation Specialist	SASDU
Srinivasa Rao Podipireddy	Senior Water and Sanitation Specialist	SASDU
Tapas Paul	Senior Environmental Specialist	SASDI
Nagaraja Rao Harshadeep	Senior Environmental Specialist	AFTEN
A.S. Harinath	Environmental Specialist	SASDI
Mikul Bhatia	Senior Energy Specialist	SASDE
Charles Cormier	Country Sector Coordinator	SASDI
Kishor Uprety	Senior Counsel	LEGES
Michael Jacobsen	Senior Water Resources Specialist	TWIWA
A.K. Kalesh Kumar	Senior Procurement Specialist	SARPS

Papia Bhatachaarji	Senior Financial Management Specialist	SARFM
Dhruba Purkayastha	Senior Private Sector Development Specialist	SASFP
Parthapriya Ghosh	Social Development Specialist	SASDS
R.S. Pathak	Senior Irrigation Engineer	SASDA
R.R. Mohan	Senior Social Development Specialist	SASDS
Sona Thakur	Communications Officer	SAREX
Muthukumara S. Mani	Senior Environmental Economist	SASDI
Chandra Shekhar Sinha	Lead Financial Specialist	LCSEG
Pratibha Mistry	Water Resources Specialist	SASDI
Pyush Dogra	Environmental Specialist	SASDI
Ranu Sinha	Operations Analyst	SASDI
Siet Meijer	Operations Analyst	SASDI
Pamela Patrick	Program Assistant	SASDI
Rachel Susan Palmer	Program Assistant	SASDI
Menahem Libhaber	Consultant – Energy Generating STPs	EASER
Prasad Modak	Consultant – Water Quality and Knowledge Center	SASDI
Nalini Chidambaram	Consultant – Legal Analysis	SASDI
Geoffrey Reade	Consultant - Project Preparation & Urban Investments	SASDU
Srinivasan Raj Rajagopal	Consultant – Project Preparation	SASDA
Jack Ruitenbeek	Consultant – Economic Analysis	SASDI
Cynthia Carter	Consultant – Economic Analysis	AFTEN
Anil Markandya	Consultant – Economic Analysis	SASDI
Don Blackmore	Consultant - NGRBA Institutions	SASDI
Paritosh Tyagi	Consultant - NGRBA Institutions	SASDI
Hari Prakash	Consultant - Environment	SASDI
Mrinal Mathur	Consultant – Research & Project Assistance	SASDI
Puneet Kapoor	Consultant – Financial Management	SARFM
Yashwant Raj Deshmukh	Consultant - Communications	SAREX
P.U. Asnani	Consultant – Solid Waste Management	SASDI
Venkata Rao Bayana	Consultant - Social	SASDI
Santhanam Krishnan	Consultant - Procurement	SARPS
Mam Chand	Consultant - Procurement	SASDS
Lauriane Cayet	Consultant – GIS Specialist	SASDI
Hrishikesh Prakash Patel	Consultant – GIS Specialist	SASDI
Anand Jalakam	Consultant – Urban Institutional Analysis	SASDU
Konrad Buchauer	Consultant – Urban WWTP Review	SASDU
Nayan Khambati	Consultant – Urban WWTP Review	SASDU
Harry Cantle	Consultant – Urban Capacity Building	SASDU
Satish Kamaraju	Consultant – Urban Capacity Building	SASDU
Pisupati Karthikeya	Consultant – Urban Financial Analysis	SASDU
Mark Heggli	Consultant – Water Quality Monitoring	SASDI

Michele de Nevers	QER Reveiwer – Sector Manager, Environment	SDN
Steve Linter	QER Reviewer - Senior Advisor	OPCQC
Julia Bucknall	QER Reviewer - Sector Manager, Water	TWIWA
Dan Biller	QER Reviewer - Lead Economist	SASDI
Manuel Marino	QER Reviewer - Lead Water and Sanitation Specialist	ECSS6
Jim Wescoat	External QER Reviewer - Professor, MIT	External
Vinod Tare	External QER Reviewer - Professor, IIT Kanpur	External
Vijay Jagannathan	PCN Peer Reviewer - Sector Manager	EASIN
Greg Browder	PCN Peer Reviewer - Lead WSS Specialist	LCSUW

Overall Implementation Support Strategy

1. *The Challenge of Scale and Complexity* The project is multi-sectoral in nature, and will support a number of investments spread over a large area in five states. Therefore it is paramount that the project adopts an innovative supervision strategy that makes the best use of the resources of the Government of India, state governments, third party consultants, and the World Bank.

2. *Client-led Supervision* Since the project aims at operationalizing the NGRBA institutions and developing their capacity for managing a large basin-level river clean-up and conservation program, supervision is integrated as part of the overall NGRBA program management. Therefore the project will be mainly supervised by the NGRBA's implementing institutions (PMG at the central level and SPMGs at the state level). They will be primarily responsible for project implementation such that the PDO is achieved in a timely manner. While the GoI will apply the NGRBA Program Framework to the entire NGRBA Program, the World Bank will neither supervise nor be responsible for the quality of application of the Program Framework to investments and activities that are not financed by this project. The World Bank supervision will be limited to the activities and investments financed by this project.

3. *Implementation Management Tools* The implementation will be facilitated by a range of management tools that have been developedand agreed,, including: detailed investment frameworks, implementation process flow (including planning, preparation, appraisal, implementation and monitoring and evaluation), Guidelines for infrastructure investment preparation, Memoranda of Agreement, Institutional arrangements, Environmental and Social Management Framework, Governance and Accountability Action Plan, and Communication and Public Outreach Plan, which collectively define the NGRBA Program Framework. The main features of these are summarized below:

(a) **Investment frameworks** have been developed for selecting and implementing infrastructure investments in the four key sectors of intervention under the NGRBA program - municipal wastewater, industrial pollution, solid waste management and river front management. The frameworks prescribe criteria and quality assurance standards covering various aspects including eligibility, prioritization, planning, technical preparation, financial and economic analyses, environmental and social management, long term O&M sustainability, community participation, and local institutional capacity. The objective is to ensure that the investments are well-prepared and amongst the most

effective in reducing the pollution loads, and implemented in a manner that makes them sustainable. Given the long-term nature of the NGRBA program and the fact that universe of potential investments is large, the adoption of the framework approach effectively sets the "rules of the game", and will allow infrastructure investments to be selected on a dynamic and ongoing basis.

(b) ***Implementation Process Flow*** along with roles and responsibilities of the entities involved in implementation of NGRBA program have been agreed and documented. The implementation process covers the various aspects including annual planning, investment prioritization, a two-stage (feasibility and detailed project report) preparation and appraisal process, execution, O&M, eventual assets transfer to local bodies, financial management, procurement, community engagement, social and environmental management, governance and monitoring and evaluation. In addition to the infrastructure investments (under Component Two of the project), the implementation process has also been agreed for pre-identified activities related to NGRBA Institutional Development (Component One of the project), innovative pilots, communications, and research and knowledge management.

(c) ***Guidelines for Infrastructure Investments*** have been prepared. A two-step process has been agreed for preparation and appraisal of investments, whereby investments would be appraised at both concept and detailed project report stage. Guidelines have been disseminated for preparation of feasibility stage and detailed project reports, including requisite contents, methodologies, and standards to be followed.

(d) ***Model Agreements/MoAs*** have been prepared to operationalize the agreed institutional model and implementation arrangements. These include: (i) Memorandum of Association and bylaws, including functions and powers of the PMG and the SPMGs and the division of roles and responsibilities; and (ii) two tripartite MoAs, one between the PMG, the SPMG and the ULB; and one between the SPMG, the EA and the ULB, for ensuring commitment and clarity on roles and responsibilities of various parties regarding execution, O&M, and eventual transfer of assets to local bodies.

(e) ***Powers of Approvals.*** Powers and procedures for technical and administrative approvals of investments, for award of contracts for works/goods and services, and for making payments have all been well defined for each implementing agency and being documented in the FM and procurement manuals. To ensure efficiency in implementation most of the powers have been delegated to the lowest appropriate levels, adopting the principle of subsidiarity. Thus, once the annual action plan is cleared by the NGRBA, most implementation related powers are vested with the PMG, SPMGs and EAs for their respective components. The only exceptions are the award of the high cost consultancy and works/goods contracts, which have been defined in the fiduciary manuals.

4. The specific annexes provide the details on Environmental and Social Management Framework (annex 10), Governance and Accountability Action Plan (annex 11), and Communication Strategy and Action Plan (annex 12).

5. Other important documents guiding project implementation are:

(a) FM Manual for the project: providing the details of funds flow, accounting, auditing and reporting, and the related control and accountability mechanisms (details in Annex 7), and

(b) Procurement Manual for the project: containing the procurement strategy, methods and procedures to be adopted, along with draft documents to be used for bidding of typical works and goods and procurement of consultant services, along with powers of actors to award these works and consultancies (details in Annex 8).

6. A *Monitoring and Evaluation Framework* has been designed to continually distill lessons from implementation experiences and introduce changes and modifications in the implementation strategy as the project progresses.

Roles of the NGRBA Implementing Institutions

7. The MoEF has used the support provided by the Project Preparation Facility (PPF) to start assembling a multi-disciplinary team for the PMG, which is in the process of being formally established. This team, with the support from the NGRBA nodal departments in each state, has been instrumental in project preparation.

8. The PMG and the SPMGs are being established as registered societies, with appropriate structure, staffing, powers and leadership to enable an effective management of the NGRBA program. The PMG and SPMGs are explicitly responsible for (a) overall planning and management of the NGRBA program (including the Bank-funded project investments), and monitoring implementation performance, (b) ensuring compliance with agreed financial management and procurement manuals, audits, and ensuring compliance with audit observations, (c) ensuring compliance with the NGRBA's Environmental and Social Management Framework, and implementing the Governance and Accountability Action Plan, and (d) regular monitoring and evaluation of project performance/ achievements, including regular review of implementation experiences for ensuring course corrections as needed.

9. The PMG is headed by the NGRBA National Mission Director, and will have about 30-40 full-time key professional staff. The SPMGs will be headed by a Project Director, and will have about 20-25 full-time professional staff in all key states. The indicative staffing plans will ensure that these implementing institutions will have the multi-disciplinary capacity in the critical areas required for the NGRBA program, including but not limited to, basin planning, water resources and water quality management, project management, economics, social and environmental management, M&E, information management, communications and public participation, financial management, law, and procurement.

10. While some of the professional staff will be drafted from within the National/State government offices/ agencies, the rest would be filled from private sector on contract basis. In addition, the PMG and SPMGs will recruit private sector agencies/ consultants/ experts (individuals, institutions or firms), including international experts from time to time as necessary to strengthen their project monitoring, evaluation and management capacity. The recruitment process for two key consultancies – the Project Management Consultancy and the Technical Support Consultancies - has already started. In the interim, a bilateral technical assistance (from the Government of France) is being put in place to rapidly deploy technical consultants for early support to the PMG and the SPMGs.

11. In addition to the planned routine and periodic supervision, the NGRBA will undertake periodic reviews of the NGRBA program, including the Bank-funded project. At the highest level, one review of the NGRBA program is expected annually, under the chairmanship of the Prime Minister. It is expected that the NGRBA Standing Committee will undertake more frequent reviews. Similar high level reviews will also take place at the state level. The PMG and SPMGs will facilitate these high-level reviews, and incorporate the review findings in the remaining period of the project implementation.

Role of the Bank Team

12. The Bank team will strive to maintain the multidisciplinary expertise assembled for the project preparation phase, including specialists experienced in river basin planning, water quality modeling and monitoring, urban water and wastewater services, sewage treatment, solid waste management, regional/urban planning, project economics, water institutions, private sector participation, procurement, financial management, social, environment, civil engineering, and MIS/Monitoring. Given the need to support higher technical standards and quality in the sectors of intervention, international consultants will be deployed particularly for improvements in sewerage and treatment technologies, river front management, net energy positive wastewater pilots, establishing the carbon credits POA, and enhancing research on Ganga water quality and environment. This technical support will be funded primarily through Trust Funds.

13. It is expected that the Bank task team that has been closely associated with project preparation will continue extending implementation support to the project at least during the first two years of the project. In addition, Bank team will employ consultants to be fielded on ground to pick up early signs of implementation barriers, public concerns and grievances, and any other issues involving reputational risks.

Supervision Modalities

14. Project implementation and supervision will be conducted through:

(a) Project launch, to be conducted soon after the project approval, to being all project functionaries together and ensure that the project scope, design, process and responsibilities are well-understood.
(b) Four full regular supervision missions every year, for the first two years; Three full missions after that.
(c) Intermediate technical missions by specialists, as needed.
(d) Regular review meetings in Delhi
(e) Annual Action Plans prepared by the PMG (in collaboration with SPMGs)
(f) Semi-annual implementation progress reports prepared by the PMG (based on inputs from SPMGs), including reports from social audits and internal auditors.
(g) Midterm review
(h) Detailed ICR at the end of the project to assess achievement of PDO and lessons

15. The supervision team would maintain close interaction with the client agencies at the center (PMG and CPCB) and in the five states (SPMGs, SPCBs and ULBs) – particularly during

the first two years of supervision. During this period, institutional capacities at all these institutions would be strengthened, significant information dissemination would be required, annual investment plans would be prepared for the first time and the bulk of the investment proposals would be appraised for compliance with the NGRBA framework requirements. Special attention would be needed in the areas which are new to the Ganga program in India, for example: (a) communications program/strategy, (b) environmental and social management framework, (c) PPP models, (d) innovative pilots, for example, in the areas of net-energy generating wastewater treatement technologies, (e) Ganga Knowledge Center, and (f) Water Qaulity Monitoring systems.

16. It is expected that at the end of the second year, bulk of the investments would have been identified. At that time, the focus of supervisionis expected to largely shift to monitoring of investment implementation and continued adherence to agreed framework requirements. The anticipated skills and corresponding time requirements are presented in the following table:

Estimated Staffing Requirements for Project Supervision

Role	Years 1 & 2 (Wks)	Years 3 to 5 (Wks)
Task Team Leader	15	10
Co-Task Team Leader	15	10
Water & Sanitation Specialist	10	6
Environment Specialist	6	4
Social Specialist	6	4
Procurement Specialist	10	6
FM Specialist	6	6
Energy Specialist	6	4
Communication Specialist	6	6
River Basin Planning Expert	6	4
Solid Waste Management Expert	6	4
Regional/Urban Planning Expert	4	4
Institutional Development Expert	20	10
Private Sector Dev. Specialist	6	4
Water Resources Specialist	4	4
Carbon Finance Expert	4	4
IT/MIS/GIS Systems Expert	6	6
River Front Development Expert	6	4
Consultant - Communications	6	6
Consultant - Water & Sanitation	6	4
Consultant - Energy Generating STPs	4	4
Consultant - Water Quality Monitoring	6	4
Consultant - Solid Waste Management	6	4
Consultant - Institutional Development	10	8
Consultant - Urban Capacity Building	6	6
Consultant - Wastewater Treatment	6	4
Operations Analyst (2 persons)	20	10

17. The following is the status on resource use and needs:

Bank funds expended to date on project preparation:

Bank resources:	US$ 1,070,702
Trust funds:	US$ 550,523
Total:	US$ 1,621,225

Estimated approval and supervision costs:

Remaining costs to approval:	US$ 100,000
Estimated annual supervision cost:	US$ 500,000 (first two years)
	US$ 300,000 (afterwards)

18. Bank budget for supervision would be augmented by resources from established South Asia trust funds which have committed to support this project. Currently, these trust funds include the multi-donor South Asia Water Initiative and the Australian Infrastructure Trust Fund.

Annex 14: Documents in the Project File

INDIA: National Ganga River Basin Project

1. Project Preparation Documents

1. Project Concept Note (PCN) and PCN Minutes, Feb 2010
2. Minutes of Workshop on Global Experiences in River Clean-Up, April 2010
3. Preparation Mission Aide Memoire, June 2010
4. Project Information Document (PID), Concept Stage, Sept 2010
5. Integrated Safeguards Datasheet (ISDS), Concept Stage, Sept 2010
6. Key Decisions from Pre-Appraisal Workshop with States, Oct 2010
7. Quality Enhancement Review (QER) PAD and QER Note, Nov 2010
8. Environment and Social Management Framework (ESMF), Jan 2011
9. Appraisal Mission Aide Memoire, March 2011
10. Project Information Document (PID), Appraisal Stage (March 2011)
11. Integrated Safeguards Datasheet (ISDS), Appraisal Stage (March 2011)
12. Financial Management Manual (April 2011)
13. Project Procurement Manual (April 2011)

2. Key Project Technical Reports

1. Assessment of Wastewater Investments in Kanpur and Allahabad, May 2010
2. Report on Industrial Pollution Control in the Ganga Basin, May 2010
3. Report on Solid Waste Management in NGRBA States, May 2010
4. Assessment of Effectiveness of Existing Wastewater Collection Networks, July 2010
5. Report on Energy Generation and Biogas Utilization in Wastewater Sector, Aug 2010
6. Guidelines for FR and DPR Preparation in the Wastewater Sector, Sept 2010
7. Report on Institutional Structures for NGRBA Functions, Oct 2010
8. Activity Description Report on Ganga Knowledge Center, Oct 2010
9. Activity Description Report on Water Quality Monitoring System, Oct 2010
10. Report on Institutional Development for NGRBA, Nov 2010
11. Institutional Evaluation of Jal Nigam and Jalkal Departments in UP, Nov 2010
12. Review of Design, Operation and Maintenance of WWTPs on Ganges River, Nov 2010
13. Activity Description Report on Strengthening Environmental Regulators, Nov 2010

14. Financial Analysis of O&M of W&S Services in Kanpur, Dec 2010
15. Capacity Building Assessment of W&S Service Providers in Kanpur & Allahabad, Jan 2011
16. Updating the Economic Analysis of the GAP to the NGRBA, Jan 2011
17. Calculations and Report on Investment Specific Economic Analysis, Jan 2011

3. Reports by Government of India

1. MOEF, Status Paper on River Ganga: State of Environment & Water Quality, 2009
2. MOEF, Compendium of Sewage Treatment Technologies, 2009
3. MOEF, Mission Clean Ganga, 2009
4. MOEF, Conservation Action Plan for the Gangetic Dolphin (2010-2020), 2010
5. MOEF, Induction Material – History, Mandate, Aims, Objectives of MOEF, 2008
6. CPCB, Status of Sewage Treatment Plants in the Ganga Basin, 2007
7. CPCB, Evaluation of Operations & Maintenance of WWTPs in India, 2007
8. IIM Lucknow, Evaluation of CPCB for MOEF, 2010
9. Comptroller Auditor General (CAG) Report on the Ganga Action Plan, 2000
10. Supreme Court Report on Utilization of Funds and Assets created under GAP, 2009

4. Legal Documents & Notifications

1. The Environment Protection Act, 1986
2. Notification of the NGRBA, Feb 2009
3. Declaration of the Gangetic Dolphin as National Aquatic Animal, Oct 2009
4. Notification of Uttar Pradesh State Ganga River Conservation Authority, Sept 2009
5. Notification of Jharkhand State Ganga River Conservation Authority, Sept 2009
6. Notification of West Bengal State Ganga River Conservation Authority, Sept 2009
7. Notification of Bihar State Ganga River Conservation Authority, Feb 2010
8. Notification of Uttarakhand State Ganga River Conservation Authority, Feb 2010

5. NGRBA Documents by Government of India

1. Minutes of First Meeting of NGRBA, Oct 2009
2. List of Initial Portfolio of NGRBA Projects, Oct 2009
3. List of Project Approved by Empowered Steering Committee, March 2010
4. Long List of Possible Investments, May 2010

5. Minutes of Meeting with Experts of NGRBA, July 2010
6. MOA between MOEF and IITs regarding River Basin Management Plan, July 2010
7. Minutes of Second Meeting of NGRBA, Nov 2010
8. Guidelines for Preparation of Project Reports under NGRBA-NRCP, Dec 2010
9. NGRBA Program Framework, April 2011

Annex 15: Statement of Loans and Credits

INDIA: National Ganga River Basin Project

Project ID	FY	Purpose	Original Amount in US$ Millions				Cancel.	Undisb.	Difference between expected and actual disbursements	
			IBRD	IDA	SF	GEF			Orig.	Frm. Rev'd
P102329	2011	Rajasthan Rural Livelihoods Project	0.00	162.70	0.00	0.00	0.00	162.91	0.00	0.00
P120836	2011	Maharashtra Agricultural Competitiveness	0.00	100.00	0.00	0.00	0.00	97.42	-4.58	0.00
P121515	2011	NHAI Technical Assistance Project	45.00	0.00	0.00	0.00	0.00	45.00	0.00	0.00
P122096	2011	Bihar Kosi Flood Recovery Project	0.00	220.00	0.00	0.00	0.00	230.20	0.00	0.00
P124639	2011	PMGSY Rural Roads Project	500.00	1,000.00	0.00	0.00	0.00	1,486.79	0.00	0.00
P105990	2010	West Bengal PRI	0.00	200.00	0.00	0.00	0.00	194.20	-13.33	0.00
P102771	2010	IIFCL - India Infras Finance Company Ltd	1,195.00	0.00	0.00	0.00	0.00	1,192.01	0.00	0.00
P102549	2010	Tech Engr Educ Quality Improvement II	0.00	300.00	0.00	0.00	0.00	280.04	-1.46	0.00
P101650	2010	A. P. RWSS	0.00	150.00	0.00	0.00	0.00	132.09	4.00	0.00
P100954	2010	AP Water Sector Improvement Project	450.60	0.00	0.00	0.00	0.00	409.47	-33.33	0.00
P097985	2010	Integrated Coastal Zone Management Proje	0.00	221.97	0.00	0.00	0.00	216.27	4.45	0.00
P096021	2010	AP Road Sector Project	320.00	0.00	0.00	0.00	0.00	296.59	28.73	0.00
P092217	2010	National Cyclone Risk Mitigation Project	0.00	255.00	0.00	0.00	0.00	255.01	0.00	0.00
P091031	2010	CBldg for Indus Poll Mgt	25.21	38.94	0.00	0.00	0.00	60.53	-4.44	0.00
P119043	2010	Microfinance-Scaling Up Sustnble & Resp	200.00	100.00	0.00	0.00	0.00	300.93	23.33	0.00
P115566	2010	POWERGRID V	1,000.00	0.00	0.00	0.00	0.00	953.42	50.42	0.00
P113028	2010	Mumbai Urban Transport Project-2A	430.00	0.00	0.00	0.00	0.00	428.93	0.00	0.00
P110371	2010	Sustainable Urban Transport Project	105.23	0.00	0.00	0.00	0.00	97.97	26.33	0.00
P110051	2010	Haryana Power System Improv Project	330.00	0.00	0.00	0.00	0.00	252.23	95.58	-76.94
P089985	2010	Dam Rehabilitation & Improvement	175.00	175.00	0.00	0.00	0.00	345.97	2.67	0.00
P071250	2010	Andhra Pradesh Municipal Development	300.00	0.00	0.00	0.00	0.00	279.07	-5.84	0.00
P112033	2009	UP Sodic III	0.00	197.00	0.00	0.00	0.00	177.84	-5.16	0.00
P102331	2009	MPDPIP-II	0.00	100.00	0.00	0.00	0.00	81.68	-16.41	0.00
P100735	2009	Orissa Community Tank Management Project	56.00	56.00	0.00	0.00	0.00	103.09	10.74	0.00
P100101	2009	Coal-Fired Generation Rehabilitation	180.00	0.00	0.00	0.00	0.00	179.55	38.00	0.00
P096023	2009	Orissa State Roads	250.00	0.00	0.00	0.00	0.00	235.36	46.32	0.00
P093478	2009	Orissa Rural Livelihoods Project	0.00	82.40	0.00	0.00	0.00	73.31	13.19	0.00
P094360	2009	National VBD Control&Polio Eradication	0.00	521.00	0.00	0.00	0.00	404.69	178.02	0.00
P101653	2008	Power System Development Project IV	1,000.00	0.00	0.00	0.00	0.00	250.64	-195.02	97.64
P102547	2008	Elementary Education (SSA II)	0.00	1,350.00	0.00	0.00	0.00	504.56	-243.64	152.14
P095114	2008	Rampur Hydropower Project	400.00	0.00	0.00	0.00	0.00	246.27	87.27	0.00
P102768	2007	Stren India's Rural Credit Coops	300.00	300.00	0.00	0.00	0.00	220.18	176.37	0.00
P083187	2007	Uttaranchal RWSS	0.00	120.00	0.00	0.00	0.00	85.34	64.60	53.21

P100789	2007	AP Community Tank Management Project	94.50	94.50	0.00	0.00	0.00	146.22	79.50	0.00
P090768	2007	TN IAM WARM	335.00	150.00	0.00	0.00	0.00	319.89	162.58	0.00
P078539	2007	TB II	0.00	170.00	0.00	0.00	0.00	53.68	-9.94	0.00
P090764	2007	Bihar Rural Livelihoods Project	0.00	63.00	0.00	0.00	0.00	28.90	-27.75	1.60
P078538	2007	Third National HIV/AIDS Control Project	0.00	250.00	0.00	0.00	0.07	157.81	145.60	0.00
P099047	2007	Vocational Training India	0.00	280.00	0.00	0.00	0.00	168.53	43.38	0.00
P090592	2007	Punjab Rural Water Supply & Sanitation	0.00	154.00	0.00	0.00	0.00	120.54	105.91	-2.09
P075060	2007	RCH II	0.00	360.00	0.00	0.00	0.00	180.54	148.24	0.00
P090585	2007	Punjab State Roads Project	250.00	0.00	0.00	0.00	0.00	115.62	49.95	0.00
P096019	2007	HP State Roads Project	220.00	0.00	0.00	0.00	0.00	145.57	59.12	0.00
P071160	2007	Karnataka Health Systems	0.00	141.83	0.00	0.00	0.00	43.55	0.79	0.00
P078832	2006	Karnataka Panchayats Strengthening Proj	0.00	120.00	0.00	0.00	0.00	35.93	-50.58	0.00
P079675	2006	Karn Municipal Reform	216.00	0.00	0.00	0.00	0.00	147.89	132.89	0.00
P093720	2006	Mid-Himalayan (HP) Watersheds	0.00	60.00	0.00	0.00	0.00	19.76	9.20	0.00
P092735	2006	NAIP	0.00	200.00	0.00	0.00	0.00	103.04	43.55	0.00
P083780	2006	TN Urban III	300.00	0.00	0.00	0.00	0.64	125.42	121.32	28.80
P086414	2006	Power System Development Project III	400.00	0.00	0.00	0.00	0.00	3.80	3.80	0.00
P079708	2006	TN Empwr & Pov Reduction	0.00	274.00	0.00	0.00	0.00	181.89	16.37	0.00
P073370	2005	Madhya Pradesh Water Sector Restructurin	394.02	0.00	0.00	0.00	6.62	233.13	239.75	0.00
P073651	2005	DISEASE SURVEILLANCE	0.00	68.00	0.00	0.00	8.31	38.66	42.11	4.80
P075058	2005	TN HEALTH SYSTEMS	0.00	228.53	0.00	0.00	20.06	104.15	0.78	-9.41
P084792	2005	Assam Agric Competitiveness	0.00	154.00	0.00	0.00	0.00	42.11	34.33	11.28
P094513	2005	India Tsunami ERC	0.00	465.00	0.00	0.00	68.99	278.15	337.10	103.01
P077856	2005	Lucknow-Muzaffarpur National Highway	620.00	0.00	0.00	0.00	0.00	26.64	26.64	0.00
P084790	2005	MAHAR WSIP	325.00	0.00	0.00	0.00	0.00	137.13	124.46	0.00
P086518	2005	SME Financing & Development	520.00	0.00	0.00	0.00	0.00	128.39	-270.61	42.72
P084632	2005	Hydrology II	104.98	0.00	0.00	0.00	0.00	70.20	69.73	57.44
P077977	2005	Rural Roads Project	99.50	300.00	0.00	0.00	0.00	16.57	8.03	0.00
P078550	2004	Uttar Wtrshed	0.00	77.60	0.00	0.00	0.00	17.94	-2.01	0.00
P082510	2004	Karnataka UWS Improvement Project	39.50	0.00	0.00	0.00	0.00	5.23	5.23	1.33
P050655	2004	RAJASTHAN HEALTH SYSTEMS DEVELOPMENT	0.00	89.00	0.00	0.00	0.00	23.39	18.81	3.65
P071272	2003	AP RURAL POV REDUCTION	0.00	315.03	0.00	0.00	0.00	56.22	-126.10	40.69
P050649	2003	TN ROADS	398.70	0.00	0.00	0.00	0.00	36.83	-13.74	0.00
P050647	2002	UP WSRP	0.00	149.20	0.00	0.00	40.11	23.11	34.33	-17.31
P050653	2002	KARNATAKA RWSS II	0.00	301.60	0.00	0.00	16.40	147.11	-18.40	0.00
P050668	2002	MUMBAI URBAN TRANSPORT PROJECT	463.00	79.00	0.00	0.00	0.00	124.83	112.12	125.12
P040610	2002	RAJ WSRP	0.00	159.00	0.00	0.00	25.84	47.71	16.37	-17.79
P071033	2002	KARN Tank Mgmt	32.00	130.90	0.00	0.00	25.07	96.75	35.47	11.25
		Total:	12,074.24	10,484.20	0.00	0.00	212.11	14,032.39	2,035.14	611.14

INDIA
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2005	ADPCL	39.50	7.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	AHEL	0.00	5.08	0.00	0.00	0.00	5.08	0.00	0.00
2005	AP Paper Mills	35.00	5.00	0.00	0.00	25.00	5.00	0.00	0.00
2005	APIDC Biotech	0.00	4.00	0.00	0.00	0.00	2.01	0.00	0.00
2002	ATL	13.81	0.00	0.00	9.36	13.81	0.00	0.00	9.36
2003	ATL	1.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00
2005	ATL	9.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	Atul Ltd	16.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	BHF	10.30	0.00	10.30	0.00	10.30	0.00	10.30	0.00
2004	BILT	0.00	0.00	15.00	0.00	0.00	0.00	15.00	0.00
2001	BTVL	0.43	3.98	0.00	0.00	0.43	3.98	0.00	0.00
2003	Balrampur	10.52	0.00	0.00	0.00	10.52	0.00	0.00	0.00
2001	Basix Ltd.	0.00	0.98	0.00	0.00	0.00	0.98	0.00	0.00
2005	Bharat Biotech	0.00	0.00	4.50	0.00	0.00	0.00	3.30	0.00
1984	Bihar Sponge	5.70	0.00	0.00	0.00	5.70	0.00	0.00	0.00
2003	CCIL	1.50	0.00	0.00	0.00	0.59	0.00	0.00	0.00
2006	CCIL	7.00	2.00	0.00	12.40	7.00	2.00	0.00	12.40
1990	CESC	4.61	0.00	0.00	0.00	4.61	0.00	0.00	0.00
1992	CESC	6.55	0.00	0.00	14.59	6.55	0.00	0.00	14.59
2004	CGL	14.38	0.00	0.00	0.00	7.38	0.00	0.00	0.00
2004	CMScomputers	0.00	10.00	2.50	0.00	0.00	0.00	0.00	0.00
2002	COSMO	2.50	0.00	0.00	0.00	2.50	0.00	0.00	0.00
2005	COSMO	0.00	3.73	0.00	0.00	0.00	3.73	0.00	0.00
2006	Chennai Water	24.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	DQEL	0.00	1.50	1.50	0.00	0.00	1.50	1.50	0.00
2005	DSCL	30.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
2006	DSCL	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	Dabur	0.00	14.09	0.00	0.00	0.00	14.09	0.00	0.00
2003	Dewan	8.68	0.00	0.00	0.00	8.68	0.00	0.00	0.00
2006	Federal Bank	0.00	28.06	0.00	0.00	0.00	23.99	0.00	0.00
2001	GTF Fact	0.00	1.20	0.00	0.00	0.00	1.20	0.00	0.00
2006	GTF Fact	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00
1994	GVK	0.00	4.83	0.00	0.00	0.00	4.83	0.00	0.00
2003	HDFC	100.00	0.00	0.00	100.00	100.00	0.00	0.00	100.00
1998	IAAF	0.00	0.47	0.00	0.00	0.00	0.30	0.00	0.00
2006	IAL	0.00	9.79	0.00	0.00	0.00	7.70	0.00	0.00
1998	IDFC	0.00	10.82	0.00	0.00	0.00	10.82	0.00	0.00
2005	IDFC	50.00	0.00	0.00	100.00	50.00	0.00	0.00	100.00
	IHDC	6.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	IHDC	7.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2006	Indecomm	0.00	2.57	0.00	0.00	0.00	2.57	0.00	0.00
1996	India Direct Fnd	0.00	1.10	0.00	0.00	0.00	0.66	0.00	0.00
2001	Indian Seamless	6.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
2006	JK Paper	15.00	7.62	0.00	0.00	0.00	7.38	0.00	0.00
2005	K Mahindra INDIA	22.00	0.00	0.00	0.00	22.00	0.00	0.00	0.00
2005	KPIT	11.00	2.50	0.00	0.00	8.00	2.50	0.00	0.00
2003	L&T	50.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
2006	LGB	14.21	4.82	0.00	0.00	0.00	4.82	0.00	0.00
2006	Lok Fund	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	MMFSL	7.89	0.00	7.51	0.00	7.89	0.00	7.51	0.00
2003	MSSL	0.00	2.29	0.00	0.00	0.00	2.20	0.00	0.00
2001	MahInfra	0.00	10.00	0.00	0.00	0.00	0.79	0.00	0.00
	Montalvo	0.00	3.00	0.00	0.00	0.00	1.08	0.00	0.00
1996	Moser Baer	0.00	0.82	0.00	0.00	0.00	0.82	0.00	0.00
1999	Moser Baer	0.00	8.74	0.00	0.00	0.00	8.74	0.00	0.00
2000	Moser Baer	12.75	10.54	0.00	0.00	12.75	10.54	0.00	0.00
	Nevis	0.00	4.00	0.00	0.00	0.00	4.00	0.00	0.00
2003	NewPath	0.00	9.31	0.00	0.00	0.00	8.31	0.00	0.00
2004	NewPath	0.00	2.79	0.00	0.00	0.00	2.49	0.00	0.00
2003	Niko Resources	24.44	0.00	0.00	0.00	24.44	0.00	0.00	0.00
2001	Orchid	0.00	0.73	0.00	0.00	0.00	0.73	0.00	0.00
1997	Owens Corning	5.92	0.00	0.00	0.00	5.92	0.00	0.00	0.00
2006	PSL Limited	15.00	4.74	0.00	0.00	0.00	4.54	0.00	0.00
2004	Powerlinks	72.98	0.00	0.00	0.00	64.16	0.00	0.00	0.00
2004	RAK India	20.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
1995	Rain Calcining	0.00	2.29	0.00	0.00	0.00	2.29	0.00	0.00
2004	Rain Calcining	10.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
2005	Ramky	3.74	10.28	0.00	0.00	0.00	0.00	0.00	0.00
2005	Ruchi Soya	0.00	9.27	0.00	0.00	0.00	6.77	0.00	0.00
2001	SBI	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	SREI	3.21	0.00	0.00	0.00	3.21	0.00	0.00	0.00
2000	SREI	6.50	0.00	0.00	0.00	6.50	0.00	0.00	0.00
1995	Sara Fund	0.00	3.43	0.00	0.00	0.00	3.43	0.00	0.00
2004	SeaLion	4.40	0.00	0.00	0.00	4.40	0.00	0.00	0.00
2001	Spryance	0.00	1.86	0.00	0.00	0.00	1.86	0.00	0.00
2003	Spryance	0.00	0.93	0.00	0.00	0.00	0.93	0.00	0.00
2004	Sundaram Finance	42.93	0.00	0.00	0.00	42.93	0.00	0.00	0.00
2000	Sundaram Home	0.00	2.18	0.00	0.00	0.00	2.18	0.00	0.00
2002	Sundaram Home	6.71	0.00	0.00	0.00	6.71	0.00	0.00	0.00
1998	TCW/ICICI	0.00	0.80	0.00	0.00	0.00	0.80	0.00	0.00
2005	TISCO	100.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00
2004	UPL	15.45	0.00	0.00	0.00	15.45	0.00	0.00	0.00
1996	United Riceland	5.63	0.00	0.00	0.00	5.63	0.00	0.00	0.00
2005	United Riceland	8.50	0.00	0.00	0.00	5.00	0.00	0.00	0.00
2002	Usha Martin	0.00	0.72	0.00	0.00	0.00	0.72	0.00	0.00
2001	Vysya Bank	0.00	3.66	0.00	0.00	0.00	3.66	0.00	0.00
2005	Vysya Bank	0.00	3.51	0.00	0.00	0.00	3.51	0.00	0.00
1997	WIV	0.00	0.37	0.00	0.00	0.00	0.37	0.00	0.00
1997	Walden-Mgt India	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00

2006	iLabs Fund II	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total portfolio:	956.52	249.41	42.30	536.35	604.74	175.91	38.60	236.35

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2004	CGL	0.01	0.00	0.00	0.00
2000	APCL	0.01	0.00	0.00	0.00
2006	Atul Ltd	0.00	0.01	0.00	0.00
2001	Vysya Bank	0.00	0.00	0.00	0.00
2006	Federal Bank	0.01	0.00	0.00	0.00
2001	GI Wind Farms	0.01	0.00	0.00	0.00
2004	Ocean Sparkle	0.00	0.00	0.00	0.00
2005	Allain Duhangan	0.00	0.00	0.00	0.00
	Total pending commitment:	0.04	0.01	0.00	0.00

Annex 16: Country at a Glance

INDIA: National Ganga River Basin Project

Annex 17: Map IBRD 38041R - The Ganga Basin in India

INDIA: National Ganga River Basin Project