

Ganga River Basin Management Plan-2015



Volume 12: Thematic Studies- Policies, Laws and Governance



Centre for Ganga River Basin Management and Studies
Indian Institute of Technology Kanpur

VOLUME 12 OF 12

NATIONAL MISSION FOR CLEAN GANGA (NMCG)

NMCG is the implementation wing of National Ganga Council which was setup in October 2016 under the River Ganga Authority order 2016. Initially NMCG was registered as a society on 12th August 2011 under the Societies Registration Act 1860. It acted as implementation arm of National Ganga River Basin Authority (NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA) 1986. NGRBA has since been dissolved with effect from the 7th October 2016, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred to as National Ganga Council).

www.nmcg.in

CENTRE FOR GANGA RIVER BASIN MANAGEMENT AND STUDIES (cGanga)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this it is also responsible for introducing new technologies, innovations and solutions into India.

www.cganga.org

ACKNOWLEDGEMENT

This document is a collective effort of a number of experts, institutions and organisations, in particular those who were instrumental in preparing the Ganga River Basin Management Plan which was submitted to the Government of India in 2015. Contributions to the photographs and images for this vision document by individuals are gratefully acknowledged.

SUGGESTED CITATION

GRBMP by cGanga and NMCG

CONTACTS

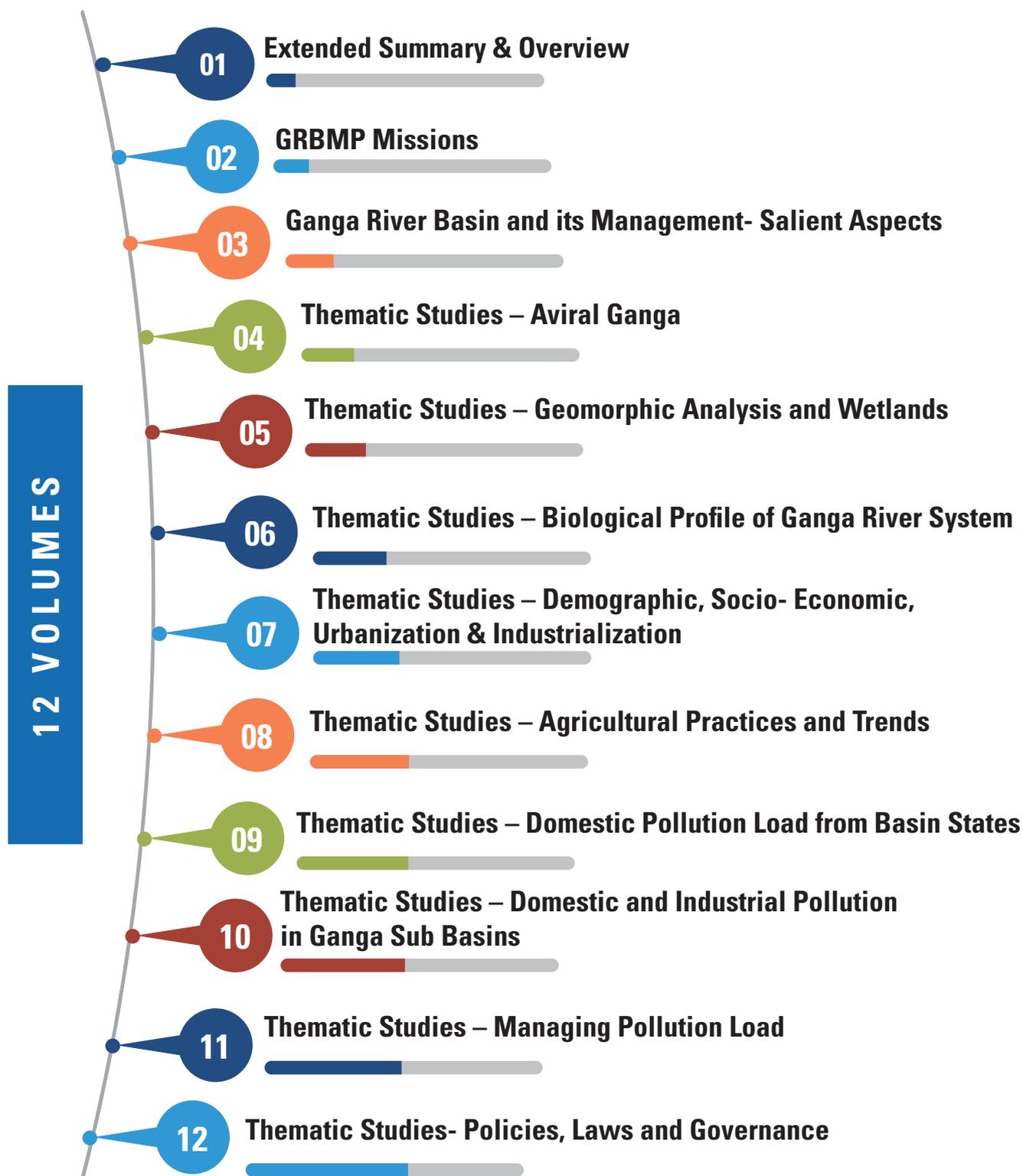
Centre for Ganga River Basin Management and Studies (cGanga)
Indian Institute of Technology Kanpur, Kanpur 208 016, Uttar Pradesh, India

or

National Mission for Clean Ganga (NMCG)
Major Dhyan Chand National Stadium, New Delhi 110 002, India

GANGA RIVER BASIN MANAGEMENT PLAN - 2015

Volume 12: Thematic Studies – Policies, Laws and Governance





**Ganga river in
Himalayas mountains**

Policy and Governance Issues in Urban Water and Sanitation Sector

A review and lessons for Ganga Basin

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



IIT
Bombay



IIT
Delhi



IIT
Guwahati



IIT
Kanpur



IIT
Kharagpur



IIT
Madras



IIT
Roorkee

Team

1. N. C. Narayanan, IIT Bombay
2. Prof. Subodh Wagle, TISS Mumbai
3. Prof. Shyam Asolekar, IIT Bombay
4. Sanjeev Chandorkar, TISS Mumbai
5. Nitin A. Lokhande, IIT Bombay
6. Pranjal Dixit, TISS, Mumbai
7. Sachin Warghede, TISS Mumbai
8. Vinod Tare, IIT Kanpur

Lead Authors

N.C.Narayanan
Nitin A. Lokhande

Contents

1. Executive Summary	04
2. Policy Shifts, Investments and PPPs in UWSS	07
2.1 Public Utilities in Crisis and Call for privatization	07
2.2 Demand for investment in UWSS	10
2.3 UWSS PPPs in India	12
2.3.1 Status of UWSS PPPs in India	12
2.3.2 Issues in UWSS PPPs and its consequences	14
3. Critical Review of GRBEMP reports	18
3.1 Ganga Action Plan (GAP)	18
3.2 Issues in Kanpur Case Study	20
3.3 Design Build Finance Operate (DBFO) Model	21
4. Contemporary policy debate and Implications for GRBEMP	31
5. Conclusions and Recommendations	34
References	36
Appendix I – Constraints and mitigation identified in context of PPP by Gol	38
Appendix II – PPP case studies from literature review	39

1. Executive Summary

A Consortium of seven Indian Institute of Technology (IIT) which has been given the responsibility of preparing the Ganga River Basin: Environment Management Plan (GRBEMP) has come out with number of reports till date. A few of these have policy suggestions about waste water management in the Ganga Basin, especially the institutional options for realizing the most important 'Zero-Liquid Discharge' (ZLD) concept. These suggestions need expert as well as public consultations in order to clarify issues of implementation. The Policy, Law and Governance (PLG) group consolidates the findings from the earlier reports of GRBEMP in this final report and highlights some recent policy perspectives from that emerged in the last two years, which came after the earlier PLG group reports. The primary task of this report is to bridge the gap in perceptions of issues in UWSS in the country and particularly in the context of river Ganga, organize the main findings of earlier reports and raise questions which need answers for successful presentation of GRBEMP. This report is broadly split into three sections discussing the policy shifts, investments and PPPs in UWSS, critical review of GRBEMP reports and alternate policy debate.

The first section starts with a review of the larger shifts in policy in favor of privatization and later to PPPs with the arguments of state failure. It maps the state facilitation in favor of PPPs in India with an assessment of the ongoing experiences. The section identifies the current thrust for centralized technological solutions that warrants high financial investments and institutional models like Public Private Partnerships (PPPs) in the UWSS. This forms the background for better understanding of the suggested technological solutions like ZLD and institutional models like 'Design Build Finance Operate' (DBFO) in the Ganga Basin. The renewed policy debate on the PPP has two strands: one that argues for huge financial inducement thrust into the sector like there port of the High Powered Expert Committee (HPEC) (HPEC, 2011) and another that cautions the viability of this trajectory and argues for larger governance changes with a more heterodox understanding of technology, investments and institutional structures needed contextually to bring in sustainable and affordable options that reach majority of the population. This section also briefly presents the current investment demand and status of PPP in UWSS.

With this backdrop, the second section presents the critical review of GRBEMP reports from a PLG perspective and comes up with number of questions which needs expert and public consultation. The section starts with the review of

reports on Ganga Action Plan (GAP) and following are the major issues that come out of the review. Since large proportion of pollution load in the river come from the municipal wastewater generated in twenty-five Class I towns¹ located on the banks of the Ganga, emphasis under the GAP was given on interception and diversion of wastewater and its treatment in Sewage Treatment Plants (STPs). There exist different issues and problems in different stretches or segments of the river (viz. upper, middle, and lower) due to different types of natural conditions and human interventions. Institutions with responsibilities of monitoring and evaluation of GAP were created at all levels - the Central Government, the State Governments and local governments. With monitoring of river water quality by different academic as well as public institutions, a loose and vague policy and legal framework, especially the lack of clarity about the roles of various stakeholders involved in the implementation of the GAP, have been important weaknesses of the very design of GAP. The lacunas, gaps and ambiguities in the existing pollution abatement laws allow departmental discretions to play a decisive role in implementation of GAP. The failure of institutional mechanisms created by GAP could be traced to multiplicity of the government agencies (departments, para-statal, government-agencies working at various levels) with overlaps and conflicting jurisdictions (GRBEMP, 2011a).

The Policy, Law and Governance (PLG) group designed an analytical framework for understanding the issues of governance related to UWSS. With introduction to key concepts, norms and tasks in infrastructure governance, it explained the core governance maladies (CGMs) such as gaps, overlaps, inconsistencies, vagueness and inadequacies in governing agencies which affects their functioning (GRBEMP, 2011b). Based on this framework, the group discussed the Kanpur case study in GAP and identified deficiencies in the sectoral responsibilities such as collection, conveyance, interception and diversion of sewage. The two broad failures in performance of the sewerage or sanitation system in the city of Kanpur are (a) inadequacy of infrastructural facilities to collect and treat sewage up to the desired standards, and (b) lack of effective operation and maintenance of the installed infrastructure. (GRBEMP, 2011c) The lacunas in the structural characteristics of governing agencies are gaps in capacities and administrative systems, lacunas in financial arrangements, vagueness in relationship between different stakeholders, misaligned perceptions, interests and norms of stakeholders.

¹ With populations exceeding 100,000 which constitutes around 75% of the pollution from all point-sources and remaining 25% of the pollution from point-sources were mainly due to untreated industrial effluents.

The report² of 'Environmental Quality and Pollution' (EQP) group suggested deploying of DBFO model, a type of PPP, as an institutional solution to the deficient sanitation infrastructure in Class I towns of Ganga River Basin for realizing the 'Zero-Liquid Discharge' (ZLD) concept and to bring in the much needed finances and expertise which are, as cited in the report, inadequate with Urban Local Bodies (ULBs). The PLG group reviewed the report and termed the DBFO model as 'End-of-the-Pipe' and 'Closed-Compound' solution³. It mapped the existing issues with the institutional problems at the levels of Policy Instruments (PIs) and Governing Agencies (GAs). Though the PLG group report suggested the need for more intensive studies, in one of its report it supported the EQP group's suggestion of the DBFO model referring to urgency of problem of pollution affecting river Ganga. A detailed analysis of the DBFO model that insulates itself from the governance maladies of existing institutions was done in this report. This clarified that there is the need for some public/government institutions to decide on tasks such as deciding the capacities of STPs, providing /facilitating land/power, ensuring quality of treated water, fix tariffs, sell/use the tertiary treated water 'bought' from the provider etc. This means that the so-called insulated DBFO model (which in reality is not) will fail if the governance issues discussed are not fairly addressed especially in the context of the political economy of governance, especially corruption in the existing institutions.

The third section revisits the larger policy discussions and clarifies important proposals that support need for heterodox solutions in place of the singular imagination of DBFO model.. The National Ganga River Basin Authority (NGRBA) has proposed a river basin treatment strategy that clearly states, "In river basins, recycle and reuse of sewage is not feasible when STPs are centralized systems to which sewage is conveyed over long distances involving intermediate pumping stations and outfall sewers". With this NGRBA suggested "a decentralized sewage system offers opportunities to efficiently use the treated sewage and hence is recommended" (GoI, 2013: 217). The reform agenda suggested in the XIIth five year plan points at the institutional model(s) for Ganga basin, "first, we will have to reduce the length of the pipeline to bring water to homes, thus reducing costs, including electricity and pumping costs and 'leakage'. This means giving higher priority to reviving local water bodies and recharging groundwater, so that we can source water from as close as possible. Secondly, we must use less, not more water in our homes, so that we have less to treat and less to dispose off. Thirdly, we must also

² Guidelines for Implementation of Sewage Collection, Diversion, Pumping, Treatment, and Reuse (Sewage CDPTR) Infrastructure in Class I Towns (Source: http://gangapedia.iitk.ac.in/sites/default/files/004_EQP_S%26R_3.pdf (Accessed on 17-04-2013))

³ Prevention of River Pollution by Urban Sewage Recommendations from Policy and Governance Perspective based on a Model Case Study (Source: http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/010_PLG_Kanpur%20Sanitation%20Study.pdf (Accessed on 17-04-2013))

cut the costs and transportation of sewage—use decentralized networks and use a variety of technologies to treat sewage as locally as possible.” (GoI, 2013: 165) The PLG group recommends that GRBEMP has to seriously debate the institutional models to be proposed for achieving ‘Zero- Liquid Discharge’ (ZLD) before arriving at the DBFO model proposed in the earlier documents. Here, we have to suggest some concrete plans to address the governance maladies like strengthening ULBs to weigh alternate technology and institutional options in a transparent and participatory manner (where people become fully aware of the consequences – financial and others) before aiming at a singular model proposed now.

2. Policy Shifts, Investments and PPPs in UWSS

This section presents the literature review for policy shifts, current demand for investments and PPPs in UWSS. It starts with reasons for state failure, privatization and later discusses the emergence of PPPs. It presents evidences from policy documents of Government of India (GoI) clearly in favor of PPPs in UWSS. Briefly describing the investments requirements, the section also discusses the status, issues and its consequences in UWSS in India.

2.1 Public Utilities in Crisis and Call for privatization

In India, a number of recent studies cite a vicious cycle of non performance in UWSS suggesting a downward spiral of deteriorating assets and declining productivity which has increased the operating costs (GoI, 2002a: 10; GoI, 2009a; Wagle, et. al, 2011; Bhatnagar & Zeug, 2011). The declining service levels have in turn affected citizen’s willingness to pay leading to declining revenues, reduced finances and further investments in infrastructure that ends up with the argument of a vicious cycle of unsustainability- unsustainable utilities, depleting natural resources and increasing demand -supply gap that completes the loop of the perpetual operational and financial distress of public utilities. A dominant explanation to such a cycle of inefficiency is the poor program design and little accountability (WB, 2008: 20; Briscoe and Malik, 2006) Thus, the state failure arguments are seen to have two strands. The first is the perspective of the International Financial Institutions (IFIs) which perceive the failure of public utilities from the point mostly of financial viability of which governance also is a part. The prescription here is mostly reduced to private participation to complement investments as well as increase efficiency. The second set of criticism comes more from the political economy angle of bureaucratic nexus with vested interests, inefficiency/rent seeking which also reflects the lack of accountability and transparency of public utilities (Davis, 2004; Bakker, et.al., 2008).

This argument is more explicit of the consequences of poor service in general and lack of reach to marginalized sections of the population as evidenced by our in-depth case study of Kanpur city. It has pointed out several inadequacies at the level of sewage collection, conveyance, treatment, and disposal because of failure of various government agencies in discharging various generic and cross-sectoral functions which spans from planning, designing, building, operating and maintaining, evaluating and regulating⁴. Whatever are the reasons for the so called 'state failure', last two decades first witnessed radical alternatives like privatization and later boiled-down versions of PPPs as solution.

The arguments of "state failure" invited call for privatization with number of general reasons put forward for private sector participation such as to improve quality, operating efficiency and system performance; reduce subsidies, introduce competition in the sector, inject private investment capital and expand service coverage to more customers including the poor (Dijk, 2008; Prasad, 2006; Alexander, 2005). The global trend got reflected in India's National Water Policy (NWP) 2002 which encourages participation of private sector in planning, development and management of water resources projects with a view to introduce innovative ideas, generate financial resources, and introducing corporate management and improving service efficiency and accountability to users (GoI, 2002b: 6). Following the policy prescription, the position paper of government on the water and sanitation sector clearly spelt out that, "all models of private sector participation, viz. build, own, operate and transfer, are acceptable" (GOI, 2009a: 6). In 2004, the Ministry of Urban Development and Poverty Alleviation (MoUD&PA) came out with guidelines for UWSS reforms and successful PPPs. These Guidelines were designed to sensitize State Governments and ULBs to the policy and procedural issues that need to be addressed as they reform urban water supply and sewerage services. They also seek to embed an evolving role for the private sector into this broader sector reform, facilitate a systematic assessment of the issues and options for successful private sector participation (PSP) and prevent improperly designed and executed PSP transactions (MoUD&PA, 2004: 1). The National Urban Sanitation Policy (NUSP) 2008 envisaged full sanitation coverage under the XIth plan by generating awareness and identifies fragmented institutional roles and responsibilities at the national, state, and city level as one of the key issue to be

⁴ Prevention of River Pollution by Urban Sewage Recommendations from Policy and Governance Perspective based on a Model Case Study (Source: http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/010_PLG_Kanpur%20Sanitation%20Study.pdf (Accessed on 17-04-2013))

addressed in the sanitation sector (GoI, 2008). The High Powered Expert Committee (HPEC) proposal clearly favors PPP as the first option wherever it is feasible. It suggests all projects to be screened for viability and implementation on a PPP basis as a first step before being sanctioned for implementation through the conventional route and recommends that contractual and financial arrangements such as Build-Operate-Transfer (BOT), annuity and viability gap funding (VGF) be more widely used in the delivery of urban services (HPEC, 2011). The Department of Economic Affairs (DEA), in 2009, suggested that the private player be isolated from regulatory risks through “a contract where only interpretations, performance monitoring as per contract, approval of capital expenditure and dispute resolutions come under the regulatory purview” (GoI, 2009a: 23). The new revised draft NWP 2012 suggested that wherever the State Governments or local governing bodies so decide, the private sector can be encouraged to become a service provider in public private partnership model to meet agreed terms of service delivery, including penalties for failure (GoI, 2012a).

Since the government has perceived privatization policies in all its earnestness it has attempted to prove the success of PPP. In a profile of failed projects that were abandoned at an early stage, the government argued that the failure is not because of drawbacks of PPP per se, but because of the limitations of the processes that were followed or the lack of enablers being in place and listed the projects which are operational as successful (GoI, 2009a: 14-16). However, the global trend shows that the private contracts in water sector have failed to deliver investment in new infrastructure as well as earn returns on infrastructure investment in developing countries. The private companies have also failed to show greater efficiency than public sector operations⁵. As a result, there has been less direct privatization of water services since the 1990s, but the commercialization trend continues, largely through the use of PPP (Hall & Lobina, 2006). In the Indian context, the policy documents released in past decade indicate a deliberate push for PPP as a favored model in WSS that calls for an evaluation of the viability of this institutional option.

⁵ In past two decades, only about 600,000 households have been connected as a result of investment by private water operators in sub-Saharan Africa, South Asia, and east Asia (outside China) – representing less than 1% of the people who need to be connected in those regions to meet the UN Millennium Development Goals (MDGs). A World Bank study showed that returns on infrastructure investment in developing countries, including water, fell far short of the cost of capital. Empirical evidence from studies in all continents shows that ownership does not appear to make any significant difference to efficiency. In 2004 the Asian Development Bank conducted a survey of 18 cities in Asia, which included two cities with private sector concessions - Manila and Jakarta. These were performing significantly worse than average on some indicators of coverage for water and sewerage, investment, about the same on six indicators, and relatively well on another five indicators (including revenue collection, and minimizing the number of staff per 1000 connections). A 2004 study by economists, covering 110 African water utilities, found no significant difference between public and private operators in terms of cost efficiency (Hall & Lobina, 2006).

2.2 Demand for Investment in UWSS

India's urban population is expected to reach 600 million by 2031 which would need massive capital and O&M investment in urban infrastructure, as highlighted by various Finance Commissions and expert bodies (Working Group on UIWSS, 2011). Hence, the scale of investment needed in UWSS sector is also expected to be substantial as the service provisioning under this sector is conceived as building, operating and maintaining centralized Sewage Treatment Plants (STPs) which involves capital and energy intensive technology solutions. Before looking at the investment demand, it would be helpful to understand the prevailing technology options of STPs and their performance in the Indian context, which is one of the major reasons for seeking increased investments.

As per a CPCB report in 2005, there are 234-Sewage Treatment plants (STPs) in India. Most of these were developed under various river action plans (from 1978-79 onwards) and are located in (just 5% of) cities/ towns along the banks of major rivers. It is found that in class-I cities oxidation pond or Activated sludge process is the most commonly employed technology, covering 59.5% of total installed capacity. This is followed by Up-flow Anaerobic Sludge Blanket technology, covering 26% of total installed capacity. Series of Waste Stabilization Ponds technology is also employed in 28% of the plants, though its combined capacity is only 5.6% (Kaur, Wani, Singh, & Lal, 2011). A performance evaluation of STPs carried out by CPCB in selected cities has indicated that though with high end technology options, out of 92 STPs studied, 26 STPs had not met prescribed standards in respect to BOD thereby making these waters unsuitable for household purpose. As a result, though the waste water treatment capacity in the country has increased by about 2.5 times since 1978-79, hardly 10% of the sewage generated is treated effectively, while the rest is responsible for large-scale pollution of rivers and ground water (Kaur et al., 2011). Since 1980 the central assistance in investments in UWSS have increased drastically from Rs 3700 crore to Rs. 43000 crore in 2005-11 (Working Group on UIWSS, 2011). Let us examine some of the projected estimates of investment demand in UWSS from recent policy documents.

The total capital investment estimates for the eight major sectors⁶ of urban infrastructure for the 20-year period from 2012 to 2031 amount to Rs 31 lakh crore at 2009-10 prices. Sectors delivering urban services such as water supply, sewerage,

⁶ Water Supply, Sewerage, Solid Waste Management, Urban Roads, Storm Water Drains, Urban Transport, Traffic Support Infrastructure, Street Lighting

solid waste management, and storm water drains account for 26 per cent (Rs 8 lakh crore) of the total investment requirement. Another Rs 8.2 lakh crore, considering all eight sectors, is estimated for renewal and redevelopment of existing facilities including slums, and capacity building. The total O&M cost⁷ for above period in UWSS sector is estimated to be Rs 8,17,671 crore amounting to a per capita investment needed for capital infrastructure of Rs 13,329 and another Rs 840 annually for operation and maintenance (HPEC, 2011: 69-84)

However, this may be an underestimation, given that the costs of water and sewage treatment,. For instance, the average cost of a comprehensive water supply scheme under JNNURM is roughly Rs 3 crore per mld while of a sewage project is Rs 3.33 crore per mld. However, the cost of building sewage treatment systems and networks under the Union government’s revamped Ganga programme averages is over Rs. 5 crore per mld – with small cities like Munger in Bihar getting as much as Rs. 7 crore per mld (Gol, 2013: 165; Working Group on UIWSS, 2011: 10). The Central Pollution Control Board in 2010 estimated the volume of waste water generated in Ganga basin from 179 class I cities/towns as about 11400 mld of waste water (see Table 1). The investment required just to build STPs to treat the currently generated waste water is thus about Rs. 57000 crore (assuming Rs. 5 crore per mld).

Table 1: Waste water generation in Class I cities/towns in Ganga Basin

No. of Class I cities/towns	Waste water Volume (mld)	Disposal Strategy
36	2637.7	Ganga river
113	7841.5	Tributaries
30	907.4	Land
Total = 179	Total = 11386.6	

Source: (CPCB, 2010: 31)

The computed capital investment has not considered the increase in waste water generated in future due to population growth, nor has it taken into the consideration the other social, economic, financial and political factors which would influence the investments in the long run. According to the HPEC estimates, the

⁷ The O&M cost includes the cost of O&M of physical assets, staff, and related administrative cost for the respective sectors. The O&M computation takes into account both the cost of O&M of existing assets as well as of new assets that will be created over the 20-year period. It does not include debt servicing, margins for operators in case of private party involvement, and depreciation.

running cost of such investments for 20 years will be in the tune of about Rs. 8-10 lakh crore which will then inflate the per capita investments need for capital and O&M.

2.3 UWSS PPPs in India

For cash strapped ULBs and parastatal public utilities that are not in a position to afford centralized technological initiative, PPP becomes a solution in the current policy context, especially through centrally sponsored schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Urban Infrastructure Development Scheme in Small and Medium Towns (UIDSSMT). In the first sub section, we attempt to understand the status of UWSS PPPs in India and try to consolidate issues and its consequences through case studies in the second ???.

2.3.1 Status of UWSS PPPs in India

PPP is a generic term that can encompass a wide range of institutional arrangements. At a general level, PPP arrangements could be visualized as a continuum of institutional options that runs from a “contribution contract”—which involves a private-sector contribution to a public facility, and minimal risk-transfer at one end to a “buy-build-operate” partnership (BBO) in which the private partner purchases an existing public facility, upgrades it, and owns and operates it in perpetuity at the another end (Allan, 1999). The ‘DBFO’ model fits at the latter end of continuum. As part of facilitating PPPs, Government of India (GoI) has identified several challenges and mitigation measures to promote private investment in the UWSS sector in India as shown in Appendix 1 which clearly shows that most of the concerns are financial such as enhancing viability for the private sector by public sector funding and reducing the private sector’s financial risks. The concern is “citizen” has to be educated into a ‘customer’, who understands water as an economic good and thus shall pay for the services. This shift then has to be ensured by a political commitment by the state through an upfront agreement and clearly a call to commoditize water, particularly to induce a market in waste water that is currently non-existent.

In India, critical studies have identified the visible fruits of this facilitation with several state governments, municipal corporations, water supply boards and other parastatal agencies entering into contracts with various multinational as well as domestic water and infrastructure companies, especially through Jawaharlal Nehru National Urban Renewal Mission or JNNURM. There are number of studies from

donor and multilateral agencies (Gol-ADB, 2010, Prasad, 2006, WB, 2008) viz. Asian Development Bank, World Bank, United Nations, civil society organizations (Dwivedi, 2010, Bhatnagar & Zeug, 2011) viz. Manthan, Centre for Science and Environment⁸, as well as government (Gol, 2009a, MoUD&PA, 2004) viz. Department of Economic Affairs, Ministry of Urban Development that evaluated the performance of the institutional option of PPP in UWSS. The review of these studies helps in understanding and identifying the issues associated with implementation of these models. In sub-sequent section, we try to summarize the issues along with consequences discussed in literature. Through this we intend not to categorize the PPP projects in UWSS as ‘success’ or ‘failure’; but to understand the present scenario for better understanding of the ongoing PPP experiences.

Table 2: Summary of PPP projects in Indian UWSS

Parameters	1990s	2000-2004	2005 Onwards
Number of PPP projects planned	5 (AP-Hyderabad; Goa, Maharashtra-Pune; Karnataka-Bangalore; TN-Tirupur)	8 (Maharashtra -Sangli, Mumbai, Chandrapur; Delhi-21 pilot zones, Sonia vihar; Karnataka-Bangalore, 8 MC; AP)	13(Karnataka-Hubli Dharwad, Mysore; MP-Dewas, Khandwa, Shivpuri; Chattisgarh-Naya Raipur, WB-Salt Lake, Haldia; Maharashtra-Nagpur,Latur, Bhiwandi; TN-Madurai, Chennai)
Contracts Awarded	1	3	13
Current status of contracts awarded	1 Operational (TN-Tirupur)	2 Operational (Delhi-Sonia Vihar; Maharashtra-Chandrapur)	12 projects are in various stages of implementation/operation; 1 project is currently stalled (Maharashtra-Nagpur)
Project funding Share	1 (100% Public funding) ; 4 NA	4 (100% Public funding), 1 (Private Investment envisaged), 3 NA	2 (100% Public funding),3 (90% public funding), 1(35% Public funding),1(Incremental investment from Pvt Operator), 6 NA
Project scope	100% bulk water supply	<ul style="list-style-type: none"> • 75% distribution O&M • 13% bulk water supply • 12% water treatment 	<ul style="list-style-type: none"> • 38% distribution O&M • 31% distribution investment + O&M • 15% bulk system investment + O&M • 8% desalination • 8% treatment + system rehabilitation/upgradation + distribution O&M
PPP model	100% BOT/BOOT	<ul style="list-style-type: none"> • 75% management contracts • 25% BOT/BOOT 	<ul style="list-style-type: none"> • 38% management contracts • 62% BOT/DBFOT and similar
Private operator mix	100% international	<ul style="list-style-type: none"> • 65% international • 35% domestic 	<ul style="list-style-type: none"> • 65% domestic • 21% international • 14% local/regional
NA: Information Not Available BOOT: Build Own Operate Transfer; DBFOT: Design Build Finance Operate Transfer.			

(Source: (Bhatnagar & Zeug, 2011))

⁸ Reports on <http://www.cseindia.org/taxonomy/term/20237/menu>

Table 2 summarizes the PPP activities in India's UWSS in 3 distinct time periods. With increase in number of instances of successful contract awards since 2005, it is also observed that there is a shift in the geographic concentration of PPPs from the initial clustering of projects in South India to a wider cross-section of cities/states with later PPPs drawing on public funding available under schemes such as JNNURM. Approximately 60 percent of the PPP projects, since 2005 are focused on improvements of the distribution system while 30 percent are aimed at bulk water supply augmentation which was predominant earlier. The remaining projects include both bulk water supply augmentation and O&M of the entire system. The type of PPP arrangements being implemented have also changed. During the 1990s, a majority of the projects were primarily BOT models with 100 percent private financing. In early 2000s, this changed to a scenario when the majority of O&M improvements were sought through management contract based interventions. Today, the operational contracts see a mix of BOT and management contracts. With most urban water supply PPP projects developed with substantial public funding, 50 percent of the ongoing projects have been developed with financial support from the government and 75 percent received funding from the central government-sponsored JNNURM and UIDSSMT schemes. Till such time the risk perceptions regarding water PPPs in India continue to remain high, the share of private investment will continue to be relatively small, with substantial reliance on public funding. A drop in international private operator's participation is observed since 2000 with increase in domestic/local/regional players from 2005 onwards.(Bhatnagar & Zeug, 2011). This trend clearly indicate the lack of market in the UWSS in India, which is more acute in waste water projects, which cautions against the assumption of large number of players coming to implement the DBFO model currently in consideration in GRBEMP (discussed in detail later).

2.3.2 Issues in UWSS PPPs and its consequences

The specific issues associated with PPPs in UWSS are escalated tariff rates, disconnections and marginalization, vested interests vying for of high profits, problems emerging from cost cutting, public guarantees of private finances and profits, efficiency and efficacy of operation, commercialization of water, control of the resource and natural resource exploitation (Dwivedi, Rehmat, & Dharmadhikary, 2007). A more general issue is that PPPs in WSS are still at the project level with lack of sector-level enablers⁹. Cities (or states, in some cases) have chosen the

⁹ PPPs in other sectors (such as power, highways, and so on) has been adopted as a sectoral strategy and sector-level enablers have been created such as a model concession agreement for highways, PPP approach for investments in major ports, new Electricity Act, and so on. Compared to this, PPPs in the water sector have been local, project-level initiatives.

PPP model for specific projects with no state or country-level approach or enabling framework for water PPPs. The availability of grant funds and limited internal resources has resulted in easier and quicker acceptance of the PPP approach by local stakeholders, including political representatives. However, they lack technical and monitoring capacity to facilitate, implement and scaling up of PPPs. (Bhatnagar & Zeug, 2011) There are number of case studies (refer Table 3) from which the above issues could be identified and consequences mapped as caution to design and implement future PPPs in WSS.

Table 3: Issues in PPP cases and consequences

Issues	Cases referred	Consequences*
Uncertainty in identifying risks	Tirupur	Loss to NTADCL
Inadequate assessment of the target area	Bangalore	Significant cost escalation later for expansion
Inefficiency and Inefficacy	Chandrapur	Public agitation, shift to bore wells and other options for water
Escalated tariff rates	Khandwa, Shivpuri, Pune, Sangli	Heavy opposition from CSOs and other stakeholders
Lack of Transparency and Accountability	Latur, Pune, Sangli	Failure to resolve conflict, secure legitimacy and acceptance from the citizen
Public funding with least or no private investment	Nagpur, DJB, Khandwa, Shivpuri, Tirupur, Pune	Profit making motive, tariff hike, Neglected Water supply to domestic consumers, Marginalization of those who are unable to pay
Debts due to huge loan	Pune	Siphoning of funds earmarked for other development programs
Complete private investment	Chennai, Khandwa, Shivpuri	Sustainability of finances of public utility, Rise in tariff

Source: (Dwivedi et al., 2007; Bhatnagar & Zeug, 2011; Dwivedi, 2010; Gol, 2009a; Working Group on UIWSS, 2011)

Note: *Refer Annexure II for more details on the cases referred.

Successful implementation of a PPP contract is dependent on how the risks associated with the project are identified, listed and allocated. An illustrative list of 15 risks¹⁰ associated with a project and its consequences is presented in the toolkit for

¹⁰ Risk categories: Commissioning, Construction, Demand (Usage), Design, Environmental, Financial, Unavoidable circumstance, Industrial relation, Latent defect, Operating, Performance, Change in law, Residual value, Technology obsolescence and Upgrade. (For details refer: (Gol, 2009b))

PPPs in Urban water supply for Maharashtra developed by GoI, Government of Maharashtra (GoM) and Asian Development Bank (ADB). The consequences of these risks are discussed completely in a techno-financial viability context and thus only to safeguard the interest of the private sector (GoI, 2009b). A comprehensive analysis and transparent public consultation process for educating citizens and taking them on board, especially for clarity on the current and future private costs (in case such projects are to be undertaken) due to possible rise in tariffs need to be conducted. This is suggested in the 12th report of Second Administrative Reforms Commission which provides a seven step model for citizen centric administration and recommends evaluation of the extent of customer satisfaction by an external agency through Citizen's Report Card (GoI, 2009c). But such initiatives figure least in the priorities in governance.

The commitment of ULBs to water PPP projects is a tactical response at times. Since substantial grants-based assistance is available, no attempts are made to link the provision of public funding to tariff reforms in the sector. In several cases, water PPP projects have been developed without revision of the prevailing tariffs to more sustainable levels. In the long run, large volumes of public funds may not be necessarily available, and therefore tariff reforms will become essential for sustained asset management and service quality (Bhatnagar & Zeug, 2011). The above discussion clearly shows that the PPP contracts have showered heavy liberty on to private sector by providing sufficient public funds and providing facilitative conditions to cost recovery to earn profits as well as neglect social obligations such as equity. There is no evidence of any assessment, either by private or public, of the conditions at ground level considering population, demand supply gap or environmental impact is done before initiating the projects. Hence, for PPPs to succeed, a huge effort is needed on behalf of government (if it choose to be facilitator) to improve its governance structure (for planning, monitoring and regulating) in order to complement the private participation as well as ensure compliance of the terms A new "vicious cycle of high-tech non-performance" of private provisioning in UWSS is emerging that points to the roots of failure in governance and thus again to arguments of state failure that triggered the new idea which brings us back to square one.



Figure 1: A new vicious cycle of high-tech non-performance

The limitations of the private participation experiments thus point to the fact that the public sector must be the important vehicle for expansion in the future, as in the past. Even the World Bank’s infrastructure policy review in July 2003 noted that private finance had accounted for less than 10% of total investment in water in developing countries in the previous decade, and concluded that: “the Bank will need to more strongly promote sustainable public sector investment and service delivery” (Hall & Lobina, 2006: 11) Although this call is to enhance the bank’s possibility (business) of funding governments, we have to look at the larger issues, especially the ongoing policy debates to understand the respective roles of various stakeholders in making UWSS not only efficient, but also sustainable and affordable.

With arguments of state failure, this section reviewed the larger shifts in policy in favor of privatization and later to PPPs. It explained state facilitation in favor of PPPs in India with an assessment of the ongoing experiences. The section briefly discussed the current investment demand and status of PPP in UWSS. The main concern was to map the consequences of the issues in PPPs, especially to better understand the suggested technological solutions like ZLD and institutional models like DBFO in Ganga Basin. But before we raise such questions, we need to organize

the main findings from the earlier reports of GRBEMP. A critical review of GRBEMP reports would provide us insights to what is missing in our earlier studies and what necessarily we must focus on for better representation of GRBEMP.

3. Critical Review of GRBEMP reports

This section presents the critical review of GRBEMP reports and comes up with a number of questions which need expert and public consultation. The section starts with the review of reports on GAP and discusses the major issues that come out of the review and in subsequent section, discuss the Kanpur Case study conducted by PLG group. A detailed discussion on the DBFO model proposed by EQP group is done in last subsection. The section raises a number of questions on characteristics of the model and its economic as well as financial viability.

3.1 Ganga Action Plan (GAP)

The idea of cleaning river Ganga was initiated by GoI in 1979; however the GAP could only be initiated in 1985 after a comprehensive survey of the river Ganga by Central Pollution Control Board (CPCB). CPCB had published few comprehensive reports on the pollution issues in the river since then. These reports formed the basis of intervention activities under GAP. The GAP was aimed at controlling pollution in a systematic and planned manner to improve water quality¹¹. (GRBEMP, 2011a). The PLG group conducted a Strengths-Weakness-Opportunities-Threats (SWOT) of GAP and presented a report which gives a comprehensive picture of GAP and its issues.

A large proportion of pollution load in the river comes from the municipal wastewater generated in twenty-five Class I towns located on the banks of the Ganga, each with a population exceeding 100,000 which constitutes around 75% of the pollution from all point-sources and remaining 25% of the pollution from point-sources were mainly due to untreated industrial effluents. Therefore, emphasis under the GAP was given on interception and diversion of wastewater and its treatment in STPs, before discharging into river. Development of dedicated and

¹¹ The other objectives were to: (a) conserve biodiversity, (b) developing an integrated river basin management approach, (c) conducting comprehensive research to further these objectives, and (d) gaining experience for implementing similar river clean-up programs in other polluted rivers in India.

specialized institutional structure was one of the deliberate strategies that the GoI implemented, in order to ensure the effective implementation of the GAP. These institutions with responsibilities of monitoring and evaluation of GAP were created at all levels - the Central Government, the State Governments and local governments. Monitoring of river water quality by different academic as well as public institutions was the integral part of monitoring mechanisms of GAP. There exist different issues and problems in different stretches or segments of the river (viz. upper, middle, and lower) which are caused by different types of natural conditions and human interventions. A loose and vague policy and legal framework, especially the lack of clarity about the roles of various stakeholders involved in the implementation of the GAP, have been important weaknesses of the very design of GAP. The lacunas and gaps in the existing pollution abatement laws create many ambiguities and gaps which allow departmental discretions to play a decisive role in the implementation of the program. These ambiguities have also paved the way for many weaknesses of the GAP itself. Similarly, multiplicity of institutions is another result of the lack of clear policy-legal framework. The failure of institutional mechanisms created by Ganga Action Plan could be traced to the overlaps and conflicting jurisdictions of the government agencies (departments, para-statal, government-agencies working at various levels).

The SWOT analysis of GAP points at the different dimensions of the broader problem of governance failure, despite some of its achievements. Issues such as delays in implementation of the program, confusion over funding, selection of technological options, operation and maintenance of the assets indicate not only typical governance failures but also clarify the gaps in policy and program design. These gaps also highlight the weakness in program planning, implementation, monitoring, evaluation, center-state coordination, state-ULB coordination, etc. The multiplicity of institutions at the local level, their conflicting/overlapping roles and low levels of citizen participation pose broader challenges and demand greater transparency. This calls for a detailed analysis of the governance-related factors affecting effectiveness of the GAP both within government agencies as well as outside. Huge amount of water diversion for irrigation purposes in the upper stretches causes intensification of the pollution in the middle-stretch of the Ganga by reducing flows even below the levels of minimum environmental flows in non-monsoon season. The decisions like diverting water seems irreversible considering the political-economy of the basin,. Similar inter-linkages within different stretches needs to be understood properly which calls for evolving a detailed interdisciplinary analysis.

Apart from understanding the inter-linkages among the problems and their social, political, economic and technological aspects, there is a need to understand the institutional aspects of the problems with respect to the GAP. Here, institutions do not signify merely the formal structure of the government agencies (departments and authorities), it is also the ways of functioning by the government and non-government actors using gaps and loopholes in the provisions in a diverse manner that cause interventions to be ineffective. It implies developing an understanding of informal ways of decision- making as well as the interpretation of the existing laws reflected in the functioning of the government agencies as well as implementation of the programs such as GAP.

The PLG group designed a policy and governance perspective and analytical framework for analysis of management of urban sewage after the in-depth analysis of GAP and its issues. With introduction to key concepts, norms and tasks in infrastructure governance, it explained the core governance maladies (CGMs) such as gaps, overlaps, inconsistencies, vagueness and inadequacies in governing agencies which affects its functioning and hence indicated need of serious attention.(GRBEMP, 2011b). Based on this framework, the group discussed the Kanpur case study in the context of GAP and identified deficiencies in the sectoral responsibilities such as collection, conveyance, interception and diversion of sewage. We now present the main findings from Kanpur Case Study relevant in current discussion.

3.2 Issues in Kanpur case study

The two broad failures in performance of the sewerage or sanitation system in the city of Kanpur: (a) inadequacy of infrastructural facilities to collect and treat sewage up to the desired standards, and (b) lack of effective operation and maintenance of the installed infrastructure. The Kanpur case study also showed that each of the generic functions—from survey and design, planning, execution, operation and maintenance, and monitoring and evaluation—were not carried out in an effective and efficient manner by the agencies concerned with governance of the sanitation sector. The lacunas in the structural characteristics of governing agencies are gaps in capacities and administrative systems, lacunas in financial arrangements, vagueness in relationship between different stakeholders, misaligned perceptions, interests and norms of stakeholders. The study identified deficiencies in sectoral responsibilities such as collection and conveyance (viz. inadequacy of sewer network, non connection of households to existing sewerage network, open defecation, inadequate maintenance of sewers), interception and diversion works

(viz. partial coverage, non tapping of nallas in areas where cities expanded, frequent choking and leakage of conveyance system, inadequate treatment facilities, irregular operation and maintenance of treatment capacities) and performing generic functions (viz. deficiencies in planning and designing of sewer network, building sewers and sewage treatment infrastructure, operation and maintenance of the assets, weak monitoring, evaluation and regulation). The crux of this diagnosis could be narrowed down in terms of the four types of core governance maladies: (a) lacunas in Policy Instruments, (b) lacunas in Governing Agencies, (c) distortions in the governance process due to misaligned perceptions and norms of the stakeholders, (d) distortions in the governance process due to misaligned interests of the stakeholders. Thus, in short, the chronic problem of pollution in the river Ganga requires a comprehensive range of solutions that are synergistically supportive of each other. It needs to be noted that the problem essentially is rooted in the governance crisis and no amount of inputs for technical, financial, or capability / knowledge enhancing will be able to reduce these core governance maladies. This is not to deny the need or utility of the technical, financial or knowledge inputs, but to warn against naiveté that prompts a search for simplistic solutions that often serve the vested interests rather than the cause of clean river Ganga.(GRBEMP, 2011c) With this discussion, we now turn our attention to 'DBFO' model as proposed by EQP group.

3.3 Design Build Finance Operate (DBFO) Model

The report¹² of 'Environmental Quality and Pollution' (EQP) group suggested deploying of 'Design-Build-Finance-Operate' (DBFO) model, a type of PPP, as an institutional solution to the deficient sanitation infrastructure in Class I towns of Ganga River Basin (GRB) for realizing the most important 'Zero-Liquid Discharge' (ZLD) concept and to bring in the much needed finances and expertise which are, as cited in the report, inadequate with Urban Local Bodies (ULBs). Box 1 and 2 presents the highlights of the 'DBFO' model and expected advantages of it respectively. organized under different heads such as institutional model and funding source, land requirement and clearance, infrastructure building and operations, power requirements, guarantee and regulation. While analyzing the features of DBFO model, it seems like the entire responsibility and risks are borne by the private service provider. However, on closer look, it is seen that the success of this model rests on a host of tasks to be carried out by the state or particularly the ULBs that is

¹² Guidelines for Implementation of Sewage Collection, Diversion, Pumping, Treatment, and Reuse (Sewage CDPTR) Infrastructure in Class I Towns (Source: http://gangapedia.iitk.ac.in/sites/default/files/004_EQP_S%26R_3.pdf (Accessed on 17-04-2013))

assumed to lack capacities and motivation as seen in the earlier state failure discussions. For example, complete responsibility of land acquisition and its clearance is borne by ULBs, annuity payment to be released after verifying the quantity, quality and disposal of treated sewage etc. .

Box 1
Highlights of the 'DBFO' model (Source: (GRBEMP, 2010: 14-17))

Institutional model and Funding source

1. Special purpose vehicle (SPV) to be set up by service provider and ULB using PPP Model. Income to the service provider will be from two sources, annuity payments and profits (if any), from commercial exploitation of resources generated through sewage treatment. The service provider and ULBs will have joint rights (as stipulated in contract) for commercial exploitation.
2. The period of O&M contract (5-15 years post commissioning) to be offered to service provider to be decided through mutual consultations.
3. Contract between the ULB and service provider will be guaranteed by the state government and counter guaranteed by the central government.
4. Other mechanisms such that the service provider is assured of payment as per the contract.
5. Bids to be invited from empanelled service provider using two bid system. The agency submitting the lowest financial bid is selected amongst the bids that are technically sound as per prescribed criteria.
6. Service provider is expected to invest the entire funds required for initial creation of the sewage pumping and treatment infrastructure as per the approved DPR and also take care of operation and maintenance of the facility throughout the contract period.
7. Funds to be made available by the state and central governments for annual payment to the service provider throughout the contract period

Power

8. Service provider responsible for uninterrupted power supply for the facility.

Land and Clearances

9. Entire land for building the facility is identified by the ULB.
10. Obtaining the associated clearances is responsibility of the ULB. No project will be sanctioned by the NGRBA without these clearances.
11. Construction of the facility must occur in phases as the quantity of sewage available for treatment increases.
12. With approval of Detailed Project Report (DPR), the identified land is leased to the service provider at a nominal rate by the ULB for the duration of the contract period.

Infrastructure building and operation

13. Service provider builds, maintains and operates the facility for the contact period.
14. Any treated sewage, sludge etc. discharged from the sewage treatment facility during the contract period to be disposed off the service provider in a safe manner and as per provisions of the contract.

Regulation

15. Payments will be released each year to the service provider only after verification that the essential contract terms regarding both quantity and quality of sewage treated and disposal of treatment residues is satisfied.
16. Suitable penalty clauses will be included in the contract in case of non-compliance by the service provider.

Box 1 presents the highlights of 'DBFO' model. There are many specific questions to each feature of DBFO which do not have clear explanation in the EQP group report. These questions are presented categorizing according to concerns of private service provider, ULBs, public and governance.

Concerns of Private sector –

(Pt No. 1) Primarily, focusing on the institutional model and funding source, the joint rights of commercial exploitation of the resource generated through sewage treatment are questionable. Are the rights of service provider and ULBs equal and on what basis? The proposed "commercial exploitation" of the products will involve costs (capital costs, operating costs, marketing costs, staff costs etc). Who will bear those? The SPV, as suggested in EQP report, will have to be a registered corporate entity governed by the provisions of the Company's Act. What will be the capital structure, debt to equity ratio etc.? The annuity payment is linked to the quantities treated, but such quantities will be dependent on the sewage available. Whose responsibilities is it to arrange the feed? If it is ULB, why private partner will accept low annuity, without its fault? Private capital will be interested in overall return over a period and any low rate of return in the initial period is expected to be compensated by higher annuities. Are there any other principles, other than "quantity of sewage water" for example like minimum rate of return? The private partners are supposed to earn revenue by selling the products (treated water etc). If annuity be based on "gap of rate of return achieved and the minimum rate of return mutually agreed upon" then it will be much more feasible proposition. Is this the underlying idea behind the proposed model?

The model if hinged on treatment cost presuming that the treatment costs per liter is the basis for putting a price tag, it presupposes that the project/company will be able to sell adequate treated water continuously for years. What is the potential market / customers? What are the existing water arrangements for these potential customers? How the proposed price tag compares with the cost they incur for the existing arrangements? How such massive quantity of the output will be delivered to the potential customers? What is the capital and operating costs involved? Where will it be accommodated for? Higher the volume of treated water higher will be the cost of delivery that enhances price making it lesser attractive to the potential customers. The off take of treated water thus becomes viable when it is either a bulk customer in proximity within an economic radius who will lift the output on own costs.

(Pt No. 2) Looking closely at the model, if it is the proposed contract for O&M is fee

based) it does not involve financial risk. The range of duration of the proposed contract indicated as 5 to 15 years is too wide and the context of viability at these two extremes (i.e. 5 years and 15 years) may not be strictly comparable. The service provider from private sector will also expect some certainty. So it would be reasonable to insert period in terms of “not less than ---- so many years” Actual minimum number of years will have to be determined based on financial analysis, indicators like breakeven point, moratorium approved by the debt providers etc. Ideally, for infrastructure (non-commodity) projects it will have to be longer term. For a capital intensive project with 15 years of operational period, there is need to assess the financial aspects based on discounted cash flows. What is observed in the report is that the operational cost of entire 15 years have been summed up and added to the capital cost, while arriving at the total costs. It is necessary to undertake break even analysis. It is noticed that it will take some time for the project to reach optimum utilization of installed capacity.

(Pt No. 3-4) In one of the features of DBFO, It is said that “entire contract” will be guaranteed by the state government and “counter guaranteed” by the central government. Is it only some clauses like “annuity payments” or the entire contract? So the commitments of the part of the state / central government will be even for the period of 15 years? What will be the terms and estimated scale of such commitments? Any state will like to crystallize its commitments. From private partner's perspective, there will be huge political risk for such a long period of 15 years wherein change of governments at state / center is a routine event. There cannot be any other alternate mechanisms, which will comfort private capital.

(Pt No. 5) It is suggested in one of the clauses that lowest financial bid will be selected through a two bid system. What shall be the criterion of “lowest”? Will it be like lowest annuity asked for or higher profit sharing with ULB?

(Pt No. 6) The proposal of DBFO model also suggests that service provider is expected to invest entire funds required for initial creation of infrastructure. In what form such funds are to be brought in? The capital structure will determine the annuity liabilities. What are the oversight mechanisms? The equal partner like ULB will not be able to discharge this responsibility. It will require some higher level of authority.

(Pt No. 8) Power is essential for operation of the facility. What is the quality of power supply in the city where this project is proposed to be set up? Additionally, what shall be the standby arrangement? Another factor is sensitivity to the interruptions in

power supply will also have to be an input for technology selection which in turn will decide the capital cost. Has the cost of the standby power arrangements been included in the capital cost?

Concerns of ULBs -

(Pt No. 9-12) Land is the crucial component for infrastructure development. It is not clear from the EQP report whether land has to be identified or provided by ULB? It is possible that the land may be owned by ULB. But it may not be the most ideal location for the project and will have impact on the financial aspect of the project. In class I cities identifying proper location with requisite size taking into account the future expansions will be rather difficult. Cost of the land will be higher in class I cities. If ULBs bear the cost, will it be taken into account while computing the capital cost? Then it should be treated as equity contribution by ULB and entitled to earn return on it.

The necessary clearance is the responsibility of the ULB. Keeping in mind the unpredictability of the route, it will have a bearing on the implementation period and has financial costs. Who will bear such costs? It is suggested that actual construction will occur in phases. Is the project components (land, buildings, equipments etc) are modular in nature and amenable to be implemented in phases? Such phased-out implementation proves to be very problematic and non-financial developments vitiate the financial viability and the original assumptions get derailed completely. It seems that lease rental has not been considered in the operating costs. What shall be the basis of such lease rentals? Should they be market determined?

It has to be checked whether the financial analysis could be based on modular approach? In the EQP report which presents some financial analysis¹³, it is observed that the entire viability statements are made for 50 MLD capacity. It is not clear the actual plant, whenever it will be set up, will be how many multiples of of 50 MLD units. The financial analysis of a capital intensive project and reasonable fixed costs, changes with the installed capacity. There is a need to undertake analysis based on discounted cash flow.

¹³ Sewage treatment in Class I towns: Recommendations and Guidelines. Source: http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/003_EQP_Sewage%20Treatment%20in%20Class%20I%20Towns.pdf

Concerns of Public -

(Pt No. 13-14) One of the important observations is that even though the project is privately operated, it is mostly publicly funded. So the cost enhancements are serious public concerns. In the proposed model, when the service provider is expected to bring initial investments and arrangements involving annuity model / guarantees, the tendency is to over invoice the capital cost. The equity is taken out of the project by indulging into cost overruns, over invoicing etc. These techniques are well established. Typically, such project gets saddled with low quality asset and high capitalized cost since the service provider is assured of the agreed return on the equity. Since the service provider takes out the equity fully or partially, the incentives are lost. This does not happen in a commodity -industrial -wholly private owned project. It is in the best interest of the promoter to set up the project with “high quality assets and low capital cost”. Regarding the disposal of treated sewage, it is expected that service provider will do it in a safe way. However, if operating costs are high (and thus drag on the profits for service provider). it will increase the overall cost. These are public concerns since bloated capital and O&M expenditure will enhance these publicly funded projects.

If DBFO model is almost entirely hinged on the premise that it will attract private capital, the entire exercise will have to be recast. The private capital will not bring entire funds by equity but will have to bring it through loan. Lender will apply all the financial parameters to ensure safeguard of their interest. The assumption that the enterprises run on promised rate of return by annuity (even guaranteed and counter guaranteed by the state or central governments), might not be valid since the enterprises run on cash flows. Cash flows are missing from the analysis of the present model, especially the question of recurring expenditures including salaries.

Concerns of Governance -

(Pt No. 15-16) Payments will be released each year to the service provider only after verification that the essential contract terms regarding both quantity and quality of sewage treated and disposal of treated residues is satisfactory. What is frequency of release of such payments? What cost and quality of supervisory/ certifying mechanism is in place for doing so? Where will these mechanisms be built in the contract?

Looking at the concerns of various stakeholders, there are a number of generic questions about the features of the DBFO model which needs answer. The implementation of DBFO involves number of governing agencies at various levels

such as local, state and central. How do we take care of issues of core governance maladies and multiplicity issues of overlap and conflicting jurisdiction which were discussed in-depth in Kanpur case study? How do we set and define the criteria for performance of the proposed model? How and who will ensure the regulatory framework and its compliance for the model to work? On what terms the funds, guarantee and assurance of payment are to be given by the state and central government and who will decide and negotiate those terms?

From the above discussion, it is evident that there are number of doubts which question the core design of the proposed DBFO model. With number of questions for each clause, it seems that the DBFO model is not well thought of or analyzed with respect to technical, financial and institutional specifications. The EQP report also has stated reasons citing advantages of DBFO model which are listed in box 2.

Box 2 - Expected Advantages of 'DBFO' model with reasons (Source: (GRBEMP, 2010: 16-17))

Proper planning and monitoring

1. ULBs will be involved in the project planning, implementation and monitoring which will inculcate a sense of ownership in ULBs for the developed infrastructure as they will be indirectly answerable for operation and maintenance of project facilities since annual payments will be made to the operator by the ULBs.

Proper operation and maintenance

2. Service provider will be interested in maintaining and operating the facilities throughout the contract period, because that is how the equity invested in the project by the service provider may be recouped and profits made,

Assured Profits

3. Depending on the mutually agreed contract terms, the annuity payments made to the service provider may be sufficient to ensure profits. Over this the service provider could make additional profits by creating a market for treated water, sludge and sludge-derived products obtained through treatment of sewage.
4. ULBs are likely to help the service provider in creating a market, since part of the profit from sale of such product will accrue to ULBs and also the operation and maintenance of the created infrastructure beyond the contract period with the service provider will partially/wholly be sustained through income generated by ULB through this route.

Incremental funding

5. Since the payments to be made by the central and state governments are spread over the contract period in this model, the yearly outgo for a particular project will be lower which allows allocation of the yearly NGRBA budget simultaneously for many projects.
6. The fate of the annuity payments will rely on budgetary provisions for this, which is hugely political and ad-hoc exercise, making this whole scheme privy to the politics of the state at that juncture.
7. In short, the scheme based on annuity will not be insulated from the impacts of governance crisis, which is at the root of the problem in Ganga basin.

The critical analysis of the expected advantages of DBFO model is presented here.

(Pt No.1-2) The important advantages which EQP group finds in bringing in DBFO model in Ganga context are proper planning, monitoring, operation and maintenance, assured profits to service provider and incremental funding. One of the main reasons in failure of the GAP project is the lack of motivation and incentives to the dominant actors in the ULB. Here, the incentives get further curtailed as the 'plum' functions are taken out of the ULB hand viz., construction of plant, while the burdensome functions are dumped on them like land acquisition and securing various clearances. Deciding and adjusting annuity payments would be hugely complex task and would require an independent organization with interdisciplinary capacity would be required to do this. It will also be a politically sensitive issue. This is a near impossibility, in view of the experience of the independent regulators in different sectors in all the northern states. As a result, the annuity payments will be the "Achilles' Heel" in this whole design. This is wishful thinking as ULBs are not known to be driven by the urge to earn funds through such enterprises. There is absolutely no interest from the ULB, other than those in the power to find this as an interesting way to earn an extra income, which will be counter-productive for the scheme.

(Pt No. 3) It is proposed that depending on the mutually agreed contract terms, the annuity payments made to the service provider may be sufficient to ensure profits. However, the term 'sufficient' is a very non-financial term – it will have to be risk-adjusted rate of return. It is said that service provider will be interested in creating market etc. In all probability they will not. As "creating market" will also have concomitant costs, which will erode the profits and expose them to greater risks, particularly if selling treated water involves capital costs (laying pipelines). There is a tricky situation here. If the private party is not assured by way of annuity payments, as enforceable clause in the contract, the private party will not bother to compensate itself by taking trouble (it is compelled) to create market. Simply it will not bid at all. On the other hand, when they are ensured some minimum rate of return, they cannot be compelled to compensate themselves.

(Pt No. 4-7) Statements like "ULBs are likely to help" looks vague. What is binding ULB in this respect? The responsibilities shall not only be clear, but will have to be linked with the financial considerations. The entire supervision is being thrust upon ULBs. The earlier pages of this or other Reports are full of arguments on governance failures which in turn is used as a justification for roping in alternate

models. What is the financial status of ULBs in the areas under consideration? Will the annual budgets of these ULBs take that load? Will not such loose ends put off potential private sector partners?

The PLG group has previously reviewed the EQP report and termed the DBFO model as 'End-of-the-Pipe' and 'Closed-Compound' solution¹⁴. It mapped the existing issues with the institutional problems at the levels of Policy Instruments (PIs) and Governing Agencies (GAs). The PLG strongly believe that even for the neat DBFO model suggested that insulates itself from the governance maladies of existing institutions, there is the need for some public/government institutions to decide on tasks such as deciding the capacities of STPs, providing /facilitating land/power, ensuring quality of supply of water, fixed tariffs, sell/use the tertiary treated water etc. This means that an insulated DBFO model will fail if the governance issues discussed are not fairly addressed especially in the context of the political economy of governance esp. corruption in the existing institutions.

Insights from a similar initiative in the Energy Sector

A case study of Independent power producer (IPP) would be worth referring here. IPP was an effort to create generating capacity in the electricity sector through private sector participation. It involved providing huge economic and financial incentives including the assured revenue through the PPAs, guarantees and counter-guarantees from the state and central governments, escrow accounts. Box 3 presents in brief what was expected out of the policy, what happened and why it failed to achieve its objectives. Understanding this case study bring upon key learning for DBFO model which is summarized as follows. There is a danger of fly-by-night operators. The possibility of the ULBs not able to work out all the clearances and land acquisition with the speed and cleanliness as expected by the private entrepreneurs in the time horizons allowed by their business calculations. The state and central government may not be ready or able to provide guarantees and counter-guarantees especially in the ear of financial and budgetary prudence. The backward linkage of the sewage input would remain in the hands of the ULB, which is as critical as was the forward linkages of IPPs. The possibility of complications of the forward linkage of annuity payment will be a huge deterrence for private player. The lenders to the STPs under DBFO may not get convinced about the annuity payments, especially in the situation of absence of counter

¹⁴ Prevention of River Pollution by Urban Sewage Recommendations from Policy and Governance Perspective based on a Model Case Study (Source: http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/010_PLG_Kanpur%20Sanitation%20Study.pdf (Accessed on 17-04-2013))

guarantees from the central government. In absence of an independent regulatory mechanism, the scheme will be victim of usual financial and political wrangling and one-up-man ship between the central and state government. These lessons might be valuable for clarifying the probable risks of DBFO model also.

Box 3 - Independent Power Producer (IPP)

What was IPP Policy?

It was an effort to create generating capacity in the electricity sector through private sector participation. It involved providing huge economic and financial incentives including the assured revenue through the PPAs, guarantees and counter-guarantees from the state and central governments, escrow accounts.

What was expected?

- Significant addition to the generating capacity

What happened?

- Large number of projects were MOUed by fly-by-night operators (related to politicians or politicians themselves) who wanted to make a quick buck by selling the project proposals at some stage
- Most genuine projects never saw the phase of financial closure, Very few projects were completed and started production
- Partially completed projects gave rise to some of the biggest scandals in the history of the states
- Capacity addition were insignificant, State governments got into financial problems
- Policy lock-in for a decade leading to a 'wasted decade'

Why IPP policy failed?

- Financial guarantees and incentives attracted an overwhelming number of non-genuine actors
- Genuine actors met many hurdles in obtaining clearance, despite assurances and efforts by the state and central government
- Backward linkage to fuel remained a critically weak link in the whole design, as it was in the hands of the public bodies which were blamed for corruption and non-competence
- Forward linkage of revenue remained another weak link despite various crafty solutions designed by the governments and the IPPs
- Lenders to these IPPs remained unconvinced despite the assurances and efforts by the state government.
- Central government, alarmed by the demands on its resources, had to restrict counter-guarantees only to eight fast-track projects favored by it.
- No independent regulatory mechanisms which can command respect and ensure integrity of the whole scheme

Contributed by Prof. Subodh Wagle (Also refer Dubash, 2002)

4. Contemporary Policy debate and Implications for GRBEMP

This section attempts to understand the larger policy shifts in UWSS currently under debate. Though state failed to address the issues in provisioning of UWSS services in early 1980s-90s, the push for privatization also did not improve the situation. The role of the state as well as private sector was increasingly realized in the last decade and new institutional models such as PPP were formulated and implemented. However, PPPs also failed to meet the expectations and are presently struggling with a host of issues that needs attention in order to succeed in its objectives. As GRBEMP looks forward towards quick implementation of ZLD, with weak parastatals and ULBs, PPP (in particular DBFO) model is looked at as an immediate choice. The weaknesses of the DBFO model examined in detail have thrown up many answered questions. This section attempts to go back to certain strands in the current larger policy debate to understand a way forward.

The renewed policy debate on the PPP has two strands: one that argues for huge financial inducement thrust (like HPEC, 2011) into the sector and another that cautions the viability of this trajectory and argues for larger governance changes with a more heterodox understanding of technology, investments and institutional structures needed contextually to bring in sustainable and affordable options that reach majority of the population. Some suggestions from government like a shift from “PPP” to LB-centric approach (Gol, 2012b: 9) clearly shows that private participation in UWSS merely on the basis of finance and efficiency is not appreciable. Hence this participation has to be limited to certain technical and management services. The working group of Planning Commission has suggested bottom up approach and decentralized solutions and is the key player for ensuring the long term sustainability, efficiency and affordability in UWSS (Working Group on UIWSS, 2011: 44).

Even the World Bank has called for a ‘rethink’ of privatization policies, having recognized the regulatory problems associated with multinational water providers, and having seen the effects of a profit-driven service delivery model on workers, low-income households and the environment (Pigeon, McDonald, Hoedeman, & Kishimoto, 2012). In the last decade cities world over in Paris (France), Dar es Salaam (Tanzania), Buenos Aires (Argentina), Hamilton (Canada) and in a series of Malaysian municipalities, defined as the transfer of water services from private companies to municipal authorities, ‘remunicipalisation’ shows that the public sector can outperform the private sector and can be an effective water provider (Pigeon et al., 2012). The important issue is of governance especially the role of government in public service delivery, either as service provider or as a facilitator. One of the

reasons why the private sector has not been able to meet the high expectations of various stakeholders has been the weak water regulatory capacity of many governments that, in some cases, has resulted in price-hikes and poor water quality and management (Tropp, 2007).

With primary focus on governance issues, the working group of Planning Commission has pointed out dozens of recommendations for careful scrutiny and assessment of PPP projects (Eg. 24X7 projects) in UWSS to ensure affordability and sustainability. The recommendations stress on cost cutting and building institutional capacities for efficient management by setting real and hard targets for affordable recycling and reuse of treated waste water (Working Group on UIWSS, 2011). The policy document suggests that it is necessary to define the governance problems plaguing this sector as lack of participation of the urban water users at various levels from bottom to top and from needs assessment to operation and maintenance. Secondly, there is lack of transparency in the way this sector is governed at various levels and various stages. Thirdly, and related to these two is the issue of institutionalizing accountability norms and mechanisms to ensure that serious problems are identified and those responsible held accountable in a timely manner (Working Group on UIWSS, 2011: 40).

The report discussed the policy and governance issues in UWSS in three broad sections. The first section reviewed the larger shifts in policy in favor of privatization and later to PPPs with the arguments of state failure. With the mapping of the state facilitation in favor of PPPs in India, the section assessed the ongoing experiences which indicated thrust for centralized technological solutions that warrants high financial investments and institutional models like Public Private Partnerships (PPPs) in the UWSS. This presented adequate insights for better understanding of the suggested technological solutions like ZLD and institutional models like DBFO in the Ganga Basin. The second section with the critical review of GRBEMP reports from a PLG perspective present many generic as well as specific questions to the proposed solution. The third section focused on alternative policies currently under debate. With the reform agenda suggested in the XII Five Year Plan points at the alternate institutional model(s) for Ganga basin, the PLG group recommends that GRBEMP has to seriously debate the institutional models to be proposed for achieving 'Zero- Liquid Discharge' (ZLD) before arriving at the 'Design-Build-Finance-Operate' (DBFO) model proposed in the earlier documents. Annuity payment is just like cleaning charges. It does not include intended profits for private party. Annuity model will fail if no incentive to improve or maintain the private sector efficiency which needs markets. But there is no market as such. Therefore, it is not PPP but a management contract. In the absence of a market, the only way out is

regulation. An Alternate model is ring fenced corporate affair where the only players would be private entrepreneur, NGRBA and Centre (eg like IPP case) in which the finance would come from Private in form of equity, NGBRA would play regulator and Centre arrange for funds. However, as seen in IPP case, the model would fail given the conditions in Indian context.

Successful implementation of a PPP contract is dependent on how the risks associated with the project are identified, listed and allocated. consequences of these risks are discussed completely in a techno-financial viability context and thus only to safeguard the interest of the private sector (GoI, 2009b). A comprehensive analysis and transparent public consultation process for educating citizens and taking them on board, especially for clarity on the current and future private costs (in case such projects are to be undertaken) due to possible rise in tariff. Here, the “citizen” has to be educated into a ‘customer’, who understands water as an economic good and thus shall pay for the services. This shift should be ensured by a political commitment by the state through an upfront agreement and clearly a call to commoditize water. These issues are even discussed in the report of working group which says that the system of estimating demand and supply of water in cities is rudimentary and leads to poor accounting and poorer planning. The report, while commenting on the issues of distribution loss, inequity in supply, ground water regulation and public health, point out that the Indian cities with its inadequate sewerage system cannot keep up with the sanitation and pollution challenges (Working Group on UIWSS, 2011). The World Bank’s infrastructure policy review in July 2003 noted that private finance had accounted for less than 10% of total investment in water in developing countries in the previous decade, and concluded that: “the Bank will need to more strongly promote sustainable public sector investment and service delivery”. (Hall & Lobina, 2006: 11) Although this call is to enhance the bank’s possibility (business) of funding governments, we have to look at the larger issues, especially the ongoing policy debates to understand the respective roles of various stakeholders in making UWSS not only efficient, but also sustainable and affordable. It is thus clear that governments will continue to play a critical role in water governance to provide an enabling framework that involve private sector and civil society actors. It is thus time to bring the government back in and re-emphasize its critical role to improve water services and management. This is perhaps most evident in the government’s regulatory authority power, which increasingly embraces new forms of governance, such as multi-stakeholder dialogue and participation, facilitating negotiations and conflict resolution between water users and the decentralization of water decision-making (Tropp, 2007: 12). The larger governance umbrella along with regulatory mechanism cannot be bypassed whether

the service is provided by public or private sector. Without addressing the fundamental governance problems in this sector, any amount of financial resources, technological changes, new infrastructure or any amount of water will have limited usefulness. (Working Group on UIWSS, 2011: 40). This discussion in no way suggests legitimising the current working of government institutions that needs fundamental changes to bring transparency, accountability and participation. Hence it is a call for a more arduous middle path to address the problems in current state and market failures in the UWSS sector.

5. Path Ahead

With the understanding of the trends, issues, consequences and present challenges, we present our remarks and the emerging questions in the context of the institutional model of DBFO proposed for waste water management in the Ganga Basin especially for realizing the most important ZLD concept. The model presumes many things such as the 100% investment and prescribed annuity costs to which private sector will be agreed upon. It is a simple model where the quality tested tertiary treated water is purchased without the government engaging in any of this processes earlier. However, the scale and thus the technology needed (mostly centralised and high technology) by the service provider can raise the cost of water and thus the annuity for private sector. Even if we assume that the 100 % capital investment comes from private sector it is clear that the cost of treatment will be very high. In absence of high tariff, with such a very high price for treated water perceived demand can only come by selling it to high end consumers (the market of which is not yet assessed) that can only be realized with stringent regulation of ground water use. This has been proved impossible in many parts of India.

There are number of questions which need to be answered before we propose the high end technical and institutional models currently perceived in the context of Ganga.

- a. Has there been any assessment of the technical, financial, social, and political viability of this model in the background of socio-economic realities in Ganga basin?
- b. Is there a market for waste water especially in the states of the Ganga basin? Where is the demand going to get created? GAP gives a figure that 75% of waste water is from urban sewage and only 25% is from industries. Will the increasing urban demands get absorbed by the industries that are pursued as probable buyers of the tertiary treated water?

- c. Without stringent regulation of current ground water use, is it possible to generate the waste water market? In the near impossible scenario of ground water regulation will there be a market for the purchased waste water to be used?
- d. Without such a market have we assessed the capital and recurring expenditure for the currently suggested centralized high tech solution?

The purchase of waste water by government has to be financed either through government subsidies or rising tariffs, which becomes unsustainable even in the medium term. Hence, the claim of efficiency through a waste water market by 'DBFO – PPP' has to be reconsidered. It is clear from the discussion that for the proposed DBFO model to function there has to be a very efficient government machinery to function with efficiency (?), transparency, accountability and participation. A huge capacity building exercise has to be undertaken for planning, technical, financial, monitoring capability of ULBs as well as ensure compliance of the services provided by the private provider. If all this can be assured within the current government and governance system, could we really aspire for an efficient public system that can ensure keeping Ganga clean?

The discussions clarify that there are no 'magic bullets' to solve the complex issues in UWSS. We will conclude with the specific issue taken at the beginning of this report - the institutional model for abating pollution in river Ganga. The detailed analysis showed flaws in the present DBFO proposal where the private service provider (PSP) and ULB are partners. Some of the institutional models under discussion are: (1) The PSP brings in capital cost, operates the facility and NGRBA purchases quality-assured water, which the PSP is free to sell in the market. This is an 'end-of-the pipe closed compound' solution. There are numerous challenges to this ideal model of privatization, the most important being the risk perceptions of PSP and the lack of an existing market in waste water treatment; (2) PSP-ULB partnership which is the currently prescribed model, the problems of which have been examined in detail; (3) more heterodox technological and institutional models which have to be thought out in detail.

With the emerging trend of 'remunicipalisation', bottom up LB centric and decentralized approach in UWSS in the current decade, a wholly new and heterodox approach of assessment of more appropriate technologies at local levels can evolve provided adequate capacities are developed with public utilities which need a serious consideration. Such a system can then work with other tiers of government and also facilitate private participation with full knowledge of the process and the

consequences. The final challenge is to develop an independent regulatory system that mediates these different interests ensuring transparency and accountability and making water and sanitation services efficient, affordable and sustainable to all.

References

- Alexander, N. (2005). The Roles of the IMF , the World Bank , and the WTO in Liberalization and Privatization of the Water Services Sector 1 By. *World*, (301).
- Allan, J. (1999). Public Private Partnership - A Review of Literature and Practice. *Public Policy*.
- Bakker, K., & Kooy, M. (2008). Governance Failure : Rethinking the Institutional Dimensions of Urban Water Supply to Poor Households. *World Development*, 36(10), 1891–1915. doi:10.1016/j.worlddev.2007.09.015
- Bhatnagar, V., & Zeug, H. (2011). *Trends in Private Sector Participation in the Indian Water Sector : A Critical Review* (pp. 1–80). Retrieved from http://urbanindia.nic.in/programme/uwss/PSP_IWS_Detailed.pdf
- CPCB. (2010). *STATUS OF WATER SUPPLY , WASTEWATER GENERATION AND TREATMENT IN CLASS-I CITIES & CLASS-II TOWNS OF INDIA* (pp. 1–93).
- Davis, J. (2004). Corruption in Public Service Delivery : Experience from South Asia ' s Water and Sanitation Sector. *World Development*, 32(1), 53–71. doi:10.1016/j.worlddev.2003.07.003
- Dijk, M. P. van. (2008). Public – private partnerships in basic service delivery : impact on the poor , examples from the water sector in India. *Int. J. Water*, 4(3), 216–234.
- Dubash, N. (2002). *Power politics: Equity and Environment in Electricity Reform* (pp. 1–184).
- Dwivedi, G. (2010). *PPP in Water Sector: Partnership or Privatisation?* (pp. 1–148). Manthan. Retrieved from www.manthan-india.org
- Dwivedi, G., Rehmat, & Dharmadhikary, S. (2007). *Water: Private, Limited* (pp. 1–110).
- Gol. (2002a). *India Assessment 2002 - Water and Sanitation - A WHO-UNICEF sponsored study* (pp. 1–71).
- Gol. (2002b). *National water policy* (pp. 1–10).
- Gol. (2008). *National Urban Sanitation Policy* (pp. 1–40).
- Gol. (2009a). *THE WATER AND SANITATION SECTOR IN INDIA* (pp. 1–46).
- Gol. (2009b). *Toolkit for PPPs in Urban Water Supply for Maharashtra* (pp. 1–212).
- Gol. (2009c). *Citizen Centric Administration - 2nd Administrative Reform Commission 12th Report* (Vol. 12th Repor, pp. 1–188).

- Gol. (2010). *Public Private Partnership Projects in India Compendium of Case Studies. Managing* (pp. 1–158). Retrieved from [http://164.100.52.24/NPBCP_images/PDFs/PPP Compendium of Case studies \(3\).pdf](http://164.100.52.24/NPBCP_images/PDFs/PPP%20Compendium%20of%20Case%20studies%20(3).pdf)
- Gol. (2012a). *NATIONAL WATER POLICY* (pp. 1–13).
- Gol. (2012b). *Improving Urban Water Supply & Sanitation Services Advisory Note* (pp. 1–28).
- Gol. (2013). *Twelfth Five Year Plan (2012–2017) - Volume I* (Vol. I, pp. 1–360).
- GRBEMP. (2010). *Guidelines for Implementation of Sewage Collection, Diversion, Pumping, Treatment, and Reuse (Sewage CDPTR) Infrastructure in Class I Towns* (pp. 1–19). Retrieved from http://gangapedia.iitk.ac.in/sites/default/files/004_EQP_S%26R_03.pdf
- GRBEMP. (2011a). *SWOT Analysis of Ganga Action Plan* (pp. 1–34). Retrieved from [http://gangapedia.iitk.ac.in/sites/default/files/Second Set of Report/006_GEN_SWOT of GAP.pdf](http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/006_GEN_SWOT%20of%20GAP.pdf)
- GRBEMP. (2011b). *Policy and Governance: Perspectives and Analytical Framework for Management of Urban Sewage* (pp. 1–32). Retrieved from [http://gangapedia.iitk.ac.in/sites/default/files/Second Set of Report/009_PLG_Poicy and_Governance_Perspective.pdf](http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/009_PLG_Poicy%20and%20Governance_Perspective.pdf)
- GRBEMP. (2011c). *Prevention of River Pollution by Urban Sewage: Recommendations from Policy and Governance* (pp. 1–56). Retrieved from [http://gangapedia.iitk.ac.in/sites/default/files/Second Set of Report/010_PLG_Kanpur Sanitation Study.pdf](http://gangapedia.iitk.ac.in/sites/default/files/Second%20Set%20of%20Report/010_PLG_Kanpur%20Sanitation%20Study.pdf)
- Hall, D., & Lobina, E. (2006). *Water as a public service* (pp. 1–52). Retrieved from www.world-psi.org
- HPEC. (2011). *Report on Indian Urban Infrastructure and Services* (pp. 1–284).
- Kaur, R., Wani, S. P., Singh, A. K., & Lal, K. (2011). Wastewater production , treatment and use in India, 1–13.
- MoUD&PA. (2004). *India UWSS: Guidelines for Sectoral Reform and Successful PPPs* (pp. 1–97).
- Pigeon, M., McDonald, D. A., Hoedeman, O., & Kishimoto, S. (2012). *Remunicipalisation: Putting Water Back into Public Hands* (pp. 1–120). Retrieved from http://www.municipalservicesproject.org/sites/municipalservicesproject.org/files/publications/Pigeon-McDonald-Kishimoto-Hoedeman_Remunicipalisation_Putting_Water_Back_in_Public_Hands_2012.pdf
- Prasad, N. (2006). Privatisation Results : Private Sector Participation in Water Services After 15 Years. *Development Policy Review*, 24(6), 669–692.
- WB. (2008). *COUNTRY STRATEGY FOR THE REPUBLIC OF INDIA FOR THE PERIOD FY2009-2012* (pp. 1–190).
- Working Group on UIWSS. (2011). *Report of the Working Group on Urban and Industrial Water Supply and Sanitation for the Twelfth Five-Year- Plan (2012-2017)* (pp. 1–61).

Appendix I - Constraints and Mitigation identified in context of PPP (Source: GoI, 2009a)

Constraint on	Description	Mitigation
Supply Side (Concessioneing Authority)	<ul style="list-style-type: none"> Capacity of ULBs to fund the asset reconstruction on the face of Operator's reluctance to take investment risk 	<ul style="list-style-type: none"> The state funds need to be supplemented with private sector funding for asset reconstruction and maintenance JnNURM funding
	<ul style="list-style-type: none"> Long term financing 	<ul style="list-style-type: none"> Commercial Borrowing with longer tenure/ takeout financing
	<ul style="list-style-type: none"> Fear of Transfer of Ownership, Suspicion of Private Developer making 'Super Normal' Profit 	<ul style="list-style-type: none"> Awareness, training on PPP in general and successful case studies in particular
	<ul style="list-style-type: none"> Capacity to undertake projects on a PPP Basis 	<ul style="list-style-type: none"> Capacity Building
Demand Side (Concessionaire)	<ul style="list-style-type: none"> Regulatory Risk of assessing the developer on stringent norms 	<ul style="list-style-type: none"> Regulation by Contract defining clear outcomes with performance linked returns
	<ul style="list-style-type: none"> Tariff Risk: Tariff low or insufficient to support costs and Lack clarity 	<ul style="list-style-type: none"> Tariff rationalisation through a Policy
	<ul style="list-style-type: none"> Market Risk: lack of financially viable 'bankable' projects with acceptable risk profiles 	<ul style="list-style-type: none"> Entire market risks not be passed and only to the extent the private developers appetite
	<ul style="list-style-type: none"> Asset requiring large scale investment 	<ul style="list-style-type: none"> Capital cost may be supplemented through VGF or funded entirely by State or Municipal bodies
	<ul style="list-style-type: none"> Lack of adequate and reliable database 	<ul style="list-style-type: none"> Establish performance metrics based on measurable & transparent data source
	<ul style="list-style-type: none"> Availability of debt 	<ul style="list-style-type: none"> Funding through IIFCL
Community Side	<ul style="list-style-type: none"> Water supply considered a 'free good' by the citizens 	<ul style="list-style-type: none"> Customer Education and Communication
	<ul style="list-style-type: none"> Low willingness to pay 	<ul style="list-style-type: none"> Customer Education

	<ul style="list-style-type: none"> Not amenable to Metering 	<ul style="list-style-type: none"> To be made mandatory for any connection
Political	<ul style="list-style-type: none"> User charge for water is a political issue 	<ul style="list-style-type: none"> Strong political commitment upfront through a state support agreement

Appendix II – Case Studies from literature review

S.No.	Case	Type of PSP	Purpose	Features
1	Delhi Water Supply & Sewerage Project, Delhi Jal Board	Management Contract	Domestic & Commercial	Delhi Jal Board had invited pre-qualification bids for management contract for Water Supply & Sanitation in operation zones South II & III on 12 Feb. 2005. The population served in these two zones is respectively, 8,00,000 & 6,00,000. DJB had short listed 4 water companies for management contracts - Suez, SAUR, Bechtel & Veolia. Mass protests, including a campaign lead by Parivartan, including several RWAs, organisations & people led to the stalling of privatisation and withdrawal by the Delhi government of the loan application to the World Bank. The WB website shows the proposal as in pipeline.
2	DJB Sonia Vihar	Not Known	Domestic	Sonia Vihar Water Treatment Plant (WTP) Rs. 200 crores contract to design, build and operate Rs. 700 cr. plant for 10 years. The scheme will supply 140 mgd water to Delhi. Water drawn from Upper Ganga Canal. Plant is ready but could not operate since Uttar Pradesh government has denied water to Delhi from Upper Ganga Canal citing shortage in Bhagirathi river and its farmers requirements. Has a take or pay clause of about Rs. 3 crores per year. Trial operations started in June 2005.
3	Greater Bangalore	Proposed Management Contracts	Urban Water Supply & Sanitation	<p>Project will cover seven City Municipal Councils (CMCs) and one Town Municipal Council (TMC) around Bangalore. BWSSB will implement the project on behalf of the urban local bodies. Privatisation is a part and parcel with the World Bank involved through the IFC. USAID is also involved. However, strong public protests by the Campaign Against Water Privatisation, a forum of many organisation in the city has put BWSSB on the defensive and has slowed the process. (Manthan, 2011)</p> <p>The city has 3610 km of sewage lines, 14 sewage treatment plants – all variations of treatment technologies have been installed in this high-tech city. The rough estimation is that the city generates some 800-1000 mld of sewage, the installed capacity to treat is roughly equivalent – some 721 mld. In other words, on paper, it would be an ideal city. It has high tariff; 100 per cent metered supply, high recovery of its dues; 100 per cent water supply and substantial investment in sewage infrastructure. However, there is significant underutilization of treatment capacity. But there is a missing link – a fatal link. As per the data provided to the Committee by city engineers, Bengaluru's sewage treatment plants only receive some 300 mld of sewage. In other words, less than half the sewage is trapped and half is treated. The city now estimates that it will have to double its current network – build over 4000 km of underground sewage to complete the missing links. This is when the city is also expanding – growing at its seams where more investment is needed to supply water and to take back sewage. (UWSS, 2012)</p>

4	Belgaum, Gulbarga and Hubli-Dharwad - Karnataka	Management Contract	Urban Water Supply	Govt. of India has received a loan of US\$ 39.5 million from the World Bank to finance Karnataka Urban Water Sector Improvement Project (KUWASIP). As a part of this, privatisation of operation and maintenance of selected demonstration zones in the towns of Belgaum, Gulbarga and Hubli-Dharwad. The total project cost is about Rs. 235.10 crores, of which the World Bank contribution is Rs. 181.70 crores and of the Government of Karnataka is Rs. 53.40 crores. Compagnie Generale des Eaux, France, has been chosen as the operator and will have the responsibility in the above cities for 2 years following one year of distribution network rehabilitation. It is expected that the water supply phase will begin by the end of November 2006. It is also intended to apply a portion of the loan proceeds to finance the services of a consultant for Citywide Water Services Planning Engineering & Feasibility Studies.
5	Dewas Industrial Water Supply (Off-take from River Narmada)	BOT	Industrial	First Planned in 1996, 23 MLD Water Supply for Dewas Industrial Estate (DIE), 9 MLD off-take will be guaranteed by MoU with industries in DIE. Estimated Cost Rs. 80 crores, likely to go up (Earlier it was Rs. 65 crores). Water to be taken from Nemawar village on the banks of river Narmada. Likely cost of water Rs. 25/ KL. MSK Pvt. Ltd., Baroda has been selected for executing the BOT project. The construction of the pipeline is underway.
6	Sangli Miraj - Maharashtra	Management Contract	Domestic	Bids had been called, project developed. But strong local protests led to cancellation in late 2002.
7	Municipal Corporation of Greater Mumbai, K-East Ward Water Supply Project	To be decided	Domestic	Privatisation of water supply in the K-East ward. Population in the ward is about 1 million. One of the profitable wards in terms of collection of water supply charges. World Bank, through the PPIAF is giving US\$ 692,500 to design and develop a pilot PSP model for water supply. Castalia (France) has been selected as the official consultant for the project from 6 consultants who had been shortlisted in October 2005. The others were PWC (India), DHV (Netherlands), Mott Macdonald, Scott Babbie (UK) & Fichtner (Germany).
8	Nagpur Municipal Corporation (NMC)	Not Known	Urban Water supply	EOI from service providers in urban water sector with national or international experience in O&M of urban water distribution system. NMC intends to make demonstrative zone with uninterrupted water supply to approximately 10,000 water connections with reduction in Unaccounted For Water and improvement in the level of service to consumers. The works include - rehabilitation of water distribution network including service connections, replacement of consumer meters, implementation of Automated Meter Reading (AMR) system, improvement in billing system, reduction in UFW and improvements in revenue, O&M of the zone for 5 years. On successful implementation of program in the zone, NMC will implement the program in entire city.

9	Tirupur Water Supply Project	BOOT	Multipurpose (Industrial, Urban and Rural Water Supply)	<p>The Rs. 1023 crores new Tirupur Water Supply Project near Coimbatore is the biggest water supply project on BOOT basis in the country so far. Multi-Purpose, mainly industrial water to large number of export oriented industries in Tiruppur. Also includes urban and rural domestic supply. The Tamil Nadu Government, Tiruppur Exporters Association and IL&FS, together designed the Tiruppur Area Development Project (TADP) as a PPP, with technical assistance from the FIRE (D) Project. A special purpose vehicle, New Tiruppur Area Development Corporation Limited (NTADCL) was formed in 1995 to implement the project. It contracted out the construction and maintenance of the systems to a Build, Operate and Transfer (BOT) consortium of Bechtel, United International, North West Water and Mahindra & Mahindra. USAID has provided long term (30 years) loan guarantees for US\$ 25 million with IL&FS to help finance this project. Project has been completed and water supply and distribution started.</p>
10	Chennai Desalinisation Plant	DBOOT	Desalination and Urban water supply	<p>The Chennai Metropolitan Water Supply and Sewerage Board had called for bids on 18 Nov. 2004 for 100/200 MLD sea water desalination plant on BOOT basis. The project has been awarded to Chennai Water Desalination Ltd (CWDL), a SPV floated by IVRCL Infrastructures & Projects Ltd., a publicly listed company in India, which owns 75% of the project company. The remaining 25% of the project company is owned by Befesa Construcción y Tecnología Ambiental, S.A.U. (Befesa CTA), which is a wholly-owned subsidiary of Befesa Medio Ambiente S.A (Befesa), a Madrid Stock Exchange-listed engineering and construction company. The total project cost is estimated at US\$ 104 million, and the IFC (World Bank) is investing up to US\$ 25 million in the form of a local currency loan. The project is located at Minjur, about 35 kms north of Chennai. A March 2006 newspaper report says that Chennai Metrowater's 100 MLD desalination plant project is awaiting environmental clearance from the Central Government. (Manthan 2011)</p> <p>Chennai, for instance, has already invested in a 100 mld desalination plant in Minjur, where the agreement with the private operator is on a BOOT basis. The capital cost of Rs 473 crore was borne by the private operator, but with the guarantee that MetroWater, the city's water agency, would pay the company Rs 48.66/kl for the next 25 years. In addition, it would pay for power costs, according to information given to the committee by city engineers. The second plant at Nemmeli, also of 100 mld, is being built also by a private company and with a different arrangement. The contract is to build the plant and to operate it for the next seven years. The water board will own the plant and capital investment has been paid through Central subsidy. This will underwrite the costs of the delivered water—at roughly Rs 20/kl. But the big issue is what these two capital-intensive and expensive plants will do to the sustainability of the city's water board. Chennai MetroWater is an efficient water utility with balanced books—more than many others. But the high capital and operation and maintenance will require the utility to rethink its future finances. The Tamil Nadu government has committed that it will pay for the cost difference. But all this does mean that utilities will continue to have to depend on external funding for their viability. (UWSS, 2012)</p>

Assessment of Potential Institutional Models for Sewage Treatment in Ganga Basin and the Way Forward

GRBMP: Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

1. Introduction

The river Ganga occupies a unique position in the cultural ethos of India. Legend says that the river has descended from Heaven on earth as a result of the long and arduous prayers of King Bhagirathi for the salvation of his deceased ancestors. From times immemorial, the Ganga has been India's river of faith, devotion and worship. Millions of Hindus accept its water as sacred. Even today, people carry treasured Ganga water all over India and abroad because it is "holy" water and known for its "curative" properties. However, the river is not just a legend; it is also a life-support system for the people of India. It is important because:

- The densely populated Ganga basin is inhabited by 37 per cent of India's population.
- The entire Ganga basin system effectively drains eight states of India.
- About 47 per cent of the total irrigated area in India is located in the Ganga basin alone.
- It has been a major source of navigation and communication since ancient times.
- The Indo-Gangetic plain has witnessed the blossoming of India's great creative talent.

Ganga, the longest river in India has a unique position in the Indian psyche. The river Ganga has a special place for the people and Government of India. People have incomparable reverence for the river Gangaji, whom they regard as a mother and believe it to be holy. Government of India (GOI) has declared it to be the Nation River and set up the National Ganga River Basin Authority (NGRBA). NGRBA was set up as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the central and state Government for effective abatement of pollution and conservation of the river Ganga.

National Ganga River Basin Authority (NGRBA) chaired by the Prime Minister in its First Meeting held in October 2009 desired to make a comprehensive Ganga River Basin Environment Management Plan (GRBEMP). This task has been given to the Consortia of 7 IITs (Indian Institute of Technology at Mumbai, Delhi, Guwahati, Kanpur, Kharagpur, Chennai and Roorkee). The most important, and also the most challenging, task is to ensure Un-polluted flow in the rivers of the Ganga Basin in general, and the main stem of the river Ganga in particularly. The task appears to be uphill in the backdrop of the general public perception that earlier attempts under much publicized Ganga Action Plan (GAP) have not yielded any fruitful results and much of the huge expenditure (to the tune of more than Rs 10,000 million) incurred has been wasted. The Central Government now proposes to allocate Rs 70,000 million with the assistance of World Bank under the Clean Ganga Mission by 2020.

The preparation of Ganga River Basin Environment Management Plan (GRBEMP) is not only a massive but complex challenge. While rectifying the existing damage done by earlier interventions and pollution, equally important is to curtail, reduce, and to the extent possible, eliminate the processes that cause damage to Ganga. In rectifying the existing damage along with technological interventions, policy interventions play an equally critical role. While policy is a framework, law provides the legitimacy to it

and its implementation rests with the institutions of governance. The sub theme on "Policy, Law and Governance" shall deal with this important task of formulating a plan for this in Ganga Basin.

2. Scope

The scope encircles the strengthening of the Governance and Institutional structures of Ganga River Basin Management Plan, with the stakeholder's engagement and participation with each other in an inclusive, transparent and accountable manner to accomplish better service provision that is, free of corruption and abuse, and performed within the rule of law.

3. Rationale for Analysis

The rationale for analysis of **Governance and Institutional Mechanism of the GAP & NGRBA** could be stated by presenting some arguments.

First, the GAP and NGRBA has been the first –ever multi state, national –level substantial effort for reducing the pollution of the national river Ganga. Being the national program it has set the precedence for Ideal Governance and Institutional Mechanism framework for the other rivers in the country.

Second, the GAP and NGRBA initiative has attempted to address the most complex dynamics around the issues of river pollution. Major issues are; vast and socio-culturally complex civilization, densely populated cities directly along its banks. Most of the urban centers lack proper sewage treatment facilities (Vajpai, 2005). Lack of empowerment of the local people all continue to contribute to the deteriorating state of the Ganga.

Third, GAP and NGRBA is a new phase by adapting a river basin approach. The Government itself has accepted that, the need for revamping the Ganga cleaning program was being widely recognized. Ganga has a special place in the hearts and minds of all Indians and these needs to be recognized. It was felt that a model for river cleaning should be set up through a new institutional mechanism. A statement to this effect was made in Parliament by Shri Namo Narain Meena, Minister of State in the Ministry of Environment & Forests. A Notification in this regard is also being issued by the Government (PIB Friday, February 20, 2009). Proposed institutional frame work of NGRBA is quite weak-Sri Nitish Kumar (PR. No. – 14, Press Release, Date-05.10.2009)

Forth, the SWOT analysis of GAP also points at the different dimensions of broader problem of Governance failure, despite some of its achievements.

GAP-I: based on Traditional approach. Major weaknesses involve:

- Financial issues
- Technological issues
- Operations issues
- Maintenance of Assets
- Neglect the Role of communities

Institutional framework of GAP



The National Ganga River Basin Authority (NGRBA)

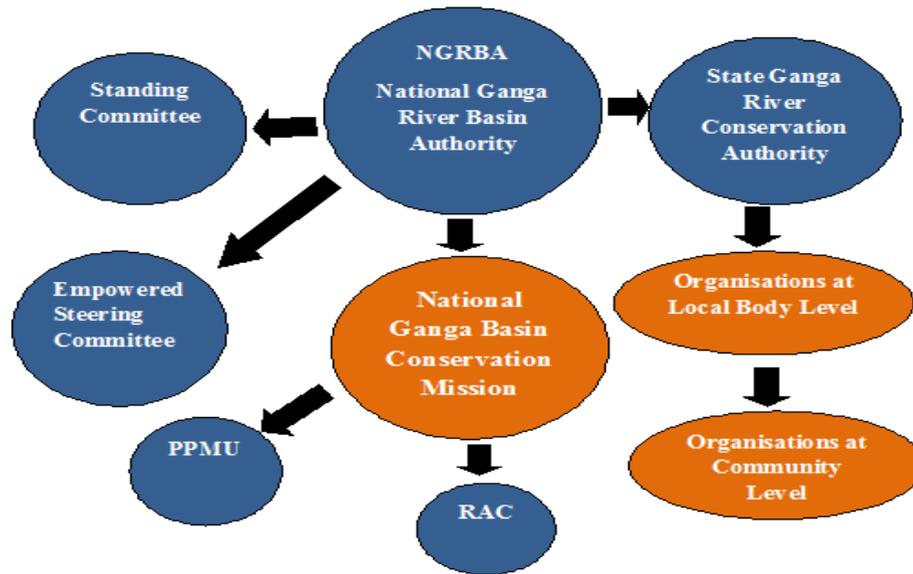
The formation: 20th February, 2009,

The Role: A Financing, Monitoring and Co-ordinating Authority.

Major weaknesses

- No Accountability
- Without Transparency
- Working in a detached manner

Institutional Framework of Existing NGRBA



NOTE: The institutions already created are shown in blue, those proposed to be created are shown in orange

4. Activities carried out

- I. Inaugural meeting of PLG group meetings at IIT Delhi on July 25, 2011 discussing the scope and objectives of the PLG group.
- II. Review of literature including documents such as reports, parliamentary debates, commentaries and critiques (Tyagi, 2010; AHEC, 2011; PIB, 2009; Kathpalia, 2006; Dixit et al, 2011; Rogers and Hall, 2008; MDBA, 2009.)
- III. Study of river basin management systems/approaches adopted elsewhere in the world, e.g. Murray Darling Basin in Australia, Rhine Basin in Europe, Nile Basin in Africa, as a source of information for picking up ideas relevant to the Ganga Basin.
- IV. Personal meetings and discussions with The Director, NRCD, Ministry of Environment and Forests (MoEF); The Director, The National Water Development Agency (NWDA); and The Director, Karnataka Urban Infrastructure Development & Finance Corporation, Bangalore.
- V. Continued discussions with other PLG group members at IIT Bombay, IIT Kharagpur and IIT Kanpur through email and phone.
- VI. Khare, M, "Environmental Policy and Governance Issues of Ganga River Basin Management Plan", in one day workshop on, "Water and Environmental Issues of Ganga River Basin Management Plan", ASCE, IIT Delhi, 4TH November 2011.

VII. PLG group meeting in IIT Delhi, on March10, 2012 discussing the proposed structure of the NGRBMP.

VIII. Khare, M, "The Governance and Institutional Structure of proposed NGRBMP" in one day workshop on, "Development of a Framework for Benchmarking of Sewage Treatment System with reference to Sewage Pumping Station", 5 April 2012, NIT Patna

5. Literature Review

The Murray-Darling Basin river catchments cover an area of 1.06 million km, or 14 per cent of Australia's land area. It is located in the states of Queensland, New South Wales, Victoria, South Australia and the Australian Capital Territory. Annual economic output from the Basin is around AUD\$23 billion (USD\$16.79 billion). AUD\$10 billion (USD\$7.3 billion) of this is from agriculture, equivalent to almost one third of the value of Australia's total annual agricultural output.

While use of the Basin's resources has brought huge benefit to Australia, this has had some detrimental ecological, cultural, social and economic consequences. In recognition that (under Australia's federated system of government) no one government alone was able to effectively manage the Basin's emerging natural resource management problems, the federal and relevant state governments negotiated the Murray-Darling Basin Agreement in October 1985 (which replaced the earlier 1915 River Murray Waters Agreement). Its aim is "to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin".

The management structure established to underpin the governance of the Agreement comprises:

- I. The Murray-Darling Basin Ministerial Council, the decision-making forum;
- II. The Murray-Darling Basin Commission, the executive and advisory arm of the Council;
- III. The Community Advisory Committee, which provides the Council with advice and provides a two-way communication channel between the Council and the community; and
- IV. The Murray-Darling Basin Act 1993, which was ratified by the five Basin governments through identical legislation enacted by each Parliament.
- V. Millington (2002) suggests there are four common features or attributes or principles that constitute best practice in integrated river basin management and it is those river basin organisations or country agencies that have addressed all four in one form or another that seem to be doing best.

They can be stated as follows.

1. An institutional framework exists which is both robust and flexible, and includes modern legislation and an integrated policy framework.
2. Planning and management is knowledge driven. Strategic assessment of water and related resources receives high priority, and does not stop at mere data management, but actively pursues the generation

of strategically focussed information and knowledge.

3. Integration is built into institutions, resource management, and policy. There is recognition of the holistic nature of ecosystems, and all policies, decisions and projects are evaluated against this background.

4. Community participation is built into all processes. It is seen as the normal way of doing business. It recognises also that the natural resources of a country belong to its people, and they have a right to participate in its management – with the flow-on effects that community participation leads to government efficiency, ownership of policies and actions by the community, and to more readily accepted principles of cost sharing.

So if the MDB Initiative is world best practice Integrated Catchment management then it will not only have these features but will have the governance structures and arrangements that enable them and account for performance.

Nile Basin Initiative Institutionalizing Cooperation

In spite of the glasnost in relations between formerly belligerent co-riparian's, moving from relations characterized by political conflict to new forms of cooperation required significant institutional development. It was not sufficient that the countries were now in a position to develop institutional cooperation; they required external assistance in order to facilitate this process. In 1997, the Nile Ministers requested that the World Bank establish a fundraising group for cooperative projects on the Nile. The Nile Basin Initiative that developed out of this request represented are-emergence of the earlier NRBAP. It now forms the most important basin-level approach to cooperative development of the Nile waters ever undertaken, and its significance extends well beyond the basin itself.

The Nile Basin Initiative describes itself as a “transitional arrangement until a permanent legal and institutional framework is in place” (NBI, 2000) and comprises a Council of Ministers of Water Affairs of the Nile Basin (Nile-COM), a Technical Advisory Committee (Nile-TAC) and a Secretariat (Nile-SEC).

Focusing on a process-oriented approach, the NBI firstly sought to establish a common point of departure for all stakeholders, namely the NBI “Vision.” This aimed at framing the tasks to be institutionalized within subsidiary action programs (SAP) at a sub-basin level. These SAPs aimed to “identify and implement investment projects that confer mutual benefits at the sub-basin level and that the riparian's agree to pursue cooperative [activities]” (NBI, 2000).

The “visioning process” took six months to complete, and the wording of it required major revision, discussion, and fine-tuning. Nevertheless, the importance of establishing the “vision” lay as much in the process undertaken as in the end result, and by bringing together all the co-riparian's (except for Eritrea which, at the time, remained an observer) raised important discussion on key legal and development issues.

The success to date of the NBI lies in one of its institutional innovations, namely the application of the principle of subsidiary, or management of the basin at the lowest appropriate level.

The Eastern Nile program and the Nile Equatorial Lakes program aimed to express the vision in terms of actions on the ground, bringing high level political engagement and agreement to socioeconomic development within the states themselves. In tandem with these action programs, a shared vision program would help to continue to support the process of cooperation, included within which were a number of cross cutting projects:

- I. Nile Basin Trans boundary Action
- II. Regional Power Trade
- III. Efficient Use for Agricultural Production
- IV. Water Resources Planning and Management
- V. Applied Training
- VI. Confidence-Building and Stakeholder Involvement
- VII. Socioeconomic Development and Benefit Sharing (see appendices).

This program was envisaged to “create an enabling environment for cooperative management and development ... through a limited but effective set of basin-wide activities and projects” (NBI, 2001).

Since 2001 the major preoccupation of the process has been the establishment of sound funding for this portfolio of projects and programs. To this end, the International Consortium on the Cooperative Development of the Nile (ICCON) was created and held its first meeting in Geneva (ICCON 1) in June 2001, at which it received pledges from donors of US\$120 million over a six to eight-year time frame. ICCON’s long-term aim as a partnership of riparian states and the international community is to promote joint funding, transparency, and more broadly to raise support for the NBI. One of the key process issues is the establishment of a multi-donor Nile Basin Trust Fund to provide “streamlined, cost-effective funding ... which would consolidate donor support and ensure the clarity and cohesiveness of the program” (NBI, 2000). Following Parliamentary approval of the NBI’s new international organization status under Ugandan law in September 2002, it was envisaged that the NTF would shortly come under the management of the Nile Basin Secretariat.

The NBI in 2003 – appropriately the International Year of Freshwater – is now at the stage of moving from the development of cooperation and the institutionalization of this process to the achievement of development through joint multilateral and bilateral projects. This is a crucial test for the whole initiative and the principles on which it is built. The credibility of the external facilitation process is also at stake. Proof of success will not, in the long term, reside in cooperative frameworks or even the absence of major international conflict; rather it will lie in the capacity of processes and institutions to translate cooperation into development, and development that achieves poverty reduction from the local level upwards. One of the major challenges to ensuring the sustainability of the NBI is in creating a process of institutional support at all levels, including civil society at regional, national, and local levels. The importance of this challenge has been emphasized within the Nile Basin Discourse Project

(undertaken since 2001) that attempts to facilitate dialogue about the NBI and to establish learning processes for institutions involved in Nile Basin-related activities be they environmental, socioeconomic, or cultural. In 2003 a formal Nile Basin Discourse Desk was established in Entebbe.

6. What is governance?

- Governance is about the processes by which decisions are made and implemented.
- It is the result of interactions, relationships and networks between the different sectors (government, public sector, private sector and civil society) involved in service delivery.
- It involves decisions, negotiation, and different power relations between stakeholders to determine who gets what, when and how.
- Governance includes more actors than just the government; many stakeholders are involved.
- All those with a legitimate interest in the outcome of a decision-making process could be involved; but who and how powerful they are will determine how they are able to influence the outcomes of any decision.
- Stakeholders include users, governmental organizations (such as municipalities), utilities, service providers, NGOs, financiers, and civil society.

6.1 What is River Basin Governance?

“River Basin Governance involves the coordinated use and management of land, water, vegetation and other natural resources on a catchment basis..... The Government seeks to balance resources utilization and resource conservation through the minimization of land and soil degradation and the maintenance of water yield and quality”.

(New South Wales Soil Conservation Service, 1986)

6.2 Integrated River Basin Management (IRBM)

IRBM is defined as an integrated and coordinated approach to the planning and management of natural resources of a river basin, and which encourages stakeholders to consider a wide array of social and environmental interconnections in catchments/ watersheds. Under the IRBM, the best management practices (BMP’S) are developed using affordability, appropriateness and equity criteria. However, there are some critical factors that may prevent effective river basin management. These are generally connected to institutional, organizational, economic and socio-culture. In order to deal with such critical factors, we need improved river basin governance mechanisms. This mechanism primarily consists of various local, cultural, political, administrative and institutional attributes. The efficiency of the good governance attributes depend on ground actions, plans of management, strategic natural resource of management policies, use of resource science, engineering and economic analysis of management

options, community participation, incentives and many different type of government and community-led initiatives.

6.3 Elements of river basin governance

- Policy development.
- Primary and secondary legislation.
- Regulation and monitoring.
- Planning.
- Decision-making.
- Control: monitoring, policing, enforcement and sanctioning.

6.4 What is good governance?

- Good governance involves constructive cooperation between the different sectors where the result is:
 1. Efficient use of resources,
 2. Responsible use of power, and
 3. Effective and sustainable service provision.
- Good governance emerges when stakeholders engage and participate with each other in an inclusive, transparent and accountable manner to accomplish better service provision that is free of corruption and abuse, and performed within the rule of law.

6.5 Principles of effective river basin governance

Transparency

- Transparency comprises all means to facilitate citizens' access to information and their understanding of decision-making mechanisms.
- Guaranteeing transparency, integrity and accountability in IRBM is fundamental to creating a peaceful and secure management structure for its implementation.

Accountability

- Good governance and sound institutions play a huge role to promote accountability. Accountability means an individual or institution must answer for their own actions. It requires that citizens, civil society organizations and the private sector are able to scrutinize actions taken and decisions made by leaders, public institutions and governments and hold them answerable for what they have, or have not, done.

Participation

- Participation implies that all stakeholders, including marginalized and resource poor groups, are meaningfully involved in deciding how water is used, protected, managed or allocated.
- IWRM can only be successful if all stakeholders can become meaningfully involved, including marginalized and resource-poor groups.
- Governments should support the participation of all stakeholders. Principles of effective IRBM governance
- Legislation needs to not only grant communities and other stakeholders a right to become involved in the RBMP process, but should also encourage their participation in statutory institutions through incentives and grant free access to information.

Access to justice

- Effective basin governance that promotes principles of IRBM should provide a framework where everybody has access to basin, which can be materialized through access to justice.
- In practical terms, this means that legal frameworks need to provide solutions that enable all users to demand their rights from duty bearers. This requires not only an effective legal framework, but also well functioning institutions.

Responsiveness

- Responsiveness refers to how well leaders and public organizations take the needs of citizens into account and is able to uphold their rights.
- A basin governance agenda addressing responsiveness could include the following components: human rights, anticorruption, integrity and regulatory equality.

6.6 Enablers for effective river basin governance

Effective governance of river basin resources and services requires broader and well-organized participation by civil society, including the media. Governments cannot solve these problems working alone. Working with civil society, which may include the local private sector, is essential.

To achieve more effective river basin governance it is necessary to create an enabling environment, which facilitates private and public sector initiatives that fit within the social, economic and cultural setting of the society. There is no single model for competent river basin governance. There are, however, some basic principles and desirable features that facilitate improved performance shown below.

6.7 An enabling environment for effective river basin governance is:

(A) Open and transparent:

- Institutions should work in an open manner;
- Use easy and understandable language to nurture trust and confidence of the public in the bureaucratic structures, which are inherent to river basin institutions;
- All policy decisions should be taken in a transparent manner so that both insiders and outsiders can easily follow the decision-making procedure.

(B) Inclusive and communicative:

- The quality, relevance and effectiveness of government policies depend on their ability to ensure wide participation throughout the policy chain, from planning to ongoing service delivery;
- Improved participation means better results and better governance.

(C) Coherent and integrative:

- Water governance should enhance the effectiveness of IRBM and decision-making should take place within an integrated framework;
- Dialogue is needed both horizontally between stakeholders at the same level (e.g. inter-sectoral collaboration), and vertically between stakeholders at community, district, basin and national levels;
- Political leadership and institutional responsibility at all levels are the basic ingredients of a consistent approach within a complex system.

(D) Equitable and ethical:

- Equity between and among the various interest groups, stakeholders, and consumer-voters should be assured throughout the process of policy development and implementation;
- It is essential that river basin governance has to be strongly based upon the ethical principles of the society in which it functions and based on the rule of law;
- Legal and regulatory frameworks should be fair and enforced impartially.

(E) Accountable:

- Decision-makers and service providers need to take responsibility for their decisions and services;
- Accountability is needed from all stakeholders involved in policy and decision-making processes;
- Decision-makers in government, the private sector and civil society organizations are accountable to the public, as well as to institutional stakeholders;

(F) Efficient:

- All types of efficiencies should be considered: economic, political, social, and environmental.

(G) Responsive:

- Responsiveness requires that policies are implemented in a proportionate manner and decisions are taken at the most appropriate level;
- It is important that policies should be incentive based to ensure a clear social or economic gain to be achieved by following the policy.

(H) Sustainability:

- The institutions should also be built considering long-term sustainability to serve both present and future users of water resources and water services.

7. Purpose of Restructuring the Institutional Framework of NGRBA

7.1 What is restructuring?

Restructuring refers to changes in “soft” management systems, or to the organizational and institutional dimensions of management systems. In simple terms, restructuring results in changes in who does what.

7.2 Why restructure?

a. Restructuring to improve performance

Many governments have reached the conclusion that significant changes to utility governance and structure are necessary to ensure the quality of service desired by users. Changes in incentive structures, management norms, and the relationship between the utility and the government are thought to be required. Accordingly, reforms in governance structures have been undertaken. Good governance is important for the effective performance of organizations, underpinning important functions such as: enforcing rules, and adapting rules as required; mediating conflict; building trust and legitimacy; and ensuring accountability. This, in turn, reduces risk. Improving governance can lead to more efficient and cost-effective service provision, service levels more attuned to users’ preferences, and increased responsiveness to changing conditions and public needs. When restructuring, particularly when creating standalone agencies and involving private companies, municipal governments must balance different aspects of good governance. For example, increasing managerial autonomy raises the question of how to maintain high levels of accountability and transparency.

b. Restructuring to source financing

In cases where governments are unwilling or unable to borrow to meet investment needs, restructuring may provide a way to source financing. Often, when finance is the key restructuring goal, private finance is a possible option, and municipal governments consider creating a stand-alone utility or delegating water supply to an independent operator who provides project financing. From the perspective of

governments, this strategy sometimes has the advantage of reducing apparent pressures on government budgets.

c. Restructuring to meet new legislative requirements

New legislative requirements may enable or even require restructuring of utility services. In many instances, legislation creates new options for restructuring; in some cases, restructuring is required by legislation. In many jurisdictions, legislation has been introduced recently that imposes new operational management requirements. In some instances, other restructuring processes (such as municipal amalgamation) may impose new legislative frameworks that drive utility restructuring.

8. Significance of Proposed NGRBMP

In the press note of 04 November 2008:-

“...there is a need to replace the current piecemeal efforts taken up in a fragmented manner in selected cities with an integrated approach that sees the river as an ecological entity and addresses issues of quantity in terms of water flows along with issues of (water) quality.”

Following in line of above, the proposed NGRBMP has the following attributes of significance:

- The composition of National Ganga River Basin Management Plan includes the Prime Minister as chairman, the Union Ministers and the Chief Ministers of states.
- NGRBMP has been created with a view to empower the community, who knows the ground reality of the river Ganga in terms of its resources, ecology and quality and quantity of the water flowing through it; and are directly affected through any changes or developments in the Ganga Basin Area.
- NGRBMP is powered by the expertise in the fields of river conservation, hydrology, environmental engineering, social mobilization and other fields and created in response to persistent demand from religious and spiritual leaders, civil society and academicians to accord a special status to river Ganga.

The river basin conservation is therefore an Integrated Ecological Approach rather than the Tradition Approach. The Traditional Approaches are essentially hydro- centric. They are single sector (water) oriented in which the river basin is viewed as a complex physical system- based on interrelationships between the hydrological and geomorphologic characteristics of the basin and its rivers and streams (Hooper, B, 2005).

On the contrary, the Integrated Ecological Approach views the river basin as an integrated ecological system which produces natural resources, products or amenities of direct or indirect human values and ecosystem services of fundamental worth. The principal objective of this approach is maintaining its overall resource productivity on a long-term, sustained-yield basis. The present structure of the NGRBA has been proposed based on the Integrated Ecological Approach, the first and foremost task of which is formulating the integrated river basin management (Hooper, B, 2005).

8.1 Governance Mechanisms in the Proposed NGRBMP

- **Use of a system approach**, in which attention is directed towards both natural and the human because both are affected directly or indirectly by the policy.
- **Use of a strategic approach**, in which attention is directed to key issues. It means that the issues are identified through consultation, disclosure with stakeholders, community, and government and with whom the issues are linked.
- **Use of a stakeholder approach**, in which the non government groups and citizens are able to participate in decisions making process about river basin resource management.
- **Use of PPP approach**, in which state governments, local governments, non-government organization (civil society, community, private partnership organization, NGO's) and individuals, each has a role, requiring common objective setting, definition of roles and responsibilities, and conflict resolution mechanisms.
- **Use of a balance approach**, in which the development and construction or projects are worked targeting the ecosystem protection, and satisfying social norms and values.

8.2 Utilities of Governance

- Extensive debate between society and government. Consensus private sector participation.
- There is adequate system of subsidies to ensure the need of the poor are satisfied.
- Assurance of reasonable rates and returns, transferring efficiency gains to the consumers.
- There is a regulatory body that is accountable for timely and adequate information to consumers and regulators.
- There is provision of opportunities for meaningful and related user's participation.
- The independent and capable regulatory bodies.
- Conflict-solving mechanisms that ensure to resolve social, environmental, ecological or economic adjudication conflict arise in the basin area.

8.3 The River Basin Management Characteristics

- Management goals are integrated rather than planning resource use and conservation from either single or multi-purpose reasons.
- Management planning is proactive rather than reactive resource: looking to identify the problems before they occur and being cautious in resource use.

- Management work in a co-operative work environment, rather than using confrontational and directive management.
- Management encourages commitment in staff rather than using command-and-control management.
- Management empowering the local and regional decision-making rather than centralizing decisions and directive staff.
- Management is based on a problem-solving rather than functionality.
- Management provides appropriate, relevant, and affordable projects and information to the effectors of the catchment area.

The modified structure of the NGRBMP being proposed here shall be having outlined different levels/stages as

A. Planning stage

- i. Define the problem/ scope the issues
- ii. Collate available knowledge
- iii. Identify the community objective
- iv. Identify the state government objective
- v. Negotiate specific objectives
- vi. Identify issues/knowledge gaps/ implementation issues
- vii. Device basic catchment plan
- viii. Identify resources
- ix. Develop more detailed plans
- x. Develop specific evaluation criteria and monitoring indices

B. Research stage

- i. Identify feasible solutions
- ii. Identify barriers to adoption of research
- iii. Identify basic physical and social research needs
- iv. Conduct basic research

v. Conduct collaborative action research

C. Implementation stage

i. Derive an implementation strategy

ii. Assign priorities & responsibilities for implementation

iii. Define available resources

iv. Allocate resources for priority activities

v. Conduct and coordinate implementation

vi. Design monitoring & evaluation

vii. Assign responsibilities and resources

viii. Conduct monitoring and evaluation

9. Outcome

During last one year (May, 2011 – April 2012), the PLG group at IIT Delhi has extensively reviewed the literature on River Basin Management and interacted in many meetings and workshops inviting the critical feedbacks from key stakeholders/NGO, Senior Executives and Managers related to water sectors.

Table 1 list out the gaps and shortcomings in the existing institutional and governance structure of NGRBA and GAP1 and describes as to how the proposed NGRBMP fulfils these deficiencies under different working regimes.

Table 1

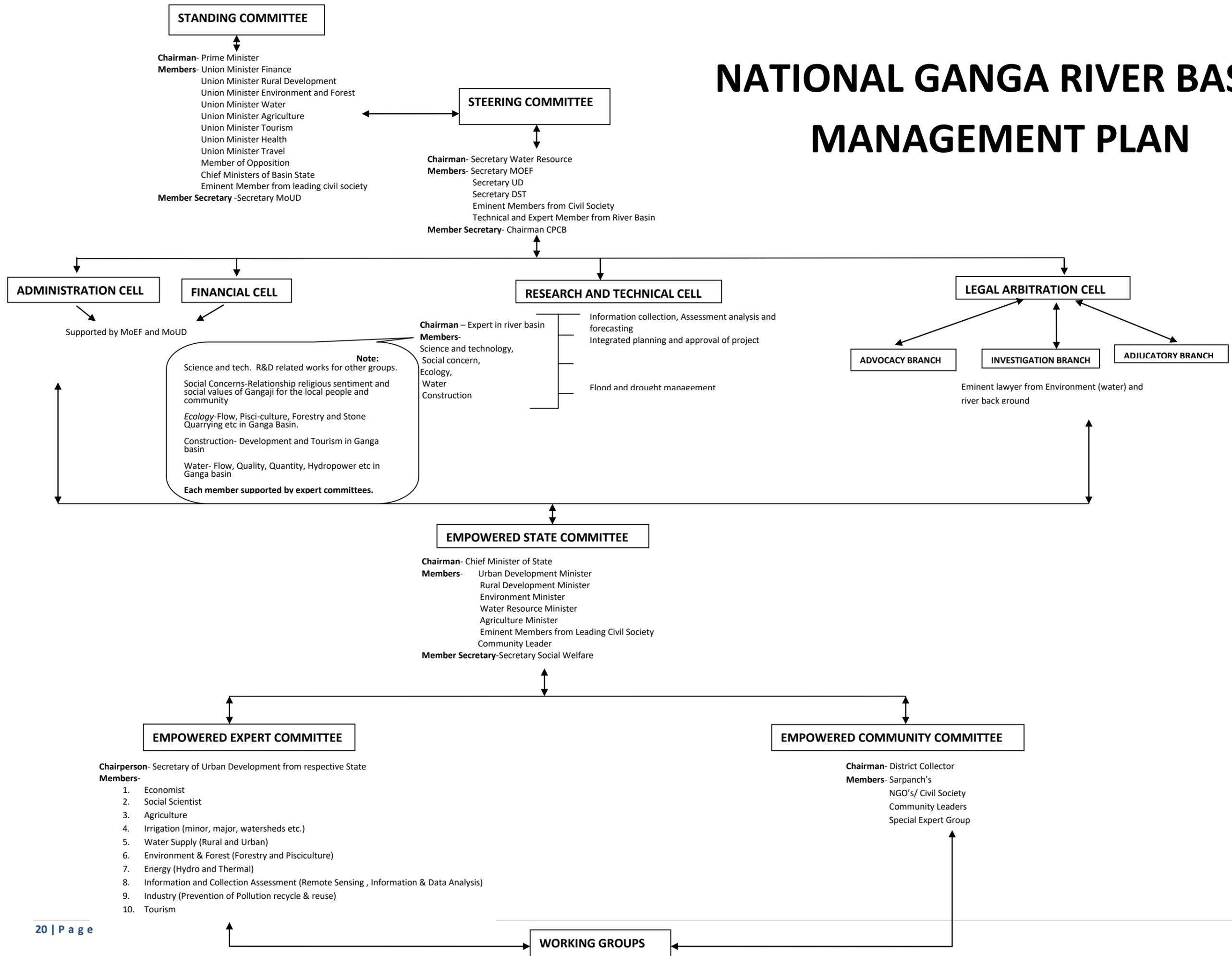
Characteristic and Approaches of Governance and Institutional Mechanism: NGRBA/GAP vs NGRBMP

Working Regime	Overview	NGRBMP	GAP-1, NGRBA
Purpose	Value sustainability, contributing to society through river management plan.	Integrated River Basin Approach, ensuring 'Aviral Dhara' and 'Nirmal Dhara'.	Hydro-centric, Based on traditional Approach.
Knowledge and Skills	Diverse Knowledge & skills, inter-disciplinary operation.	Knowledge and Skills to understand links between physical & social systems. <i>"Ability to Work Across Disciplines"</i>	Knowledge and Skills to ensure control and economic valuation.
Approach towards Relationships	Willing to engage with others, open minded, respectful of different perspectives.	Focus on genuine engagements & connection with others. <i>"Involved Upfront, Trusting and Respectful"</i>	Directive and Formal relationship.
Accountability & Transparency	Clear accountability mechanisms and information; Provision to facilitate stakeholder scrutiny and participation.	Accountability & Transparency facilitated by communicating and debating issues openly. <i>"Decision Making with Stakeholders"</i>	No such provision; Accountability & Transparency are only formal.
Continual Improvement	Experimental learning, evaluation & ongoing innovations.	Learning through experience and questioning current approach. <i>"Show and Demonstrate"</i>	Theoretical education and learning with formal evaluation.
Risk Management	Addressing risk associated with uncertainty.	Risk is shared and reduced through information and communication. <i>"Risk Communication"</i>	Risk is controlled; often underwritten by the Government.
Leadership	Clear & strong leadership to set the direction and engage other to participate.	Leadership through influencing, encouraging and supporting others. <i>"Influencing and Guiding"</i>	Formal leaders influenced by the Government; directing others.
Cooperation & Collaboration	Working together to achieve common goals.	Partnership considering member's needs including PPP. <i>"Interactive and Community Deliberation"</i>	Formal partnership involving the Government.
Infrastructure	Infrastructure is integrated; enabling to value river basin ecosystem and its health.	Decentralised infrastructure tailored for site requirements; enabling fit for purpose use. <i>"Site Specific"</i>	Large scale, centralised infrastructure.
Administrative arrangement	Distinct role and responsibilities; facilitate effective member interaction.	Facilitate cooperation for the community and local body; <i>"Working Closer Together"</i>	Centralised
Authority	Power should be shared; and strategic considerations be at the forefront of the political process.	Power decentralised; individual responsibility is emphasised. <i>"Empowering the Community Level"</i>	Power centralised with government; and enforced through <i>top-down</i> mechanisms.

10. The NGRBMP

Based on the above analysis, the PLG group of IIT Delhi has proposed the modified institutional and governance structure of the NGRBMP for further critical discussions and feedback which is appended with this report.

NATIONAL GANGA RIVER BASIN MANAGEMENT PLAN



After further discussion on the structure with Prof. Vinod Tare, Mr. Om Kareshwar, we modify the institutional governance structure and prepare a questionnaire to support or give verity to our proposed Structure.

After the 74th amendment of Constitution of India we are supposed to decentralize power as much as possible but in reality whether it is Centre or State; none is truly willing to adhere to the spirit of this much talked amendment.

In this existing NGRBA structure in Standing Committee instead of several Cabinet Ministers along with Prime Minister it should be proposed to have such a composition which to a great extent could reflect the political will of the Nation in respect of Ganga River Basin. It is most often observed that whenever there occurs such a high level non-party executive meeting where Prime Minister chairs; seldom any cabinet colleague dares to speak anything before him either because of courtesy or lacking of having any additional point. In such a case it is sheer wastage of valuable time of other Cabinet Ministers. The Prime Minister is the Head and Principal of its Council of Ministers. The Prime Minister seldom takes any decision on policy matter without the approval of its constituent ruling political parties and later on that political decision of those ruling parties are approved through formal CoM meeting. In such a good procedure in place; it is really useless to have such a structure where PM has to take decision again with his Cabinet colleagues, it's nothing but repetition and faulty decision making process.

Therefore it is suggested that this Standing Committee should be Chaired by Humble PM who is expected to come with requisite preparation i.e. has already done his homework and coordination with concerned ruling parties and Ministries in advance. The members should be the Leader of Opposition from Lok Sabha and Rajya Sabha. This would in true sense represent the Union of India at Centre. As the Ganga River Basin is spread and related to 11 Basin States it is highly desirable that this highest policy making body should have their representations as most of work and subject regarding any River Basin in India constitutionally vested with the basin States only. In a vibrant democracy it is widely recognized the need of civil societies and other eminent opinion makers to make a truly functional and participatory form of governance. Therefore the Chief Ministers of respective basin States should be the members along with the PM, Leader of Opposition (LS & RS) and eminent members of civil society through proper search and screening process. Then, this committee should have the top-most bureau crate i.e. Cabinet Secretary as Member Secretary. The Chairman of the Steering committee being in charge of implementation and execution should be invited member just to be the witness of Political Will and Concern. Thus whatsoever policy decision is taken by this highest body, it would be the mandate of the entire executives to make the policy working on ground level. This highest body should not have any executive role like sanctioning or authorizing or interfering with other decision making after setting the tone and tenor of the policy i.e. this body would not sit on the decision whether this or that project should be given green signal or not. No political interference at all.

After having a policy line in hand there comes the need of Steering Committee that should have full time Chairman having excellent track record and ranking similar to Cabinet Secretary/Chief Election Commissioner. The Secretaries of concerned and related Ministries e.g. UD, RD, DST, MoEF and others should be the member along with eminent members of civil society. This Chairman would work as Chief-Executive. Under the chairman there should have state of art secretariat. This secretariat should house separate and autonomous Administrative, Financial and Legal wing along with a centralized resource centre which may even be called as 'GANGA KNOWLEDGE CENTRE'. This GKC would have large base of empanelled experts of various related fields, e-library and other knowledge resources. The Legal wing would have Advocacy, Investigation and Adjudication cell independent but interlinked with each other.

Similar to the Central Standing Committee each Basin State should have their own Standing Committee comprising of Chief Minister as Chairperson along with Leader of Opposition of Vidhan Sabha and Parishad, eminent members of civil society and Chief-Secretary of the respective State as Member-Secretary and the Chairman of State Steering Committee as invited member.

Likewise there should be State Steering Committee comprising full time Chairman having rank and position of Chief-Secretary along with Secretaries of concerned Departments/Ministries, eminent members of civil society, From here there would be different approach i.e. from here onward, once the State Political Will is made clear and the Steering Committee has prima-facie decided to implement it, it would arrange the resources by coordinating with Central Secretariat under the Chairmanship of Steering Committee. Once the plan, DPR and all technical work is finished by Central Secretariat Resources in complete sync with local body, the State Steering Committee in coordination with Central Secretariat would facilitate the local body to implement the work efficiently.

It is envisaged that ultimately the decision should come from the community; work should be performed by the local bodies only. Neither the Centre nor the State shall be allowed or permitted to vitiate the spirit of 74th amendment. Both the governments' role would be confined to financing and facilitating through empowering the community and local bodies.

There shall not be misuse of any resources at any level therefore it is proposed for centralized state-of-art secretariat with GKC. This would pool the resources whether it's financial or human or time.

NATIONAL GANGA RIVER BASIN MANAGEMENT PLAN

STANDING COMMITTEE
Topmost Political Authority

STEERING COMMITTEE



- Chairman-Members-**
- Prime Minister
 - Leader of Opposition (Lok Sabha)
 - Leader of Opposition (Rajya Sabha)
 - Union Minister of Finance
 - Chief Ministers of 11 Basin States
 - Chief Justice of India
 - Eminent Members from Civil society through Search Committee
 - Vice-Chairman, Planning Commission
 - Chairman, Steering Committee
- Member Secretary -** Cabinet Secretary

- Chairman-** Full time Executive upto 70 years of age through search and screening committee (I.A.S. senior than Secretary-eligible for either Cabinet Secretary/Election Commissioner)
- Members-**
- Secretary, Finance
 - Secretary, Urban Development
 - Secretary, Rural Development
 - Secretary, Environment and Forest
 - Secretary, Water
 - Secretary, Agriculture
 - Secretary, Tourism
 - Secretary, Culture
 - Secretary, Science and Technology
 - Secretary, Commerce and Industry
 - Secretary, Social Justice and Empowerment
 - Secretary, Panchayat Raj
 - Secretary, Health
 - Secretary, Power
 - Secretary, Energy
 - Secretary, Renewal Energy
 - Eminent Members from Civil Society
 - Technical and Expert Members from River Basin
- Member Secretary-** Secretary DST

ADMINISTRATION CELL

FINANCIAL CELL

GANGA KNOWLEDGE CENTRE

LEGAL ARBITRATION CELL

Advocacy Branch

Investigation Branch

Adjudicatory Branch

Supported by MoEF AND MoUD

Eminent lawyer from Environment (water) and river background

EMPOWERED STATE STANDING COMMITTEE

EMPOWERED STATE STEERING COMMITTEE

EMPOWERED COMMUNITY COMMITTEE

- Chairman-Members-**
- Chief Minister of State
 - Leader of Opposition (Vidhan Sabha)
 - Leader of Opposition (Vidhan Parishad)
 - Eminent members of civil society
 - Chairman State Steering Committee
- Member Secretary-** Chief-Secretary

- Chairman-Members-**
- Full time Executive
 - Urban Development Minister
 - Rural Development Minister
 - Environment Minister
 - Water Resource Minister
 - Agriculture Minister
 - Eminent Members from Leading Civil Society
 - Community Leader
 - Leader of Opposition
- Member Secretary-** Secretary Social Welfare

- Chairman-Members-**
- District Collector
 - Sarpanch's
 - NGO's/ Civil Society
 - Community Leaders
 - Special Exert Groups

QUESTIONNER ON GAZETTE

1. Effective abatement of pollution?
2. Conservation of river Ganga?
3. River basin approach?
4. Comprehensive planning and management?
5. Maintain minimum ecological flows?
6. Why only river Ganga, why not the entire Ganga river basin tributaries?
7. How the ecological flows related to water quality & environmental sustainable development?
8. Sub-section (1) and (3) of section 3 of the environment protection act –study.
9. Process to amendment the Gazette notification specifically Composition of Authority.
10. Section 4 of the Gazette notification gives power to take all such major & discharge functions as it deems necessary for effective abatement of pollution in conservation of river Ganga in keeping with the sustainable development, then why not the existing NGRBA has taken / till date? What majors & which function NGRBA has taken for effective abatement of pollution? Or conservation of river Ganga?
11. Don't you think that ongoing & proposed hydro electricity generation plan is against the conservation of river Ganga?
12. Whether there are any mechanism developed to supervise/ securitizes the projects ongoing into Ganga river basin mandatory requirement under NGRBA or not?
13. Section 4 to(a) is description about river basin management plan & regulation of activities , where as the present NGRBA authority has changed the river basin management plan into RBEMP. Why it is so, what is the legal authority behind it? How it has been changed. (IIT's where earlier asked to prepare GRBMP & latter on being changed to GRBEMP, what is the rationale behind it?
14. Aimed- to maintain water quality? Prevention? Control? An abatement of pollution.
15. Other major relevant to river ecology & management in the Ganga basin state.
16. As per section 4 (2) (b) minimum ecological flow is needed or mandatory. With the aim of ensuring water development. In their respect what majors have been taken the authority till date?
17. As per section 4 (2) (c) what are measures steps necessary for planning , financing & execution for abatement of pollution & environmentally sustainable river conservation have taken till date?
18. Presently what is the source of finance?
19. What is the present status of World Bank finance support to NGRBA?
20. Why do we need money from World Bank?
21. Has NGRBA look for alternative financial arrangement like creating PPP or let polluters pay or let stakeholders or the community collective responsibility or private utility?
22. Section 4 (2) (f) why not SPV is created till date?
23. What are the steps have been taken till date by NGRBA to fulfill its function & use its power as per section 4?
24. As per section 4 (2) (i) is there any directions issued under section 5 of this act?

25. What are the experiences of working of this Act with other central or state Act? Like is there any conflict or overlapping effect?
26. As per section 5 what are the regulations, rules are been created to regulate its own procedure for transacting its business including its meetings?
27. As per section 7 what are the mechanism have been involved? if not, why not involved till date for monitor of effective abatement of pollution & conservation of river Ganga & whether any direction under section 5 have been issued ?
28. As per section 7 , what would be or edge difference between monitoring by NGRBA & other agencies like CPCB,SPCB, CGWB and other similar monitoring body's?
29. As per section 8, how much corpus have been allotted to the authority the central government & what is the present financial status / details like expenditure on various needs?
30. As per section 9 MoEF is nodal ministry would it happen better if other ministry like MoUD or MoWR would happen the nodal ministry? Or authority should have been created as a constitution authority?
31. As per section 10, how many states have created SGRCA, till date? What are their achievements till date? How much money has been spent till date?
32. As per section 11, Integrated Basin Management plan phase is used and, whereas at other place Environment Management Plan, which is being asked to prepare by IIT'S &it some places GRBMP. What are the differences among these& what steps for comprehensive management of the river have been taken by the respective basin states?

11. References

1. Tyagi, P (2010), "Institutional Development for National Ganga River Basin Authority".
2. Alternate Hydro Energy Centre (2010), "Guidelines for preparation of project report under NRCP and NRGB", IIT Roorkee.
3. Dixit, P, Narayanan, N C, Wagle, S, Tare, V (2011), "SWOT Analysis of Ganga Action Plan", Report code 006_GBP_IIT_GEN_ANL_01_Ver 1.
4. Kathpalia, G N, Kapoor, R (2006), "Charting a New Course" Pub. Dhruva Narayan for Alternative Futures and Daanish Books.
5. Rogers, P and Alan W Hall (2008), "Effective Water Governance", Paper No. 7, pub.Elanders, Sweden.
6. 2009 "The Basin Plan" a concept statement pub. Murray Darling Basin Authority.
7. Hooper, B (2005), "Integrated River Basin Governance", pub.IWA.
8. www.elsevier.com
9. CPCB (2010) "Summer Average Values for Water Quality on Main Stem of River Ganga under Ganga Action Plan", Central Pollution Control Board, Government of India, published online.
10. Jaiswal, R., "Ganga Action Plan –A Critical Analysis", Eco Friends, Kanpur, 2007, available at [http://www.ecofriends.org/main/eGanga/images/critical analysis of GPA.pdf](http://www.ecofriends.org/main/eGanga/images/critical%20analysis%20of%20GPA.pdf), accessed July 03, 2010.
11. MoEF (2011) "Status of Programs Under GAP-II as on 30-12-2009, Ministry of Environments and Forests, Government of India, available at [http://moef.nic.in/modules/recentinitiatives/ NGRBA/progress.htm](http://moef.nic.in/modules/recentinitiatives/NGRBA/progress.htm)
12. NRCD (2009) "The Status Paper on Ganga Action Plan", National River Conservation
13. Directorate, Ministry of Environments and Forests, Government of India, available at [http://ahec.org.in/Status paper on River Ganga 2009.pdf](http://ahec.org.in/Status%20paper%20on%20River%20Ganga%202009.pdf)
14. River Conservation Directorate, Ministry of Environment and Forests, Government of India.
15. <http://www.ecofriends.org/>, <http://www.moef.nic.in>, <http://kn.fcm.ca>, <http://www.powi.ca>,
16. www.watergovernance.org, www.waterintegritynetwork.net, www.riverbasingovernance.com.

Assessment of Public Consultation Process for Environmental Clearance of Hydropower Projects in Upper Ganga Segment

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin Environment Management Plan (GRBMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin Management Plan (GRBMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRBMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report is given on the reverse side.

Dr Vinod Tare
Professor and Coordinator
Development of GRBMP
IIT Kanpur

The Team

- G N Kathpalia gnkathpalia@gmail.com
- Indrajit Dube, IIT Kharagpur indrajit@rgsoipl.iitkgp.ernet.in
- Mukesh Khare, IIT Delhi mukeshk@civil.iitd.ac.in
- N C Narayanan, IIT Bombay ncn@iitb.ac.in
- Paritosh Tyagi, Former Chairman, CPCB paritoshtyagi@gmail.com
- Shyam Asolekar, IIT Bombay asolekar@iitb.ac.in
- Subodh Wagle subodhwagle@gmail.com
- Uday Shankar uday@rgsoipl.iitkgp.ernet.in
- Vinod Tare vinod@iitk.ac.in

Lead Persons

- N C Narayanan, IIT Bombay
- Kalyan R Tanksale, IIT Bombay

Contents

S No		Page No.
1	Preamble	1
2	Introduction	1
3	Rationale for Preparing Report	1
4	Objectives	2
5	Methodology	2
6	Comparative Analysis of Provisions of PC Process between EIA Notification of 1994 and 2006	4
7	Analysis of Public Consultation Process	8
7.1	Objectives and Role of the Actors Involved in Public Consultation	8
7.2	Ministry of Environment and Forest (MoEF)	9
7.3	State Pollution Control Board (SPCB)	9
7.4	Project Developer	9
7.5	Project Affected People (PAPs)	10
7.6	Local Governance (Gram Panchayat)	10
7.7	Public Hearing Panel	11
7.8	Environmental Groups (Activists/Protest group)	11
8	Lacunae in Existing PC Process and Practice	11
8.1	Dissemination of Information	11
8.2	Provision of Knowledge Inputs	12
9	Timing and Venue of Public Hearing	13
10	Time of Public Consultation Process	14
11	Incorporation of Peoples' Concerns in the Final Decision	14
12	Recommendations	15
13	Concluding Observations	17

List of Abbreviations

DPR	:	Detail Project Report
EAC	:	Environmental Appraisal Committee
EC	:	Environmental Clearance
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
HPPs	:	Hydro Power Projects
IA	:	Impact Assessment Division
MoEF	:	Ministry of Environment and Forest
MW	:	Mega Watt
NTPC	:	National Thermal Power Corporation
PAPs	:	Project Affected People
PC	:	Public Consultation
PLG	:	Policy, Laws and Governance
PRIs	:	Panchayat Raj Institutions
SPCB	:	State Pollution Control Board
UEPPCB	:	The Uttarakhand Environment Protection and Pollution Control Board

1. Preamble

This report analyzes the Public Hearing and Consultation (PC) process which is mandatory for hydropower projects (HPPs) to ensure transparency, accountability and participation in the environmental clearance process. PC is an important vehicle in democratic environmental decision making by developing an arena where the views and suggestions of public are incorporated. Eight case studies of HPPs sampled for rivers Bhagirathi and Alaknanda were undertaken to understand the issues in PC. There is no claim of representativeness of these samples since it is only a miniscule proportion of the HPPs in the region. However, the in-depth case studies illustrated issues in the microcosm, which is indicative of the macro issues. This report especially brings out Civil Society Organisations' (CSOs) perspective, which if considered appropriately may expedite the process of development while protecting the environment and equitable utilization of natural resources.

2. Introduction

Uttarakhand Government with the support of Central Government sanctioned various small, medium and large Hydropower Projects (HPPs) on rivers Bhagirathi, Alaknanda and their tributaries. River Ganga, plays a significant role in the lives of people living on her banks economically, socially, historically, politically, culturally and spiritually thereby making them natural stakeholders in the schemes leading to alterations in natural settings of river Ganga. Public participation is an important vehicle in democratic environmental decision making by developing an arena where the views and suggestions of public are incorporated. The environmental clearance process of projects is one aspect of its application where elements like accountability, transparency, inclusivity and fairness can be brought in.

The Environmental Impact Assessment Notification-2006 issued by Government of India prescribes the stage of 'public consultation' mandatory in the environmental clearance process in hydropower projects. This report analyzes the Public Consultation (PC) process for environmental clearance of hydropower projects in Upper Ganga Basin to identify the violations and/or inadequacies. The report is based on the one month long extensive field visits that covered the *Garhwal* Region of Uttarakhand (in the districts *Haridwar, Deharadoon, Chamoli, Uttarkashi, Pauri Garhwal, Tehri Garhwal and Rudraprayag*). Eight case studies of hydropower projects sampled for rivers Bhagirathi and Alaknanda were undertaken to understand the issues in public consultation.

3. Rationale for Preparing Report

According to EIA notification, 2006 the 'Public Consultation' stage is mandatory to get clearance for bringing in transparency, accountability and participation regarding the decision making of HPPs. This report mainly focuses on public consultation process to find the gap between what needs to be done and what is being done. It also attempts to identify

the gap between the legislative procedures and the practices in the environmental clearance process.

4. Objectives

1. To review the provisions for PC process as per the EIA notification of 2006.
2. To assess the process of PC for environmental clearance of HPPs in upper Ganga basin through case studies.
3. To draw implications for improving the PC process for HPPs in India.

5. Methodology

To understand the provisions for public consultation and the process, a review of latest EIA notification was done. A detailed comparative review of notifications (1994 and 2006) is presented. Eight case studies were conducted to understand the issues on the ground considering the difficulties in generalizing the projects, which are of different scales (small and large). The sampling criteria and samples are given as follows:

1. River Basin : Alaknanda and Bhagirathi
2. Size of the Projects: Small, medium or large
3. Provisions applicable to the project: Notification of 1994 or 2006
4. The project developer: Government, Public Sector Company or Private Company
5. Stage of construction and status of clearance: Completed and in operation; PC done and project under construction, PC is done but either EC decision is pending or decision has been taken but the construction work is yet to start.

Figure 1 illustrates the statutory provisions for PC and concepts of participation based on available information. Among eleven attributes identified, the first one and last eight were used for understanding inadequacies in the existing notification and for identifying lacunas in its implementation whereas conclusions are based on attribute nine to eleven. There is no claim of representativeness of these samples since it is only a miniscule proportion of the HPPs in the region. The in-depth case studies, to a large extent, illustrate the issues in the microcosm, which is indicative of the macro issues. However, the insights are triangulated with a range of knowledgeable stake holders who are well aware of the issues at hand in the region.

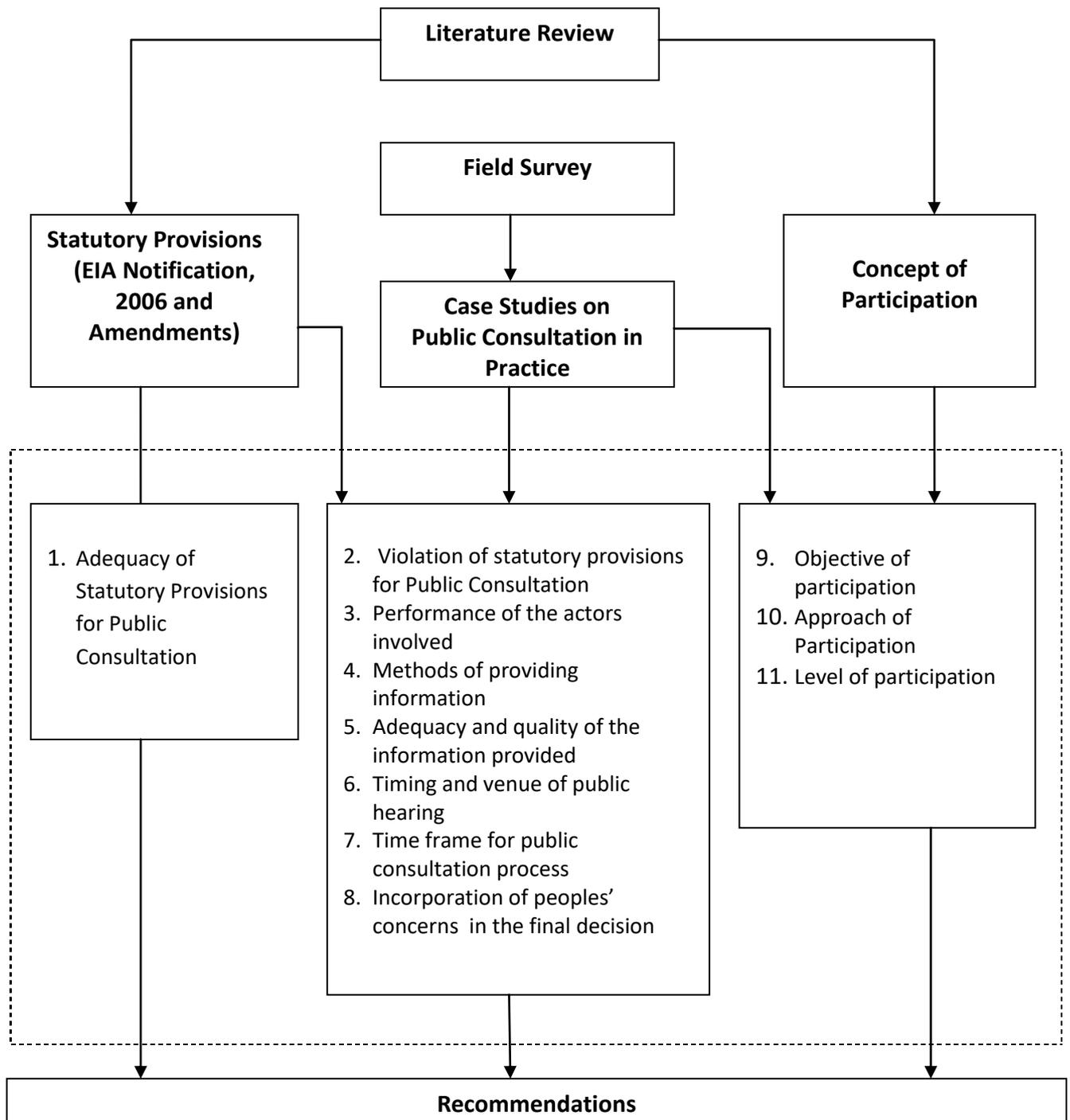


Figure1: Framework for analysis of the statutory provisions for public consultation and concepts of participation in according Environmental Clearance to Hydropower Projects in Ganga Basin

Table 1: Details of the cases selected for the study

Name of the Project		Capacity (MW)	Developer	Status*
Alaknanda Basin	Kotli Bhel 1B	320	NHPC	Under Construction
	Vishnugad Pipalkoti	444	THDC	Under Construction
	Vishnu-Prayag	400	JP Associates	In Operation
	Devsari	252	SJVNL	Under Construction
Bhagirathi Basin	Maneri Bhali -2	304	ULVNL	In Operation
	Phalenda	22.5	Swasti PEL	In Operation
	Singoli Bhatwari	99	L&T Power	Under Construction
	Phata Beyung	25	Lanco	Under Construction

6. Comparative Analysis of Provisions of PC Process between EIA Notification of 1994 and 2006

While the provision of Public Hearing was originally introduced in the 1994 notification with a view of strengthening it, prima facie some of these provisions appear to have been diluted in the latest notification of 2006. This section analyses certain important provisions in the EIA notifications to identify its lacunae and gaps and dilutions made therein over a period. The implementation of these will be taken up in detail and illustrated through the observations in the case studies in the next section.

Table 1: Comparison of Provisions for PC as in 1994 and 2006 EIA Notifications

Attributes of the Comparison	Provisions in 1994 Notification	Provisions in 2006 Notification
Applicability of the provisions	Public Hearing mandatory (<i>Schedule 4</i>) for all projects listed in Schedule I of the notification for hydropower projects of all capacities.	Projects having installed capacity less than 50 MW and for which, as suggested by SEIAA, EIA studies are excluded from PC provisions (<i>Para 3, i (C)</i>) If project site is extending beyond a state/district, PC should be undertaken in each of the State/district. (<i>Schedule 4, Point 2.1</i>)
Government Agencies to undertake PC	SPCB was given the responsibility to inform people about meeting, facilitate the meeting and forward proceedings to the EAC. (<i>Schedule 4, Para 2</i>) EAC, after considering the concerns expressed by people as reflected in proceedings of the meeting and final EIA report prepared by developer, was to make recommendations for EC. (<i>Clause 2.III.c</i>)	District Magistrate (DM) is responsible to steer the meeting being a panel member. The change in date, time and venue and postponement of meeting only on her/his recommendations. (<i>Schedule 4, Point 4.1</i>) DM is supposed to sign the proceedings of the meeting on the same day. (<i>Schedule 4, Point 6.4</i>)

Table continued to next page... ..

... .. Table continued from previous page

Attributes of the Comparison	Provisions in 1994 Notification'	Provisions in 2006 Notification
Participants	<ol style="list-style-type: none"> 1. Any person who is likely to be affected by grant of EC 2. Bonafide residents 3. Environmental Group 4. Any person who owns or has control over the project 5. SPCB, MoEF officials (<i>Schedule 4, Para 2, point 2</i>) 	<p>Only</p> <ol style="list-style-type: none"> 1. Affected People 2. Government Officials and 3. Concerned Government Officials <p>Can attend the meeting. Other interested people can raise their objections, suggestions in writing to the SPCB (<i>Clause 7 (III) 1, EIA Notification 2006</i>)</p>
Methods of intimating people about the meeting	<p>SPCB issues a notice in at least two newspapers widely circulated in the region around project, one of which shall be in local vernacular language (<i>Schedule 4, Para 2, Point 1</i>)</p>	<p>In addition to the provision of informing people through newspaper notice, following government agencies are supposed to widely publicize about the meeting in their jurisdictions</p> <ol style="list-style-type: none"> 1. District Magistrate 2. Zila Parishad and Municipal Corporation 3. District Industries office 4. Concerned regional office of the MoEF (<i>Schedule 4, Point 2.3</i>) <p>SPCB is supposed to use innovative ways of informing people like for example using village level drummers to make announcements or posters, pamphlets etc. (<i>Point 3.2, amendment of 2009, S.O.195</i>)</p>
Documents to be made available	<ol style="list-style-type: none"> 1. Executive Summary of Draft EIA report in local language 2. Environmental Impact Assessment report (<i>Schedule 4, Para 1, Point 1</i>) 	<p>Same documents are to be provided with a change that confidential information including non-disclosable or legally privileged information involving intellectual property right shall not be made available (<i>Clause 7.III.VI</i>)</p>
Availability of the documents	<p>The aforementioned documents are to be made available at following places:</p> <ol style="list-style-type: none"> 1. District Magistrate 2. Zila Parishad and Municipal Corporation /local body 3. District Industries office 4. Concerned regional office of the MoEF 5. Head office of SPCB 6. Concerned departments of the state government (<i>Schedule 4, Para 4</i>) 	<p>In addition to the places designated by the earlier notification MoEF is also supposed to promptly display the summary of draft EIA report on website and to make available full draft EIA report available for reference at notified places in Delhi. (<i>Schedule 4, point 2.3</i>)</p>
Timing and venue of the Public Hearings	<p>To be decided by SPCB and should be informed to the people through notices published in newspapers (<i>Schedule 4, Para 2, Point 1</i>)</p>	<p>Specified that SPCB should intimate people about the time and venue of the meeting within 7 days from the date of receipt of the draft report. And People to be provided with minimum of 30 days period for furnishing their responses. (<i>Schedule 4, Point 3.1</i>)</p>

Table continued to next page... ..

... .. Table continued from previous page

Attributes of the Comparison	Provisions in 1994 Notification'	Provisions in 2006 Notification
Composition of the Panel	<ol style="list-style-type: none"> 1. Representatives of SPCB 2. District Collector or the nominee 3. Representative of state government dealing with the subject 4. Representative of department of the state government dealing with environment 5. Not more than three representatives of the local bodies such as municipalities or Panchayats 6. Not more than three senior citizens of the area nominated by DM <p><i>(Schedule 4, Para 3)</i></p>	<ol style="list-style-type: none"> 1. District Magistrate or his representative not below the rank of Additional District Magistrate 2. Representative of SPCB <p><i>(Schedule 4, Point 4.1)</i></p>
Methods for facilitating the PC	No provision	<ol style="list-style-type: none"> 1. No quorum required for attendance for starting the proceedings<i>(Schedule 4, point 6.2)</i> 2. A representative of developer should initiate the discussion with a presentation on project and EIA <i>(Schedule 4, point 6.3)</i> 3. Attendance of all those who are present should be noted and annexed to the final proceedings. <i>(Schedule 4, point 6.1)</i>
Methods for developer to respond to the peoples' concerns	No provisions	Makes it mandatory for developer to address, after completion of the public consultation, the material environmental concerns expressed during the meeting and make appropriate changes in the draft EIA-EMP report. <i>(Clause 7.III.VII)</i>
Methods to ensure transparency	No provisions	Videography, photography of the entire process to be made <i>(Schedule 4, point 5.1)</i> A statement of the issues raised by the public and the comments of the applicant should be prepared in the local language and English and annexed to the proceedings. <i>(Schedule 4, point 6.5)</i>
Methods to ensure transparency	No provisions	The proceedings of the public hearing should be conspicuously displayed at <ol style="list-style-type: none"> 1. Office of the panchayats concerned 2. Office of the concerned Zila Parishad and DM 3. Office of the SPCB <p><i>(Schedule 4, Point 6.6)</i> SPCB should also display those on their website and objections if any raised should be communicated to the MoEF directly. <i>(Schedule 4, Point 6.6)</i></p>
Time frame for the PC	60 Days <i>(Schedule 4, Para 5)</i>	45 Days

Table continued to next page... ..

... .. Table continued from previous page

Attributes of the Comparison	Provisions in 1994 Notification'	Provisions in 2006 Notification
Consideration of people's concerns	EAC should consider the proceedings of public consultation while recommending for an EC. (Clause 2.III.c)	Every person present at the venue shall be granted the opportunity to seek information or clarifications from the Developer. (Schedule 4, Point 6.4) The summary of the public hearing proceedings accurately reflecting all the views and concerns expressed should be recorded by the representative of the SPCB and read over to the audience at the end of the proceedings explaining the contents in vernacular language. (Schedule 4, point 6.4) A Statement of the issues raised by the public and the comments of the Developer should also be prepared in the local language and in English and annexed to the proceedings. (Schedule 4, point 6.5)
Peoples' participation in conducting EIA studies and preparing EMPs	No provision	No Provision
Provisions to make people able to challenge the final EC decision	No provision	No Provision

The following are the key general issues and observations from Table 1. The dilutions are mostly in the latest notification compared to the earlier one. Violations in the PC process are discussed in the next section through the observations from the case studies.

1. Public consultation is applicable to all Category 'A' and Category B1 hydropower projects. This is contested by many civil society activists since there is possibility that small scale projects which do not fall under these categories can also bring in huge environmental damage.
2. The 'interested people' (e.g. informed activists) other than project affected people (PAPs) are moved away from the public hearing meeting. Their involvement is changed from 'oral' and 'direct' mode to 'written' and 'indirect' mode of communication. This has seriously deterred the efficacy of the process, especially since the feedback process is weak. The inclusivity demanded by clause 7. III and exclusivity found in definition given here in the same clause (7.III.1) of the 2006 notification are thus contradictory. The term "material concerns" suggested has to be defined properly.
3. For a meaningful participation in public hearing, information about the project is needed. However, the notification suggests, "confidential information including non-

disclosable or legally privileged information involving Intellectual Property Right, source specified in the application shall not be placed on the web site (Clause 7 (III) 6, EIA Notification 1994)". It is not clear what is confidential and disclosable information since nothing is available in the website regarding the projects.

4. About the District Magistrate (DM) being responsible for steering the meeting: DM has the advantage of knowing the local context and interests. The disadvantages are that: (i) DM might not be in a position to deal with the local political interests; (ii) DM might not be able to spare quality time with other duties.
5. In the initial notification, SPCB was given the responsibility to decide the venue of the public hearing meeting and inform people and developers about it. The venue of the hearing in the 2006 notification is statutorily to be *"the project site or a place in its close proximity"*. This provision acts more in favor of the developer, the implications of which are discussed in the next section.
6. In Paragraph 6.2 of Appendix IV, there is no quorum needed to start the proceedings of the PC. This is an evasive provision, the need for which might have come because of the non-participation of people either due to lack of information or lack of faith in the process. The process has to be strengthened to ensure widest possible participation as prescribed in point 1, Annexure IV of 2006 notification.
7. The time frame from intimation about the process to forwarding the proceedings to EAC is reduced from 60 to 45 days, which reduces time available for people to understand the nuances of the EIA report and mould informed opinions.

The following are the observations from this section: There are contradictions in provision even within the same clause (example: provision for inclusivity); ambiguity of certain sections on applicability regarding and dilution of provisions between the old and new notification; inadequate information sharing and feedback process and doubts about the use of discretionary provisions like deciding the need for PC. These issues and others will be clarified and illustrated in the analysis of case studies in the next section.

7. Analysis of Public Consultation Process

This section closely examines the implementation issues of the public consultation process on the ground. It combines the perspectives of key stakeholders and the insights from case studies.

7.1 Objectives and Role of the Actors Involved in Public Consultation

An arena of actors ranging from MoEF to informal activists' groups and from developers to people concerned of the project is involved in the process of PC. Each one of these, from their respective perspectives, is playing a crucial role in the process. Based on their perspectives and interests there are differential perceptions about the objectives and

outcomes of the PC process. The following section attempts an indicative mapping of these from the case studies. Though generalization of the findings will be far-fetched, it definitely points to the issues at hand in the PC process.

7.2 Ministry of Environment and Forest (MoEF)

MoEF is an umbrella agency to implement the provisions for environmental clearance and PC is an important element of it. It has laid down provisions and has described the procedure for public hearing through EIA notifications. The 'Impact Assessment (IA) Division' has been given responsibility of implementing provisions of public consultation as a part of the EC process. IA relies on the state pollution control boards for conducting public hearing meeting of people affected by and concerned about projects and inviting concerns and suggestions from other interests groups.

7.3 State Pollution Control Board (SPCB)

SPCB is responsible for convening the PC process. After receiving an application from the developer to invite a public hearing, SPCB is supposed to i) publish a newspaper advertisement intimating concerned people about the date, venue and time of the public hearing (PC) meeting; ii) receive necessary documents from the developers and make those available for reference at various government offices as prescribed in the notification; iii) conduct public hearing meeting as a panelist and iv) forward proceedings of the meeting to EAC. The Uttarakhand Environment Protection and Pollution Control Board (UEPPCB), the concerned SPCB, informed that in the absence of required infrastructure, human and financial resources they often find it difficult to discharge their duties (For example, SPCB has to spent from their own budget the costs of publishing notification, logistics a sum of rupees fifty thousand to one lakh per public hearing meeting). Although constrained with resources, SPCB manages the logistics of inviting and conducting PC meetings, as informed by the villagers visited. Some of the objections raised by them were not included in the proceedings that were forwarded to the EAC and even vested interests were allowed to modify and supply names of fictitious people (For example in the case of third public hearing of Devsari project). Hence, the minutes of the public hearing and recommendations by panels do not always reflect the actual proceedings.

7.4 Project Developer

The project developer, while applying to SPCB for inviting a public hearing meeting, submits a set of documents about the project as input essential for informed and active participation. The developer also arranges the venue of the meeting and allied logistics. During public hearing the developer is supposed to inform the participants about the project, its possible impacts on environment and resulting livelihood issues and propose a plan for minimizing and mitigating these impacts. Since the developer is a party in the debate they are not supposed to sit on the public hearing panel. However, developers often violate this statutory norm and also try to influence public opinion by elegantly hosting PCs and circulating pamphlets claiming the positive outcomes of the project to the people. They

seek to control the meeting by putting barricades, bringing large number of police and use muscle power to control and constrain people. Once the representatives of the people expressed their concerns and suggestions, developers are supposed to incorporate those in the final EIA-EMP and send it to EAC for decision regarding clearance or otherwise of the project.

7.5 Project Affected People (PAPs)

The role of project affected people is very important in two ways: i) they are the one who will have to bear the costs of possible loss of their local natural environment directly; ii) they are the local custodian of the natural resources for generations and have the indigenous knowledge about these. The notice about the public hearing meeting is announced through a small advertisement published in a newspaper in local language and a national daily. The PAPs are supposed to proactively read the notice and attend the meeting at a venue in proximity of project, which might be far away from the habitation areas. This is a common observation across the cases studied that people (particularly women) found it difficult to attend the meeting by travelling to far away project sites. During the meeting they should only raise their concerns about the possible impacts of the project. In many of the cases studied, it was found that the people are aware of the project activities and unfortunate experiences of people affected from different projects in the state. Hence, they are less willing to believe in the developers' promises (See Section 3.6). As reported by one of the informed activists, since it is not mandatory for EAC to give speaking justifications of their recommendations, people believe that once the public hearing is done it is less likely that the concerned authorities would adhere to the provisions for considering their perspectives while giving the clearance. Therefore, as learned from the case of Kotli Bhel 1B, Devsari and Vishnugad Pipalkoti, people boycotted the meeting creating conflict situation.

7.6 Local Governance (Gram Panchayat)

The EIA notification at present does not prescribe any role for the Panchayat Raj Institutions (PRIs) and thus have ignored the potential of local formal and informal institutions. The *Gramsabhas*, *Womens' Gramsabhas* and the traditional practices of disseminating information in villages are useful instruments for participation. The communities generally seem to have great respect for and faith in the *Grampradhan*, who plays a crucial role in mobilizing villagers and dealing with developers. There are cases like Kotli Bhel 1B, Vishnugad Pipalkoti and Devsari where the *Grampradhans* of affected villages played important roles in encouraging their community to participate in the PC process and representing community to express their concerns during PC meeting. On the other hand, there are also some cases like Vishnuprayag and ManeriBhali II where the *Grampradhan* were influenced and manipulated by the project developer by taking their consent for the project in an uninformed way.

7.7 Public Hearing Panel

A representative of SPCB, who is allocated work of recording minutes of meeting, and the district magistrate who chairs the panel could sit on the panel. However, in almost every case studied it is evident that many people including but not limited to developers, local elected representatives, government officials sit on the panel. District Magistrate (who often does not come for the meeting sending a representative as per the directives of the notification), being accountable to the elected representative like MLA cannot make them to comply statutory provisions. The panel is expected to ensure that public hearing meeting is done in the prescribed manner and to control the situations leading to violation and disputes. Neither DM nor SPCB officer is expected to ensure whether the developer is furnishing correct information and adequately responding to people's concerns. There is no provision for an independent authority and or a person with expertise in the hydropower projects to be in the panel and facilitate the discussion. Moreover, the EIA consultant employed for conducting the surveys and preparing the EIA report must also be present in the public hearing so that the questions raised can be replied and suggestions incorporated.

7.8 Environmental Groups (Activists/Protest group)

Environmental and social activists and leaders of protest groups have done substantive activism fighting for the environmental, social and cultural concerns of local people. These groups showed their participation in the public consultation process overwhelmingly by commenting on EIA reports, by sending letters to authorities regarding violations of environmental laws and human rights. There are innumerable examples in all the case studies where they continuously mobilized, facilitated and encouraged the PAPs to raise their voices by educating them and by unveiling the facts about the positive and negative impacts of the hydropower projects. A two-day workshop on 'how to conduct an EIA' was organized for villagers in Chamoli district which was facilitated by the Hazard Centre in Delhi is a good example of contribution from environmentalist groups and activists to build capacities of the villagers to conduct and understand EIAs.

8. Lacunae in Existing PC Process and Practice

Existing processes of i) disseminating information regarding the PC meeting; ii) acquainting them with adequate knowledge by providing necessary documents; iii) conducting meaningful public hearing meeting and incorporating people's views in final EIA report, and; iv) considering people's concerns in final clearance decision has several challenges to overcome. Following sections discuss these challenges as understood from on field interactions with various stakeholders.

8.1 Dissemination of Information

Even though the provisions of providing necessary information about PC through newspaper publication of the public notice is followed, it was found inadequate. The Gujarat High Court passed an important judgment pertaining to the advertisement for public hearing in EC

process which brought two major elements; i) the newspapers should have a wide circulation, and ii) the public notice must be sent to the concerned Gram Panchayat. However, while investigating the newspaper cuttings of public notices, it was found that the size and font of the advertisement are not encouraging enough to be read, the notice is published once in a while and only in selected regions. Importantly, the people in remote villages of Uttarakhand rarely read newspapers and even if they get chance to read, may skip the advertisement, resulting in manipulated participation or non-participation.

The EIA Notification, 2006 prescribes various places where the documents providing knowledge essential for meaningful participation can be accessed. However, the case studies revealed that in the absence of a responsible authority for ensuring that the documents are made available, they are either not available or could only be accessed during office hours making it tedious work. For example in case of Kotli Bhel 1 B, only the date, venue and time of public hearing were intimated through newspaper notice but it had not mentioned about the place where from people could access the relevant documents. As per the amendment of 2009 to EIA notification the SPCB should use innovative ways like beating the drum in villages (in addition to this they can also practice public meetings, advertisement on radio and television, announcements through loudspeakers, display of illustrative materials such as pamphlets, maps, models, etc.). However, as informed by an UEPPCB officer, they could not implement this provision because of lack of resources.

8.2 Provision of Knowledge Inputs

For a meaningful participation, stakeholders must be acquainted with adequate and credible knowledge on possible effects on environment and livelihoods. This includes design of the projects, its various construction activities (like tunneling, blasting for road construction) and their possible impacts. The developer is supposed to undertake a detailed EIA study through independent consultants. However, the design and content of these studies are inadequate (See Report: 008_GBP_IIT_PLG_ANL_02_Ver 1_Dec 2011). For instance, in case of Bhilangana, the consultant had neglected all affected areas arguing that there are no residents around the project and for this reason is blacklisted by the World Bank. Similarly in the case of Kotli Bhel 1B, the consultant employed for EIA was a Professor from a local University who had employed students (of different discipline) to undertake surveys for EIA studies, which, as informed by the villagers, resulted in inadequate and incredible information. And in case of Devsari hydropower project, only 5 out of the affected 26 villages were taken for survey.

Some of the developers (like in case of Devsari Hydropower project, Kotli Bhel 1B and Vishnugad Pipalkoti) claim to have established 'information centers' with a view of helping people to access outputs of EIA studies and clarify their doubts. However, case studies revealed that in the absence of a facilitator with required competence to interact with people, these centers could achieve only limited success. For example, in the case of Devsari hydropower project, as found in the field visit, 100-125 villagers from 26 villages had visited

the information centre being far away from their places and having less confidence about receiving credible and adequate information. In order to overcome these lacunae and inadequacies three kinds of demystification has to be done. These are discussed as follows:

1. *Demystifying the complex, technical language: EIA reports and other documents that are to be provided to the villagers are being presented in highly sophisticated and technical manner making it difficult to communicate to a diverse and often formally illiterate population. Although, developers make summary of EIA reports available in local language, a twenty five page summary might not adequately communicate the findings. In some cases (Bhilangana Hydropower project for example) these reports were kept secret. There is a debate about whether the detailed project report (DPR), which the developer and EIA notification claims to be an intellectual property, be made available in public domain. While asked about this provision, an officer from National Thermal Power Corporation (NTPC) informed that people do not have required competence to understand technical designs of the project given in DPR; it is less useful for them and even a summary of DPR adequately gives the essence of the report.*
2. *Provision of knowledge in local Language: Since the summary of EIA reports is prepared in English, villagers cannot understand it. Therefore it is mandatory for developers to provide summary of EIA reports in local language. However, violation of this provision is evident in some cases like Bhilangana and Vishnuprayag hydropower projects. Secondly, the summaries are not written in Hindi but translated from original documents in English. Translations are done literally and it makes document burdensome. In some of the cases, like Kotli Bhel 1B, Vishnugad Pipalkoti and Devsari, developers instead of providing summary of EIA notification had circulated a pamphlet describing only the positive impacts of the project and its benefits to the villagers, which is not expected. However, there is no statutory provision to avoid such unintended practices.*
3. *Inclusion of indigenous knowledge: Conduct of EIA and preparation of EMP can and should engage local people so as to incorporate their indigenous knowledge, experience and perspectives in environmental management. At present there are no such provisions and practices for encouraging this.*

9. Timing and Venue of Public Hearing

The place where public hearing is conducted has a significant role in the process as it determines the extent of public participation and the question of who controls the process. In some cases like Kotli Bhel 1B and Devsari, the venue for public hearing was very far from many of the affected villages discouraging them (particularly women, elderly people and poorer sections of the community) from attending the meeting by spending money on traveling. Similarly, the season of the year is also a crucial element. If conducted during the rainy season, on the eve of local/national festivals and peak agricultural seasons, it results in low public participation. None of the cases revealed that the date and time were finalized after consulting with the local people. Statutorily the venue of the hearing is to be *“the*

project site or a place in its close proximity". This provision acts more in favor of the developer and sometimes allows them to influence the process by 'hosting' the event.

10. Time of Public Consultation Process

The statutory provision of 30 days' time to complete public hearing process is insufficient for villagers and other interest groups to access documents made available at different places to understand the nuances of the project, submit written comments on EIA reports and raising concerns during public hearings due to the inherent limitations of the mechanism. Every project is supposed to undertake only one public hearing per district which, according to the civil society activists and villagers visited, is done just with an aim of completing the requirement for getting the clearance. On the contrary, it may require more than one public hearing based on the administrative jurisdictions, population, nature and significance of the concerned issues. In most of the cases, many people informed that they were neither given enough time to speak in public hearing nor for discussions and even opinions of the entire participants who were willing to talk were not recorded. PC is supposed to be done before the developer prepares the final EIA report and applies for the environment clearance. However, the developers procure the land; start constructing office buildings and approach roads simultaneously with the conduct of EIA. Once these investments are made, developers argue against relocating the project. Thus, for making participation meaningful, facilitating participation in the initial phase of the project is a must.

11. Incorporation of Peoples' Concerns in the Final Decision

The case studies revealed that people's concerns have been disregarded and neglected in the environmental decision making process. Developers, violating the statutory norms did not respond satisfactorily during meetings and people's concerns were inadequately incorporated in the final proceedings. Also, it is not mandatory for EAC to give speaking justifications to the people in order to inform them how their concerns and suggestions are considered while recommending for the clearance. This is mainly because of (i) gaps (including dilutions) in existing notification, (ii) violation of provisions, and (iii) absence of the feedback mechanism to ensure meaningful communication between people and the decision makers. There are cases (for example: Vishnuprayag, Maneri Bhali-II, Devsari and Bhilangana) where people's concerns were inadequately considered while making clearance decision, and adverse impacts on local environment and livelihoods is evident and people are suffering. Some cases (for example: Bhilangana and Maneri Bhali II) pointed out that the developers did not adhere to their promises, especially after inflating people's expectations that led to unintended consequences like agitation.

12. Recommendations

The report related to Environmental Clearance Process (008_GBP_IIT_PLG_ANL_02_Ver 1_June 2011) suggests alternative provisions and procedures for the environmental clearance, especially a serious re-vamp of the PC process in the long run. Understanding the pressing need for addressing inadequacies and serious lacunae in the process, some tentative recommendations for immediate intervention are suggested below:

1. The public consultation process must be mandatory even for the hydropower projects having a capacity of less than 25 MW because they also cause significant environmental and social impacts.
2. If the public consultation process could not be completed because of people's protest or other reasons; it must not be postponed and should again be conducted by the same agency. MoEF may exercise their statutory powers to appoint other (independent) public agencies also to undertake public hearing meetings.
3. All concerned people through their respective *Gramsabhas* should be intimated formally about the date, venue and timing of the meeting. The implementing authority should ensure provisions for widespread diffusion of information suggested in the new notification to ensure adequate and informed participation. The timing and venue of the meeting for public hearing must be finalized after consultation with the respective *Gramsabhas* and *Mahila (Women's) Gramsabhas* to ensure their convenience.
4. Knowledge is an essential requirement for a meaningful participation. People must be provided with adequate and credible knowledge in simple local language. It is better that this task is assigned to an independent body to make sure that all the information; especially the negative impacts are not omitted from the document. The good practice of establishing information centers, which seems not working satisfactorily at present, could be extended to village level activities like illustration/presentation/discussion on EIA reports for facilitating people's learning of complex concepts.
5. District Magistrate, who is accountable to the local elected representatives in the state assembly, sometimes cannot resist attempts by these representatives to sit on the panel and influence the process. Hence, the public hearing panel must be chaired by a competent judicial authority not below the rank of the District Judge with two other members including the DM and a person of social eminence and credibility among a wide range of stakeholders hailing from different, preferably a distant district. It should also be ensured that all the concerns expressed by stakeholders are incorporated in the proceedings of the meeting and adequately addressed in the final EIA report.
6. The public hearing panel should be finalized well in advance and should meet a day before the meeting and ensure that the transparency related provisions in the notification are adhered to.
7. In order to ensure meaningful participation, the concerned agencies should streamline

the process to ensure active and informed participation, which then needs removing of counterproductive provisions in the notification such as “no quorum of attendance is required to start a public hearing meeting”. Adequate time should be given to the interested people to learn the EIA-EMP reports and express their concerns and suggestions to ensure meaningful consultation since they are supposed to convey their concerns and suggestions through written communication, instead of directly attending the public hearing meeting. Knowing the limitations of the written communication, EAC may invite interested stakeholders for more interactive sessions like public proceedings.

8. The following necessary provisions are to be included in the notification: (i) to provide final EIA-EMP reports in simple local language, incorporating views of the people expressed during public hearing and through written communication to the EAC, (ii) to ensure that the EAC would respond formally to the concerns and suggestions communicated; (iii) to inform people about how their suggestions and concerns are considered while making clearance decisions; and (iv) to allow people to raise objections if their concerns are not incorporated adequately and appropriately in final EIA-EMP report and challenge EAC decisions in the absence of it.
9. Experience of many projects that were studied pointed that the provisions in the EIA notification were not adhered to. Hence, it should be made mandatory for concerned implementing authority to compile a report on compliance and send it to the Secretary, MoEF. The Secretary, MoEF will be responsible for ensuring preparation and timely submission of such compliance reports (in a prescribed format) and its dissemination to local people through the offices of DM and DJ, and also through the MoEF websites.
10. The following is the summary of suggestions for strengthening the EC process: (i) the date, venue and time of PC to be decided after consulting with people; (ii) ways of disseminating knowledge about project activities and their impacts by incorporating indigenous knowledge and perspectives; (iii) appoint more credible people having wider acceptance from various stakeholders in the PC panel. In addition to District Magistrate, a District Judge and a person having social imminence and from different district preferably a distant one is preferable; (iv) implementation of transparency related provisions by making it mandatory for the PC panel to be constituted a day before the meeting and oversee all such provisions; (v) implementation of statutory provisions for making preparation and submission of a report on compliance mandatory for SPCB; (vi) by suggesting that the Secretary, MoEF should be responsible for such compliances; (vii) before the final EC decision, EAC should inform people about how their concerns and suggestions are incorporated in the EC recommendations; and (viii) by making necessary provision to strengthen each of the stakeholder’s right to challenge the EAC decision.

13. Concluding Observations

Public participation in environmental decision making is essential to bring in transparency and accountability in the EC process and ensure the incorporation of local perspectives. Though the State has made attempts to make the EIA-EC practice more transparent and accountable to reach out to affected people and other interest groups, the efforts have been limited to “hearing” and “consultation”. The cases studied revealed that the public participation in PC process has been limited and needs fundamental restructuring. Strengthening the EC process would help expedite the project clearance and smoother implementation to avoid financial and other losses due to social conflicts and in turn to make the process more transparent and accountable.

Mapping of Policy Instruments and Governance Agencies *for Environmental Clearance of Hydropower Projects in Upper Ganga Segment*

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin Management Plan (GRBMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin Management Plan (GRBMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRBMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report are given on the reverse side.

Dr Vinod Tare
Professor and Coordinator
Development of GRBMP
IIT Kanpur

The Team

- | | |
|--|---|
| 1. G N Kathpalia | gnkathpalia@gmail.com |
| 2. Indrajit Dube, IIT Kharagpur | indrajit@rgsoipl.iitkgp.ernet.in |
| 3. Mukesh Khare, IIT Delhi | mukeshk@civil.iitd.ac.in |
| 4. N C Narayanan, IIT Bombay | ncn@iitb.ac.in |
| 5. Paritosh Tyagi, Former Chairman, CPCB | paritoshtyagi@gmail.com |
| 6. Shyam Asolekar, IIT Bombay | asolekar@iitb.ac.in |
| 7. Subodh Wagle | subodhwagle@gmail.com,subodh@prayaspune.org |
| 8. Uday Shankar | uday@rgsoipl.iitkgp.ernet.in |
| 9. Vinod Tare | vinod@iitk.ac.in |

Lead Persons

1. N C Narayanan, IIT Bombay
2. Kalyan R Tanksale, IIT Bombay

Acknowledgement

The lead persons of this report wish to express their sincere gratitude to the following individuals for extending help and cooperation in preparation of this report.

- Dr. Ravi Chopra, Member, NGRBA and Director, Peoples Science Institute, Deharadoon
- Dr. Paritosh Tyagi, Chirman, Accreditation (Technical) Committee of NABET
- Dr. Kathpalia GN, Senior Irrigation Engineer and Planner
- Dr. Ms. Nalini Bhatt, Advisor, Ministry of Environment and Forests, GOI
- Prof. Vinod Tare, Professor, Environmental Engineering and Management, IIT Kanpur
- Mr. Rajiv Sinha, Director-NRCD, Ministry of Environment and Forest, GOI
- Dr. Ms. Sanchita Jindal, Director, Impact Assessment Division (River Valley Projects), Ministry of Environment and Forests, Government of India
- Dr. Shekhar Singh, Formerly Chairperson of an EAC and Professor from Indian Institute of Public Administration
- Dr. Bharat Jhunjhunwala, Economist and formerly Professor of Indian Institute of Management, Bangalore
- Shri. Himanshu Thakkar, Director, South Asian Network for Dams, Rivers and People (SANDRAP), Delhi
- Dr. A.K. Singh, Chief Engineer, National Thermal Power Corporation, Delhi
- Shri, PPS Man, General Manager, Vishnugad Pipalkoti Hydropower Project of THDC.
- Ms. Sona Thakur, Project Officer, World Bank
- Ms. Sushila Bhandari, (for hydropower projects at Phata Beyung and Singoli Bhatwari)
- Shri Gangadhar Nautiyal, Based at town Rudraprayag (on hydropower projects at Phata Beyung and Singoli Bhatwari)
- Shri Lakshman Negi, Director, *Janaadesh*, Joshimath
- Shri Piyush Dogra, Environmental Expert-Asia, World Bank
- Shri Vimal Bhai, Convener, *Matu Jan Sanghatan*

In addition to these a large number of villagers in the periphery of the project sites visited have helped us understand the issues from their perspective. We wish to convey our sincere thanks to all of them.

List of Abbreviations

BMC	:	Billion Cubic Meter
CAT	:	Catchment Area Treatment
CEA	:	Central Electricity Authority
CIA	:	Cumulative Impact Assessment
CPSU	:	Central Public Service Utilities
CPCB	:	Central Pollution Control Board
CSOs	:	Civil Society Organizations
DoE	:	Department of Environment
DPR	:	Detail Project Report
EAC	:	Environmental Appraisal Committee
EC	:	Environmental Clearance
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EPA	:	Environment Protection Act
GAs	:	Governing Agencies
GoI	:	Government of India
GWh	:	Giga Watt hour
HPPs	:	Hydro Power Projects
HQ	:	Head Quarter
IA	:	Impact Assessment Division
IPPs	:	Independent Private Parties
MoEF	:	Ministry of Environment and Forest
MoP	:	Ministry of Power
MW	:	Mega Watt
NBWL	:	National Board for Wild Life
NCEPC	:	National Committee on Environmental Planning and Co-ordination (India)
NGO	:	Non Governmental Organization
NGRBA	:	National Ganga River Basin Authority
P&G	:	Policy and Governance
PIs	:	Policy Instruments
PLG	:	Policy, Laws and Governance
PPM	:	Post Project Monitoring
PSI	:	Peoples Science Institute
ROs	:	Regional Offices
SANDRAP	:	South Asian Network for Dams, Rivers and People
SEAC	:	State Environmental Appraisal Committee
SEIAA	:	State Environmental Impact Assessment Authority
SPCB	:	State Pollution Control Board
SROs	:	State Regional Offices
THDC	:	Tehri Hydro Development Corporation
ToR	:	Term of References
UGR	:	Upper Ganga Region
UJVNL	:	Uttarakhand Jal Vidyut Nigam Limited
UTPCB	:	Union Territory Pollution Control Board
WHO	:	World Health Organizations

Contents

S No		Page No.
1	Introduction	1
1.1	Objectives	2
1.2	The Policy and Governance Perspective	2
1.3	Methodology	3
2	Rationale for Hydropower Projects in Upper Ganga	3
2.1	The River Ganga and its Significance	3
2.2	Rationale for Hydropower Development	4
2.3	Hydropower Development in Upper Ganga Segment (UGS)	4
2.4	Environmental and Social Impacts of Hydropower Development in UGS	5
2.4.1	Drying of Rivers and Change in Natural River Flow Regime	5
2.4.2	Crowding of Environmental Perturbations and Cumulative Impacts	6
2.4.3	Seismicity and Possibility of Earthquake Disasters	6
2.4.4	Loss of Livelihoods of Local Communities	6
2.4.5	Loss of Aesthetic Value of Ganga	6
3	Review of Existing Governance Framework	6
3.1	Policy Instruments (PIs) for EIA-EC	6
3.1.1	Principles Forming Philosophy of PIs for EIA-EMP	7
3.1.2	Associated Laws	7
3.1.3	EIA Notifications	7
4	Mapping of Government Agencies for EIA-EC	7
4.1	Ministry of Environment and Forests (MoEF)	8
4.2	Impact Assessment Division (IA)	8
4.3	Central Pollution Control Board (CPCB)	8
4.4	State DoE and SPCB	8
4.5	MoEF Regional Offices (ROs)	10
5	Environmental Clearance Procedure	10
6	Collation of Challenges and Opportunities	12
6.1	Purpose of EIA inadequately understood	12
6.2	Developer Appoint and Pay the Consultant	12
6.3	No Standards for Designing and Conducting EIAs	13
6.4	EIA Studies as Conducted presently are Inappropriate	13
6.4.1	Identified Geographical Boundary for EIA Studies	13
6.4.2	The notion of E-Flows and Climate Change is not Considered	13
6.4.3	EIA are done simultaneously with Construction Activities	13
6.4.4	Methodologies to conduct EIA are Poorly Prescribed	14
6.4.5	Content of the Present EIA Studies is Inadequate	14
6.4.6	Project Specific EIAs are Inadequate	14
6.4.7	Alternatives for Proposed Plant are not Assessed	14
6.5	EMPs are Inadequate to Serve the Purpose	15

Contents

S No		Page No.
6.6	Inappropriate Public Consultation	15
6.6.1	Public Hearings are done in an uninformed Manner	15
6.6.2	Violation of Provisions to Restrict Participation to Tokenism only	15
6.6.3	Public Hearing Meetings are controlled by Vested Interests	15
6.6.4	Its only "Hearing" and "Consultation"	16
6.7	Lack of Competency, Transparency, Accountability and Participation	16
6.7.1	Lack of Independent Structure	16
6.7.2	EACs need Technical Capacity	16
6.7.3	Lack of Required Competency and Legitimacy	16
6.7.4	Need for Conceptual and Methodological Framework for Decision Making	16
6.7.5	Violation of Provisions for Transparency under the EIA Notifications	17
6.7.6	Non Compliance of the Post Clearance Activities	17
6.7.7	Lack of Capacity for Post Clearance Monitoring	17
7	Tentative Recommendations	17
8	Concluding Observations	18
	References	19
	Annexure I: List of Various Laws Relevant to the EIA- ECs (SJVNL, 2010)	21
	Annexure II: List of Key Respondents	23

1. Introduction

Electricity demand forecasts, which seek to meet the demands of projected economic growth rates and the growing population, underlines accelerated need for massive additions in the existing installed capacity for power generation in the country (Planning Commission, 2011). For instance, the 2021-22 electricity demand forecasts the need for 1, 94,508 GWh requiring an installed capacity of 2, 98, 253 MW (MoP, 2011; Prayas, 2004). The reliance on fossil fuel is increasingly questioned with the climate challenge due to emissions. Hydropower, having known to be from the family of renewable alternatives is considered as a “green” source of power. Himalayan region, which is rich in glaciers and forms the headwaters of the major perennial rivers of the country like Indus, Brahmaputra and Ganga, is the water tower of the country that has immense potential of hydropower generation (Agarwal *et al.*, 2010). Given the need for power generation and availability of the flowing water resources, the nation in 1991, has already opened up the power generation sector for the private sector investors (MoP, 2011). As a result, a huge number of hydropower projects are either planned or under construction in the major river systems of the country (Agarwal *et al.*, 2010; Planning Commission, 2007), of which the Ganga is of special significance.

Close to half of Indian population stays in the Ganga basin which constitutes about one fourth of the country's total geographical areas. The river Ganga is of special significance because of the cultural-religious values attached and livelihood dependence of millions of people. Ganga carries huge amount of waters all over the year and provides the head differences ideal for generating electricity at several places, which attracts energy planners, private and public sector developers that results in a number of hydropower project proposals. The debate involves country's power demand, scope for State to harness it for commercial use and the plausible threats to the local environment and livelihoods. The need for hydropower and thus dams is well articulated, known and widely accepted by the State, developers and other sections of the society. However, social and environmental consequences of such dams demand a balance between the economic activities like dam construction and associated environmental and social externalities. Environmental Impact Assessment (EIA) - a globally accepted environmental management tool (Muttamara, 1996) is believed to be able to serve as an instrument to seek an expected balance between economic growth and environmental protection.

While Environmental Clearance is an essential requirement for some scheduled categories of interventions, there are several issues in its design and implementation. Hydropower development as an activity, involves many stakeholders ranging from the state to the people and from commercial developers to the environmentalists and their differential, often with contradictory perspectives and interests. EIA and EC, for the state, is a management tool that can show a pathway to achieve developmental goals without compromising environmental protection objective, for developers it is an essential procedural requirement for the project construction to start and for environmental activists and project affected people that would be affected by the project, it is the only way to

safeguard their interests. This misalignment of goals and expectations from the EIA-EC process is leading to violations of rules and laws, bringing out the limitations of the existing institutional framework, procedures and implementation. These symptoms of the core problem point to the gaps inherent to the statutory provisions in the Policy Instruments (PIs), and in the competency and legitimacy of Governing Agencies (GAs).

An EIA is supposed to provide conceptual framework and methodology to undertake a detailed appraisal of the base line information of the concerned ecosystems and development projects that are to be introduced in these ecosystems, predict possible negative impacts of such an intervention and explore mitigation measures to minimize the impacts. In 1994, Government of India (GoI), made it mandatory for a range of projects including hydropower projects that demands conduct of EIA studies and prepare an Environmental Management Plan (EMP) and laid down a governance procedure called as “Environmental Clearance (EC)” (MoEF,1994). This was replaced by a new notification in 2006 (MoEF, 2006). Although, there are several issues and challenges associated with its existing framework, EIA has been seen as a hope for the better. Civil Society Organizations (CSOs) and activists have grievances about the existing PIs and performance of GAs for environmental clearance.

1.1. Objectives

This report has twin objectives: (1) to systematically map the institutional structure (PIs and GAs) for environmental governance in India and (2) to bring out the critical perspectives of this from the civil society angle. This is consciously done since the perspectives from the State and Developers on the need for hydropower dams is well known. This report is preceded by another report (007_IIT_GRB_PLG_ANL_Ver 1 Dec 2011) on one aspect i.e. public consultation- to bring in transparency, accountability and participation of the EC process.

1.2. The Policy and Governance Perspective

The problem of effective implementation of provisions for the EIA-EC of hydropower projects has been aggravating because of the number of stakeholders, their differing and contradictory expectations from the EIA-EC and inadequacy of necessary competence and legitimacy of the Government Agencies. Since the introduction of legislations and building capacity of the concerned agencies to implement those 3 core issues, a progressive restructuring of the EC governance has been made by addressing the gaps in the Policy Instruments, and also making the Governance of EIA-EC more Transparent, Accountable and Participatory.

According to the ‘Policy and Governance’ perspective, the problems in performance of government agencies lie in the problems in the process of governance and the lacuna in the policy instruments for governance. As a result, until these root-causes or the core malady in governance is addressed, the other measures (such as financial inputs, technical solutions, management fixes, institutional innovations) can hardly improve the situation. A preliminary

analysis of the EIA legislations from the perspective of 'Policy and Governance' indicates that the main problem with the design and implementation of these legislations is that the measures to improve these legislations essentially focused on the symptoms, while leaving the core malady intact. Therefore, the P&G perspective requires that a thorough analysis of situation is conducted with an appropriate framework to identify: (a) problems with the policy instruments for environmental protection, and (b) the problems in the process of governance, especially issues of implementation of the PIs.

1.3. Methodology

In order to identify the actual instances of lacunas in the policy instruments, in the performance of the government agencies and the misalignments in Norms and Interests, diverse methods could be employed. To map the institutional structure, the study is restricted to a review of policy documents and existing body of academic knowledge on these issues. To distil the critical perspectives on the EC process, a range of stakeholders ranging from government officials, NGO workers, social activists and local people were interviewed in the Upper Ganga Basin. A list of respondents is given in Appendix 1.

2. Rationale for Hydropower Projects in Upper Ganga

A brief review of significance of river Ganga, hydropower development on Ganga and consequences of this development is presented as follows.

2.1. The River Ganga and its Significance

The 2,510 km long river Ganga originating from the *Gangotri* in the Himalayas in the state of Uttarakhand drains through one million square kilometers before emptying in the Bay of Bengal (NGRBA, 2011). The river is of special significance to the nation because of the:

- a) **Ecosystem Services and Livelihood Values:** The total catchment of the river Ganga, which is one of the largest Indian Rivers, constitutes 26% of the country's total landmass and supports rich biological diversity including 43% of Indian population (NGRBA, 2011).
- b) **Cultural and Religious Values:** Apart from the biological services and livelihoods of the people, Ganga is considered 'holy' and worshiped by Hindus and thus have great cultural and sentimental values attached to it.
- c) **Hydropower and Irrigation Potential:** Surface water resources of the Ganga has been assessed to be 225 Billion Cubic Meter (BMC). On an average each sq km stretch of Ganga, which flows over high 'head' differences, receives one million cubic meter of water through rain fall. 50 percent of this is available as surface runoff (NGRBA, 2011), making an ideal scenario for irrigation and hydropower development.

2.2. Rationale for Hydropower Development

The arguments for hydropower development in the country are as follows:

- a) **Urgent Need for Addition to the Installed Capacity for Power Generation:** Electricity demand in the country has increased forty folds since independence because of the increasing population and for ensuring higher economic growth. The long term demand forecast for the country is 1, 94,508 GWh for 2021-22. To meet this demand the country will have to have an installed capacity of 2, 98, 253 MW (MoP, 2011; Prayas, 2004).
- b) **Shift from Government Owned and Fossil Fuel Based Power Generation:** The distribution of present installed capacity (as per the means of generation and as per administrative sectors) is given in Figure 2 a) and b) respectively. The maximum installed capacity is owned by government and heavily consumes fossil fuels. In order to meet the forecasted energy demands in an environmentally sustainable manner government has recognized hydropower generation as a clean energy option and private sector is encouraged.

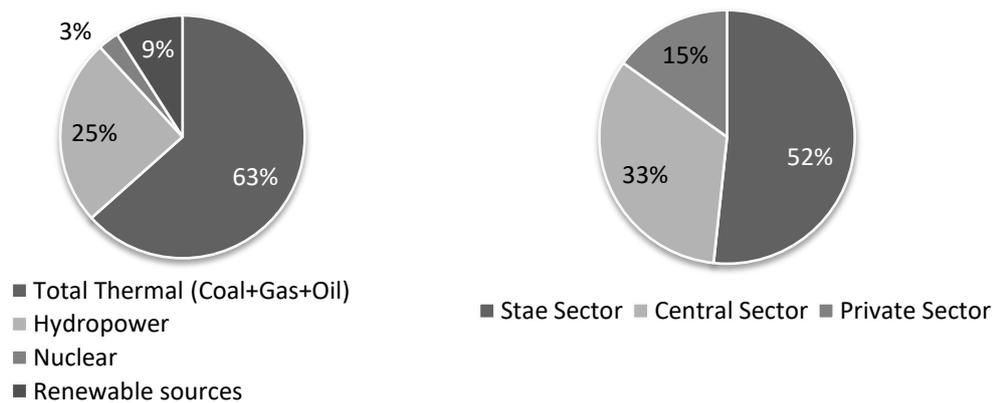


Figure 1 a) and b): Distribution of Installed Capacity in MW as per means of generation and as per administrative sector (CEA, 2007)

- c) **Incentives for State Governments:** As per the present structure, the state government by allowing private, public sector developers to invest in and use resources for power generation can earn twelve percent of the profit. This, as argued by the State, shall percolate to the masses for their welfare.

2.3. Hydropower Development in Upper Ganga Segment (UGS)

The present study focuses on the hydropower development in the rivers Alaknanda and Bhagirathi in the state of Uttarakhand, which is a part of the Upper Ganga Segment (UGS). There are competing estimates of hydropower development from three major sources which includes, Central Electricity Authority (CEA), Uttarakhand Jal Vidyut Nigam Limited (UJVNL) and Peoples Science Institute (PSI) in Deharadoon. A total number of 75 hydropower projects with a total installed capacity of 12,039 MW is proposed to be constructed on river Ganga in seven different states, of which 64 projects having installed

capacity of 11,129 MW are to come in the state of Uttarakhand alone under 50,000 MW initiatives only (CEA, 2010a ; CEA, 2010b; CEA, 2010c). Other source of the information is the situation analysis done by People’s Science Institute (PSI) in 2009 (PSI, 2009). According to this study, a total number of 286 hydro power projects, those falling under all capacity ranges, have been proposed on Ganga in the state of Uttarakhand (PSI, 2009). Some of these projects are part of 50,000 MW initiative while others are being constructed or planned for by state and central governments and have been undertaken by state agencies (UJVNL, 2010e), Independent Private Parties (IPPs) (UJVNL, 2010c) and Central Public Service Utilities (CPSU) (UJVNL, 2010b), whereas about 86 projects have been already commenced (UJVNL, 2010a; UJVNL2010d). The state of these projects is shown in Figure 2.

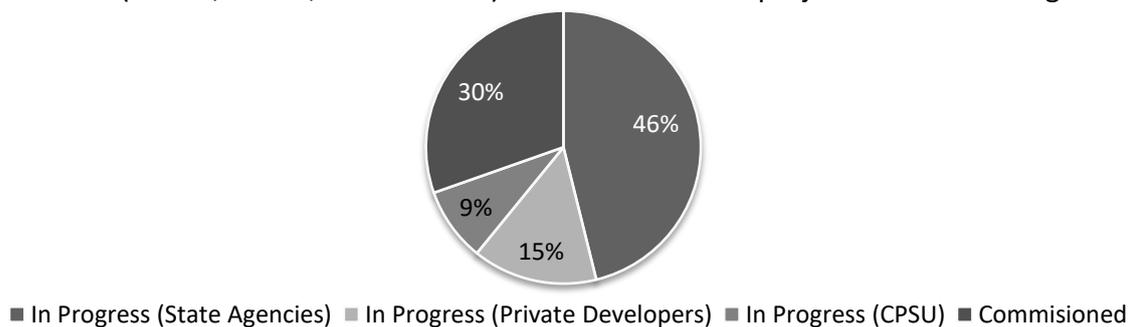


Figure 2: Developer Wise Distribution of HPPs in Uttarakhand

2.4. Environmental and Social Impacts of Hydropower Development in UGS

Some of the major arguments against damming of the river Ganga are described in following sections.

2.4.1 Drying of Rivers and Change in Natural River Flow Regime

The wide range of temporal variations in the rain fall patterns over the year already cause natural fluctuations in the river flow characteristics. Damming of rivers will further interrupt and alter the river’s important ecological processes by changing the flow of water, sediments, nutrients, energy and biota. Due to the densely located Hydro Power Projects (HPPs), water drained from one dam would enter the reservoir of the next HPP. This would lead to seasonal drying of the river stretches during the lean season flows in Ganga.

2.4.2 Crowding of Environmental Perturbations and Cumulative Impacts

The numbers of hydropower projects (HPP’s) that are proposed to be constructed in series are so densely located in the region that their influence zones overlap each other (according to the EIA guideline it is the region within the radius of 7km from a Dam). The cumulative influence zone is as high as 35% of the total influence zone. It is now proven that the cumulative environmental impacts result from spatial and temporal crowding of environmental perturbations. Project specific EIAs easily overlook such overlaps and related cumulative impacts in the present methodology (Agarwal *et al.*, 2010).

2.4.3. Seismicity and Possibility of Earthquake Disasters

Himalayan region is a geo-dynamically sensitive zone (Seismic zone IV; IS 1893:2000), that is naturally prone to disasters (NGRBA, 2011). According to the EIA guidelines of the MoEF, dam break analysis for disaster management planning is required for individual projects, wherein, there can be no consideration for other dams upstream or downstream, ignoring the cascade effects of the dams. In practice, the failure of structure of one dam would result in the failure of others in the cascade (Agarwal *et al.*, 2010).

2.4.4. Loss of Livelihoods of Local Communities

A hydropower project requires construction of storage reservoirs, a penstock and power plant and power transmission facilities. The reservoir submerges the agricultural land and surface water bodies, the blasting results in fractures in the mountain, changing groundwater flow directions and drying of wells, destabilizes the mountain slopes, destroy trees and pasture land, and dam wall blocks fish migration and thus loss of livelihood opportunities for the local communities. HHPs brings influx of laborers and visitors leading to the dilution of the pastoral culture, induction of new diseases and cause stress on the carrying capacity of local natural resources¹.

2.4.5. Loss of Aesthetic Value of Ganga

With the development of HHPs the river flows will disappear and cause tremendous loss to the panoramic landscape, natural beauty and cultural heritage of the region resulting in decreased tourism potential². The damming of rivers also causes flash floods which can be harmful to the lives of the local people, cattle and the visiting pilgrims.

3. Review of Existing Governance Framework

Environmental Clearance, which is supposed to be accorded on the basis of findings of EIA studies and adequacy and accuracy of the Environmental Management Plan (EMP), an integrated part of an EIA, was adopted and enacted in 1994 by Ministry of Environment and Forest (MoEF). The present major policy instrument is the 2006 notification for enacting EIA-EC. However, there are several laws associated with it. While mentioning the need to study these laws the present section will discuss the institutional structure and procedure for environmental clearance and challenges and opportunities in its design and implementation.

3.1. Policy Instruments (PIs) for EIA-EC

We define Policy Instruments as statutory provisions that define the jurisdiction of the concepts that are to be applied and lay down the necessary conceptual, procedural and methodological frameworks for the application of the concepts and its governance.

¹ Personal communication with Dr. Ravi Chopra, Director, People Science Institute, Dehradun

² Personal communication with Dr. Bharat Jhunjhunwala, renowned economist & formerly professor of IIM, B

3.1.1. Principles Forming Philosophy of PIs for EIA-EMP

Two principles form the philosophical basis to address the conflicts associated with EIA-EMP-EC mechanism. Polluter pays' principle states that the polluter has to bear the cost of all remedial or clean up measures, and also the amounts payable as compensation to the victims of pollution (Gaines, 1991). Precautionary principle requires the government authorities to anticipate, prevent and attack the causes of environmental pollution. This principle also imposes the responsibility of proof on the developer to show that his or her action is environmentally benign. If the environmental damage is considerable then the project proponent should think in terms of alternatives (Nash, 2008).

3.1.2. Associated Laws

There is a menu of laws, as prescribed by a study on EIA of hydropower projects done by *Sutlej Jal Vidyut Nigam Limited (SJVNL, 2010)*, that provide statutory basis to ensure the protection of environment under different conditions. For instance, the Forest (Conservation) Act of 1980 provides for regulating diversion of forest lands for non-forestry purposes like constructing a HPP (MoEF, 1980). An EIA study must consider these laws while identifying environmental attributes and should consider the mandate of these laws while predicting negative impacts of hydropower projects and suggesting measures to minimize and mitigate those. Identification of each of such laws and investigation of provisions therein would be helpful for critically analyzing the purpose of doing EIAs and adequacy of the check list of the content of an EIA report as prescribed in EIA notification. However, because this is beyond the scope of this study, we are giving an available list of these laws (See Annexure II) in view of initiating a discussion.

3.1.3. EIA Notifications

In exercise of the powers conferred by the Environmental Protection Act, 1986 (Gol, 1986) Government of India (Gol) on 27th January 1994 made it mandatory for expansion and modernization of existing projects to have prior environmental clearance (EC) (MoEF, 1994) Thirteen amendments were made to it during 1994 to 2005 (Kohli *et al.*, 2011) and then, in 2006 principle notification was replaced with a new one (MoEF, 2006). The initial notification is no longer in effect, but it is our opinion that in comparison with the principle notification, the new one is weak in some of the areas, at least. Following section shall discuss our major arguments.

4. Mapping of Government Agencies for EIA-EC

In order to administer the procedure laid down by the EIA notification, several institutions including but not limited to ministry, government departments, boards and regional bureaucracies have been set up over a period, both at the central as well as state level. A brief description of their jurisdictions and functions is given in the following sections. The government agencies with legal authority like Environmental Appellate Authority (EAA), National Green Tribunal (NGT) and High Courts and Supreme Court, which deal with grievance redressal are not included here but deserve a detailed appraisal of their roles and authorities.

4.1. Ministry of Environment and Forests (MoEF)

Following the Stockholm Conference and developments thereafter, the Department of Environment (DoE) was established as per the recommendation of the NCEPC in 1980, which was finally converted to a full-fledged Ministry of Environment and Forest (MoEF) five years later (Rao, 1997). Indian Parliament enacted the environmental protection act of 1986 (EPA-1986), which is an umbrella act covering various environmental aspects and MoEF is responsible for its implementation. MoEF through its Impact Assessment Division (IA) processes the case of hydropower projects. The Central Minister concerned (at present minister for state with independent charge), based on the recommendations of the EAC (see next Para) and on the behalf of Government of India in the Ministry of Environment and Forests, is responsible to take decisions about environmental and forests clearance of hydropower projects within the mandate of the ministry. Minister, having veto power can however make decision as different from the recommendations of the EAC and is accountable to the nation through the parliament.

4.2. Impact Assessment Division (IA)

In the matters of impact assessment of all polluting agencies/activities in the country, IA serves as the working arm of the MoEF. It is responsible for setting guidelines for the preparation of EIA reports in consent with the relevant state and central authorities, prepares and issues various notifications and amendments pertaining to environmental laws. IA has constituted six multi-disciplinary expert committees known as Environmental Appraisal Committee (EAC) to carryout review of different kinds of projects. These committees are supposed to appraise the impact assessment and management documents and recommend for clearance or otherwise to the Ministry. The facilitation of appraisal process of EC, involving review of the EIA reports and various documents submitted by the project proponent is the leading responsibility of IA. IA may also seek clarification from the proponent and conduct site visits if necessary during the review procedure. Based on the documents submitted and clarification presented, IA either grants or rejects the environment clearance of the developmental project (Ritu, 2006; Murthy, 2005).

4.3. Central Pollution Control Board (CPCB)

The CPCB is an autonomous organization under the administrative control of MoEF. It has no direct role in environmental clearance process, though it acts as a research organization by collecting, analyzing and disseminating information pertaining to pollution prevention and abatement; this benefits the MoEF, SPCBs and several other stakeholders of environmental clearance process. (Ritu, 2006).

4.4. State DoE and SPCB

Environmental matters of any state ranging from the execution to formulation of guidelines have been entrusted to the state department of environment (DoE). The state pollution

control boards (SPCBs) work under DoE having different structures for project appraisals³. For the rest, member secretary or Chairman of the pollution control board does it (Ritu, 2006). Earlier these departments had no role in conducting EC process but the amendment in EIA notification defined the role of state departments for EC of small hydro projects of installed capacity less than 50MW. The IA has conferred the responsibility of public hearings to SPCBs. The minutes of the meeting and major findings are to be furnished to IA within 30 days (Ritu, 2006).

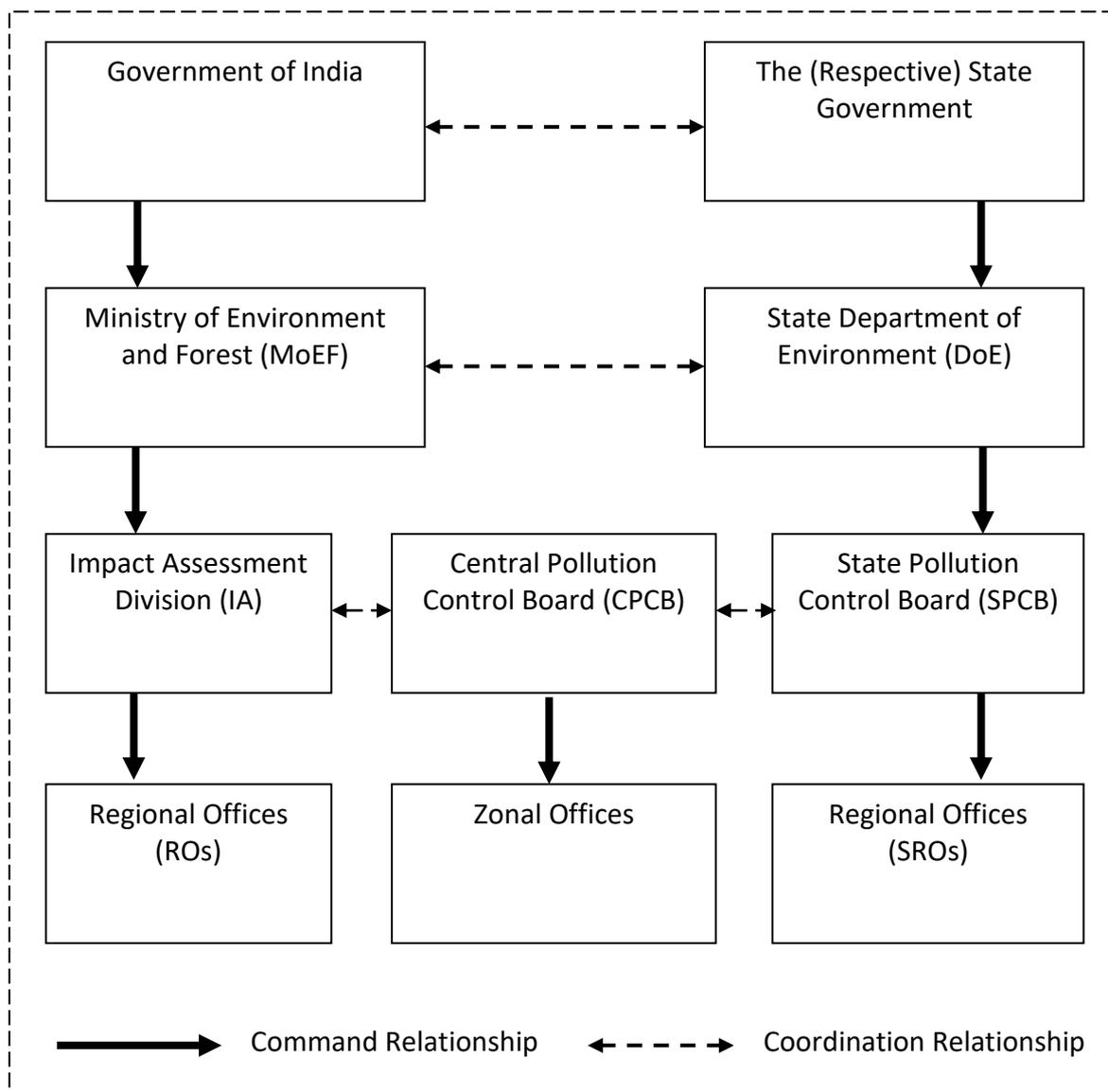


Figure 4: Map of Government Agencies for the Implementation of PIs of EC Process

³ For instance, Andhra Pradesh (AP) government has State Environmental Appraisal Committee (SEAC) under SPCB, which appraises the report submitted by project proponent before issuing No Objection Certificate (NOC). Contrary, the states of Maharashtra, Gujarat, West Bengal and Karnataka have created SEACs directly under DoE instead of SPCBs, which issues NOC (Source: Personal communication with Mr. Himanshu Thakkar of SANDRAP, Delhi. However, Mr. Paritosh Tyagi, former chairman of Central Pollution Control Board, was of opinion that the information about Andhra Pradesh SEAC provided here is incorrect and the fact requires to be verified).

4.5. MoEF Regional Offices (ROs)

The MOEF has set up six regional offices with a head quarter (HQ) unit at New Delhi for monitoring and implementation of stipulations under Forest (Conservation) Act, 1980 and provisions for environmental clearance, whereas office at Delhi coordinates with all regional offices. Post Project Monitoring (PPM) of the cleared projects in particular is the major responsibility of these offices. Project authorities are required to submit monitoring reports to these ROs every 6 months, detailing progress of implementation of the conditions, detailed while granting EC to the projects. These offices are allowed to take up site visits. If any violation of environmental standards is noticed, ROs inform HQ to take necessary actions (Ritu, 2006).

5. Environmental Clearance Procedure

As laid down in the EIA notification of 2006 (MoEF, 2006), procedure for EC follows four stages elaborated as follows and further detailed in Figure 2.

Stage 1 - Screening: Is only for category B projects. This stage determines whether a project requires an EIA. In case of river valley projects this stage is applicable only to projects with 25 to 50 MW capacities. The projects requiring an Environmental Impact Assessment report are termed Category 'B1' and remaining projects are termed as Category 'B2' and will not require an Environment Impact Assessment report.

Stage 2 - Scoping: At this stage EAC or SEAC is supposed to develop the detailed and comprehensive terms of references (ToR) based on the information provided by the proponent addressing all relevant environmental concerns for the preparation of an EIA report. Category B project does not require this stage. The ToR is to be conveyed to the applicant within 60 days from the submission of the documents. If it is not conveyed in due time, the ToR submitted by proponent will be accepted. Once the ToR is finalized, the applicant can start the EIA study. However, the concerned regulatory authority, on recommendations of EAC or SEAC, in case of projects requiring prior clearance, can reject the project.

Stage 3 - Public Consultation: Is a process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project are consulted through public hearing at project site or its close proximity to obtain written responses. All category A and Category B1 projects are liable to undertake public consultation. It's mandatory for concerned government agency and developer to well inform other stakeholders about the public hearing meeting and provide a summary EIA report in the local language.

Stage 4 - Appraisal: At this stage, EAC or SEAC is supposed to scrutinize the final EIA report, public hearing proceedings and applications. The applicant may be invited for further clarifications during scrutiny. The process must be completed within 60 days from the receipt of the final application. EAC/SEAC should place their recommendations before the

final regulatory authority within the next 15 days. The MoEF or SEIAA shall consider EAC/SEAC recommendations and convey its decision to the applicant within 45 days. If any clarifications are required, the authority should seek it during these 45 days. EAC/SEAC can give its views in another 60 days and this will be considered by the authority and will convey their decision to applicant in another 30 days, without which the recommendations of an EAC/SEAC, whether clearance or rejection, is considered as final decision.

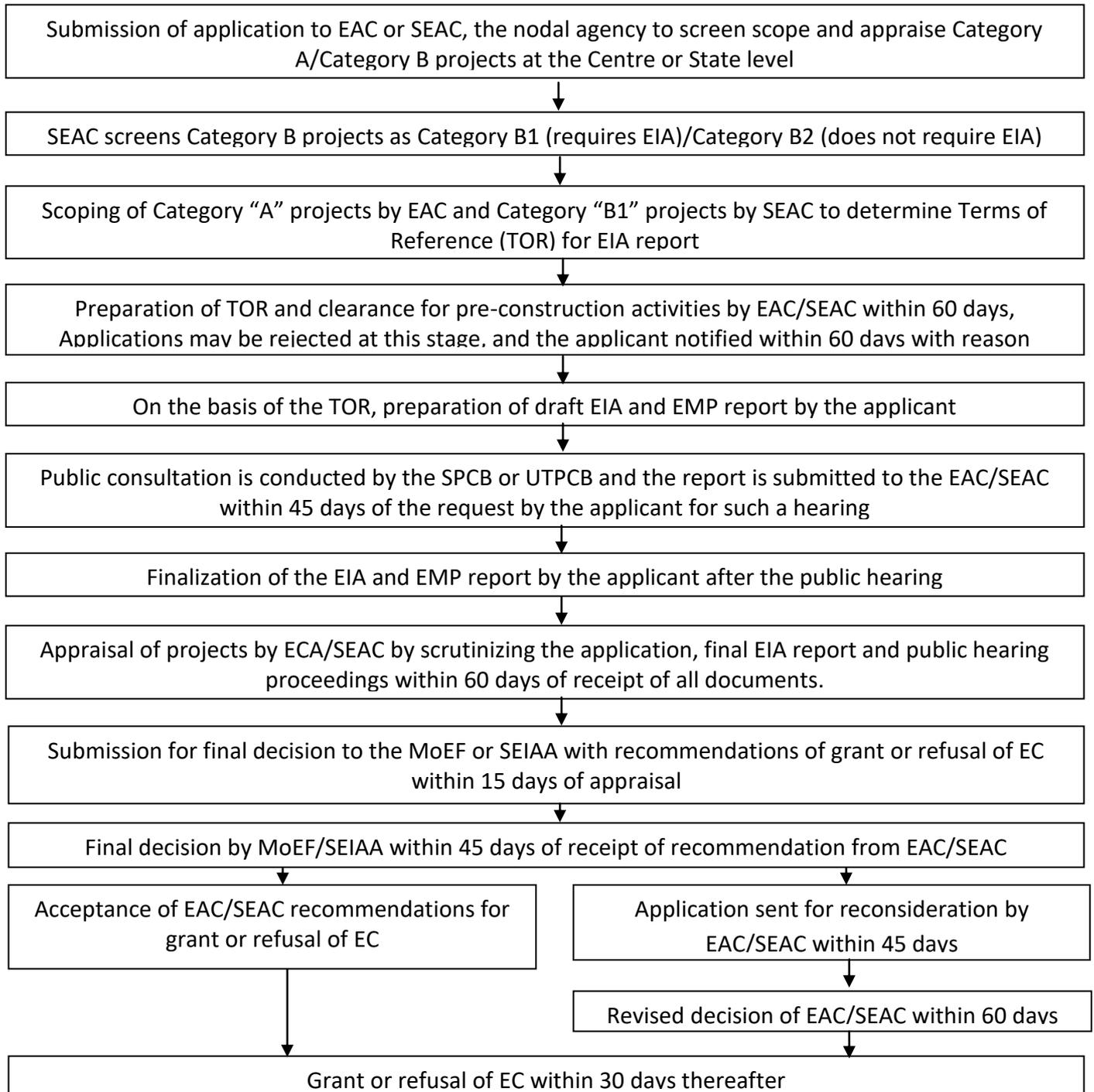


Figure 3: Procedure for obtaining EC as per EIA Notification 2006

Stage 5 – Post Clearance Compliance and Monitoring: The EC is a one time approval and it is valid for five years for all projects and ten years for river valley projects. The post monitoring is to be done through compliance reports submitted every six months by the project proponent.

6. Collation of Challenges and Opportunities

The Policy Instruments (PIs), provisions therein and Governance Agencies (GAs) for the EIA-EC implementation have been discussed informatively in the previous section. This section will present opportunities and challenges of these as articulated by the respondents of civil society in our field study and a review of literature. The section concludes with preliminary and tentative recommendations with a view of progressive restructuring of the system.

6.1 Purpose of EIA inadequately understood

An EIA study is supposed to be a tool that can assist environmental decision makers to make decisions in the interest of conservation of nature and local people. However, presently EIA has been understood by the developers as a formality that needs to be done for obtaining a clearance for the project^{4,5,6,7}. A hydropower development project is an activity that seeks to utilize the land and water resource available. However, when multiple demands of these resources like irrigation, drinking are there, the EIA should explore the trade-offs among various alternate uses to set the priorities⁸. The framework for designing EIA studies from MoEF has to be analyzed thoroughly to ascertain to what extent this has been achieved.

6.2 Developer Appoint and Pay the Consultant

Environmental Impact Assessment studies are actually carried out by a professional consultant or a consultancy firm. Selection of consultant is thus a very important part of the process, which at present is the responsibility of the Developers. The practice of developers identifying and appointing consultants could lead to serious conflicts of interests because the loyalty of the consultants under such circumstances mostly remain with the proponent of the project. In order to bridge this shortcoming, the ministry, through Quality Council of India (QCI), has established two committees under National Accreditation Board for Education and Training (NABET). The Technical Committee, one of these two, has developed the procedural framework for accrediting EIA consultants and certifying them. NABET shall also evaluate after every three years, performance of the accredited consultants so that the

⁴Personal communication with Dr. Ravi Chopra, Director, Peoples Science Institute, Deharadoun

⁵ Personal communication with Dr. Shekhar Singh, Former Chairman of an Environment Appraisal Committee

⁶ Personal communication with Mr. Himanshu Thakkar, Director, South-Asian network on Dams, Rivers and People

⁷ Personal communication with Dr. Bharat Jhunjhunwala, Former Professor of IIM Bangalore & an anti dam activist

⁸ Personal communication with Mr. Katpaliya, a senior engineer and planner from irrigation department

quality of impact assessment would be ensured⁹. Ministry is looking forward to allow only NABET certified consultants to undertake EIA studies who will continue to be paid by the developers. Though the advisor to the ministry principally accepts that the consultants should be paid by the ministry through the corpus created by collecting impact assessment costs from the developers, in her opinion, to establish this practice it will require several legislative changes to be done through the parliament which is a tedious process¹⁰. Apart from this, another important challenge that needs to be dealt lies in developing mechanisms to verify the track record of consultants and to ensure implementation of the provision of blacklisting consultants or cross checking their work^{11, 12}.

6.3 No Standards for Designing and Conducting EIAs

There are no standards for identifying regional specific attributes for conducting, prescribing safer limits of impacts and designing the methods of EIA studies. This can lead to confusion and arbitrariness. However, there are guidelines prepared by MoEF and World Bank, which can give only a broad picture with different interpretations lacking a specific purpose²⁴. Therefore the guidelines are less likely to be implemented without manipulation in the favor of the project proponent.

6.4 EIA Studies as Conducted presently are Inappropriate

The inadequacy of EIA studies is mainly because of the following reasons:

6.4.1. Identified Geographical Boundary for EIA Studies

Present EIA studies consider impacts in area within the radius of seven kilometers measured from the location of the dam site (Agarwal, Lodhi, & Panwar, 2010). This criterion is inadequate particularly in the Himalayan region which is geo-dynamically sensitive area (Agarwal, Lodhi, & Panwar, 2010) and going to house many number of hydropower dams that will be constructed in series, where a Cumulative Impact Assessment (CIA) is extremely important.

6.4.2. The notion of E-flows and Climate Change is not Considered

The amount of environmental flows to be released (PSI, 2007), damming and effect on micro climate change (Agarwal *et al.*, 2010), resulting in melting of glaciers in the region must be studied in the context of the projects on river Ganga (PSI, 2007).

6.4.3. EIAs are done simultaneously with Construction Activities

The environmental and social impacts are always being looked at not after, but at least simultaneously to other things happening in a project. Hence there is always a pressure to finish studies as quickly as possible and the Ministry grants clearance even on the basis of

⁹ Personal communication with Dr. Paritosh Tyagi, Chairman, Technical Committee of the NABET

¹⁰ Personal communication with Dr. Nalini Bhatt, Advisor, Ministry of Environment and Forests, Gol

¹¹ Personal communication with Dr. Shekhar Singh, Former Chairman of an Environment Appraisal Committee

¹² Personal communication with Dr. Bharat Jhunjunwala, Former Professor of IIM Bangalore & an antidam activist

'Quick EIA', '3 months EIA' or 'do it later on' which is not acceptable because once the project is cleared then it is less useful assessing later on¹³.

6.4.4. Methodologies to conduct EIAs are Poorly Prescribed

The aforementioned problems exist because methodologies to help conducting EIA studies are not adequately prescribed in the notification. In the absence of such standard methodology, EIA consultants can hardly complete the EIAs to meet the desired purpose of doing it on ground resulting in inadequate studies and borrowed from the previously done studies^{14,15,16,17}. However, Ministry has recently prepared and published on its website a set of thirty five manuals to guide the impact assessment studies^{18,19}. This may have to be analyzed for its adequacy to serve the purpose.

6.4.5. Content of the Present EIA Studies is Inadequate

MoEF has provided a checklist of what all should be considered in an EIA study (MoEF, 2010c). However, it is a generic framework and one has to take care of several context specific factors which are not covered in the checklist. At present the content of EIA studies are limited largely to the biodiversity studies only and underestimate the other possible negative impacts¹⁶. Moreover, the need of having EIA studies done and extent of such a study is to be decided by the concerned agency of the respective state government while writing terms of references (ToR) at the Scoping stage. Thus, the ToR is supposed to dictate case specific contents of the EIA studies and hence the capacity of concerned agency to incorporate such specific requirements while writing ToR need to be assessed. An EIA report is supposed to contain, in addition to EMP, an environmental monitoring plan and a risk assessment and disaster management plan. Adequacy of these studies as incorporated in the present EIA reports requires to be assessed¹⁹.

6.4.6. Project Specific EIAs are Inadequate

Because the dams constructed in series will have cascade impacts on each other, as the present way of doing the project specific EIAs cannot appreciate it in the present practice of EIAs, less importance is given to understand how the projects fit into the ecology and social setting of the region.

6.4.7. Alternatives for Proposed Plant are not Assessed

Concepts of EIA includes the assessment of alternatives for the proposed activities and negative environmental impacts should be assessed for each of these alternatives. The

¹³ This is the personal opinion of Mr. Himanshu Thakkar of SANDRAP. However Dr. Paritosh Tyagi and Dr. Sanchita Jindal, Director IA division (River Valley Project) disagree.

¹⁴ Personal communication with Dr. Bharat Jhunjunwala, Former Professor of IIM Bangalore & an antidam activist

¹⁵ Personal communication with Dr. Shekhar Singh, Former Chairman of an Environment Appraisal Committee

¹⁶ Personal communication with Dr. Ravi Chopra, Director, Peoples Science Institute, Deharadoon

¹⁷ Personal communication with Mr. Himanshu Thakkar, Director, South-Asian network on Dams, Rivers and People

¹⁸ Personal communication with Dr. Nalini Bhatt, Advisor, Ministry of Environment and Forests, Gol

¹⁹ Personal communication with Dr. Paritosh Tyagi, Chairman, Technical Committee, NABET

alternatives should be assessed comparatively and the least negative impact ones must be selected and approved. Present EIAs do not consider this notion.

6.5 EMPs are Inadequate to Serve the Purpose

In order to reduce, mitigate and manage negative environmental impacts, it is mandatory for project proponent to prepare and implement an Environmental Management Plan (EMP) suggesting precautionary measures and mitigation plan in detail, and it must be approved by MoEF (MoEF, 2010a). However, proponent takes onus of neither implementing one's own plan, nor to evaluate the efficacy of its implementation which is generally done by the Forest Department with finance received from the proponent²⁰. Even if an EMP is implemented effectively it is not adequate because of the conceptual shortfalls in it. For instance, definition of a Catchment Area is ill-defined in the case of Catchment Area Treatment (CAT) plan which are integral part of EMP and then there are issues regarding the fund and work allocation.

6.6 Inappropriate Public Consultation

6.6.1. Public Hearings are done in an uninformed Manner

People must be made aware about the importance and modalities of public hearing since informed participation plays a critical role. Because people are not formally introduced to the process, and the significance of public hearings and expectations, it finally becomes a bone of contention between many groups.

6.6.2. Violation of Provisions to Restrict Participation to Tokenism only

The EIA Notification has laid down the detailed procedure for providing necessary information (like date, time and venue of the meeting, summary of DPR and EIA-EMP reports) in local language well before the date of the meeting. However, though these provisions are not violated per se, are not also followed to meet the desired end of the study and to encourage them to participate in the debate by ensuring an open, democratic process whereby their concerns are respected. In other words, participation is manipulated, if not neglected.

6.6.3. Public Hearing Meetings are controlled by Vested Interests

The meetings are conducted by concerned government officials and local people are constrained to express their concerns. Since the meetings are supposed to be conducted at the project site or its close proximity, it is possible that the developers and their supporters take control of the situation and to influence the situation at least serve as "the Host" of the meeting.

²⁰ Personal communication with Dr. Bharat Jhunjhunwala, renowned economist and formerly Professor of IIM Bangalore.

6.6.4. Its only “Hearing” and “Consultation”

The EIA notification stipulates that the project proponent should give the replies to the concerns expressed by people. There are no provisions to ensure that people’s concerns have been adequately addressed since it is a one time process and final decisions are not communicated back to them.

6.7 Lack of Competency, Transparency, Accountability and Participation

6.7.1 Lack of Independent Structure

Problems associated with project appraisal and clearance process are a problem of organizational structure. EAC is only an advisory body and has no authority to make decisions about clearing or rejecting a project (MoEF, 2006). It’s very difficult, however, for members of EAC who are appointed by government to be fully independent of political influence, which points to the need of an independent structure that can bring transparency and accountability in operations.

6.7.2 EACs need Technical Capacity

The EACs, at present, are a group of professionals/experts working part time. Practically, in one or two meetings in a month, EAC has to evaluate 15-16 projects. EAC being a committee of people working for part time, need support staff to appraise the EIA studies and other documents for doing objective analysis.

6.7.3 Lack of Required Competency and Legitimacy

The chairperson and/or members of the EAC, to deliver their functions, require essential competency, particularly the environmental credentials of many are doubtful and some of them have conflict of interest since their backgrounds and perspectives are contradictory to their roles in the committee²¹. The previous notification (MoEF, 1994) had a clear directive for including CSOs and social scientists in the expert committees. The present notification has altered this provision of including NGOs in the Expert Appraisal Committee or the State Level Expert Appraisal Committees (MoEF, 2010d).

6.7.4 Need for Conceptual and Methodological Framework for Decision Making

In the absence of clear criteria for evaluation of EIA documents, the approval process is not always objective leading to a non-transparent, non-accountable decision making process²². An environmental clearance is designed to be a one time decision given for a period of five years, making it tedious to revisit or change it on proven grounds¹⁷.

²¹ Key Respondent: Mr. Himanshu Thakkar, Director, SANDRAP, Delhi.

²² Personal communication with Dr. Bharat Jhunjhunwala, renowned economist and formerly Professor of IIM Bangalore

6.7.5 Violation of Provisions for Transparency under the EIA Notifications

Under the section 10-ii of EIA notification, 2006 (MoEF, 2006) it is specified that ministry shall display all latest EIA reports including ToRs, EIAs and EMPs on their website. However, having inadequate human resources, there are difficulties in making the documents available and/or accessible^{23,24}.

6.7.6 Non Compliance of the Post Clearance Activities

Presently, while the projects get clearances based on the conditions, there is urgent need to improve the ability to ensure that the post clearance activities are duly complied. The practice called 'Pari-Pasu' which started with Narmada, went on to Tehri, which, if the developer is not able to get the clearance, government agencies grant clearance subject to the condition that the developer shall continue the EIA studies while construction activities progress.

6.7.7 Lack of Capacity for Post Clearance Monitoring

The seven Regional Offices (ROs) of MoEF across the country are given the responsibility of monitoring the violations during post clearance construction stage. A limited number of staff at ROs is supposed to monitor and ensure compliance twice in a year for projects belonging to more than 35 categories scheduled in the notification. Looking at the massive number of hydropower projects being constructed, it is a tall task for ROs to ensure monitoring violations on ground and compliance.

7. Tentative Recommendations

1. Pre-environmental clearance based on EIA studies is to be made mandatory for projects of all capacity/types including micro-mini- projects and small-medium-large projects whether run-off-the river or otherwise. All of these project types are likely to cause significant impact on local environment which must be studied. Although ministry, given the limited capacity in terms of human capital available, wishes to prioritize first the large and medium projects only; we strongly suggest to take appropriate steps to make EIA studies mandatory for all projects.
2. An independent authority having required technical competence and supported financially by a consortium of developers is to be established through MoEF. Such an agency should design and conduct feasibility studies and location specific EIAs, if not cumulative impact assessments under the regulation of MoEF. This proposition differs from the consultancy services development mandate of the government²⁵ and hence, its merits and demerits are needed to be discussed in detail.

²³ Personal communication with Dr. Sanchita Jindal, Director of the concerned department of MoEF

²⁴ Personal Communication with Dr. Nalini Bhatt, Advisor, MoEF

²⁵ Personal communication with Dr. Paritosh Tyagi, Chairman, Technical Committee of the NABET

3. Independent professionals having required competence in their respective subjects and adequate environmental credentials should be appointed as EAC members and must be provided with adequate secretarial support to thoroughly appraise and evaluate findings of feasibility studies and EIAs, and to recommend for a clearance through a public proceeding.
4. To ensure transparency and accountability in the environmental clearance decision making process, it should be made mandatory for the concerned agencies to give speaking justifications of their decisions and to share the proceedings with the citizens of the country. Ministry officials are of the opinion that minutes of EAC meeting adequately justify their recommendations and same can be considered as speaking orders²⁶. This deserves verification from the critiques. Since, the Minister has veto power to make decision, in the interest of the nation, as different from the recommendations of the EAC; under such case the Minister should also give speaking orders.
5. Another independent authority should be established to monitor violations during post clearance construction activities and ensure proactive compliances from the developers. Such authority should be empowered to cancel accorded clearance in case of serious violations and blacklist respective developers and consultants. As informed by a senior officer at MoEF, in recent future it is going to set up one such agency called National Environmental Assessment and Monitoring Authority (NEAMA)²⁷.

8. Concluding Observations

While acknowledging the need for hydropower generation, the process of according environmental clearances to hydropower projects on the basis of their EIA studies is an essential tool for safeguarding the ecological integrity and resulting livelihoods in the Ganga basin. Though the State has taken stringent provisions to make the EIA-EC practice mandatory for hydropower projects, various stakeholders (especially from CSOs) have expressed grievances about the lacunae in policy instruments and performance of governing agencies leading to violations in practice.

EIA studies can provide scientific basis for the necessary decisions and EC process can ensure their implementation, which needs the following: 1) comprehensive feasibility analysis and EIAs of all category projects, by an independent authority having required competence; 2) evaluation of projects by various stake-holding groups through public proceedings as different from consultation with clearance decisions based on their recommendations; 3) ensuring strict monitoring of post clearance construction activities

²⁶ Personal communication with Dr. Sanchita Jindal, Director, IA Division, Ministry of Environment and Forests

²⁷ This is as informed by Dr. Nalini Bhatt, Advisor, Ministry of Environment and Forests, Gol.

and compliances by an independent authority empowered to implement the provisions for cancelling the accorded clearances and blacklisting of EIA consultants/developers.

9. References

- Agarwal, D. K., Lodhi, M. S., & Panwar, S. (2010). Are EIA studies sufficient for projected hydropower development in the Indian Himalayan region? *Current Science* , 98 (2), 154-161.
- Aruna Murthy, H. S. (2005). *Environmental impact assessment process in India and its drawbacks*. Bhuvaneshwar: Environment Conservation Team, Vasundhara .
- CEA (2007). *Details of Hydro Capacity added during 10th Plan (2002-07)*.
- CEA (2010a). *Details of Hydro Capacity added during 11th Plan (2007-12)*.
- CEA (2010 b). *Status of 50,000 MW Hydro Electric Initiative*. Government of India , Central Electricity Authority.
- CEA (2010 c). *HE schemes under survey & investigation*.
- CVC, R. (1997). Environmental impact assessment state-of-art. *Tech Monitor* , 14 (3), 40–9.
- Government of India, (1986). *Environmental Protection Act, 1986*, Governemnt of India .
- Kohli, K., Menon, M., Das, S., & Divya, B. (2011). *Calling the Bluff: Revealing the state of Monitoring and Compliance of Environmental Clearence Conditions*. Delhi : Kalpavrikshya .
- MoEF (1980). *Indian Forest Right Act, 1980* . MoEF, Government of India.
- MoEF, (1994). *EIA Notification*. MoEF, Government of India.
- MoEF (2006). *Notification of MoEF*. Gazette of India.
- MoEF (2010 a). *MoEF- Environmental Management Plan*.
- MoEF (2010 b). *MoEF Office Memorandum- Procedure for conduct of public hearing*. MoEF, Government of India.
- MoEF (2010 c). *MoEF- Requirements and Procedure for seeking Environmental Clearance of Projects*.
- MoEF (2010 d). *MoEF- Composition of the Expert Committees for Environmental Impact Assessment, MoEF, Government of India*.
- MoP (2011). Retrieved March 2011, from <http://www.powermin.nic.in>
- Muttamara, S. (1996). Environmental impact assessment (EIA). *Resources, Conservation and Recycling* , 16, 335-349.
- National Ganga River Basin Management Authority, N. (n.d.). Retrieved April 2011, from Ministry of Environment and Forest Website : moef.nic.in/modules/recent-initiatives/NGRBA/index.html
- People's Science Institute,(2007). *A proposed framework for impact assessment of large water infrastructure development project*, People's Science Institute, Deharadoon.
- Peoples Science Institute, (2009). *Hydropower in Uttarakhand Situation Analysis Repor*, People's Science Institute, Deharadoon.

Planning Commission. (2011). Retrieved March 2011, from <http://planningcommission.nic.in/plans/planrel/fiveyr/welcome.html>

Planning Commission (2007). *Eleventh Five Year Plan*, Planning Commission, Governemnt of India.

Prayas (2004). *Know your power*. Pune: PRAYAS Energy Group.

Ritu, P. (2006). EIA practice in India and its evaluation using SWOT analysis. *Environmental Impact Assessment Review*, 26, 492-510.

SJVNL (2010). *Environmentl regulations and legal framework in India*. SJVNL.

UJVNL (2010 a). *Details of Hydro Projects Developed by UJVNL*.

UJVNL (2010 b). *Details of Hydro Projects Developed by CPSUs*.

UJVNL (2010 c). *Details of hydro projects developed by IPPs*.

UJVNL (2010 d). *Details of Projects Under Operation in Uttarakhand State*.

UJVNL (2010 e). *List of Hydro Projects Developed by Various State/Private Agencies in Uttarakhand State*.

Annexure I

List of Various Laws Relevant to the EIA- ECs (SJVNL, 2010)

S No	Title of the Law	Provisions/ Mandate
01	The Electricity Act, 2003	Create a framework for the power sector development. Electricity Act does not explicitly deal with environmental implications of activities related to power transmission. The applicable legal provisions under this Act are as follows: Section 68(1) - sanction from the Ministry of Power (MoP) is a mandatory requirement for taking up any new project.
02	The Forest (Conservation) Act, 1980	Provides for the conservation of forests and regulating diversion of forestlands for non-forestry purposes. When projects fall within forestlands, prior forest clearance is required from relevant authorities under this act.
03	The Environmental (Protection) Act, 1986	Provides a framework for the protection and improvement to the environment. Provides for obtaining environmental clearances for specific types of projects and for submission of compliances.
04	Air (Prevention and Control of Pollution) Act, 1981	Provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carrying out the aforesaid purposes, of Boards, and assigning to such Boards powers and functions.
05	Water (Prevention and Control) Act, 74	Provide for the Prevention and Control of Water Pollution and the maintenance or restoration of the wholesomeness of water and for the establishment, of boards to carrying out the aforesaid purposes
06	Hazardous Waste (Management and Handling) Amendment Rules, 2003	Requires proper handling and disposal of Hazardous wastes. Organization will seek authorization for disposal of hazardous waste from concerned State Pollution Control Boards (SPCB) as and when required.
07	Wildlife Protection Act, 1972	According to the Act, "wildlife" includes any animal, bees, butterflies, fish and even vegetation which forms part of any habitat. Whenever, any part of Wildlife Sanctuary / National Park is getting affected by a hydro project the forest clearance proposal requires ratification from Hon'ble Supreme Court, which is to be based on recommendation of Standing Committee of NBWL.
08	The Biological Diversity Act, 2002	Provide for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the sued of biological resources and knowledge. As per the provision of act certain areas, which are rich in biodiversity and encompasses unique and representative ecosystems are identified and designated as biosphere reserve. All restrictions applicable to protected areas are also applicable to these reserves.
09	Fisheries Act, 1897	Section 5 of the Act prohibits destruction of fish by poisoning waters.
10	The Indian Forest Act, 1927	Makes it punishable if any person, who, poisons water of a forest area. The State Government has been empowered to make rules relating to poisoning of water in forests (Sec.32-f).

Table continued to next page

... .. Table continued from previous page

S. No.	Title of the Law	Provisions/ Mandate
11	The Factories Act, 1948	Factories Act, 1948 is social welfare legislation intend to secure health, safety and welfare of the workers employed in factories. However, some of the provisions of this Act are concerned with prevention of water pollution.
12	The River Boards Act, 1956	The Act provides for the creation of River Boards for regulation and development of interstate rivers and river valleys. One of the functions of the Board is to advise to the Government concerned on “prevention of pollution of the waters of the interstate rivers”.

Annexure II

List of Key Respondents

State Officials:

1. Dr. Ms. Sanchita Jindal, Director, department concerned to EIA-EC at MoEF, Government of India
2. Dr. Ms. Nalini Bhatt, Advisor, Ministry of Environment and Forest, Government of India

Project Developers:

1. Dr. A.K. Singh, Chief Engineer, National Thermal Power Corporation, Delhi
2. Shri, PPS Man, General Manager, Vishnugad Pipalkoti Hydropower Project of THDC.

Representatives of Civil Society Organizations and other stake holders

1. Dr. Bharat Jhunjhunwala, Renowned economist and formerly professor of Indian Institute of Management, Bangalore
 2. Dr. Shekhar Singh, Formerly Chairperson of an EAC and Professor from Indian Institute of Public Administration
 3. Dr. Ravi Chopra, Director, Peoples Science Institute, Deharadoon
 4. Ms. Sona Thakur, Project Officer, World Bank
 5. Ms. Sushila Bhandari, a conscious stakeholder in case of hydropower projects at Phata Beyung and Singoli Bhatwari
 6. Shri. Gangadhar Nautiyal, Based at town Rudraprayag a conscious stakeholder in case of hydropower projects at Phata Beyung and Singoli Bhatwari
 7. Shri. Himanshu Thakkar, Director, South Asian Network for Dams, Rivers and People (SANDRAP), Delhi
 8. Shri. Lakshman Negi, Director, *Janaadesh* – A NGO located at town *Joshimath*
 9. Shri. Piyush Dogra, Environmental Expert-Asia, World Bank
 10. Shri, Vimal Bhai, Convener, *Matu Jan Sanghatan*
-

Policy and Governance

Perspective and Analytical Framework for Management of Urban Sewage

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin Management Plan (GRBMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin Management Plan (GRBMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRB EMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report are given on the reverse side.

Dr Vinod Tare
Professor and Coordinator
Development of GRBMP
IIT Kanpur

The Team

- | | |
|--|---|
| 1. G N Kathpalia | gnkathpalia@gmail.com |
| 2. Indrajit Dube, IIT Kharagpur | indrajit@rgsoipl.iitkgp.ernet.in |
| 3. Mukesh Khare, IIT Delhi | mukeshk@civil.iitd.ac.in |
| 4. N C Narayanan, IIT Bombay | ncn@iitb.ac.in |
| 5. Paritosh Tyagi, Former Chairman, CPCB | paritoshtyagi@gmail.com |
| 6. Shyam Asolekar, IIT Bombay | asolekar@iitb.ac.in |
| 7. Subodh Wagle | subodhwagle@gmail.com,subodh@prayaspune.org |
| 8. Uday Shankar | uday@rgsoipl.iitkgp.ernet.in |
| 9. Vinod Tare | vinod@iitk.ac.in |

Lead Persons

1. Subodh Wagle, IIT Bombay
2. Pranjal Deekshit, IIT Bombay

Contents

S No		Page No.
1	Brief Summary	1
2	Introduction	1
3	Key Concepts and Terms	2
3.1	Governance of Infrastructure Sectors	2
3.2	Governance Objectives (GOs)	4
3.3	Policy Instruments (PIs)	4
3.4	Governing Agencies (GAs)	6
3.5	Interrelationship between Governance Instruments	7
3.6	Formal Rules of Other (Non-Governing) Agencies	7
3.7	Norms	8
3.8	Interests	8
3.9	Impact of Norms and Interests on GAs and PIs	9
4	Governance Grid	9
4.1	Sectoral Responsibilities	9
4.2	Generic Functions (GFs)	10
4.3	The Core Governance Tasks (CTs)	12
4.4	Execution of Generic Function	14
4.5	Compliance Ensuring (CE)	14
5	The Governance Process: Limitations and Failure	15
5.1	The Ideal type of Process of Governance	15
5.2	Governance Process in Practice	16
5.3	Lacuna in the Structural Elements of GAs	16
5.4	Lacunas in the Policy Instruments	17
5.5	Different type of Lacuna in Functioning of GAs	17

1. Brief Summary

During the analysis of the urban sewage problem on the banks of Ganga, an urgent need was felt to evolve and articulate a systematic, comprehensive, conceptually sound, and internally consistent perspective—and an analytical framework based on it—that is focused on the policies and governance. The ‘Policy and Governance Perspective’ and the analytical framework with the same title that are presented here are built on the foundation of some clearly defined basic concepts and terms. It also presents a conceptual schema—called as the ‘Governance Grid’—which takes a comprehensive view of governance of an entire sector. The perspective then presents an ‘ideal type’ of the ‘process of governance’. Using all these as foundation, the perspective then presents a comprehensive and conceptually coherent schema of the actual process of governance as it generally unfolds in reality. The schema begins with the ground-level problems in any sector and helps the analyst identify the core governance maladies of different types in the sector. To address these maladies, the analyst then can evolve recommendations for appropriate changes in—or creation of new—policy instruments and / or governing agencies. The perspective prompts an argument that such core governance maladies cannot be cured by technical, financial, or managerial ‘fixes’. It also makes a note that all governance problems cannot be addressed using the policy and institutional ‘fixes’ either, as they cannot resolve such problems rooted in the ‘political bottom-line’. In other words, the problems rooted in the adverse balance of political-economic powers acting against the goals set for the governance of the sector can be resolved only through political action by the sections of society supporting the goals set for governance.

2. Introduction

In every sector, problems faced by different stakeholders at practical levels or on the ground are aplenty. Often, these are blamed on policy defects, i.e. problems in design of policies, lacuna in implementation, or simply on the unresponsive or irresponsible governing agencies. Despite the efforts made to deal with all these factors, these problems persist.

The problem of pollution of Ganga could be seen as a glaring example in this regard. This is a chronic problem that has been festering despite many attempts by government agencies to clean up the river, including the mega-programs like Ganga Action Plans: Phase I (GAP I) and Phase II (GAP II). One of the main sources of pollution in Ganga is sewage from urban habitats situated on the banks of the river and of its tributaries. Both the GAPs were largely focused on addressing the problem of pollution due to urban sewage.

The problem of pollution of Ganga caused by urban sewage could be viewed and analyzed from different perspectives, and all of these perspectives need not be exclusive of each other. For example, from the technical perspective, the problem could be seen as the result of improper technological choice, inadequate or inefficient equipment, faulty operation or maintenance procedures, and/or inadequate capabilities of the technical work-force.

Similarly, different explanations of the same problem could be proposed from the financial or managerial perspectives. All these explanations need not be exclusive of each other, in the sense that all explanations, to differing extents, could be simultaneously correct.

This document makes an attempt to present another perspective called as the Policy and Governance (P & G) perspective. It also elaborates on the Policy and Governance Framework, based on the Policy and Governance Perspective. The framework will be useful for analyzing the problems evident in various sectors, especially the infrastructure and public services sectors, including the urban sewage sector which is contributing to pollution of Ganga.

The main idea underlying this effort is to prepare a systemic tool in the form of P & G Framework for analysis of the ground-level problems from the P & G perspective. This tool is expected to be (a) conceptually sound and internally consistent (mainly on conceptual grounds) (b) adequately comprehensive to cover all the possibilities, (c) simple in structure to the extent possible, and (d) applicable across many sectors. It needs to be noted that this is not claimed as the only one, correct, or true perspective, neither the framework is seen as the most efficient, effective, or appropriate framework.

While structuring the perspective, a lot of effort is put in defining terms and concepts — which are apparently familiar—in a very clear, precise, and coherent manner. The exercise is aimed at bringing on the same plane or wavelength all those involved in conducting and understanding the analysis using the framework presented here. The main barrier in this effort is multiple interpretations and definitions of various terms and their use in every-day, popular-level language. Hence, significant effort is made here to define these terms in such a systematic and precise and ‘technical’ manner so that they can be employed for ‘analytical’ or ‘theoretical’ purposes.

3. Key Concepts and Terms

The P&G Framework relies on a set of key concepts and terms such as Policy Instruments (PIs), Governing Agencies (GAs), (Formal) Rules (of organizations other than GAs), Norms (Informal / unwritten Rules), Interests (of Stakeholders), and Misalignments. This section presents definitions and explanations of these key concepts. Box 1 presents short definitions of key concepts for ready references¹.

3.1 Governance of Infrastructure Sectors

There are scores of definitions of the term ‘Governance’. At the very preliminary level, governance could be seen as managing and administering of the public affairs in a given

¹ The basic definitions or explanations of the core concepts are introduced here in the box in order to make preliminary introduction of all the core concepts and terms to the readers at the beginning. As all the concepts are interrelated, the references to other terms are unavoidable while explaining of one concept. Such a short introduction is expected to make things easier for the reader.

sector or in a given geographic area by ‘Public Agencies’, with peculiar demands on them of legitimacy and accountability². The idea of governance, especially when it is used to understand the ground-level reality is quite comprehensive and complex. Hence, this note attempts to define the idea of governance in term of a conceptual—but which is more attuned to the practical use—schema called the Governance Grid. This is explained in detail in the later part of this document.

Box 1: Basic Definitions and Explanations of the Core Concepts and Terms

Governance Objectives (GOs): The government having the mandate to represent the public/citizens would decide the objectives guiding all efforts to govern the given sector or issues, so that the broader goal of protecting and promoting public interests can be achieved.

Policy Instruments (PIs): In a practical way, policy instruments (PIs) could be explained as different types of rules, such as laws, rules, regulations, departmental circulars, government notifications, with the Constitution of the country at the pinnacle. Policy Instruments could be seen as instruments for furthering or realizing the governance objectives (or GOs).

Governing Agencies (GAs): The agencies that are entrusted with the responsibility of discharging various governance functions and tasks in order to fulfil the GOs set for the sector (or issue) are called Governing Agencies (GAs).

Governance Instruments (GIs): The PIs and GAs, together are called here as the main Governance Instruments (or GIs).

Governance Processes: Processes that are the direct outputs of the efforts of governing agencies, using policy instruments, in order to achieve the GOs.

Norms: Informal, unwritten, and often unarticulated rules that the stakeholders (individuals, groups, or organizations) accept and adhere to—in conscious manner or otherwise—while participating in governance processes.

Interests: In a simple and practical way, interests could be seen as linked with the benefits (in most cases, economic and political benefits) which would accrue to the stakeholders or are expected by the stakeholder. Thus, interests could be seen as both (a) expectations and desires of obtaining benefits, or (b) the expected or desired benefits.

² Public affairs are those affairs wherein the transaction between two or more parties spill over (or have potential to spill over) beyond the parties involved, affecting others who are not involved in the transaction. It is expected that the two transacting parties are involved in a private transaction ‘willingly’ and ‘knowingly’. Moreover, public affairs also include those private transactions, wherein there is a possibility that one party is drawn or retained in the transaction not in fully ‘knowing’ or ‘willing’ manner. In other words, when party is seen as very weak or vulnerable and there is strong possibility that the vulnerable party would not be able to make informed decision at its own will—with a possibility of coming under duress—at the time of the entry or exit in the transaction. Further, the public affairs are governed by governing agencies in the public sphere. The governing agencies are ‘public’, because of their following characteristics: (a) they are expected to protect and promote public interests, (b) they use public funds, (c) they possess ‘legitimacy’ (or ‘public mandate’) to work on behalf of the public. This public legitimacy or public mandate with the governing agencies flows from accountability they have towards public or society at large. As against this, the private agencies are controlled by private owners and accountable largely to their owners.

3.2 Governance Objectives (GOs)

The government, having the mandate to represent the public / citizens, would decide the objectives underlying all efforts to govern the given sector (or issues) in order to serve the broader goal of protecting and promoting public interests³. In fact, in the democratic set-up, the party (or the coalition) controlling the government is expected to get the mandate from its constituents on the basis of the proposed governance objectives and targets it present to citizenry before the elections, often in the form of the 'election manifesto'. These Governance Objective (or GOs) would be of two types: (a) sector-specific objectives, and (b) broader social, economic, political, cultural, and other governance objectives. Sector-specific GOs pertain to the direction and the manner in which the sector is to be governed, while the broader GOs emerge from the broader vision of the government. Some of the sector-specific GOs could also be derivatives of broader GOs.

3.3 Policy Instruments (PIs)

In a simple and practical way, policy instruments (PIs) could be explained as different types of rules—made and used by governing agencies—such as laws, rules, regulations, departmental circulars, government notifications, with even the Constitution of the country at the highest level. Policy Instruments can be seen as instruments for furthering or realizing the governance objectives (or GOs). More specifically, policy instruments are the instruments that are used: (a) to guide and influence the thinking and / or behaviour (and hence decisions and / or actions) of different stakeholders, and (b) to create or establish governing agencies (or GAs) and shape their (i.e., GAs') structure and functioning. Here, GAs are expected or employ the PIs in their functioning. The different types of PIs are:

Laws (or Acts): These are created or enacted by the legislature or similar bodies made of representatives of citizens. This type of instruments receives legal sanction due to the very fact that it is approved by the body of representatives of citizens. The laws could be seen as providing basic normative frames for the governing agencies to carry out a set of sectoral responsibilities (SRs) and Generic Functions (GFs) in a particular sector. These terms are explained in the section of Governance Grid. They are often broad in scope and non-specific or ambiguous in content. The laws devolve to GAs other than the legislature the responsibilities: (a) to further articulate the normative frame, (b) to fill up the required non-normative elements in the framework for execution, and/ or (c) carry out execution of generic functions. The laws are also expected to follow the frame provided by the meta-level policy instrument such as the Constitution. The laws are justiciable in the courts in order to ensure their adherence to the Constitution.

³Here the term 'public interests' could be defined in diverse manner. The definition which is simple, practical, and still adequately comprehensive could be as follows: Public Interests are the sum total of the broader and long-term interests of the society as a whole (such as social equity or environmental integrity), as well as the private interests of the disadvantaged and vulnerable sections of society.

The laws are considered to have highest force of law, as they have direct and express sanction from the highest-level 'political' body, viz., the legislature made of representatives of citizens. The concept of force of law establishes the comparative legal status of various policy instruments. Higher the force of the law, higher is the precedence in legal hierarchy.

Rules or Regulations: These are prepared and finalized by the governing agencies other than the legislative bodies, on the basis of the authority delegated to them by the legislative bodies through provisions in the law (or in some cases by the Constitution through constitutional provisions). These are sometimes placed before the legislative bodies for their explicit sanction or implicit ratification. The rules and regulations are expected to further articulate the 'normative frame' provided by the law, and hence they are supposed to be less broad in scope but more specific in content. These are considered to have lower force of law when compared with the law and are justiciable in the court of law within the framework of the relevant laws and the meta-instrument like the Constitution.

Criteria, Government Orders, Notifications, Government Decisions/ Resolutions, Executive Orders, Circulars: These are again created by the governing agencies other than the legislative bodies. Often, these are not placed before the legislature for ratification or information. However, some of these instruments are published in the official gazette of the government in order to required legitimacy. These instruments are expected to fill up the technical, financial, and administrative details—which mostly are non-normative and objective in nature—in the narrow and well-articulated normative frame given by rules and regulations. However, they, sometimes, have some normative components intricately intertwined with non-normative aspects.

Policy Documents: All the above mentioned instruments have differing level of force of law supporting them as well as commensurate legal obligation to implement and abide by them in spirit and in letter. However, there is another type of PIs called Policy Documents. Policy Documents are essentially declarations of the intentions of the government. Though the contents of such document are expected to guide functioning of the governing agencies, they often are not ratified by the legislative bodies, and hence there is no legal obligation to implement them. In a sense, these documents are not justiciable. Often, Policy Documents give rise to the process of preparing and enacting the laws.

Thus, in summary, the first three types of policy instruments have hierarchical relationship. The force of law underlying the instruments reduces from the first to third type. Similarly, while the normative content and substantive scope of instruments reduces from the first to third, the degree of specificity increases from the first to third. In the case of Policy Documents, while there is no force of law, the normative and substantive scope of the policy-document is often wider than the laws and ambiguity is greater. Based on the location of their origins and source of their mandate, first two types (i.e. laws, rules and regulations) could be called as the legislative PIs, while the third set could be called as administrative PIs.

3.4 Governing Agencies (GAs)

The agencies that are entrusted with the responsibility of discharging various governance functions and tasks in order to fulfil the GOs set for the sector (or the issue) are called Governing Agencies (GAs). For achieving the GOs, the GAs are expected to use and employ many PIs. Through some PIs (i.e. laws and rules), these GAs are given the mandate (that includes the responsibility, authority, legitimacy, and obligation of accountability) to discharge certain governance functions.

Any GA could be understood in terms of its structure and functioning. Its functioning could be seen as a result of two factors: (a) strengths and limitations of GAs, which are product of created by the structure of the GA, (b) the mandate given to it, and (c) the PIs it uses (or can use) while discharging its mandate.

The 'structure' of the GAs could be understood in terms of the following 'structural characteristics' or 'structural elements' of the GAs. It needs to be noted here that these structural characteristics are determined and shaped by the PIs that establish GAs, define their mandate, and articulate the elements.

Composition: The term 'composition' of a GA indicates the main characteristics of the individual functionaries occupying important offices within the GA. The relevant characteristics include their education, training, capabilities, experience, and professional background. These, in turn, determine their capacity to carry out the given functions.

Functions and Responsibilities: The scope and depth of the functioning of the GA is determined by the functions, responsibilities, and/or duties given to it as part of its mandate by the relevant defining policy instruments. These functions generally include a mix of generic functions and sectoral responsibilities as explained in the paragraphs discussing the Governance Grid.

Jurisdiction, Powers, Authority: These characteristics determine the overall ability of the GA to carry out the functions mandated to it as well as the efficiency and efficacy of the GA in conducting them. These three characteristics need to be commensurate with the mandated Functions and Responsibilities of the GA, so that the GA would have required legitimacy, ability and to discharge the functions.

Accountability Relationships and Mechanisms: The policy instruments are also expected to define the accountability related characteristics of the GA. These include accountability relationships within the GA across different levels of staff and officials. These also include the accountability relationships of the GA with other agencies and stakeholders. Further, the accountability relationships are accompanied by mechanisms for extracting accountability in all these relationships.

Resources and Capabilities: The PIs that establish and shape the GAs often provide some indication of the level of resources (human, financial, and other) available to the GA. The subsequent PIs (such as the budget documents and government decisions on special grants)

determine the extent of availability of resources and capabilities to GAs. Here, the capabilities of the GA refer to the number and capabilities of the officials, staff, consultants (which the GA is empowered to and afford to hire), and other associates that the GA can have access to in discharging the mandated functions.

Other Characteristics: The structural characteristics described above are directly defined (or not defined) by the policy instruments. However, there are other and equally important structural characteristics which are not directly defined by the policy instruments such as awareness, vision, and willingness of functionaries in the GA. While they are implicitly and partly influenced by the policy instruments, the other broader and external factors do have significant influences on these characteristics. Most important of these other factor influencing directly or indirectly the GAs are the norms and interests of functionaries in GAs.

These structural characteristics largely determine the functioning of the GAs. However, it needs to be acknowledged that the GAs do not function in vacuum; rather their functioning is highly influenced by the other actors. This issue is discussed later in the document in detail.

3.5 Interrelationship between Governance Instruments

The PIs and GAs, together, are called here as the main Governance Instruments (or GIs). While the GAs employ or use different PIs to carry out their functions, the structure and functioning of GAs are, in turn, defined and shaped by some PIs.

Following this, PIs could be roughly classified in three groups: (a) those PIs which only establish GAs or define mandate and/or their structure, (b) those PIs which are employed or used by the GAs in their functioning or discharging their functions an duties, and (c) those PIs which do both of the above. Here, a PI can be seen at the level of the policy instrument as a whole (such as a law or the Constitution) or at the provision level (a section in the law or an article in the Constitution).

There is a need to understand the relationship between the PIs and GAs. Prima facie, they appear to be cyclical. But, a close scrutiny reveals that the relation is spiral in nature. The Constitution (PI₁) gives rise to the legislature (GA₁). Then the legislature (GA₁) produces the Laws (PI₂). The laws (PI₂) set up new authorities and / or departments (GA₂). The departments and authorities (GA₂) prepare notifications, departmental circulars, and even regulations (PI₃). This spiral relationship between PIs and GAs make the P&G perspective and the framework more complicated.

3.6 Formal Rules of Other (Non-Governing) Agencies

Most agencies and organizations from the public sphere could be called GAs, as they are often created through PIs and/or given a mandate though PIs for some public cause and have role in governance of some issue or sector. However, there are many formal agencies and organizations in the private sphere that—as stakeholders—respond to or participate in efforts of GAs to govern the issues or sectors and interact with GAs.

The structure and functioning of such formal private agencies are often partly regulated by the PIs which are meant to guide and control the behaviour of these formal agencies. However, there is a lot of flexibility and latitude available to these agencies to set their own formal rules. These formal (often written) rules also shape their behaviour and that of their influence in the public sphere.

3.7 Norms

Apart from the formal public governing agencies and private formal agencies, many stakeholders participate in the governance processes. They do not have any formal rules of their own, though many GAs (through PIs) and private agencies (through their formal rules) wield influence on behaviour of these informal groups or individual stakeholders. But, equally, if not more, important are the informal, unwritten, and often unarticulated rules or norms that these groups and individuals accept and adhere to, while participating in governance processes. These informal norms, together, are often called by an umbrella term: 'the culture'. Norms wield immense influence especially on those individuals who often have very few formal rules of their own to guide their behaviour in public sphere.

These norms are often linked with the two other related concepts, viz., behavioural patterns and perceptions. The informal rules or norms are often rooted in perceptions of the respective stakeholders about the reality that surrounds the issues or sectors and about the other stakeholders. But, the relationship between the behavioural patterns, norms, and perceptions is not necessarily always a one-way, causal relationship. Many times, repeated behaviour might give rise to new norms, and a particular normative perspective can also engender new perceptions. In short, the relationship between behaviour patterns, norms, perceptions is cyclical and mutually reinforcing.

However, norms are not restricted only to individual stakeholders or small groups. Individuals working in the public or governing agencies as well as private formal agencies also have their own norms, behavioural patterns, and perceptions. Some of these norms, behavioural patterns, and perceptions are shared by a large number of members of the particular organization or agency (public or private); rather, the individuals adopt some of these norms, behaviours, and perceptions, largely because they become members of the organizations. These shared norms, perceptions, and behaviours become characteristics of the particular agencies. Thus, in addition to the formal rules (in the case of public or governing agencies, the PIs), the organizations also possess informal norms. The umbrella term that is used often for all these norms, perceptions, and behaviour patterns—which are shared by a large number of members of the organization—is the 'organizational culture'.

3.8 Interests

Apart from the norms, another factor that significantly influences behaviour of stakeholders, whether individuals or groups, are the interests or stakes they hold. In a simple and practical way, interests could be seen as linked with the benefits (in most cases,

economic and political benefits) which would accrue to the stakeholders or are expected by the stakeholder. Thus, interests could be seen as both (a) expectations and desires of obtaining benefits, or (b) the expected or desired benefits.

The stakeholders have a variety of interests around an issue on in a sector. They could be of different types (e.g. economic, financial, political, social or ideological). There is some kind of order of priority among these interests, where priority depends largely on—and varies across—the stakeholders. Similar to interests, the individuals and groups within GAs and formal private agencies also have their own interests. Moreover, individual stakeholders, the GAs or a formal private agency, as a whole would have its own organization-level interests.

3.9 Impact of Norms and Interests on GAs and PIs

As mentioned before, the GAs also have their own organizational culture—made up of unwritten norms, underlying perceptions, and behaviour patterns—and organization level interests. In addition, the functionaries who decide and act on behalf of the GA also have their own norms and interests—at the individual and group levels. All these three levels or types of norms and interests immensely influence the functioning of the GAs, their interpretations of their mandates and, their use of PIs in their functioning. This influence and impact on functioning of the GAs is carved through their actions to their outputs and outcomes of these output. One of the critical outputs of some GAs is the PIs which they create. As a result, the PIs are also influenced heavily by the all the three levels or types of norms and interests of the GAs that produce the PIs.

4. Governance Grid

To explain the concept of ‘Grid of Governance’, it is envisaged that the governance of the infrastructure sectors involves discharging various responsibilities, functions, and tasks that can be organized in a nested, hierarchical grid of three levels, each level representing one level of responsibility of governance. The three hierarchical levels, in the order of nesting are: (a) the broad and major Sectoral Responsibilities (or SRs), (b) Generic Functions (GFs), under each of these SRs, and (c) Core Tasks of Governance (CTs) to be performed in order to discharge each of the GFs. In other words, governance of infrastructure sector, at the first level, involves discharging the main sectoral responsibilities. Discharging each of these sectoral responsibilities require carrying out certain generic functions. Finally, carrying out each of the generic functions (for each of the sectoral responsibilities) involve conducting all the (three) core governance tasks.

4.1. Sectoral Responsibilities (SRs)

At the outset, governance of the infrastructure sector (or for that matter any sector) involves ensuring smooth conduct of some broad and major responsibilities in the sector. For example, in the case of the electricity sector, the major sectoral responsibilities (SRs)

are: Generation of Electricity, Transmission of Electricity and Distribution of Electricity. In the case of urban water sector, the SRs include: Sourcing of Water, Transport of Water, Treatment of Water, and Distribution of Water. Similarly, the sectoral responsibilities (or SRs) for the urban sewage sector taken here as an example, are:

- Collection of Sewage (from the points of generation)
- Conveyance of Sewage (to the treatment facility)
- Treatment of Sewage (as per the desired process and up to the desired standard)
- Disposal of Treated Sewage (in an appropriate manner)

Table 1: Basic Structure of the Governance Grid

	Sectoral Responsibility 1	Sectoral Responsibility 2	Sectoral Responsibility 3	Sectoral Responsibility 4
<i>Generic Function 1</i>				
<i>Generic Function 2</i>				
<i>Generic Function 3</i>				
<i>Generic Function 4</i>				

4.2. Generic Functions (GFs)

For successful discharge of each of these sectoral responsibilities, certain generic functions are to be carried out. Table 1 presents basic structure of the ‘governance grid’, comprising of GFs and SRs. The following discussion briefly presents these generic functions:

Survey, Planning, and Technical Designing: This includes Survey, which essentially means collection of the quantitative and qualitative data required for conducting the planning function and preparing technical designs of the facilities and equipment. The planning function includes decisions like appropriate site-selection and planning for ensuring smooth supply of inputs and transport of outputs. Technical design includes design of civil facilities as well as of mechanical and electrical equipment and systems. Technical designing should also include development of management systems. After finalizing technical designs, necessary approvals from designated authorities sanctioning technical designs should also be secured.

Administrative Approvals and Financing: This involves obtaining the necessary sanctions from all the administrative agencies that have jurisdictions pertaining to the particular generic function to be performed. This also involves all the activities that need to be conducted in order to ensure timely availability of finances, such as identifying sources of finance, negotiating and entering into contracts and agreements, and securing the actual fund-flow in timely manner.

Infrastructure Development: Once approvals and finances are available, development of infrastructure or actual establishment of facilities and equipment is the next step. This often

involves: Site-Preparation, Procurement of Material, Erection of Facilities, and Commissioning and Pilot-testing of equipment and facilities.

Operation, Maintenance, and Service-Provisioning: Once the equipment and facilities are ready, the operation and maintenance of the equipment and facilities are the main functions. There is need to emphasize on the sub-function of maintenance, considering the almost universal experience of utter neglect of maintenance of facilities and equipment in the infrastructure sector in the country. The 'operations' also includes provisioning of services or of resources generated by the facilities to customers. The function of 'Provisioning of Services', in turn, covers all the other related activities, including Metering of Consumption, Billing for Consumed Services, Recovery of the Bills, and Grievance Redressal.

The sub-function of 'Grievance Redressal', alike the sub-function of 'maintenance of facilities,' also needs a special mention. Though logically it is the sub-function of service provisioning, the function needs elaborate and careful treatment in developing the PIs and GAs. Here, the term 'Grievance' is restricted to complaints of individual consumers of services—about the quality and quantity of the service or about the metering, billing and recovery of bills. In other words, here we are considering, service-related grievances of consumers⁴. Redressal of service-related grievances requires separate and special treatment, because; (a) such grievances are of individual concern, (b) the number of such grievances could be large, (c) they often are recurring in nature, and (d) timely, effective, and efficient service related grievances often determine the acceptability and credibility of the governance in the eyes of large number of consumers. Further, redressal of consumer-grievances involves ensuring compliance of the service code, which is a normative document providing standards for service provisioning.

Monitoring and Evaluation: The last generic function is monitoring of performance along the parameters which are selected a priori. The data collected through monitoring activities is used to evaluate performance of the agencies, by comparing the actual performance with pre-determined standards or benchmarks.

The particular grouping or order of the generic functions (or GFs) presented here is illustrative; it is more at the conceptual level. The grouping and the order could be different in practice, depending on the nature or volume of work involved in each of the functions or depending on the existing policy, institutional arrangement, or governance system.

⁴There could be other types of grievances such as grievances of project affected people (or PAPs) against the design and implementation of rehabilitation and resettlement (R&R) package. Here, the grievances are of individual nature and the potential number of aggrieved individuals could be large. Hence, such situation also requires a separate mechanism for redressal of grievances. However, such a mechanism needs not to be permanent as in the case of the mechanism for redressal of consumer grievances.

4.3. The Core Governance Tasks (CTs)

At the very basic level, there are three core tasks involved in conducting any generic (governance) function, viz., (a) Laying normative foundation (i.e., preparing the Normative Frame) pertaining to the particular GF within the particular SR, (b) Execution (or Implementation) of Normative Frame, pertaining to the particular GF within the particular SR (c) Ensuring Compliance, i.e., compliance with the relevant and binding PIs while performing the first two tasks. Thus, while conducting each of these generic functions, the three core governance tasks will have to be carried out. Table 2 is the revised version of Table 1, in which these three core governance tasks (CTs) are integrated. Thus, Table 2 presents the full picture of the Governance Grid. The following paragraph discusses these three governance tasks in some details.

Normative Framing (NF)

This essentially means creating a Normative Frame or a frame of ‘normative’ or ‘value’ choices, within which a particular Generic Function in a particular Sectoral Responsibility is to be carried out. This CT includes three sub-tasks: (a) outlining ‘value contours’ for the particular GF (to chart out operational area or what is in and what is out of the purview of or ambit of ‘public governance’ pertaining to the GF), (b) stipulation of specific governance objectives to be achieved through conduct of the particular GF, (c) providing some additional guidelines—optional or mandatory — or standards to be followed during the process of execution or implementation of the GF. These guidelines may sometimes include non-normative elements⁵.

This is called ‘Normative’ because all these sub-tasks involve making critical decisions that, in turn, are shaped by ‘subjective’ choices that are guided or determined by the ‘societal values’ or ‘norms of society’. These values or norms of the society (as a whole), pertaining to the particular GF would then determine what should be achieved through Execution of the particular GF, and in what manner. Therefore, these decisions are called normative decisions. The norms also provide guidelines for ensuring compliance in terms of benchmark or standards against which the performance (i.e., output, outcome, or even the process of conduct) of the concerned GA in the case of the particular GF is to be assessed.

To elaborate further, the society’s ‘values’ would, for example, decide which section of society would receive benefits and which section would pay costs involved. They would also decide the quantum and timing of share of costs and benefits that would accrue to different sections of society. Because such decisions form the core of ‘politics’ of the society, these decisions are also called as ‘political’ decisions. Further, these decisions are expected to be based on ‘value’ choices of society as a whole, the task of preparing Normative Frame

⁵ The boundary line between normative and non-normative elements, in practice is often blurred. In many cases, apparently technical or administrative elements are based on implicit normative choices. So use of the term ‘normative’ here is made with this caution in mind.

should be handled by the authorities or agencies that have clear and ‘expressed’ mandate from society (or polity) to make such decisions on behalf of the society.

A good example in this case is enactment of a law by the elected legislature. The law would contain provisions that would provide the Normative Frame for those GFs under the particular SRs in the sector, which are covered by the law. The institutions or agencies which obtain such ‘political’ mandate through the electoral process have authority to make such decisions on behalf of society. In short, the core governance task of ‘Normative Framing’ involves making subjective choices based on societal values, and hence, it needs to be performed by GAs that have ‘political’ mandate from society. The task of ‘Normative Framing’ can be seen as laying ‘normative foundation’ for the two subsequent CTs in the entire process of governance.

The process of ‘Normative Framing’ often takes place in stages, producing a hierarchical range of outputs in the form of different PIs with varying force of law. The source of all policy (legal and administrative) instruments that provide ‘Normative Framing’ in India is the Constitution of India. The Constitution provides basic Normative Frame and also is the original source of legitimacy—required to make normative decisions—for all GAs. The Constitution devolves the duty and required legitimacy to legislatures to enact laws which translate or adapt the broader values in the Constitution to the situation in the concerned sector, with more specifications. The legislature then devolve the duty and required legitimacy to other GAs to make rules, regulations and other instruments which further elaborate the normative frame provided in the law, along with some non-normative guidelines. In other words, while the Constitution and the law are broad in scope and ambiguous, the rules, regulations, and other instruments are expected to be narrow in scope but specific.

In sum, the Normative Frame for any GF (within any SR) is the frame provided by all the relevant provisions in the PIs (right from the Constitution) that have implications for the concerned GF. The GF has to be executed in this frame. Even the compliance of execution function is to be checked against this frame.

Table 2: Grid of Governance for Infrastructure Sectors
 [Matter in the brackets gives details for the urban sewage sector]

	SR 1 (Collection of Sewage)	SR 2 (Conveyance of Sewage)	SR 3 (Treatment of Sewage)	SR 4 (Disposal of Sewage)
GF 1 : (Survey, Planning, & Technical Design)	Normative Framing	Normative Framing	Normative Framing	Normative Framing
	GF Execution	GF Execution	GF Execution	GF Execution
	Compliance-Ensuring	Compliance-Ensuring	Compliance-Ensuring	Compliance-Ensuring
GF 2: (Financing & Administrative Approvals)	Normative Framing	Normative Framing	Normative Framing	Normative Framing
	GF Execution	GF Execution	GF Execution	GF Execution
	Compliance-Ensuring	Compliance-Ensuring	Compliance-Ensuring	Compliance-Ensuring

Table continued to next page

... .. Table continued from previous page

	SR 1 (Collection of Sewage)	SR 2 (Conveyance of Sewage)	SR 3 (Treatment of Sewage)	SR 4 (Disposal of Sewage)
GF 3: (Infrastructure Development)	Normative Framing	Normative Framing	Normative Framing	Normative Framing
	GF Execution	GF Execution	GF Execution	GF Execution
	Compliance- Ensuring	Compliance-Ensuring	Compliance- Ensuring	Compliance- Ensuring
GF 4: (Operation, Maintenance, & Service Provision)	Normative Framing	Normative Framing	Normative Framing	Normative Framing
	GF Execution	GF Execution	GF Execution	GF Execution
	Compliance- Ensuring	Compliance-Ensuring	Compliance- Ensuring	Compliance- Ensuring
GF 5: (Monitoring and Evaluation)	Normative Framing	Normative Framing	Normative Framing	Normative Framing
	GF Execution	GF Execution	GF Execution	GF Execution
	Compliance- Ensuring	Compliance-Ensuring	Compliance- Ensuring	Compliance- Ensuring

4.4. Execution of Generic Function

This core governance task (or CT) involves every activity that needs to be conducted in order to translate the Normative Frame into achievement the governance objectives. The ‘Governance Grid’ presented in Table 2 explains this point further. Once the Normative Frame is prepared for execution of every GF of every SR, then the next step is to execute these GFs within the Normative Frame. These GFs would be executed by GAs which are mandated by the PIs to perform the particular GF. The structure and functioning of GA would be defined by the PI so that the GF would be performed in efficient and effective manner. Execution of task would include two main groups of sub-tasks: (a) making Non-Normative Decisions (within the given Normative Frame), and (b) Implementing both types of the decisions.

The first group of sub-tasks would, involve preparing a variety of policy instruments that are primarily non-normative and technical, or administrative in nature. These would, for example, include preparation and promulgation of various PIs such as criteria, notifications, and circulars. The second group of sub-task would, for example, include setting-up new agencies or restructuring, re-equipping the existing ones, or conducting training programs.

It needs to be clarified here that the neat distinction between normative and non-normative decisions and their conduct is somewhat unrealistic and difficult to achieve in practice. So, even during the task of execution of GF, the ‘executive’ agencies in charge of this tasks have to make many normative decisions—though of less importance and with impact that are less significant.

4.5. Compliance Ensuring (CE)

This essentially means ensuring that each of the decision and action undertaken during discharge of the first two tasks is in adherence to the relevant PIs (i.e., law, rule, regulation, or government order) which is applicable and binding on the concerned functionary and

agency, while making the particular decisions as taking the particular action. This is primarily aimed at ensuring and extracting accountability—towards the members of society—of the functionaries in the governing agencies who have been given the mandate—direct or indirect—and powers to act on behalf of the society.

This task could be seen as divided in three sub-tasks: (a) setting the benchmarks/ standards for the parameters of performance to be monitored⁶, (b) monitoring performance on the relevant (for which the standards are set) parameters and comparing the performance with the standards, and (c) enforcing compliance with the standards. The third sub-task primarily involves penalizing the actors who default on compliance.

Thus, the Governance Grid depicted in Table 2 is based on the three concepts of Sectoral Responsibilities, Generic Functions, and Core Governance Tasks. The governance of infrastructure sector like the urban sewage sector can be viewed and analyzed using this governance grid.

5. The Governance Process: Limitations and Failure

5.1. The Ideal type of Process of Governance

The governance process is, ideally, seen as a conscious attempt by GAs to simultaneously achieve both types of governance objectives (or GOs). GAs carry out core governance tasks mandated to them in order to achieve these two sets of governance objectives. Ideally, the separate GAs are structured to carry out separate CTs. Thus, there are GAs that carry out only the task of Normative Framing for all GFs in all SRs. In other words, the legislature enacts a law that covers all the relevant SFs & GFs. Similarly, the ministry preparing the rules for a law covers all the SRs and GFs covered by the law. The GAs, carrying out ‘Execution’ tasks are often organized as per the SRs and/or GFs. Whereas the GAs carry out the task of ‘compliance Regulation’ are organized as per the capabilities. For example, the Office Account General looks into accounts of all the GFs of all the agencies, while technical audit will be done by technically competent agency like NEERI or IT. Agencies like CAG, IRAs often possess multiple capacities. This arrangement of work in GAs has evolved through a long history.

In discharging their mandate, the GAs employ PIs to influence thinking and behaviour of certain targeted stakeholders in the sector, in order to fulfil the governance objectives. Various stakeholders, including other GAs, respond to these efforts of GAs, especially to their use of PIs. These responses are expected to help and facilitate efforts by GAs to achieve governance objectives. Thus, both the instruments of governance (GIs), i.e., the PIs and GAs, together, are expected to work in unison to achieve governance objectives, while

⁶The sub-task of standard setting, when it does not involve normative or value choice, and which essentially pertain to non-normative matter could be handled by an agency which has expertise in the concerned non-normative matter. However, when the standard setting involves significant normative component, then it should be handled by a ‘politically competent’ GA.

the other stakeholders are expected to respond 'positively' and work in alignment of the efforts of GAs made through employing of PIs to achieve the governance objective.

5.2. Governance Process in Practice

However, in practice, this ideal process of governance often does not work as narrated in the previous paragraphs. As a result, many deficiencies (limitations and failures) in performance of the GAs are evident in reality. In other words, the GAs, in many instances, fail to realize or achieve the governance objectives placed before them. Rather, in some situations, they end up creating many unintended adverse effects or problems. This failure in governance or failure of GAs to perform efficiently and effectively, and hence, their failure to achieve GOs is postulated here as the result of the following main causes:

1. Different types of lacunas in the structural characteristics or structural elements of the GAs involved
2. Different types of lacunas in various policy instruments (PIs) that are available to or used or employed by the GAs during their functioning, in order to discharge its mandate

The following paragraphs discuss three sets of lacuna one by one:

5.3. Lacuna in the Structural Elements of GAs

The lacunas in the structure of GAs need to be identified in terms of lacunas in different structural elements or characteristics. They, then, can be traced to the PIs defining the particular structural element of the GAs. As we have seen before, there are five types of elements or characteristics of the structure of the GAs. The following discussion explains different type of lacuna in the structural elements of GAs.

Vagueness or Ambiguity: One type of structural lacunas in GAs emerges from the vagueness/ambiguities (i.e., lack of specificity and elaboration) in articulation of any of the elements itself. This is often is the result of vagueness or ambiguity in the concerned PI defining the problematic element. The vagueness or ambiguity in the structural element creates an opportunity or latitude for the functionary in-charge to use its own discretion, while interpreting the provisions. This in turn, provides an opportunity to the functionary for adapting the interpretation of the element to its own taste, interest, and convenience. Such a convenient interpretation is often at odds with the original interpretation assumed at the time of articulating the PI. This leads to performance of GA that is divergent from the expected performance. Also, this often leads to multiple interpretations and confusion, resulting in non-performance or conflict and even litigation.

Inadequacies: The second type of the structural lacunas in GAs emerges from the inadequacies in the characteristics or elements of structure of the GAs. The provisions defining the concerned problematic characteristic, even if a specific could provide for limited authority, or jurisdiction, or a certain function might be missing in the provision. This could also result in non-performance or conflict.

Inconsistencies: The third type of structural lacunas emerges from the inconsistencies across the five elements or characteristics. For example, the defining PIs could create a GA that does not have jurisdiction, authority, or resources that are commensurate or consistent with the functions and responsibilities entrusted to the GA. These could be attributed to the problem with provisions in the PIs that define the inconsistent elements. Such inconsistencies also lead to inefficiencies and ineffectiveness or conflict.

In short, the lacuna in the structural elements of the GAs could be traced to the PIs that define these elements.

5.4. Lacunas in the Policy Instruments

Often, PIs are found to fail or to be inadequate as instruments for the GAs to achieve or fulfil the goals of governance. Alternatively, as demonstrated in the previous section, the structural lacunas in GAs are created due to lacunas in the PIs that define these structural elements of the GAs. In such situations, the failure or limitations of PIs could be traced to the following types of lacunas in the PIs.

Gaps: These refer to complete failure on the part of the concerned PI to take cognizance of certain aspect of the GFs, CTs, or SRs. This failure results in a sort of vacuum or gap in governance as far as the particular aspect is concerned. Such vacuum either leads to complete neglect of the particular aspect or leads to multiple interpretations—as a result of efforts by the functionaries to fill up the gap in an ad-hoc manner. This, in turn, leads to confusion, conflict, and litigation, all of which are deleterious for governance.

Overlap: This situation is exactly opposite to the previous situation. Here, the two provisions in one or different PIs deal with the same aspect of the GF or SRs. Such overlap or multiplicity also leads to similar harmful effects on governance, especially if there is some discrepancy in the articulation or interpretation of the two overlapping PIs.

Inconsistencies: In this situation, two provisions in the single or different PIs are not overlapping but still lead to not only different but also mutually inconsistent interpretations of the same aspect of GF or SR, or they lead to different and inconsistent answers/paths to the same issue. Such inconsistency also creates similar deleterious effects on governance.

Contradictions: In some situations, the two provisions (from the same or different PIs) not only give inconsistent solutions or directions, but they provide exactly opposite answers. This is also a very harmful situation.

5.5. Different type of Lacuna in Functioning of GAs

There could be situations in which one cannot trace the failure of GAs to either of the two abovementioned problems, i.e., lacunas in the structure of GAs (a) lacunas in the PIs to be used by GAs to perform their functions. In such situation when the GA is not able to perform despite having appropriate structure and PIs to use, its failure to perform could be traced to the following two factors. First, the failure lies within the GA, which is not able to perform

due to internal contradictions. Second, alternatively, the problem lies outside the GAs or PI if used and with the other stakeholders whose behaviours and thinking the GA attempting to guide using the PIs. These internal and external problems are explained using the concept of misalignments.

Misalignments

Interests and (informal) norms are expected to influence the governance process in significant manner. The interests and / or norms of a stakeholder—which are internal to the stakeholders—guide and prompt the stakeholder to think and / or act in a particular manner and in a particular direction in relation to a particular aspect of the issue or of the sector. At the same time, from outside, the GIs attempt to guide the thinking and behaviour of the stakeholder in a particular direction, in relation with the same aspect of the issue or a sector. This is attempted in order to ensure that the thinking and actions of the targeted stakeholder are conducive to achievement of governance objectives. GIs make such attempts by providing certain incentives or disincentives to the targeted stakeholder through a variety policy instruments. If these two directions are not aligned, then there is tussle and tension between the two sets of forces pushing the stakeholder in the two contradictory directions.

There is a third set of actors, the other stakeholder or non stake-holding actors that provide some pressures and/or enticements to the targeted stakeholder in a particular direction; when it comes to the concerned issues or sector. These third party forces acting on the stakeholder targeted by GA could be intentional or non-intentional, implicit or explicit, benevolent or malevolent, bonafied or malafied; but often these forces play crucial role in determining the behaviour of the targeted stakeholder. These forces again work through different incentives/disincentives which could be tangible or intangible.

In such situation, the actual behaviour of the stakeholder depends on how the stakeholder responds to these three sets of forces: (a) incentives and disincentives provided through policy instruments, (b) internal compulsions—guiding the thinking and/actions—created by the ‘misaligned’ norms and/or interests, and (c) forces exerted by the third party or the other actors. If the force of the internal compulsion and/or the force of the third party actors overwhelms the motivation provided by policy incentives or disincentive, then the resultant thinking and / or behaviour of the stakeholder proves divergent if not counter-productive to the efforts of the GAs and to the governance objectives they want to achieve. Such behaviour results in some distortion or perversion in the governance process, which create deficiencies in performance of governing agencies, harming the efforts to achieve governance objectives.

Thus the misaligned behaviour of the stakeholder targeted by GAs create problems. This misaligned behaviour could be rooted in ‘misaligned’ norms and/or interests of the stakeholders itself can be called as secondary misalignment. This could also be simultaneously rooted in the misaligned influence or incentives offered by the third party

actor. This can be called as tertiary misalignment. Both types of misalignments create pervasive or distortion in the governance process.

Such distortions or perversions require efforts or measures to convince or motivate the concerned stakeholder to realign its 'misaligned' thinking or behaviour and contribute 'positively' to the efforts of GAs to achieve governance objectives.

In case of tertiary misalignments, created due to influence of third party actors, one approach is to employ measures to nullify these influences by focusing on the influences themselves or on the third party actors. This is especially, true in case of pressures or perceived threats from the third party actors, where the stakeholder would need protection. Alternatively efforts can be aimed at creating strong incentives to wean away the targeted stakeholder from the attractions/enticements provided by third party actors.

In the case of misaligned norms or perceptions of the stakeholder itself (i.e. secondary misalignment), these measures for realignment could, for example, come in the form of effort to create awareness aimed at changing or modifying the norms or perceptions influencing the behavioural pattern of the stakeholder.

These measures might attempt to incentivize realignment of the behaviour or to disincentives the counter-productive behaviour. The existing PIs could be modified to include, accommodate, or reflect these measures or new PIs could be designed for this purpose. However, the efforts and incentives should be adequately strong to result in the change or modification in the 'misaligned' norms and perceptions, or behavioural pattern, which often are hard to change.

Similarly, in the case of misaligned interests of the stakeholder, some incentives or disincentives—adequately strong—are required to produce realignment of interests and behaviour supportive of the policy objectives. Here, again, it needs to be noted that one's own interests are powerful drivers and to dissuade the stakeholder to behave against the interests requires really strong disincentives or incentives. Considering this, in the case of dominant stakeholders, the penalizing disincentives, in all probability, will not work, as the stakeholders would resist or attempt to dodge the disincentive, creating new sets of problems. At the same time, the positive incentives will have to provide significant benefits to dominant stakeholders in order to counter the lure of misaligned interests. However, such significant benefits might defeat the very governance objectives, especially those with the equity and sustainability at the heart. This situation leads to two options: (a) adjust the objectives and policies so that the misalignment with the interests of dominant stakeholders will be minimal or (b) working on 'norms' on 'perceptions' of the dominant stakeholders so that they will see the need to give up their misalignment interests.

Primary Misalignment

This leaves us with a situation wherein there is failure in governance but there is no problem with the PIs that define the GAs and that the GIs can use; neither is there problem of

secondary or tertiary misalignment. As mentioned before, in this case, the problem lies within the GA.

The GA is composed different types of functionaries including political appointees, permanent staff, contracted staff, and hired consultants. These functionaries act as individuals and even as interests groups organized along different shared interests and attitudes/values. Thus individual functionary has norms and interests at individual level. Various groups have norms and interest at individual level. Various groups have norms and interests at the group level. Finally the organization itself has its own set of interests and norms.

In addition to the PI that define and shape GAs structure and functioning, these norms and interests openly at the three levels-individual, group, and organization-do create incentives for the functionaries to think and act in a particular direction. If this direction is not aligned with the direction defined by the PIs, then there is misalignment, which is within the GA. This is called as the primary misalignment. Efforts are needed in the forms of incentives and disincentives operating at individual or group, and organizational level to realign the norms and create misaligned interests within the GAs. The incentives could be diverse in the form of economic or behavioural incentives or they could be disincentives in the form of penalties or punishment.

Roots of the Lacunas in the PIs

The failure or limitations in the PIs could be further analysed to trace their roots in the faulty design of the PIs. Considering the fact that PIs are created by the GAs, the lacunas in the PIs or the faults in their designs which could be traced to the following two factors:

- (a) The first factor could be the misalignments between the GOs on one hand, and the norms and interests within the GA (operating at the three levels, viz., organizational, group-level, and individual). This type of misalignments described here could be called as 'Internal Misalignments' as they are within the governance system.
- (b) The second factor could be deficiencies in the level of preparedness of the GAs (that produced or articulated the particular PI) that is required to produce an efficient and effective PI. The preparedness, here, could be seen in terms of the five attributes: Awareness, Vision, Capability, Resources, and Willingness.

The Policy and Governance Perspective

The Policy and Governance (P&G) Perspective could be presented now using the concepts and terms explained in the previous sections.

The perspective essentially argues that the problems of performance in different sectors and issues are often rooted in the deficiencies (failures and limitations) in the performance of the governing agencies responsible for achievement of given governance objectives.

These deficiencies (failures and limitations) in the performance of the GAs are, in turn, rooted in the five core maladies presented in box 2.

Box 2: Five Core Governance Maladies

Different types of lacunas in various policy instruments (PIs) that are used or employed by the GAs during their functioning (Gaps, Overlaps, Inconsistencies and Contradictions)

Different types of lacunas in the PIs that define the problematic structural characteristics or structural elements of GAs involved (Vagueness/Ambiguities, inadequacies, Inconsistencies)

Primary Misalignments: Misalignment (Internal) between the internal norms and / or interests of the GAs (at group, individual and organizational level) on one hand, and the Governance Objectives (GOs)

Secondary Misalignments: Misalignment between the efforts of GIs (using PIs) to achieve GOs on one hand, and the norms and/or interests of the targeted stakeholders (Individuals or Organizations)

Tertiary Misalignments: Misalignment between the efforts of GIs (using PIs) to achieve GOs one hand, and the pressures, threats or enticement exerted of stakeholders, by third-party actors

Many deficiencies or problems in the working of the GIs are often observed to be arising out of non-governance factors or aspects such as Technical, Economic, Financial, Managerial (TEFM) factors. However, on many occasions, on closer scrutiny, some of these T, E, F, and M problems are found as not essentially the TEFM problems but which are becoming problems because of: either (a) lacunas in the structural elements of GAs or (b) the PIs that are used or employed by GAs. In such situations, these two types of lacunas need to be integrated with the earlier list of the lacunas. However, it must be admitted that there would be many TEFM factors that are inherently, essentially, or purely technical, economic, financial, or managerial in their nature⁷.

Thus, apart from the factors that are essentially and inherently TEFM in nature, all deficiencies in the performance of GAs are rooted in the six types of core governance maladies identified before (presented in Box 2).

⁷ For example, factors like non-availability of desired technology on the shelf, extremely high requirement of financial resources, very high level of managerial capabilities that can be expected only from highly trained or motivated functionaries. These could be seen as results of governance failures or maladies in other sectors like 'Science and Technology Policy'.

It needs to be noted that there are some problems in the sector, which are TEFM in nature or even of policy and governance in nature, are created by the PIs or GAs from the other sectors. In that case, the solution lies in the policies and governance in the other sectors⁸.

The Policy and Governance Framework

Based on the P&G Perspective, a framework could be developed to analyze problem situations in different sectors or around problematic issues, in order to assess and determine the core governance maladies underlying the problems encountered. The framework is presented in this section in step-wise manner. The framework has two parallel streams of actions. Stream A is based on desk research. It involves textual analysis of all the policy instruments (i.e., it is based on secondary data) relevant for the conduct of Sectoral Responsibilities (SRs) and Generic Functions (or GFs) of all the SRs in the sector under study. Alternatively, the study could be restricted to one or more GFs or SRs.

Stream B begins with the real-life empirical data about the deficiencies (or failures) in the governance, more precisely in the performance of governing agencies (which can be seen as symptoms of governance failure). The work in the stream begins with collection of primary and secondary data about various performance-related problems in the sector. These are to be traced to various deficiencies in the Policy Instruments, Governance Agencies, and the Governance Process. Both the streams are explained in the subsequent paragraphs.

Stream A: Textual Analysis of Policy Instruments

Step 1: Preparation of the Governance Grid for the Sector

Preliminary information collected from the literature and through interviews of the experts and practitioners should be used to prepare the Governance Grid for the sector on the lines of Table 1.

Step 2: Data Collection

All the policy instruments need to be collected that pertain to the governance of the sectorial responsibilities and generic functions that are to be studied. These include: laws or acts, rules and regulations, government orders or resolutions or decisions, notifications, and policy documents.

Step 3: Organization of the Provisions from Different PIs

Organize various provisions and sections in different policy instruments as per their relevance for each of the cells in the Governance Grid for the sector. This will help bring the

⁸ For example, the attendance in the rural school may be affected by the combination of P & G factors from outside the education sector such as: (a) policies for economic development that force entrepreneurs (in order to ensure their survival) to cut down their labour costs drastically, and (b) failure of GAs in the social-security sector to curb child labour.

relevant provisions from different policy instrument, together, facilitating their study and comparison.

Step 4: Identity Different Types of Lacunas in the Policy Instruments

Study the provisions from different PIs to identify different types of the lacunas in the policy documents, such as Gaps, Overlaps, Inconsistencies, and Contradictions.

Step 5: Making Recommendations

Using the above analysis, prepare a list of recommendations for addressing the lacunae identified in the previous step. After going through all the identified lacunas individually, try to organizes the recommendations for amendments in the policy instrument in a coherent and systematic manner.

Stream B: Analysis of Deficiencies in Performance of Governing Agencies

Step 1: Preparation of the Governance Grid for the Sector

Preliminary information collected from the literature and through interviews of the experts and practitioners should be used to prepare the Governance Grid for the sector on the lines of Table 1. This step is similar to Step 1 in the Stream A.

Step 2: Preliminary Mapping and Analysis of the Governing Agencies

Using the data and information collected, preliminary mapping of the governing agencies entrusted with different sectoral responsibilities and different generic functions is to be conducted. This mapping should lead to better understanding of the history and current status of these agencies. These GAs then could be mapped using different techniques such as drawing an organogram and/ or mapping of the agencies on the governance grid made up for the sectoral responsibilities and generic functions. While the organogram would point out organizational gaps and gaps in the accountability relationship, the fitting GAs on the Governance Grid would help see the gaps or overlaps in organizational responsibilities.

Step 3: Documentation of Problems in the issue under the study

The next step will be to articulate and document in detail the various problems encountered in the sector or the issue under to be studied/analysed. There is a need to go beyond the anecdotal evidence and collect sound qualitative and quantitative data and information. However, anecdotal information is equally important, especially when it is difficult to obtain hard data.

Step 4: Building of Causal Tree Diagram of the Problems

These problems will then be analyzed to unravel underlying successive causal factors at deeper and deeper levels, by preparing the 'Causal Tree Diagram'. This causal analysis is to be conducted using information and data collected from primary and secondary sources.

Step 5: Classification of the Causal Factors

All the causal factors identified in the last layer of the causal tree diagram are to be first separated in the four main groups.

1. The causal factors that are clearly rooted in or related to deficiency in any of the policy instruments that are used by the GAs
2. The causal factors that are clearly rooted in or related to deficiency in any of the structural characteristics or structural elements of any of the governing agencies
3. The causal factors that are clearly rooted in or related to deficiency in the functioning of any of the governing agencies
4. The causal factors that at least prima-facie do not appear to be related to policy instruments or to governing agencies; and rather are related to technical, economic, financial, managerial, (i.e., TEFM) or any such aspect.

Step 6: Analysis of Causal Factors Traced to PIs

The causal factors from the first group clearly point out some deficiency or lacuna in the policy instrument either at the instrument level or at the provision level. Such deficiencies can be addressed by the following measures either at the instrument level or provision level: (a) appropriate changes or amendments in the concerned PI, (b) creation of new PI(s), and/ or (c) deletion or repealing of the unwanted PI(s). Appropriate recommendations for changes, modifications, additions, or deletions in the PIs need to be evolved and articulated.

However, while evolving the recommendations for modifying or changing the PIs, the two sources of deficiencies in PIs that are mentioned before need to be noted here. One source of the deficiencies in PI is the lack of preparedness of the GAs which created the PI. In this situation, the choice is between two options. One option is to give the ready-made solution in the form of changed or modified or an entirely new PI (instead of the suggestions for changes / modifications or creation of new PI). The other option is to work on the preparedness of the GA that is entrusted with the task of creating the particular PI and help it to modify or create a new PI required. This will be helpful in the long term.

The second source of deficiencies in the PIs the misalignment of the norms and interests of the GA producing the PI with the GOs themselves (primary misalignment). In this case, the above-mentioned two options do exist, but the challenges are more daunting. There is the danger that the suggestions for changes in PIs or for creating new PIs will never be addressed or acted upon seriously or effectively. Nor would there be willingness to respond to efforts to enhance preparedness.

Further, there are two problems with the strategy of giving the ready-made solution (in the form of articulation of modification or creation of PIs). First, there are chances that the GAs which are going to use the PIs have norms and interest similar to those of the GAs producing these PIs (Double, Primary Misalignment). In this situation, the ready-made PI will never be employed effectively. Second, the GA entrusted with the task of creating the PIs at that level will continue to produce problematic PIs in the future, as its capabilities remain at the lower level. The more sustainable solution in this situation is to work on the norms and interests of both the sets of the GIs, one preparing and the other using the PI.

Step 7: Analysis of Causal Factors Traced to Lacunas in the Structural Elements of GAs

The causal factors that are found to be rooted in the deficiencies or lacunas in the structural elements of the GAs (the second group) can be first analysed to see what type of lacuna in the structural elements is creating this causal factor. This will help clarify the situation further. Once the clear understanding of the lacuna in the structural elements of GAs is obtained, it can be traced to lacunas in the PIs which define the problematic structural element of the GA. The lacunas in the PIs then can be addressed by adopting the procedure explained in Step 6.

Step 8: Analysis of Causal Factors Related to TEFM Aspects

The causal factors from the above-mentioned fourth group are to be probed further and classified in the following two sub-groups.

The first sub-group will contain those TEFM factors that are inherently, essentially, or purely TEFM factors and no amount of modifications in the existing PIs or GAs from the sector under study can resolve these causal factors. In this situation, the technical design or the accepted benchmarks will have to be changed and, if necessary, even the governance objectives will have to be changed to accommodate this reality. The relevant changes in PIs and structural characteristics of GAs will have to be made, following these changes in governance objectives, technical design, or benchmarks. Appropriate recommendations for changes in relevant provisions in the concerned PIs or in the concerned structural elements of GAs will have to be evolved at this stage.

The second sub-group will contain those TEFM factors that do not fall into the first sub-group. These TEFM factors could, after in-depth scrutiny, be traced to certain deficiencies either in PIs or in GAs from the sector under study. Thus, these causal factors, though of TEFM in nature, are, at least partially, can be addressed by changes in the PIs and GAs from the sector under study. If these apparent TEFM factors could be traced to some deficiency in any of the PIs, then as we did for the first group, appropriate recommendations are to be evolved to change or amend the relevant provisions in the concerned PIs, with proper cautions mentioned in the Step 6. If the deficiency is found to be related or rooted in any of the structural element of any of the GAs, then these causal factors should be treated by following the procedure explained in Step 7. Coming to the final possibility, if the deficiency is traced to the lacunas in the functioning of the GAs, it needs to be addressed by following the procedure described in Step 9.

Step 9: Analysis of the Causal Factor related to Functioning of the GAs

The causal factors that are traced to the problems in the functioning of any of the governing agencies [i.e., in the third group mentioned in steps] could then be further divided in the following four sub-groups.

(a) Lacunas in the PIs guiding or shaping the functioning of the GAs

- (b) Primary Misalignment between the governance objectives, on one hand, and, the norms (along with behaviours and perceptions) and / or interests within the GAs (at the organizational, groups, and individual levels)
- (c) Secondary misalignment between the governance objectives, on one hand, and, the norms, and/or interests of the targeted stakeholders (individual or organizations)
- (d) Tertiary misalignment between the governance objectives of GAs (and PIs), on one hand, and, the pressures and enticements exerted by third party actors on the targeted stakeholders(individual or organizations)

Though we have taken into consideration the first sub-group earlier, it is possible that such problematic PIs are identified at this level of analysis. This is to be addressed following the procedure presented in Step 6.

Coming to the subsequent two groups, we essentially have to deal with the misaligned norms and interests of either GA functionaries or targeted stakeholders. To deal with the misaligned norms of the stakeholders or functionaries of GAs, it is necessary to employ measures for changing or modifying norms or perception or affect change in the behavioural patterns. This can be achieved through a category of measures often titled as 'behavioural measures' such as the 'naming and shaming' measures. Alternatively, measures can be employed to create awareness about the negative aspects of the old norms and positive aspects of the new or modified norms (in the form of awareness campaigns).

To deal with the misaligned interest, adequately strong incentives or disincentives would have to be created, which would nullify the internal compulsions created by the interests. In order to build the new incentives and disincentives, new PIs and GAs might need to be introduced or the existing PIS and / or GAs need to be modified. The necessary recommendations for such changes in PIs and GAs will have to be articulated.

To deal with the misaligning pressures/threats executed by the third-party actors on the stakeholders targeted by the GAs, appropriate PIs to be used to protect the targeted stakeholders from these third-party actors. These could be targeted to these threatening actors. In the case of misaligning enticements offended by the third party actors, similar efforts could be made to nullify the attraction of these enticements. Alternatively, new incentives could be offered to the stakeholders to wean away from these enticements.

It needs to be noted that, in the real-life circumstances, the norms and interests of the stakeholders act in a complex and intermingled way. Hence, the misaligned norms and interests of the particular stakeholder and the ways to address them need to be thought in an integrated manner.

Step 10: Organizing Policy Recommendations

All the changes in PIs to address the Lacunas in the PIs could be listed as Policy Recommendations. Further, in order to address the lacunas in GAs, some changes in structural elements of the GAs might be required. The required changes in PIs that define

these structural elements could then be added to the list of Policy Recommendations. Some PIs that are used by GAs in their functioning might also require some changes. These could also be added to the list of Policy Recommendations.

Addressing the misalignments require provision of some new incentives and disincentives in order to ensure realignment. Changes in the existing PIs or structuring of new PIs would be required to create these new incentives or disincentives. In some cases, the changes in existing PIs would be required to discontinue the current incentives that create or strengthen misalignments.

Similar to these changes in PIs, some changes might be required in existing GAs or there could be need to create new GAs. These changes in GAs would require changes in PIs that define the structural element of these GAs. Further, some of the norms and perceptions could be addressed by building awareness and inculcating new norms in stakeholder. These require special efforts and campaigns. The PIs and GAs required for such efforts could also be part of the Policy Recommendations.

The list of these policy recommendations could be organized along the existing PIs, GAs, or any other convenient manner.

Conclusion

The P & G Framework presented in this note, which is based on the P & G Perspective, could be used to analyze problems of performance on the ground, especially in the infrastructure and public services sector. This framework could also be used for other sectors, with certain adaptation.

In summary, the P & G Perspective views the problems in infrastructure and public services sectors as the outcome of the deficiencies in the functioning of governing agencies (GAs) that are entrusted with the responsibility of achieving governance objectives (GOs).

However, these efforts of GAs are often marred by the five types of core governance maladies (or CGMs) mentioned in Box 2. To address these CGMs, some changes in the PIs and GAs will have to be affected. In order to address the misalignments, some measures altering the current incentives and disincentives will have to be undertaken. This would require some modifications in existing or creation of new PIs or GAs. To deal with the misaligned norms, some behavioural measures for creating new values or vision will have to be undertaken. These measures will also require some changes in existing PIs or GAs or creation of new PIs or GAs.

To conclude, the perspective prompts an argument that until these five types of core governance maladies (CGMs) are addressed and corrected, the problems rooted in these maladies cannot be addressed or resolved. No amount of financial or knowledge inputs, capacity building, or infrastructure building will make much headway in changing the ground situation. In other words, the technical, financial, managerial 'fixes' will not be able to correct the core governance maladies mentioned above. What is required here is diligent and patient efforts to deal with the CGMs though the P & G approach elaborated above.

This needs to be considered while developing programs or projects for cleaning up Ganga in future.

At the same time, one caution needs to be mentioned here. The changes in PIs and GAs aimed at addressing the CGMs have their own limitations. The policy and governance (P & G) measures identified and evolved through the above-mentioned framework can work up to a certain extent. However, these Policy and Governance 'fixes' cannot correct all the P & G lacunas. The boundary or limits of the efficacy of P & G measures is defined as the 'political bottom-line'.

The 'political bottom-line' exists in every sector (or around any issue) and is defined by the existing balance of political and economic power between actors that are supporting the governance objectives (GOs) and actors who are against. If those who are for and supporting the GOs have overwhelming power, then there is no bottom-line or limitation for the P & G measures. If this is not the case, then the dominant stakeholders who are not for GOs will decide to what extent the P & G measures will be allowed to work effectively. This extent of efficacy of the P&G measures called here as the 'political bottom-line' will depend on to what extent these dominant stakeholders are ready to allow the measures to work against their interests (and / or norms).

The only way in this situation is to change the existing balance of political and economic powers. This can be affected by expanding the coalition supporting the GOs⁹. Alternatively, this could be achieved by political mobilization or political action by the stakeholders who are in favour of the GOs. Such political mobilization or action is beyond the purview of the P & G measures envisaged here.

However, even in such a situation, changes in Policy Instruments and Governing Agencies can make some contribution. Changes in PIs and GAs could be devised to increase opportunities for non-dominant stakeholders to intervene in governance processes in order to counter the dominant stakeholders working against the GOs. These changes in PIs and GAs should be aimed at creating new and effective mechanisms for transparency, accountability, and participation (or TAP) so that interventions by non-dominant stakeholders in governance processes would be effective and affordable. In order to ensure use of such mechanism, changes in PIs and GAs should also attempt to prepare the non-dominant interests¹⁰. Again, these changes would not prove as a panacea, by themselves, for the fundamental problem of adverse political-economy balance. Here is the crucial role for another element that might change the 'political bottom-line,'—viz., action by citizens and stakeholders.

⁹ This could be achieved even by making some changes in the GOs or in the existing coalition.

¹⁰Preparedness, here, includes five elements: awareness, vision, resources, capabilities, and willingness (to act).

Prevention of River Pollution by Urban Sewage

*Recommendations from Policy and Governance
Perspective based on a Model Case Study*

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin: Environment Management Plan (GRB EMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin Management Plan (GRBMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRBMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report are given on the reverse side.

Dr Vinod Tare
Professor and Coordinator
Development of GRBMP
IIT Kanpur

The Team

- | | |
|--|---|
| 1. G N Kathpalia | gnkathpalia@gmail.com |
| 2. Indrajit Dube, IIT Kharagpur | indrajit@rgsoipl.iitkgp.ernet.in |
| 3. Mukesh Khare, IIT Delhi | mukeshk@civil.iitd.ac.in |
| 4. N C Narayanan, IIT Bombay | ncn@iitb.ac.in |
| 5. Paritosh Tyagi, Former Chairman, CPCB | paritoshtyagi@gmail.com |
| 6. Shyam Asolekar, IIT Bombay | asolekar@iitb.ac.in |
| 7. Subodh Wagle | subodhwagle@gmail.com,subodh@prayaspune.org |
| 8. Uday Shankar | uday@rgsoipl.iitkgp.ernet.in |
| 9. Vinod Tare | vinod@iitk.ac.in |

Lead Persons

1. Subodh Wagle, IIT Bombay
2. Pranjal Deekshit, IIT Bombay

Contents

S No		Page No.
1	Brief Summary	1
2	Sanitation System: Status and Issues in Kanpur	1
2.1	Introduction	1
2.2	Rationale	2
2.3	Methodology and Research Design	3
2.4	Kanpur: Rationale for Choice	3
2.5	Historical Development of Kanpur	3
2.6	Sanitation Issues in the Pre-Gap Period	4
2.7	Sanitation Component Under 'Ganga Action Plan' in Kanpur	5
2.8	Findings: Performance Deficiencies in Kanpur Sewage System	6
2.8.1	Deficiencies in Sectoral Responsibilities: Collection and Conveyance	7
2.8.2	Deficiencies in Sectoral Responsibilities: Interception and Diversion Works	8
2.8.3	Deficiencies in Performing Generic Functions	9
3	Analysis of Kanpur's Sewage System using Policy and Governance Framework	10
3.1	Applying 'P and G' Framework to the Kanpur Sanitation Sector	10
3.2	Review and Analysis of Major Policy Instruments (PIs)	10
3.3	Lacunae in the Normative Frame for Governance of Sanitation Sector	11
3.3.1	Constitutional Perspective	11
3.3.2	Review of Central Policies	11
3.3.3	Review and Analysis of National Urban Sanitation Policy	13
3.3.4	Review and Analysis of Uttar Pradesh Urban Sanitation Policy (UPUSP)	14
3.3.5	Gaps Related to Standards	15
3.4	Lacunae in the Governing Agencies in Kanpur's Sewage System	16
3.4.1	The Governance Grid for the Urban Sewage Sector in Kanpur	16
3.4.2	Mapping of the Governing Agencies	17
3.4.3	Mapping of the Governing Agencies	18
3.5	Other Lacunae in the Structural Characteristics of GAs	21
3.6	Misaligned Perceptions and Norms of Stakeholders	22
3.7	Misaligned Interests	24
4	Recommendation and Conclusions	30
4.1	Recommendation for Addressing the Governance Deficiencies	30
4.1.1	Overlaps in Planning function	30
4.1.2	Overlaps in Designing and Building Infrastructure	31
4.1.3	Overlaps in Operation and Management of Assets	32
4.1.4	Overlaps in Function of Monitoring, Evaluation and Ensuring Compliance	33
4.1.5	Piloting for decentralized sanitation system and recycling	33
4.1.6	State Financing arrangements for Small Towns	33
4.2	Conclusions	33
4.2.1	Need for More Case Studies	33
4.2.2	Feasibility and Efficacy of Retrofitting Governance Instruments	34
4.2.3	Political Bottom-line and Lessons for Future Projects	35
4.2.4	Three-Pronged Strategy	36
4.2.5	Closed Compound Approach	36
4.2.6	Addressing the Political Bottom-Line	37
	Appendix I: Governing and Regulation of the IDT Projects with 'Close-Compound' Approach	40
	Appendix II: Regulatory Design for Urban Sewage Sector Services	45

1. Brief Summary

This report presents an analysis of the ground-level situation of the sewage conveyance and treatment systems in the Kanpur city in the Indian state of Uttar Pradesh. The objective is to bring out important policy and governance related lacunas in the sector, causing continued release of partially treated or untreated sewage and faecal-matter in the river Ganga. This report broadly follows the template presented in the report titled: Policy and Governance Perspective and Analytical Framework (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011). This report begins with background information on the city of Kanpur with the focus on the activities of the Ganga Action Plan (GAP) executed in two phases (GAP I and GAP II) in the city. After the introductory sections, it presents findings of this study. The findings focus on different deficiencies in the performance of the sewage system in the city of Kanpur. Further, it presents the review and analysis of various major Policy Instruments (PIs), the in-depth analysis of the lacunas in the Governing Agencies (GAs). The report then moves to recommendations that emerge from the analysis of PIs and GAs. The concluding section takes a broader view of the problems, and, based on the analysis, presents a three-pronged strategy.

2. Sanitation System: Status and Issues in Kanpur

2.1. Introduction

A thorough review of various studies and reports available on the issue reveals many key challenges. For example, the first challenge was that there is hardly any essentially policy or governance analysis. What is available is technical, economic, or institutional analysis, with brief add-on attempt of analyzing policies and governance issues. Most of the studies and reports present performance evaluations of the schemes and projects in the sector. The second and more critical challenge was that there is hardly any methodological and conceptual basis available for further work on policy analysis of the issues in the sector.

Considering these, first an attempt was made to evolve a systematic, comprehensive, and at the same time, adequately in-depth analytical framework from the Policy and Governance Perspective. Based on the framework, the field-work, data collection, and analysis of the performance of the sanitation and sewage sector in the city of Kanpur was undertaken. This report presents the findings of the case study of the city of Kanpur on the banks of the river Ganga and in the state of Uttar Pradesh based on P & G Perspective and Analytical Framework presented in one of the earlier reports (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011).

2.2. Rationale

Sewage is an important source of pollution and accounts for about 75% of the total pollution from all point-sources. Urban settlements, of different sizes, contribute most of the sewage related pollution in the river Ganga. Further, the sewage problem continues to aggravate despite the considerable emphasis by the Ganga Action Plan (GAP I and GAP II) on diversion and treatment of urban sewage. All these factors require diligent analysis of the

sewage-related challenges and issues, of performance of the sectoral institutions, and of mechanisms dealing with these challenges or issues. The study should also assess performance of the measures like GAP employed to remedy the situation. As per the 'Policy and Governance' (P&G) Perspective presented in the earlier report (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011), the core or root cause underlying such performance crisis is the governance failure. Following the perspective, this analysis is focused on different aspects and factors of the governance of the sewage sector.

2.3. Methodology and Research Design

The analysis using the P&G Framework is aimed at unraveling qualitative nuances of different lacunae in policy instruments and governing agencies. It also attempts to draw out qualitative understanding of the misalignments between, on one hand, policy objectives, and, on the other, the norms and interests of different stakeholders. Such a qualitative and nuanced enquiry would require a method like the Case Study method. The Case Study method helps the researcher to look at the case as a microcosm of the larger reality. In this study, the method would help us gain nuanced understanding of the complex situation on the ground in the cities. Through comparisons of cities and towns, it will also allow us to locate and understand the finer differences in the ground-level situation and also to uncover possible causal factors underlying these differences.

However, the constraints on time and resources (including human resources) in this phase of the project allow study of only one city to begin with. In this light, Kanpur was chosen as the city for the model case study. Apart from providing substantive knowledge, understanding, and insights, such a study will help to validate the framework and methodology and create a template for preparing case studies of other towns and cities.

Before going to the case study, it should be mentioned that the limitations of time and resource also restricted the depth and scope of the study of Kanpur case study. The limited time and resources put restriction to the number of secondary data sources studies and the depth of their study. Similarly, the limited resources also restricted the number of informants that were interviewed. As a result, it was not possible to collect all the policy instruments, especially the subordinate instruments such as rules, regulations, government resolutions, and office orders. In absence of these instruments the analysis of PIs has remained restricted to that of laws easily available on the internet. In view of these limitations, it was decided that the data collection and analytical efforts under this particular study be focused on analysis of lacunas in governing agencies (GAs). Though these limitations certainly affected the depth and scope of the findings of the study, the study provides a very effective demonstration of the need to repeat similar studies with the same framework for gaining better understanding of the governance crisis, which is at the core of the problem of pollution of the river Ganga.

2.4. Kanpur: Rationale for Choice

Kanpur city was chosen for the model case study mainly because of its important features, briefly described as follows.

First, Kanpur is one of the biggest cities located on the banks of the river Ganga, by size of its geographic area and population. Being a city with a population of over 3.5 million people, it generates sewage in massive quantity.

Second, it is also one of the oldest and biggest industrial, trading, and educational center in the state, having army and air-force bases. As a result, the scale of economic and political activities in Kanpur is large, and, in turn, it is able to attract due attention of policy-makers. The cultural diversity and presence of non-formal, small-scale industrial sector in Kanpur increases the complexity of issues around pollution of the river Ganga. This pollution could be traced to the wide-spread practice of releasing industrial effluent and domestic sewage—either mixed together or through separate channels—into the river.

Third, Kanpur is located on the most polluted middle-segment of the river Ganga, in which the water flows in the river are highly inadequate due to large scale diversion of water in the upper-segment. Large quantities of partially treated and untreated sewage and industrial effluent, when released in the thin flow of the river, drastically increase the intensity of the pollution.

Fourth, the statistics¹ show that large, capital-intensive projects for sewage conveyance and treatment under Ganga Action Plan (hereafter GAP) have been implemented in Kanpur for addressing the issue of pollution. There is a great need to learn from the successes or failures of these projects.

Fifth, one famous historical, religious, and pilgrim place called Bithoor on the banks of the river Ganga is just 15 kilometers upstream of Kanpur. Bithoor receives tourists and pilgrims in huge numbers, who take holy bath and offer prayers in large religious congregations. This requires that the quality of water is adequately good.

Thus, the Kanpur city offers all the diversity and complexity of the issues around sewage-related pollution of the river Ganga. These features make Kanpur as one of the most eligible and most preferred candidates for model case study.

2.5. Historical Development of Kanpur

Kanpur has been one of the oldest cities on the banks of the river Ganga. The trajectory of development of the Kanpur city shows different phases of its development as an industrial and strategically important city.

Prior to Independence, it was the second most industrialized city in India after Calcutta. It was called the 'Manchester of India' due to existence of a large number of cotton textile units. During the British era, Kanpur was of strategic importance due to the important role it

¹ Refer to the websites of National Ganga River Basin Authority (NGRBA) and Uttar Pradesh Jal Nigam (UPJN)

played during the great revolt of 1857. This led to development of a large cantonment base at Kanpur. After independence, Kanpur continued to be an important city, and many large public sector companies established their facilities in the city (CDP Kanpur 2007).

The presence of British in Kanpur influenced the development of the city in many ways, including establishment of the municipality. Kanpur Municipal Council was established on 22nd November 1861. It became a Municipal Corporation (locally called as Kanpur Nagar Nigam or KNN) in 1959. The corporation is administered under the Uttar Pradesh Municipal Corporation Adhiniyam, 1959. This has been amended in 1994 by the UP Act 12 of 1994 (w.e.f. 30 May, 1994), the UP Act 26 of 1995 (w.e.f. 30 May 1995) and amendments subsequent to the 74th CAA, 1992 including the functions given in the 12th Schedule of the Constitution (CDP 2007).

Today, being an important industrial, educational as well as a trade-center located on the banks of the river Ganga, Kanpur is known as the biggest city in the state of Uttar Pradesh. Kanpur has a population of about 2.5 million according to 2001 census. Considering the trends in the growth of the population of Kanpur, a rough estimate suggests that, by now, the population of the city must have reached to 3.5 million. Naturally, in terms of generation of sewage and its disposal into Ganga, the Kanpur city plays a significant role. Kanpur alone contributes a large share of the total (both treated and untreated) sewage generated by all the cities on the banks of the river Ganga.

2.6. Sanitation Issues in the Pre-Gap Period

The sanitation system in Kanpur was first established by the British in the 19th century for some parts of the city. The sewerage network was laid in the year 1904 in a limited area. In 1920, it was extended to cover more areas by providing trunk, main, and branch sewers. In 1952, Kanpur Development Board reorganized the entire sewerage system for a population of 9.5 lakhs, which was designed to carry sewage at the rate of 180 lpcd (or liters per capita per day) (Administrative Staff College of India, City Sanitation Plan of Kanpur).

After 1952, there was no major development or renovation in the Kanpur sewage system, whereas the geographical area as well as the population had grown to a large extent. Increased load of sewage was finding its way to the river Ganga through 13 different natural drains (*nallas*).

The sources of this sewage are from both the categories, domestic and industrial, with a major portion coming from domestic sources. There has never been separate sewerage system for these sources; neither was there any arrangement to segregate domestic and industrial sewage.

In the pre-GAP period, in the Kanpur city, problems in sanitation sector causing pollution of the river originated in the lack of treatment of the sewage. The entire sewage of the city was finding its way into river Ganga, either through piped discharge or through *nallas* (streams). Not just domestic sewage, but even the wastewater and effluents generated by

industries flowed into the river largely untreated. The industrial units at Panki and Dada Nagar industrial areas as well as tannery units also discharged their effluents through *nallas* or the tributary called the river Pandu.

2.7. Sanitation Component Under ‘Ganga Action Plan’ in Kanpur

Ganga Action Plan (or GAP), launched in 1985 was primarily focused on two tasks: (a) controlling direct sewage disposal, and (b) controlling direct effluent disposal into Ganga. As a strategy, the natural storm-water drains (*nallas*) that were carrying sewage to the river were tapped (or intercepted) and the sewage was diverted to Sewage Treatment Plants (STPs). Under the first phase of GAP, the following activities were undertaken in Kanpur for reducing pollution in river Ganga due to sewage.

- Kanpur Sewage Reorganization Master Plan (immediate works)
- Cleaning of trunk and main sewers
- Tapping of *nallas*
- Expansion of domestic sewage system
- UASB Pilot Sewage Treatment Plant and improvement works
- Wastewater Conveyance System for Northern Jajmau belt
- 36 MLD UASB Combined Treatment Plant for wastewater from tanneries + sewage
- 130 MLD Sewage Treatment Plant
- Low cost sanitation measures
- Solid waste management measures
- Public Health education and Community Development
- Sewer Cleaning in Jajmau Area (Indo-Dutch program)

In sum, GAP I focused on three aspects in Kanpur, viz., (a) Expansion and cleaning of sewer networks, with interception of *nallas* and diversion of sewage to STPs, (b) Construction of sewage treatment facilities, and (c) Institutional and Community Development. Prima facie, all the three aspects show an integrated approach for addressing the pollution caused by deficiencies in sanitation management. The total cost of the works undertaken was Rs. 730 million. It took almost 18 years for completing the works undertaken under GAP I for the agencies involved, which were concluded in the year of 2003.

The prioritization of interception of *nallas* and diversion of sewage to STPs—instead of overhauling of the sanitation systems of the city—was rather prudent as an immediate action. But, construction of underground sewerage system and improvements in the pre-existing system was not avoided completely.

GAP II, which commenced in 1993 well before the GAP I works were complete, focused on treatment of remaining 224 MLD of the total wastewater that GAP-I had not covered. It continued with the interception and diversion works by laying reliving sewers and bringing wastewater to the intermediate pumping stations and further to treat under a proposed 200 MLD treatment plant. The wastewater of the Halwa Konda nalla and COD nalla will also

be sent for its treatment to this proposed STP. Under GAP II 16 schemes were sanctioned, out of which central government sanctioned 14 schemes and UP state government sanctioned 2 schemes.

- Renovation of existing sewer and pumping stations (Old Kanpur, Kidwai Nagar, etc)
- Integrated development for south city service district of Kanpur city Phase-I, water supply
- Relieving sewers for (Juhi Transport-Nagar, Bakarmandi, Rakhimandi)
- Intermediate pumping stations at Munshipurwa, Rahimandi
- Tapping of Ganda-nala and Halwa-Konda nalla
- Main pumping station related works
- Rehabilitation of water supply production facility and rehabilitation of water supply at Govindnagar [executed by Kanpur Jal-Sansthan]
- Water treatment plants at Ganga Barrage (Plant I: Capacity – 200 mld, Year of Construction – 2005-06, Cost – 1080 lacs, Current Utilized Capacity – 30 mld; Plant II: Capacity – 200 mld, Year of Construction – 2011-12, Cost – 2220 lacs; Plant III: Capacity – 200 mld, Year of Construction – 2011-12, Cost – 3242 lacs)
- Solid waste management, part-I and part-II [executed by Kanpur Nagar Nigam]
- Low cost sanitation [executed by Kanpur Nagar Nigam]
- Land Procurement Costs [Funded by UP state government]
- Trunk Sewer along with COD nalla [Funded by UP state government]

The total expenditure incurred is 7305 lakhs under the GAP I. The works sanctioned under GAP-II are still in progress, despite the fact that planned duration has elapsed way back in 2000. Hitherto 8694.5 lakhs of rupees have been spent for the GAP-II works. In the middle, another some important works for improving sewerage systems have been proposed and sanctioned under the Jawaharlal Nehru National Urban Renewal Mission which include drainage works worth Rs. 105 cores and sewerage works worth Rs. 265 crores being executed by Kanpur Nagar Nigam (KNN) and Uttar Pradesh Jal Nigam (UPJN), respectively. Majority of the works under GAP-I and GAP-II were executed by UPJN. However, KNN did execute some of the works, such as low cost sanitation for squatter settlements and slum areas, solid waste management projects, and river front development projects. Kanpur Jal Sansthan is primarily vested with the responsibility of operation and maintenance of the water supply and sewer-lines, but it also implemented the projects pertaining to the improvement and rehabilitation of the water supply facilities.

2.8. Findings: Performance Deficiencies in Kanpur Sewage System

This section presents preliminary findings of the short case study of the city of Kanpur's sewage-related situation. These findings, essentially, are different deficiencies in performance of the sanitation system of the city. These deficiencies, together, lead to the performance crisis plaguing the sanitation sector in the city.

These deficiencies are presented here from two perspectives, in order to ensure full coverage and deeper understanding. First, they are presented as deficiencies in the sectoral responsibilities in the sewerage sector, viz., collection, conveyance, treatment, and disposal (Section 2.8.1 and 2.8.2). Second, they are also presented as deficiencies in the generic functions involved in all these sectoral responsibilities (Section 2.8.3).

It needs to be noted that these findings also match with the generic deficiencies in sewage-systems, which are presented in the report titled Sewage Collection, Diversion, Pumping, Treatment, and Reuse (Sewage CDPTR) Infrastructure in Class I Towns (004_GBP_IIT_EQP_S&R_03_Ver 1_Dec 2010).

The performance deficiencies in discharging the sectoral responsibilities have to be understood in the context of the deliberate strategy adopted under Ganga Action Plan of interception and diversion of sewage flowing through *nallas* to STPs. The performance of this strategy (interception and treatment) needs to be analyzed separately, while the performance of the sewerage-system for collection and conveyance of sewage needs a separate treatment. This is because, while the measures under the interception and disposal strategy implemented with support from Ministry of Environment and Forests, the works on the sewerage system was implemented by Kanpur Nagar Nigam (KNN), with the grant support from Ministry of Urban Development and/or Ministry of Housing and Poverty Alleviation (Government of India).

2.8.1. Deficiencies in Sectoral Responsibilities: Collection and Conveyance

Inadequacy of sewer network: The underground network for draining sewage simply does not exist in many parts of the city, especially in the newly-developed localities, unauthorized colonies, and slum clusters. The sewage generated from such colonies also gets diverted into *nallas*, both tapped and untapped, which ultimately finds its way into the river.

Non-Connection of Households to Existing Sewerage Network: It was found that in many areas of Kanpur, despite existence of the sewer lines, many households remain unconnected to these lines. They either use soak pits, septic tanks and/or release sewage/septic tank overflows into the *nallas*.

Open Defecation: Households, especially from the slums and squatter settlements, still practice open defecation. It was also reported that the public toilets do not exist in adequate numbers, locations, and with adequate capacities; further, existing public toilets are not maintained properly, putting them out of use. The number of 'Pay-to-use' toilets is also inadequate to cover the population.

Inadequate Maintenance of Sewers: The sewer network in some parts of the city is more than 100 years' old. Some areas in old Kanpur city have an underground sewer network built—with bricks—during the British period. As one of its components, the GAP I focused on cleaning of this old network. GAP I also involved development of sewer network in the parts of Kanpur that are adjacent to the river Ganga and where the network was not present

in 1985. However, even in these areas, many households are not connected to the sewer network. Besides, after 1985, none of the sewers are cleaned fully or regularly. This has resulted in frequent choking of sewers, especially due to garbage. Both lack of connections as well as choking of sewers result in diversion of sewage flow directly into *nallas* and further to the river, if *nallas* are untapped.

2.8.2. Deficiencies in Sectoral Responsibilities: Interception and Diversion Works

Partial Coverage of the Interception and Diversion: As an important and urgent component of GAP I, the interception of storm-water *nallas* and diversion of sewage towards STPs was undertaken. However, inadequate coverage of *nallas* while tapping (or intercepting) is one of the prime reasons for direct disposal of untreated sewage *into* the river. Among the 23 *nallas* in Kanpur, all *nallas* were not tapped. For example, three major *nallas* called Ganda Nalla, COD nalla and Halwa-kund nalla are still disposing the sewage into the Pandu river, which meets river Ganga some distance downstream of Kanpur.

Non-Tapping of *Nallas* in Areas where City Expanded: In addition to these *nallas*, many *nallas* in the areas where city geographically expanded over the period of last 20 years are not tapped. As the city kept expanding, resulting in increased population and in establishment of new colonies, the number of *nallas* carrying raw sewage increased. But, neither tapping (interception and diversion works) could not keep pace with the speed of urbanization; nor were STPs built to treat the increased quantities of sewage.

Frequent Chocking and Leaking of Conveyance System: The diversion of sewage towards STPs through the built conveyance system by interception of *nallas* has also not worked properly. Inadequate and irregular maintenance is the prime reason for this dysfunction. Pumping stations are inadequate in their numbers and capacities, while some are malfunctioning. As a result, sewage conveyance system is often choked, leaking, or overflowing, resulting in dysfunctional/malfunctioning conveyance system.

Inadequate Treatment Facilities: An inadequate sewage treatment capacity has also been an important reason for disposal of untreated sewage into the river. In 1985, the Kanpur city was generating 200 MLD of sewage, as against the 171 MLD installed capacity of the STPs. Over the 25 years period, the sewage generation has doubled and reached well over 425 MLD.

Irregular Operation and Maintenance of Treatment Capacities: Operation of treatment facilities at partial capacity is also an important reason for discharging untreated sewage into the river Ganga. The main reasons for not running STPs in full capacity include: blocked sewers, malfunctioning of pumping infrastructure, and lack of continuous electricity supply. Kanpur has an alternative diesel-based electricity supply system to run the pumping stations, which also reported to face problems due to unavailability of diesel and/or non-availability of funds to buy diesel.

In this way, the lasting problem of discharge of untreated sewage into the Ganga river can, thus, be attributed to two broad failures in performance of the sewerage or sanitation system in the city of Kanpur: (a) inadequacy of infrastructural facilities to collect and treat sewage up to the desired standards, and (b) lack of effective operation and maintenance of the installed infrastructure. Absence of sewers, of household connections, inadequate capacity as well as inadequate number of STPs, inadequate pumping stations and electricity problems refer to the inadequacy of infrastructural facilities. Similarly, choking of networks, broken pipes, underutilized capacity of STPs refer to the lack of effective operation and maintenance.

2.8.3. Deficiencies in Performing Generic Functions

According to the P & G Framework, the above-mentioned two broader performance deficiencies indicate deficiencies in carrying out three sectoral responsibilities, viz., collection, conveyance (transport), and treatment of sewage. These performance deficiencies in sectoral responsibilities could be also traced by mapping instances of failure of various government agencies in discharging various generic, cross-sectoral functions. The following observations and findings clearly point this out.

Deficiencies in Planning and Designing of Sewer Network: The master plan for Kanpur city's sanitation and sewage management (collection, treatment and disposal facilities) was inadequate by itself. Additionally, it had no strategy to accommodate the growing population in the peripheral areas of the city, in terms of building new infrastructure. This clearly shows the deficiencies in survey, design and planning functions as well as lacuna in execution of designs and plans for building infrastructure.

Building Sewers and Sewage Treatment Infrastructure: The frequent choking and leaking of system also underscores the poor quality of the built infrastructure. It is also clear that the design norms were not adhered to during the process of laying sewers and building other infrastructure such as conveyance systems and pumping stations.

Operation and Maintenance of the Assets: The failure of effective operation and maintenance of the assets is primarily rooted in inconsistent stream of finance from different government agencies, especially ULBs, state Government, as well as the central government. Analysis of arrangements for financial resources also reveal that there have been repeated instances of insufficient finance as well as delays in releasing the funds for carrying out operation and maintenance.

Weak monitoring, evaluation and regulation: Similarly, monitoring and evaluation of the existing infrastructure facilities shows ineffectiveness in terms of reporting the problems and initiating actions to correct the deficiencies in both the generic functions—survey and planning as well as operation and maintenance.

Thus, the analysis shows that each of the generic functions—from survey and design, planning, execution, operation and maintenance, and monitoring and evaluation—was not

carried out in an effective and efficient manner by the agencies concerned with governance of the sanitation sector. Obviously, there are certain genuine constraints, as well as, serious lassitude and apathy which prohibited agencies from carrying out the functions effectively.

3. Analysis of Kanpur's Sewage System using Policy and Governance Framework

3.1. Applying 'P and G' Framework to the Kanpur Sanitation Sector

The Policy and Governance Framework based on the Policy and Governance Perspective is available in other report (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011). The framework is applied here to the Urban Sewage Sector in the case of Kanpur city, which lies in the state of Uttar Pradesh.

The framework essentially helps the researcher unravel the qualitative deficiencies in the sphere of policy and the governance that lead to various problems evident in the infrastructure sectors. The basic thesis is that various deficiencies in these governance instruments and distortions in the governance process lead to various problems in the functioning of the governing agencies and, ultimately affect their performance in achieving the policy objectives set before them. This framework helps the researchers to identify, in systematic manner, these deficiencies in the two instruments of governance (PIs and GAs) as well as distortions in the process of governance. With this knowledge, the researcher can then suggest a set of recommendations to make appropriate changes in these instruments of governance addressing the above-mentioned deficiencies and distortions.

Before going into application of the framework, it is necessary to reiterate the limitations of time and resource, under which the current study was conducted. As a result, some of the steps in the framework were altogether dropped, while some were curtailed to narrower scale and shallower depth. This has imposed severe limitations on the scope and depth of the case study of Kanpur city's sewage system developed here.

The subsequent sections in this report are devoted to application of the framework for the Kanpur's city sewage system. The discussion begins with application of the steps under Stream A of the framework, which is based on the desk-based analysis of various policy instruments. This is then followed by the discussion along the steps of framework under the Stream B.

3.2. Review and Analysis of Major Policy Instruments (PIs)

To begin with, the P&G Framework is applied in this section for analysis of the content of some major policy instruments. This, however, does not strictly follow the steps elaborated under the Stream A of the P&G Framework articulated in the concerned report (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011). It needs to be noted that the P&G Framework applied here is a much improved version, improved after incorporating the lessons and

insights gained while applying the earlier draft of the framework in the field-work in Kanpur city. As a result, there are some significant differences in the final version of the framework presented in the earlier report and the framework used in this report for the case-study.

Further, despite efforts to undertake analysis following the framework, it was not possible to undertake this with full rigor and depth as expected in the framework, primarily due to constraints on time and resource. Similarly, due to the same constraints, it was not possible to cover all the policy instruments at the national, state, and city levels in this analysis. Hence, the analysis is limited to some key provisions from the limited number of major policy instruments.

The following paragraphs present review and analysis of the content of some major policy instruments, aimed at identifying the strengths as well as lacunas in the instruments.

3.3. Lacunas in the Normative Frame for Governance of Sanitation Sector

The review of policy documents brings out that there are two broader goals for the governance of the urban sewage sector. The first goal is to increase availability of sanitation services to citizens, especially to the poor and disadvantaged sections. This calls for increase in the capability of the infrastructure required. The second goal is to avoid pollution of water and other natural resources due to sewage and human excreta. These goals largely direct the efforts to discharge sectoral responsibilities and generic functions.

3.3.1. Constitutional Perspective

The Constitution of India is the original source of all policy instruments. It does cover environmental and health aspects of sanitation. As per the Constitution, the subject of 'sanitation' falls within the legislative jurisdiction of the state governments. The 73rd and 74th Amendments in the Constitution devolve the responsibility of providing sanitation services to Panchayat Raj Institutions (PRIs) and Urban Local Bodies (ULBs). States are vested with the constitutional right to plan, implement, operate, and maintain sanitation and drainage projects.

3.3.2. Review of Central Policies

Though 'sanitation' is a subject under the jurisdiction of states, the central government provides support to state governments, PRIs, and ULBs by financing infrastructure, as well as by providing knowledge inputs.

The 'Water Pollution and Control Act, 1974', enacted during the fourth FYP, has been an important policy instrument which could be seen as an effort to increase the role for the central agencies in the sanitation and sewage sectors. Until then, the role of the central government was restricted to provisioning of technical inputs and building capacity of agencies of state governments. To this end, CPHEEO was created under the then 'Housing and Works Ministry', following recommendations of an expert committee set up on public health and sanitation in 1953.

Until the year 2008, not a single policy-document was available as a comprehensive policy instrument on urban sanitation sector in India. Even today, there is no exclusive law on sanitation in India. The vision, goal, and objectives guiding the sectoral development and management are available in a scattered and disjointed form in various policy instruments, such as, CPHEEO Manuals, state laws governing the ULBs and para-statal agencies of various state governments, various guidelines issued by Ministry of Urban Development (MoUD) and Ministry of Environment and Forests (MoEF) of Government of India (GoI) from time to time.

The vision that emerges from the major PIs for sanitation management is rather broad and sketchy, in comparison with the complexity and broad scope of issues involved. The main rationale for provision of sanitation services as part of the public services emanates from the concern for 'public-health' as well as for 'environment'. In other words, sanitation systems are to be developed, operated, and maintained in order to avoid pollution of natural resources and urban environment due to sewage, which might cause serious harm to public health.

The review of policy documents clearly brings out the fact that preoccupation or sole emphasis on the centralized sanitation systems has influenced the vision, rationale, and objectives. This preoccupation is a relic of the earlier policy era (i.e., the initial decades after independence) when the understanding was that the soviet-style, centralized, big systems relying on 'sophisticated' technologies are required for handling the gigantic challenges of development in different sectors. Thus, there is hardly any cognizance of the new thinking in the sector, focusing on the decentralized sanitation systems, depending on the small scale and simpler technologies, which are suitable especially for developing countries. As a result, there has been complete neglect of efforts to develop: (a) schemes and institutions for developing technology-options for decentralized sanitation systems, or (b) an appropriate policy-frame for promoting, incentivizing, and supporting decentralized sanitation systems for urban areas.

The powers and functions pertaining to the eighteen different urban services (including sanitation services) were devolved to ULBs through 74th Constitutional Amendment Act (74th CAA). Prior to this devolutions, many important urban services such as water and sanitation services were governed by the state governments' departments (such as Public Health Departments or PHDs) or by para-statal agencies created by state government (such as UP Jal Nigam or UPJN). Though the 74th CAA devolved eighteen functions to ULBs, many states did not comply with the 74th CAA. These states enacted confirmatory legislations that had lots of gaps or escape-routes; and many states did not implement these state laws effectively. As a result, in all major states, para-statal agencies (or PHDs) are still operating with their old mandates when it comes to urban sanitation services. The role of ULBs has remained limited to or providing lands or offering 'No Objection Certificates' to the plans and works undertaken by para-statal agencies.

3.3.3. Review and Analysis of National Urban Sanitation Policy

The 'National Urban Sanitation Policy (NUSP) 2008' acknowledges many of the lacunas in the policy instruments, such as multiplicity of agencies, functional overlaps, fragmented roles and responsibilities, lack of attention to peri-urban areas, and problems created by poor awareness and occupational aspects of the sanitation. It also mentions the need to reach to the un-served and poor sections and availability of limited technology choices. Importantly, it accepts a more comprehensive definition of the sewerage and sewage management and does not restrict scope of sanitation merely to the safe disposal of grey water and human excreta. The policy emphasizes on three core goals: (a) awareness generation and behavioral changes, (b) cities free of open-defecation, and (c) integrated city-wide sanitation. It also encourages the states to formulate their own strategies and city-sanitation-plans and rearrange institutional arrangements. The demand-driven approach and awards program for behavioral change are some of the key strategies suggested.

While focusing in its discussion on knowledge generation, capacity building and support, financial support, national level coordination, monitoring and evaluation as activities of the union government, the policy lays equal emphasis on importance of the strategies to be adopted by the states.

However, as far as the gaps are concerned, the central government seems to have not learnt any lessons from the earlier experiences of the two strategic approaches, viz., (a) the Demand-Driven Approach and (b) Award Schemes. Rather, the central government continued to introduce new schemes such as Total Sanitation Campaign following the same approaches, without undertaking serious and sufficient analysis of the ground-situation and efficacy of these approaches.

The experience of *Ganga Institutional and Community Development Project (GICDP)* undertaken in Kanpur is worth a mention. This program focused on capacity building aspects is considered as an abject failure. The project had serious design lacunas, which were further aggravated by circumventions, distortions, and perversions of the strategies of implementing agencies. Essentially, such projects and program focused on institutional and knowledge/ capacity building look at the ground reality in very naive and sanitized manner. In doing so, they fail to take cognizance of the power exercised on the governance processes by the informal norms and interests of the stakeholders. The programs, due to same reasons, fail to build subversion-proof mechanisms and procedures for transparency, accountability and public participation. These failures automatically lead to various circumventions, distortions, and perversions. It was reported that when the coordinator of the project, a British national, tried to put his foot down, he was forced to withdraw. There is great need to analyze, in an in-depth manner, the capacity building and knowledge inputs programs for these lacunas.

Similarly, there are problems in the manner in which projects and program based on Demand-Driven Approach (DDA) are conceived. The DDA proposes that if there is demand for the program from the community, then the community will have the sense of

‘ownership’ about the program. This will translate into effective monitoring of the construction work as well as efficient and effective operations and management of assets by the community.

However, more often than not, the programs based on DDA approach are not designed in subversion-proof manner. This then allows the vested interest to capture the program, who collude together to demonstrate demand on paper, when the community is not even aware, let alone have commitment and ownership about the program. Thus, though the DDA approach is desirable, the on-ground complexities require that the programs are designed to guard against such pitfalls. Such designs would require sound analysis from the policy and governance perspective and measures that are hard to implement in a targeted and time-bound manner especially for commercial consultants and professional NGOs.

Further, though the policy makes a mention of ‘low cost sanitation,’ it does not give due space for the decentralized sanitation systems. As a result, various policy-level measures for facilitating sufficient experimentation, pilot-testing, and incentives for development of markets for decentralized sanitation systems are completely neglected.

Finally, though NUSP takes cognizance of the policy gaps such as ‘multiplicity of agencies’ and their ‘fragmented roles’ as important lacunas in the current institutional set up in the sanitation sector, it does not provide an alternative model of the institutional set-up for the states to follow. This leaves out the urgent need of streamlining all the three important functions in the governance, Normative Framing, Execution, and Compliance-Ensuring.

3.3.4. Review and Analysis of Uttar Pradesh Urban Sanitation Policy (UPUSP)

Following the NUSP, the Uttar Pradesh government has also drafted the ‘Uttar Pradesh Urban Sanitation Policy (UPUSP)’. While adopting certain provisions from NUSP, the UP government watered down some of the provisions in NUSP in the UPUSP². UPUSP has retained goals and objectives of the NUSP in the same manner. Similarly, it has also retained the concept of ‘city-sanitation-plans’. However the state government diluted many important provisions from NUSP. In fact, the original draft given to the UP government by the consultant was detailed and did not just retained provisions of the NUSP, but presented a good analysis of these provisions with implications for the state³. The key provisions of this draft are presented in (Table 1)

However, the final and official draft of UPUSP posted by ‘International Environmental Law Research Centre’ on its website has remained silent on many key aspects such as:(a) streamlining of the organizational structure in order to remove the overlaps and conflicting jurisdictions, and (b) strengthening regulatory functions of the government as well as finance-related provisions. Interestingly, it does not talk about reforms in the required detail. The UPUSP has provided for establishment of ‘City Sanitation Task Force (CSTF)’.However, it has curtailed the functions of the CSTF as compared to the design

² Available at www.ielrc.org

³ This detailed draft policy documents is available on the India Sanitation Portal.

proposed by the consultant, by limiting it to a body responsible for awareness building and implementing campaigns under the chairmanship of the City-Mayor or ULB. In addition to these lacunas, the official draft of UPUSP also suffers from the lacunas of NUSP discussed before.

Table 1: UP Urban Sanitation Policy-Key Provisions in the Suggested Draft

Why?	Objective: Public Health, hygiene and protection of the environment
For Whom?	Key Benefits and Beneficiaries: Toilet facilities for individuals, community and public in general, Special attention to the women, children and handicapped
What?	<ul style="list-style-type: none"> • Sanitation Infrastructure: 1.Low-cost toilets, community-toilets, 2. Collection, Conveyance, Treatment and Reuse Infrastructure for sewerage and solid waste (all types), 3. Infrastructure for Storm water collection, reuse and disposal, 4. Disposal of liquid and solid waste in environmentally sound manner. • Programs and Schemes: Infrastructure building programs (such as JNNURM, UIDSSMT, State-programs), Awareness Building Programs (TSC, urban sanitation awards)
Who, & How?	<p>Standard Functions and Existing Mechanisms:</p> <ul style="list-style-type: none"> • Planning: ULBs and Development Authorities, through city sanitation plans based on assessment of gaps in sanitation-infrastructure • Finance: ULBs through ‘User-Charges’, SG +CG though their own sources • Execution: ULBs, Development Authorities, and Private Sector Agencies • Awareness Building: ULBs, DAs, and NGOs/CBOs • O&M: ULBs and Private Sector Agencies • M&E, Coordination of Sanitation Programs: State Urban Development Department, with ULB, Health Department, Housing, Environment <p>New Mechanisms:</p> <p>City Sanitation Task Force: It will undertake the following functions:(a) INVOLVE multiple stakeholders; (b) CONDUCT sanitation campaigns; (c) APPROVE progress-reports of implementing agencies, material purchase and ‘city-sanitation-plans’, agencies/NGOs contracted by implementing agencies; (d) HOLD consultation with citizens for approvals, field visits to monitor; (e) GIVE press-briefings, (f) RECOMMEND ULBs the fixing of responsibilities on a permanent basis, (g) IMPLEMENT ‘information-system-improvement plan’ and ‘performance-improvement-plan’</p>
Key Features	<ul style="list-style-type: none"> • Equitable provisioning, focus on vulnerable sections, • Designing infrastructure according to use-culture and traditions based on indigenous knowledge and skills • Commitment to devolution of the responsibilities

3.3.5. Gaps Related to Standards

UPJN is the state-level agency for the state of Uttar Pradesh, which is entrusted with the responsibility of developing standards relevant for the state for the sectors of water supply and sanitation. However, UPJN has largely been following the manuals developed by

CPHEEO (Central Public Health Engineering and Environmental Organization), except in cases where external agencies required different standards, such as in the case of sewage treatment plant built with assistance from the Dutch Bilateral Cooperation agency.

‘Central Public Health Engineering and Environmental Organization’ (CPHEEO) has been responsible for creating norms at the central level. CPHEEO developed a comprehensive manual on sewage collection and treatment in 1993. There was no comprehensive manual or guidelines before development of this manual. The design standards in this manual revolve around four key aspects: (a) Engineering, (b) Environmental, (c) Process, and (d) Costs. However, the major gap in the manual is that it concentrates only on the centralized systems for collection, transport, and treatment designs. It does not take any cognizance of decentralized systems for sanitation. Effectively, norms for decentralized systems have not been developed.

3.4. Lacunas in the Governing Agencies in Kanpur’s Sewage System

The step-wise procedure depicted under the Stream B of the P&G Framework is applied here with focus on the deficiencies in the structure and functioning of the governing agencies working in the urban sewage sector in the city of Kanpur and at the state level in the state of Uttar Pradesh. Due to the limitations on the resources, some steps from the framework are not covered here, while some steps are covered in somewhat limited manner.

3.4.1. The Governance Grid for the Urban Sewage Sector in Kanpur

The analysis begins with setting the sectoral context by developing the Governance Grid for the sector under study. The Governance Grid is expected to depict the comprehensive picture of the responsibilities of the governing agencies functioning in the sector. Table 2 provides, the Governance Grid for the urban sewage sector in the city of Kanpur. It shows all the important Sectoral Responsibilities in the top row, while presenting all the relevant generic functions in the left-most column. Each of the cells from the grid—representing one generic function under one sectoral responsibility—involves three core governance tasks.

Table 2: Governance Grid for the Urban Sewage Sector in Kanpur

Generic functions	Collection of sewage	Conveyance of sewage	Treatment of sewage	Disposal of sewage
Survey, planning & technical design	Policy-making	Policy-making	Policy-making	Policy-making
	Policy-execution	Policy-execution	Policy-execution	Policy-execution
	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring
Financing and administrative approvals	Policy-making	Policy-making	Policy-making	Policy-making
	Policy-execution	Policy-execution	Policy-execution	Policy-execution
	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring

Table continued to next page

Table continued from previous page

Generic functions	Collection of sewage	Conveyance of sewage	Treatment of sewage	Disposal of sewage
Infrastructure development	Policy-making	Policy-making	Policy-making	Policy-making
	Policy-execution	Policy-execution	Policy-execution	Policy-execution
	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring
Operation, maintenance, & service provision	Policy-making	Policy-making	Policy-making	Policy-making
	Policy-execution	Policy-execution	Policy-execution	Policy-execution
	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring
Monitoring and evaluation	Policy-making	Policy-making	Policy-making	Policy-making
	Policy-execution	Policy-execution	Policy-execution	Policy-execution
	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring	Compliance-ensuring

3.4.2. Mapping of the Governing Agencies

An overview of the GAs serving sanitation sector of the Kanpur city shows there are seven different governing agencies involved in sectoral responsibilities of collection, transport and treatment of sewage in Kanpur, including providing safe sanitation services to the citizens.

The Uttar Pradesh Jal Nigam (UPJN): UPJN was established in 1976 by UP state government, in order to carry out all functions in the Water Supply and Sanitation (WS&S) sector in the state⁴. UPJN is entrusted with all major functions, generic such as Planning, Execution, Financing as well as, O&M, M&E as well as building infrastructure. Nonetheless, it is an official agency for defining state-norms for WS&S, both, rural and urban. It has its functional branch office in Kanpur, which is named as ‘Ganga Pollution Control Unit’ (GPCU) after the commencement of Ganga Action Plan in 1985. It has been the primary agency for creating assets under GAP I as well as under GAP II.

Kanpur Jal Sansthan (KJS): KJS is part of the ‘Jal Sansthan’ agencies established by the state governments especially for undertaking improvements and operation of the WS&S schemes at the local level. Initially, these agencies were established for famous KAVALS towns (and later extended to other cities). There is a considerable overlap in functions of these Jal Sansthans; however, JSs function under UPJN. In Kanpur, KJS was earlier responsible for creating and maintaining water supply and sanitation related assets, but recently it was brought under KNN. In future, though it will not have an independent identity, it would be responsible for functions and possess all powers of KNN. At present, it maintains the sewer-network, especially gravity-based network.

District Urban Development Agency (DUDA): It works under state’s Urban Development Agency (UDA), and implements government schemes. It also discharges the duty of creating water and sewage facilities for Malin Bastis (Slums) in Kanpur. DUDAs and UDAs are

⁴Refer: Uttar Pradesh Water Supply and Sewerage Act, 1975

⁵ KAVAL towns are Kanpur, Agra, Varanasi, Allahabad, and Lucknow, the bigger cities in Uttar Pradesh.

established under a central government scheme called 'Swarna Jayanti Shahari Rozgar Yojana'.

Kanpur Development Authority (KDA): KDA was established under UP Urban Planning and Development Act in 1973. The agency is mainly responsible for planning and facilitating development in the peripheral parts of the city. Main functions include: planning, land acquisition and development, constructing and facilitating housing and other infrastructure, financing of scheme/s or raising finance from public and private agencies. In sewage sector, it discharges the functions of constructing sewers for suburbs, including pumping stations and STPs.

UP Housing Development Board (UPHDB): It is primarily established for providing housing for LIG and EW sections of society. It develops housing colonies, has the mandate to build sewage system for the developed area. In context of Kanpur, UPHDB has developed 3 major schemes, which are known as Awas-Vikas.

Uttar Pradesh Pollution Control Board (UPPCB): As specified in Table 2, the agency functions under the Water (Prevention and Control of Pollution) Act, 1974. In the context of sewage collection and treatment, it has powers to monitor, evaluate, control, issue notices, prosecute and penalize the persons / agencies responsible for pollution.

District Magistrate and Divisional Commissioner: The officials are specially directed to monitor the progress of GAP I as well as GAP II, including other River Action Plans. District Magistrate (DM) and District Collector (DC) have important powers to set up departmental enquiries and penalize officers and employees for non-compliance issues too.

3.4.3. Mapping of the Governing Agencies

Different governing agencies have been functioning in the city of Kanpur in the urban swage sector. A quick analysis of their functions, responsibilities, and jurisdictions indicate at a large number of and significant overlaps among them. These overlaps are identified by cross-mapping of provisions from different policy instruments that define and shape the concerned structural characteristics of the governing agencies.

Table 3 and 4 present mapping of agencies, handling different generic functions under the three main sectoral responsibilities. The sectoral responsibility of Transport or Conveyance of sewage is divided in two sub-types. The tables vividly depict the overlapping functions and responsibilities of different agencies. The following paragraphs briefly discuss the overlaps in the structural elements or characteristics of the governing agencies involved.

Table 3: Agencies Involved in Sewage Management in Kanpur

Agency	Functions
U.P Jal Nigam (UPJN)	Mainly responsible for construction, operation and management of water supply and sanitation related infrastructure across the state, on behalf of the state government
Kanpur Jal Sansthan (KJS)	Construction and management of the water supply and sewage infrastructure
Kanpur Nagar Nigam (KNN)	Local government agency, responsible for providing basic services including water supply and sewerage, storm-water drainage, waste-disposal, roads and bridges, electricity etc. Owns the assets.
Kanpur Development Authority (KDA)	A para-statal body, mandated to build infrastructural facilities including housing in Kanpur. It acquires land and develops new colonies, suburbs and builds all infrastructural facilities for it.
UP Housing Development board (UPHDB)	UP housing board is an autonomous body, that frames, plans and executes housing and market development projects, provides all infrastructure facilities in the developed areas and enjoys powers to acquire and dispose land for the same (Under State Department of Urban Development)
District Urban Development Agency (DUDA)	Agency specifically established to undertake and implement infrastructure programs under central schemes, mainly for urban BPL families and slums (Under Ministry of Urban Employment and Poverty Alleviation)
UPPCB (Kanpur)	Pollution control board (under Environment Protection Act, 1986) works to prevent water, air and noise pollution and penalizes for non-compliance of the norms.
District Collector and Magistrate (Kanpur Rural & Kanpur Urban)	Monitoring agency for all the projects, programs in the district and region in general, as well as (under special directions) for monitoring of GAP and other RAPs.

Table 4: Overlap in Functions of Sewage Management Agencies in Kanpur

Generic Functions	Sectoral Responsibilities			
	<i>Collection of Sewage (Connecting HHs)</i>	<i>Transport of Sewage (Gravity based)</i>	<i>Transport of Sewage (Pumping based)</i>	<i>Treatment of Sewage</i>
<i>Survey and Design</i>	KNN, UPJN, KDA, UPHDB, DUDA	KNN, UPJN, KDA, UPHDB, DUDA	UPJN, KDA, KNN	UPJN
<i>Planning</i>	KNN, UPJN, KDA, UPHDB, DUDA	KNN, UPJN, KDA, UPHDB, DUDA	UPJN, KDA, KNN	UPJN
<i>Financing</i>	KNN, CG, and SG.	KNN, CG, and SG.	UPJN, KDA, KNN	KNN, CG, and SG.
<i>Execution (Constructing Sewers)</i>	KNN, UPJN, KDA, UPHDB, DUDA	KNN, UPJN, KDA, UPHDB, DUDA	UPJN, KDA	UPJN
<i>O & M</i>	KJS (KNN)	KJS (KNN)	UPJN	UPJN
<i>M&E (Only Third Party Monitoring)</i>	KNN, UPCB, DM-Kanpur-Nagar, Regional Commissioner	KNN, UPCB, DM-Kanpur Nagar, Regional Commissioner	KNN, UPCB, DM-Kanpur Nagar, Regional Commissioner	KNN, UPCB, DM-Kanpur Nagar, Regional Commissioner

Overlaps in Planning: UP Jal Nigam enjoys full powers for developing state plans. However, local urban local bodies and local Development Authorities also play important role in this. This overlap results not only in confusion but also leads to somewhat chaotic situation. This is because all the five agencies (viz., UPJN, KDA, UPHDB, KNN, and DUDA) prepare designs

and vie for projects for the sewerage system. Such a situation also results in complete absence of integrated planning or integrated development of the city, including that of its sewage system.

Overlaps in Designing and Building Infrastructure: Overlaps in planning also result in overlaps in design and building of infrastructure. According to the laws, three independent institutions, viz., Kanpur Nagar Nigam, UP Jal Nigam, and Kanpur Jal Sansthan have the mandate to design and build sewers and sewerage systems at different scale. In addition to these three institutions, Kanpur Development Authority and UP Housing Development Board also construct sewers and STPs in the areas where they carry land and housing development work. Moreover, there is a special agency called District Urban Development Agency, established to undertake programs for slums, which also looks after water and sanitation issues in slums.

Overlaps in Financing Capital Costs: As far as the financing of infrastructure is concerned, hitherto, the central government (CG) and the state government (SG) have been bearing the responsibilities, and even between them, the CG has shared the bulk of the load. KNN also spends—through ward-levels works—funds for small-scale capital works such as those required for connecting households' water-closets to the sewers. Nonetheless, this overlap between the functions of local and state/central governments is not of much importance. However, the overlap between functions of agencies of the central and the state governments really harms the sector significantly. This overlap allows the tactic of 'passing the buck' to each other, when it comes to accountability; it also results delays in decisions over financial allocations and release of grants. For example, in GAP I and II, confusions as well as disagreement between the state and central governments over the share of capital costs affected the progress of construction of GAP assets and quality of these assets.

Overlaps in Operation and Management of Assets: All these five agencies are expected to transfer assets to KJS (under KNN) for maintenance, as per the current arrangements. It was found that, in practice, along with KNN (KJS), UPJN shares these responsibilities, in which KJS only maintains the gravity-driven sewer networks, whereas UPJN maintains the pumping-driven sewer networks and STPs. Thus, half of the sewage collection infrastructure is managed and maintained by KJS (KNN), while remaining half is managed by UPJN. In addition, UPJN maintains pumping and treatment infrastructure.

Overlaps in Financing of Operations and Maintenance: In terms of finances for operation and maintenance, for many years, there was confusion. Formally, the UP Water Supply and Sewerage Act, 1975 empowers UPJN to define the tariffs based on the projected or actual costs of operation and management. Similarly, UP Municipal Corporations Act, 1959 also empowers Municipal Corporation of Kanpur for the same function as well for levying and collecting taxes from the citizens. On the issue of determination of tariffs/taxes, this overlap always results in conflicts or disagreements between these two agencies, even in formal interactions. However, in practice, both provisions are not operational and water supply schemes are dependent on state finance for operation and maintenance.

Overlaps in Monitoring and Evaluation (M&E): The function of M&E is generally vested with both the types of agencies: (a) implementing or executing agencies, and (b) agencies that finance the works. In addition, special-purpose agencies such as Pollution Control Agencies also discharge the responsibility of monitoring and evaluation. In effect, the Kanpur sewage system is monitored by different agencies, such as KNN (as a local government agency and responsible for providing basic services), KDA and UPJN (as implementers as well as, as a agencies mandated to carry out this function according to respective laws), KJS (as an agency discharging operation and maintenance function), and the Kanpur PCB Unit (as an agency controlling the water pollution). Further, in addition to all these agencies, the state government and the central government agencies (departments) also undertake monitoring through the local agencies as well as through by specially-appointed (temporary) agencies. Despite the presence of all these M&E agencies, Kanpur swage system suffers from significant level of non-compliance and non-adherence, primarily because of this overlap and resulting confusion and dilution of responsibility.

3.5. Other Lacunas in the Structural Characteristics of GAs

Apart from the overlaps which came out sharply in the analysis, some other instances of different types of lacunas could be found in the structural elements or characteristics of the governing agencies (GAs) involved in governing the sewage sector in the city of Kanpur during even such a short study.

Gaps in Capacities and Administrative Systems: Gaps in administrative system are wide-spread across the governing agencies involved in the sector institutions. Apart from the GPCU, functioning of every important agency is marred by lack of adequate and dedicated staff, constant shifting of responsibilities, and unclear reporting structures. For example, despite being the only central government agency for direct monitoring of water pollution and GAP, the UPCB Kanpur Unit is very poorly staffed.

Lacunae in the Financial Arrangements: Many of the governing agencies involved in the sector (including the local government agencies as well as para-statal agencies) have been entrusted with the function of raising finances through levying of charges, taxes, fees, or by issuing debentures and bonds (e.g., UPJN). However, their decisions in this regard are directly and tightly controlled by the state government. In fact, while transferring the important functions of urban services to the urban local bodies following the 74th constitutional amendment, the state government did not decentralize the sources of funds. Obviously, all the para-statal agencies and KNN are poorly financed and starved of funds even for their daily operations. It was reported that the state government seldom disburses adequate funds for operation and maintenance of sewage management assets in timely manner.

Vagueness in Relationships between KDA and UPJN: The relationship between KDA and UPJN is vaguely defined in both the acts concerned, except two provisions which establish that: (a) The Managing Director of UPJN is an ex-officio member of the Development

Authorities (DAs)⁶, and (b) Development Authorities require that every amenity constructed in the 'development-area' is consistent with the master and zonal plans Prepared by the DA. Prima facie, these provisions establish the control of the DAs (in this case, KDA) over each sewerage or drainage proposal in the development area, but also create contestation, as UPJN also enjoys same functions as far as the sewerage and water supply is concerned.

Vagueness in Relationships between KJS and UPJN: UPJN has authority to inspect the operations of Jal-Sansthans (JSs) in the state, to finance new schemes of local authorities including JSs, as well as to undertake construction of its own schemes, subject to state directions or permissions. However, if both agencies operate in one city, those are independently accountable to the state government, but not directly accountable to each other. Thus, UPJN seems to have supremacy over the Jal Sansthans in the state, but only indirectly, as both the institutions have independent jurisdictions.

3.6. Misaligned Perceptions and Norms of Stakeholders

As mentioned in the report on the framework, informal rules or norms do guide thinking and behavior, in significant manner, of not only individual and informal stakeholders but also of the governing agencies and formal but non-governing agencies. Naturally, these norms do affect the functioning of the GAs, which are trying to direct the behavior and thinking of stakeholders in the direction appropriate for achievement of the policy objectives set before them.

The informal rules or norms are often rooted in perceptions of the respective stakeholders towards the overall reality and the other stakeholders. But, the relationship between the behavioral patterns, norms and perceptions is not necessarily always a one-way causal relationship. Many times, repeated behavior might give rise to new norms, and a particular normative perspective can also engender new perceptions. In short, the relationship between behavior patterns, norms, perceptions is cyclical.

These perceptions and norms of a stakeholder guide and prompt the stakeholder to act in a particular direction. At the same time, the GAs attempt to guide the thinking and behavior of the stakeholder in a particular direction in order to achieve the policy objectives by employing certain incentives or disincentives through the policy instruments. If these two directions are not aligned, there is tussle between forces pushing the stakeholder in two contradictory directions. In this situation, the actual behavior of the stakeholder depends on how the stakeholder responds to, on one hand, the incentives and disincentives provided in the policy, and, on the other hand, the internal compulsion created by the misaligned norm. If the force of the norm overwhelms the motivation provided by policy incentives, then the behavior of the stakeholder results in some distortion or perversion in the governance process. These distortions or perversions in the functioning of governing agencies create deficiencies in their performance, harming the efforts to achieve policy objectives..

⁶ Refer Section 4 (3) of The Uttar Pradesh Urban Planning and Development Act, 1973

The study found out many perceptions that shaped the norms and behavior, which were misaligned with the policy objective of cleaning Ganga.

'The holy river Ganga can never be polluted': There is a wide-spread belief that the river Ganga is a holy river and can never get polluted. The popular belief that the holy-river Ganga can be dirty but never be polluted is an expression of a deep cultural belief of a large religious community. This concepts of being 'dirty' and being 'polluted' carry significantly different meanings altogether, which reinforces another perception that 'the river especially the Ganga has self-cleansing capacity'. These perceptions shall perpetuate the ignorance about the 'pollution' of the river and, thus, breed apathy in the minds of the local people about pollution abatement works.

'The Ganga is not a holy river for us': It is increasingly said that Ganga holds religious importance for only a particular religious community, but for other communities. It is a wide-spread belief that, due to this feeling, these non-believing communities are not sensitive to the issue of pollution of Ganga.

'The ULBs are neither capable nor motivated enough': Various experts and academics often champion the cause of decentralization of funds, functions, and functionaries to the urban local bodies. This, according to some of them, is the panacea for improving governance of municipal public services. However, there is an increasing perception that the ULBs are neither capable nor motivated to take-over and discharge the governing functions—in efficient, effective, and timely manner—especially those related to the sewage and solid-waste management. This perception is quite rampant in the general public, media, state-level bureaucracy, and even in some sections in ULBs. This is found to be leading to demands for privatization of these functions.

'Urban un-connectedness to the river': Despite significant failure of the GAPs, there has not been any strong disapproval on the part of the citizens, their representatives from the urban areas on the banks of the river and her tributaries. The failures clearly are rooted in lack of effective extraction of accountability of the governing agencies. However, the problem is not restricted only to lack of appropriate mechanisms for extraction of accountability. The problem also lies in general apathy of the urban citizens and their representatives who are unwilling to extract accountability. This apathy seems to be rooted in perception of remoteness and lack of attachment that common urban citizen harbor toward the river. As a result of this apathy in urban citizens, the political parties do not find the issue of pollution in Ganga worth investing their time and resources as there is no political dividend to gain. One explanation of this apathy or un-connectedness is the disjunction urban citizen experience in their daily lives, their daily needs on one hand, and the river on the other.

'Kanpur Jal Sansthan is left with dirty work of maintenance': There is wide-spread feeling among the functionaries of KJS that KJS is a low profile agency. This perception seems to have emerged because of the fact that KJS, being a local agency, its engineers enjoy less powers, salaries, and status. They believe that they have been assigned this dirty function of

cleaning of sewers and other ‘engineering’ agencies enjoy respectable functions of building infrastructure. This perception breeds apathy toward their work of maintenance of sewerage network.

‘We can be held responsible for our corruption, but not of others’: The officials in the agencies which have been assigned with the operation and maintenance (O&M) related responsibilities often face the music for bad operations and maintenance and are blamed for the resulting performance problems. However, they claim that many of the O&M problems are rooted in the bad designs and sub-standard work during the stage of building of the infrastructure. These problems during the building of infrastructure are believed to be results of large-scale corruption, nepotism, incompetence, and sheer apathy on the part of the agencies involved in the infrastructure building. Hence, the functionaries who are given the responsibility only of O&M feel that they cannot be held accountable for the misdeeds of the infrastructure building agencies. This situation makes it difficult to nail the accountability of problems evident at the users’ end.

‘Cleaning of Ganga a job of UP Jal Nigam’: Many agencies believe that the cleaning of Ganga is a job of the UPJN since it administers a special authority called Ganga Pollution Control Unit (GPCU). KNN is agency which is ultimately responsible for providing sewage services to the citizens of Kanpur. However, KNN neither has any powers to monitor the UPJN nor it has any role in operationalizing the related programs. Even if it faces any problem related to pollution in Ganga, it cannot do much as KNN does not enjoy any direct powers over UPJN or pollution related programs. This allows KNN to shirk away from the responsibility of providing good sewage services.

Courts do not have control over execution, could be taken lightly: on many occasions, the High Courts and the Supreme Court have intervened on the issue of pollution of Ganga. However, there is a wide-spread perception that the role of the courts has been not effective mainly because the execution of the court orders is finally rested with the public governing agencies, which remain unaccountable even to the courts. The governing agencies and general citizens feel that *“courts do not have police force of its own to control public governance agencies”*. For this reason, on one hand, the citizens are increasingly losing faith in efficacy of judicial interventions, and, on the other hand, the governing agencies are increasingly getting bold in flouting the court orders. In fact, some officials are bold enough to blame court interventions for the delays in implementation of programs.

3.7. Misaligned Interests

In the report on the framework (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011), interests were defined as the expectations or desires of obtaining benefits—especially economic, financial, or political benefits—on the part of the stakeholder.

Interests are powerful factors that shape and guide thinking and behavior of individuals and organizations. Interests prompt the stakeholder to think and behave in a particular direction, whereas the GAs attempt to guide the thinking and behavior of the stakeholders

to think and behave in a particular direction, using various incentives and disincentives through policy instruments and in order to achieve the policy objectives. If these two directions are not aligned, then the actual behavior of the stakeholder depends on its relative responses to, on one hand, to policy incentives, and, on the other hand, the lure of interests. If the lure of interest overwhelms the motivation provided by the policy incentives, then the actual behavior of the stakeholder creates distortion or perversion in the governance process, affecting achievement of the policy objective adversely. This subsection maps some major stakeholder and their main interests. It also discusses how these interests manifest in misalignments and how these misalignments adversely affect the policy objective of cleaning the river Ganga. Some of these points are briefly depicted in Table 5.

Table 5: Stakeholders and their Interests in Sanitation Sector (Kanpur)

Stakeholder Group	Major Interests	Manifestation in Misalignments	Adverse Impact on the Policy Objective
Political parties	Securing and increasing popular support from the electorate	Reluctance to levy adequate charges for recovering the costs even of operation and maintenance of the sewage system	Overall financial viability of the sewage system is affected Expansion of infrastructure of public services affected
		No push for connecting households to the main sewers	Sewage keeps flowing through <i>nallas</i>
	Securing capital intensive projects and monetary benefits	Nexus between contractors and politicians is formed for sharing the benefits	Adverse impacts on the overall financial viability, quality of work, technical efficiency, siting and timing of costly projects
UPJN	Ensuring expansion of economic and political clout of the organization	Preoccupation with bigger capital-intensive projects Neglect of the operation and maintenance aspects	Low level of O&M efficiency, reduction in the life of assets, alienation of users
Kanpur Jal Sansthan	Ensuring expansion of economic and political clout of the organization	Without opportunity for engaging in capital works, KJS is stuck with O&M job, with no extra benefits. The KJS officials also find their salaries and financial powers much less than their counterparts in other agencies. This results in loss of moral, apathy, and bitterness towards the responsibility entrusted.	Adverse impact on O&M, quality of services, life of the assets, goodwill of users
Kanpur Nagar Nigam	Ensuring expansion of economic and political clout of the organization	Securing (often extorting) benefits from the infrastructure building projects, at the time issue of no-objection-certificates to the executing agencies such as UPJN	Delay in work, cost-overruns, artificially inflated budgets, low quality construction, neglect of quality control, handing out undue benefits to all other concerned
Private Service Providers (Septic Tank Cleaning Services)	Securing steady business revenues	Lobby against measures for connecting household to sewer lines	Coverage by the sewer system is adversely affected, allowing untreated sewage to flow into the river

Table continued to next page

Table continued from previous page

Stakeholder Group	Major Interests	Manifestation in Misalignments	Adverse Impact on the Policy Objective
The Pujari/Pandit Community	Securing steady business revenues	Reinforcing the deep-rooted belief that the Ganga river cannot be polluted	Increases the apathy of the people towards the pollution issue
Business Sections	Keeping the cost of business operations minimum to the extent possible	Mixing of commercial and industrial effluents with the domestic sewage, making the treatment of sewage difficult	Increased flow of untreated or semi-treated effluents into the river
State level – ruling party	Ensuring continuation and expansion of political power and economic gains to the people, sections, and areas providing electoral support	Prioritizes money allocation in the best possible manner to the areas and towns, which provide electoral support	Creates regional imbalance across the state, results in overdesigning or under-designing of infrastructure, neglect of funds for operation and maintenance of assets
Design Consultants	Securing steady business revenues and profits (which are based on percentage of the total project costs)	Prescribing and supporting solutions/projects requiring large-scale investments, with the neglect of low cost but effective solutions Formation of nexus with other stakeholders having vested interests in big-ticket projects	Waste of scarce resources on unnecessary high-cost projects, affecting overall expansion of the sewage system
Technology Companies	Securing steady business revenues at the least costs	Selling of technologies which they sell and which bring high levels of profits, rather than providing technologies which are appropriate	Waste of scarce resources on unnecessary technologies, which often prove inappropriate and unviable at the time of operations
Donors/Financers	Pushing Broader Policy agenda Sponsoring Chosen Consultants	Promotion of technologies and policy models that suite to their larger agendas	End up thrusting policy models and technological solutions that are unsustainable and unviable, affecting the broader policy objective of cleaning of Ganga
Common Citizen	Cutting down the expenditure on daily needs	Reluctance to pay the user-fees charges for public services Reluctance for connecting water closets (WCs) to the sewers, and allowing swage to flow into <i>nallas</i>	Perpetuation of the financial crisis of governing agencies Perpetuation of the open sewage problem in the city
Contractors	Securing steady business revenues at the least costs	Inflating the costs of the projects Forming the nexus with political and administrative decision-makers	Impact on coverage of the sewage system, low quality and shorter life of assets, early brake-down of the sewage system

Political Parties: Popular support is the principal source of power for political parties. Hence as part of electoral politics, political parties are always sensitive and supportive of perceptions of the dominant sections of the electorate. The proposals to raise taxes or impose new fees on the services is part of the reforms attempt to ensure financial viability of the sectoral operations. However, ruling political parties always show reluctance to raise taxes, fearing loss of votes in the next elections. Opposition parties also show a lot of political opportunism and campaign against the ruling parties, if they propose to raise taxes or user-fees. This affects the revenue and perpetuates the problems of paucity of funds for operation and maintenance. This is the situation around the issue of payment of O&M costs by KNN to UPJN, as per the court guidelines. According to the orders issued by the Hon. Supreme Court, KNN is expected to collect user-charges and pay for operation and maintenance of the assets created under GAP I and II. However, since the KNN has not been successful in imposing and collecting user-fees and always short of money otherwise, it has never been consistent in paying the required amount to UPJN. In the end, the UP state government started sending the money directly to UPJN, by cutting the amount from the KNN's share in grants from the state government, which are actually meant for creating new and much required infrastructure for improving other basic services. This failure on the part of KNN has not only increased the strife between UPJN and KNN, but also has adversely affected the expansion of the infrastructure in the city.

Uttar Pradesh Jal Nigam: It is a well-known fact that capital intensive, high cost projects bring with them political clout and economic benefits to the governing agency and its functionaries. As a result, all governing agencies are always attempting to chase and secure such projects. In the case of urban sewage sector in UP, other governing agencies and the civil society always accuse UPJN of being preoccupied with and chasing high capital cost projects. This preoccupation results in neglect of operation and maintenance of the assets.

Kanpur Jal Sansthan: The KJS officials always try to find point out lacunas and bitterly complain about the quality of infrastructure during the joint inspection of assets created by UPJN. This joint inspection is conducted at the time of handing over the assets to KJS for maintenance. The main grouse underlying these complaints is the disparity between the functions and powers of KJS and UPJN. While UPJN works on infrastructure building project, KJS is saddled with the responsibility of maintenance of sewer line. Further, while the infrastructure projects involve very high level of expenditure, the level of expenditure involved in the maintenance work is very low. The UPJN engineers of the same rank enjoy powers for sanctioning of larger expenditure and earn more salary than what their counterparts of the same rank in KJS enjoy. All these create serious disparity in the total earnings of the officials of the two organizations. This result in serious neglect of O & M, which, in turn, affect quality of service, life and utility of assets, and good will of users/citizens.

Kanpur Nagar Nigam (KNN): KNN officials have the similar grouse against the UPJN colleagues. As a result, they strike when they could wield their power of creating trouble for

UPJN. UPJN is expected to secure No-objection Certificate (NoC) from KNN officials before commissioning any infrastructure work in the city limits. KNN officials ensure inordinate delays in issuing of NoC. They wait until their due or undue benefits are secured to the extent possible. This causes inordinate delays even in completing the projects, which further result in time-overruns and cost-escalations. Envisaging all these, the executing agencies try to inflate the budget to the extent possible. But, often, the tight resource position restricts the budgets, which in turn result in sub-standard work and even failure to complete the work. This creates a disjointed, unconnected, chaotic, and sub-standard sewage system.

Service Providers for Septic Tank Cleaning: Many household have improved toilet systems in their houses, however their water closets (WCs) or septic tanks are not connected to the sewer lines. Such septic tanks are periodically cleaned by private service providers, which is a big business in the city. The interest of these service providers lies in securing steady business revenue, which would get severely affected if WCs or septic tanks are directly connected to the underground sewers. It was reported that these agencies always try to lobby—in legitimate and illegitimate manners—against the measures for connecting households to the sewer systems.

The Pujaris/Pandits: The Pujaris who help the pilgrims to perform religious rites and rituals are dependent on the belief-system that makes the river Ganga an eternally holy river. If the pilgrims find Ganga polluted, they would stop coming for pilgrims and the livelihoods of the Pujari community will be in trouble. Hence, this community, in order to ensure their continuity of their business and livelihoods, always try to maintain the belief that ‘the river Ganga can never be polluted’ by vigorous proclamations of the same. However, it is observed by many that this belief effectively alienate citizens from the efforts for cleaning pollution in river Ganga.

Business Community: Kanpur has a large business community of owners of small units such as tanneries, textile units, and textile-dyeing units. Apart from the big tanneries, the other small informal units do not treat their effluent. Even bigger tanneries do not treat their effluents in order to cut down their costs as far as they could. With strong backing from political and criminal elements, these sections try either to co-opt the functionaries of pollution control agency through enticements or pressure, or create barriers to their efforts to monitor and enforce regulations. Lack of adequate capacities and resources with the pollution control agency and lack of effective mechanisms to ensure its autonomy and accountability are the factors that allow this interference. Thus, the misalignment of interests of the business community, and the lacunas in the policy instruments, together, creates serious threats to the efforts to curtail pollution in river Ganga.

State Level Ruling Parties: The political party in control of the state government has strong interest in maintaining and expanding its political power by distributing economic benefits to the sections of society and geographic areas that provide electoral support to the party. As a result, it tends to use its authority to ensure larger share and priority to these sections and regions. This creates disparity among regions and sections of society, and results in

developmental imbalance across the state. The other regions and sections of society starve from funds for infrastructural development as well as for proper operation and maintenance.

Design Consultants: Design-consultants, like other commercial consultants are driven by the sole motive of increasing business profits. Their fees are generally based on a certain percentage of the project costs. Thus, they develop interests in increasing the total project costs to the extent possible. As a result, they tend to prescribe and support technical and managerial solutions that are high capital costs. They also tend to participate in the nexus with other stakeholders who have similar interests in pushing high-cost projects. This encourages wastage of scarce resources due to unnecessarily high cost projects, affecting the other possible projects and O&M of the other existing projects.

Technology Companies: Technology companies and consultants, driven by interests similar to those of the design consultants, often tend to sell the high-cost technological options that give them higher profit margins, instead of providing technological solutions that are appropriate to the needs of the sector. This again leads to wastage of scarce resources and the inappropriate technologies pose many problems at the time of operation. This obviously affects the efforts to clean up pollution in river Ganga.

Donor or Financing Institutions: As it happened in the case of UASB technology, in which Dutch-funding played a decisive role in the selection of UASB technology, donors tend to push technologies owned by the companies from their own countries. Many times, the donors have broader agenda of pushing certain policy solutions. The technologies or policy pushed in such manner often tend to prove misfits for local conditions and create new barriers for achievement of policy objectives.

Common Citizens: One of the major reasons why KNN has not been able to raise resources for O&M through taxes or tariffs is reluctance of citizens to pay the taxes. The citizens are always interested in cutting down expenditure on services. This is further aggravated by the absence of norms that would prompt common citizens to make payments for the public services they use. Hence, if imposed strictly, citizens tend to evade or delay the payments. These norms and interests also make political parties to fear about the backlash from citizens if they support efforts to increase revenue through user-fees. This severely affects the financial viability of the governing agencies and that of infrastructure projects.

Contractors: Constrained by stringent budgets and inordinate delays in sanction and payments of their bills, contractors tend to enter into illegitimate arrangements with the administrative and political functionaries who wield power over these decisions. As a result, they tend to inflate the project costs and go for sub-standard material and practices to cover their profits. This naturally affects the technical efficacy, efficiency, and life of the facilities and infrastructure.

4. Recommendation and Conclusions

4.1. Recommendation for Addressing the Governance Deficiencies

4.1.1. Overlaps in Planning function

As clearly mentioned in the preamble as well as goals and objectives of the Development Authorities Act (UP), the role of the Kanpur Development Authority (KDA)) DA is to plan the city, considering existing problems as well as future demands. In adherence to these legal provisions, the planning function should be retained with the DAs, however, DAs need to be dissociated from the project-design and execution functions. Similarly, the planning function assigned to different sectoral agencies especially the *para-statal* bodies, such as UPJN, KJN, UPHB should be withdrawn. Such streamlining exercise would essentially do away with the overlaps and facilitate better coordination and avoid conflicts that affect the functioning in a negative manner.

Importantly, it would be extremely necessary to align this restructuring or streamlining exercise with implementation of urban reforms as well as the provisions of the 74th Constitutional Amendment Act (or CAA). One of the important governance reforms in the set of 23 urban reforms introduced under JNNURM is “Assigning City Planning Function to ULBs”. Implementation of this reform, although largely neglected at present, questions the role of DAs in future. In pursuit of showcasing compliance to this reform, the government assigned the responsibility of preparing ‘City Development Plans’ to the ULBs and confined the geographical scope of the City Development Plans (or CDPs) to the municipal limits. Whereas the DAs continued and are still continuing with the implementation of Development Plans (DPs) they prepared including plans for the peri-urban areas or the areas that newly entered into the municipal limits. In view of the dynamics of political-economy among these various agencies, these overlaps are hard to resolve. But, resolving them is extremely critical for smooth and effective discharge of planning and execution function related to the sewage collection, treatment and disposal systems.

4.1.2. Overlaps in Designing and Building Infrastructure

Similarly, other functions devolved under the 74th CAA and the new mechanism of Public Private Partnerships (PPPs) implies restructuring of agencies such as UPJN in a fundamental manner. This is mainly because the amendments require transfer of the functions of design and infrastructure-building entirely to the ULBs; and, hence, divesting para-statal agencies of this function. For example, in the Maharashtra state, trifurcation of the existing ‘Water Supply and Sewerage Board’ has been proposed into three different companies. In fact, an NIUA report indicates that a similar thinking prevails in many of the state-level policy makers in UP.

However, on various fronts, the process of restructuring UPJN is not going to be easy for the UP government. It is feared that among many other difficulties, the UP state government would face the major problem of placing the huge staff of UPJN appropriately among other

agencies including ULBs. The employees of the UPJN have already indicated their reluctance and resistance to such restructuring, as they are not willing to work for ULBs.

At the same time, urban reforms as a larger process of governance reforms under JNNURM as well as under other several reform initiatives by the state are creating enabling environment for private sector participation in the basic infrastructure services like urban sewerage and sanitation services. These policy-level developments have put pressures on staff of UPJN, which would face severe competition from the private sector entities. This threat has further aggravated their resistance to restructuring. Another important danger is that the process of restructuring would create an institutional vacuum, as it would dissolve a state-level, reliable body playing supportive role to the ULBs, by handling regulatory and financing functions in addition to the function of infrastructure building. Moreover, this vacuum would be disastrous especially in situations, wherein either the PPP arrangement fail, or the private partner in the PPP agreement starts using its advantage of superior expertise and capabilities to reap monopolistic benefits, as there would not be any fall-back mechanism available to ULBs. To avoid such situations or to take-over the failed PPPs, state-owned organizations like UPJN—having necessary human resources, capability, and infrastructure—need to be maintained and strengthened. These aspects justify UPJN's continued existence and role in the sewage and sanitation management, along with the water supply.

It is evident that the institutional restructuring at the state level is going to be a daunting task for state authorities, as it involves negotiations and intense stakeholder processes at various levels. Hence this is going to be a time-consuming job. The success of efforts for brining effectiveness in sectoral responsibilities, (i.e. collection, conveyance, treatment and disposal) would depend on the speed and efficacy of state authorities in carrying out restructuring of para-statal agencies and streamlining ULB functions. Besides, the dangers of policy failure, especially in the case of private participation, can also affect restructuring to a great extent. On this background, the pollution-abatement work for the river Ganga cannot wait until the institutional restructuring and streamlining are completed; and needs immediate action. This calls for striking a right balance between constitutional responsibility and mandate to implement 74th CAA, on one hand, and, on the other, the need to avoid the possibility of institutional vacuum due to restructuring or disbanding of UPJN. The UPJN can play an important role in designing, erecting, and maintaining projects for interception, diversion, and treatment (or reuse) of sewage. However, UPJN would have to be made accountable to the SPCB as well as to the State Environment Ministry in order to streamline the functions.

4.1.3. Overlaps in Operation and Management of Assets

At present, the UPJN and Jal Sansthan are handling the function of the operation and maintenance (O&M) in majority of the sewerage collection-conveyance systems as well as STPs. However, JNNURM reforms would transfer this function to the ULBs. Since, for bigger cities, the process of merging respective Jal Sansthan's into the ULBs is in pipe-line, these

ULBs (i.e. of KAVAL towns and other big cities) would develop capacities to manage the O&M. However, a large number of medium and small towns would still need institutional support to operate and run the systems. The UPJN can fill this void. However, it needs to be ensured that the UPJN would conduct only the function of O&M for interception, diversion and treatment facilities and would not interfere in the inner city sewerage systems as far as possible. In such cases, if ULBs experience inability to operate the projects, UPJN may get involved in management of sewer systems, provided that Directorate of Municipal Administration, State Department of Urban Development and State Department of Environment and Forests jointly give directions to UPJN.

4.1.4. Overlaps in Function of Monitoring, Evaluation and Ensuring Compliance (M, E and EC)

The review of overlaps in this function bring out two important observations: (a) according to the existing statues and laws, these functions are distributed among agencies that are responsible for financing (up to a limited extent), building infrastructure (such as UPJN or KJS, and the revenue department) as well as purely monitoring agencies such as CPCB, and (b) the procedures for penal measures for non-compliance are also highly complex (for example, departmental enquiry or secret-reports), and these responsibilities are also distributed among various agencies.

In order to clean up the existing distribution of M, E and EC functions, it is highly recommended that CPCB and SPCB need to be given higher autonomy in their functioning. At present, the CPCB is functioning merely as a technical support agency. It has not even been supported with an independent funding source, unlike SPCB which can collect its own cess. Another important limitation is that SPCB is accountable to the state-government for any action they take against the non-complying companies or ULBs. This clearly shows that CPCBs and SPCBs have capabilities to effectively conduct monitoring and evaluation functions but they are relatively weaker in conducting the function of compliance-ensuring, mainly due to low level of autonomy. Hence, it is strongly recommended that their autonomy is increased on one hand, and, also new and more spaces are created for interventions and participation by public and civil society in the M, E, and EC functions, on the other hand.

The complicated and secretive procedures for evaluating the performance and compliance of the employees and officials is another important hurdle in bringing effectiveness and efficiency in the pollution abatement tasks, pertaining to sewage collection and treatment. This has made the process opaque and restricted accountability relationships (among the officials) to the vertical direction, whereby the employee or the official is accountable only to the higher authority and not to the broader cause or other important stakeholders like citizens. There is a great need to restructure these accountability relationships and make them horizontal, and to create spaces for participation of civil society and the citizens, in evaluating the performance and extracting accountability of the utility (and its officials) responsible for the functions in sewage and sanitation management.

4.1.5. Piloting for decentralized sanitation system and recycling

It has been evident from the efforts hitherto that the sufficient level of experimentation has not taken place for decentralized and in-situ sewage disposal techniques. There is a great need to incentivize such techniques as well as their production and market development if such experiments are to become successful. Such new techniques and practices could be used in the rapidly developing peri-urban areas of large urban agglomerations such as Kanpur as well as to smaller cities which do not have centralized systems for sewage collection, conveyance, treatment, and disposal/reuse.

Incentivizing market development for recycling and reuse is another equally important area, especially for cities that are having centralized systems. The shortage of freshwater is being increasingly faced by the industries in many part of the country which have adequate financial strength to raise finance for undertaking reuse or purchasing treated sewage for industrial use. This potential need to be assessed and pilots should be undertaken at appropriate locations, especially in industrial towns after conducting feasibility assessment of such pilots.

4.1.6. State Financing arrangements for Small Towns

Small towns would continue to face the financial crisis; even after successful introduction of reforms, primarily because of the smaller sizes of their local economies, which are almost stagnated. Such towns would need continued state support; for sewage treatment, which would be an important issue for these towns. UP state government could support these towns through UPJN and route the financial allocations for setting up and running the STPs through State Finance Commissions.

4.2. Conclusions

4.2.1. Need for More Case Studies

The discussion until this point vividly brings out that there are serious lacunas in the governance instruments (GIs, i.e. PIs and GAs together) and distortions in the process of governance. Examples of many of these lacunas and the root-causes of the distortions are brought out by the analysis of the ground situation in Kanpur city. Though this case study has serious limitations—as it was conducted under severe resource and time constraints—it corroborates many findings of the earlier report (004_GBP_IIT_EQP_S&R_03_Ver 1_Dec 2010) in this series and also the comments of many observers and the available anecdotal evidence. It certainly will be useful to take up more in-depth case studies—using the P & G Framework presented in a separate report—covering a varied sample of towns and cities from all the states along the banks of Ganga and her tributaries. Such studies would bring out many more lacunas in PIs and GAs and sources of distortions (i.e., misalignments) in the governance process. These would help us to identify the amendments and revisions in GAs and PIs, which would be needed to address these lacunas and distortions. This, in effect, would help us improve the governance of urban sanitation (or sewage) sector in different states along the banks of river Ganga and her tributaries.

4.2.2. Feasibility and Efficacy of Retrofitting Governance Instruments

But, considering the urgency of the goal of cleaning up the river and the severity of her pollution, there is need to take a deep and serious look at the feasibility of these recommendations aimed at retrofitting GAs and PIs. As mentioned before, the crux of the diagnosis presented in the earlier sections can be narrowed down in terms of the four types of core governance maladies: (a) lacunas in Policy Instruments, (b) lacunas in Governing Agencies, (c) distortions in the governance process due to misaligned perceptions and norms of the stakeholders, (d) distortions in the governance process due to misaligned interests of the stakeholders.

In a plural society like India, Policy Instruments (PIs) are shaped by the contestation and tussle among various interest groups of stakeholders. The dominant interest groups and the groups which have access to the process of making and implementing PIs have greater say in actual design and use of policy instruments. Thus, the final design and effective implementation of PIs are the outcome of a certain balance of political and economic powers of various interest groups that vie for influencing governance instruments (on in short, the 'political-economy balance') related to the issue or sector under study. Similarly, the structure and functioning of governing agencies—which are shaped significantly by the concerned PIs—could also be seen as the outcome of the balance of political economy in the sector. In other words, the political processes and tussle among different groups determine the balance of political economy, which, in turn, shapes PIs and GAs. Hence, it is very difficult to bring in effective changes—beyond a certain limit—in PIs or GAs, unless there is change in the balance of political-economy (or of the political-economic power of interests groups). Such a change in the political-economy balance is the matter of the political process; and it cannot be engineered by changes in PIs and GAs alone.

Coming to the misaligned norms, the genesis of norms is quite a complex process; and discussion on this process is out of the purview of this report. As mentioned before in the previous report on the P & G Perspective (009_GBP_IIT_PLG_ANL_03_Ver 1_Dec 2011), norms, perceptions, and behavioral patterns have a somewhat cyclical relationship. Further, the norms and perceptions pertaining to a particular sector are often intertwined in a complex manner with the broader culture of the community. Norms and perceptions also have close links with history, political economy, and livelihoods of communities of stakeholders involved. Usual economic incentives often prove ineffective in dealing with norms and perceptions, while behavioral measures and incentives (like rewards or awareness-building aimed at inculcating new values) take long time to be effective. In short, it is difficult to modify, in a short time, the norms and perceptions, or to reduce their impact on the governance processes, either with behavioral or economic incentives.

Addressing distortions in the governance process due to misaligned interests of stakeholders poses equally fundamental challenges. The main strategy often used to address the misaligned interests is to provide a 'carrot' in the form of some (adequately attractive) benefits to the stakeholders involved, or / and (simultaneously) wield the 'stick'

in the form of strong penalties, in order to convince them to make appropriate changes in their thinking and/or behavior. However, in a country like India, where the dominant sections of society enjoy disproportionately high level of economic and political power, these dominant sections are effectively immune to the threats of the 'stick'. Further, the dominant interest groups, who are capable of creating distortions in the governance process, often, anyway, enjoy high-level of benefits from the governance process, making the 'carrot' option unattractive. Rather, these benefits (drawn by the dominant sections)—often undue and harmful for others and for the society—are at the root of many of the social and environmental problems that the governance process attempts to address. Hence, providing these dominant interests with additional ('adequately attractive') benefits often defeats the very purpose of the governance objectives, especially those objectives which have equity and environmental sustainability as the underlying values. In other words, while the 'sticks' fail to deter the powerful stakeholders, the 'carrot' proves counter-productive to the governance objectives.

In sum, it can be surmised that it is very difficult to significantly reduce the impacts of most of the lacunas in governance instruments (i.e., PIs and GAs) and the distortion in the process of governance especially in a quick manner and in a short term. This is because the adverse balance of political economy continues to work against the efficacy of the changes suggested in the governance instruments. Correcting this adverse balance of political economy is not possible through the amendments in GIs or incentives through PIs.

4.2.3. Political Bottom-line and Lessons for Future Projects

This does not, however, mean that the recommendations for changes in PIs presented in the earlier section are not at all useful. Implementation of these policy recommendations, to a certain extent, will certainly create some positive changes in the governance process. However, it needs to be noted that these changes will have limited impacts. It is the limitation of the policy amendments that they cannot address this 'political bottom-line'—i.e., the need to change the adverse political-economy balance, disfavoring the governance objectives often prompted by concerns for equity and environment.

This understanding also helps to diagnose the failures of the earlier Ganga Action Plan (GAP I and GAP II). The GAP and other similar measures were focused on providing technical and financial support to state and local level GAs primarily for creating supplementary infrastructure for urban sanitation. These measures were inadequate for addressing the core governance maladies described earlier. Rather, these measures fell prey to the same governance maladies and were turned into opportunities for dominant sections for acquiring additional undue benefits or, when and where such benefits were not accruing, to scuttle the efforts under GAP. As a result, it is no wonder that GAP not only was inordinately delayed, but abjectly failed in cleaning river Ganga.

The earlier project aimed at capacity building and community awareness with NGO involvement was the victim of machinations of dominant vested interests emboldened by

the same adverse political economy balance. It was reported that the British official who was heading the project was forced to leave when he tried to confront the dominant interest groups. In sum, the core governance maladies cannot be cured by the technical, financial, managerial, or knowledge ‘fixes’, as these fixes do not affect the adverse balance of political economy.

There is a critical lesson here for the future efforts to clean up Ganga. It needs to be noted that any amount of financial support and knowledge support to efforts for infrastructure building, community awareness, or capacity building will not address these core governance maladies or, more importantly, the adverse political economy. As a result, such efforts would meet the same fate as the earlier Capacity Building project or GAPS.

4.2.4. Three-Pronged Strategy

Coming back to the point that the policy amendments have limited efficacy in addressing the adverse political-economy balance, there is need to look for the possible opportunities for the policy and governance prescriptions to contribute to the governance objective of cleaning up river Ganga.

In this situation, the policy and governance prescriptions should be designed following the three-pronged strategy. The first prong involves attempting—through amendments in PIs and providing new incentives and disincentives—to improve the efficiency and efficacy of the governance process to the extent possible. This is to be achieved by reducing impact of the above-mentioned four core maladies of governance on the governance process. This precisely is attempted through policy recommendations presented in the earlier section of the report.

4.2.5. Closed Compound Approach

The second prong of strategy is aimed at finding solutions that would circumvent the problem areas, and still allow achievement of the main goal of governance, viz., cleaning up of river Ganga. In this regard, the technical solution of ‘Interception, Diversion and Treatment’ (IDT) appears to be appropriate for this approach under the second prong. This solution involves building facilities for diverting the *nallas* (or open sewers) to Sewage Treatment Plants (STPs), at the meeting points of these *nallas* and the rivers or rivulets, and treating the sewage flowing in the *nallas* in STPs before its disposal in appropriate way. Viewed from the P&G Perspective, this solution essentially attempts to circumvent the GIs (both PIs and GAs) at the state and ULB levels which are problem-ridden as per findings of the case study. The rationale is that these state and local GIs are difficult for the central government—which has conviction and willingness to clean up the river Ganga—to control or regulate in order to improve their performance. In other words, the approach here is to circumvent the policy instruments and jurisdictions of the local and state level governing agencies and still try to address the issue of cleaning river Ganga.

This approach could be termed as ‘End-of the Pipe’ and ‘Closed Compound’ approach as it allows the central government’s agencies to circumvent the state and local level GAs. As it is

the 'End-of-the-Pipe' approach, the bad performance of state and local GAs in discharging Sectoral Responsibilities of Collection and Conveyance of Sewage would not harm the efficacy of the solution, though it would increase the burden on these efforts. It is called 'Closed-Compound' approach as it assumes isolation of the governance of this approach from the governance agencies and processes at the state and local levels, on which the central government does not have any control. In order to make this solution more effective and efficient, from the P&G perspective, an appropriate institutional model can be suggested. This model is presented very briefly in Appendix I of this report.

It needs to be noted that, In GAP I and II, many projects were based on the technical solution of IDT. However, the main problems with such projects (apart from instances of obvious bungling or subversion) were: (a) inadequate capacities of the STP plants (b) decisions on siting and designs based on an assumption of successful implementations of other projects by state or local agencies, and (c) involvement of state and local level agencies in a significant manner. The approach suggested here has two major and distinct elements: (a) complete circumvention of the state and local agencies, (b) strict regulatory control by an independent expert authority in transparent, accountable, and participatory manner. It is expected that these special features will not allow repetition of the GAP experience.

The 'Design-Build-Operate' (DBO) model presented in the earlier report (004_GBP_IIT_EQP_S&R_03_Ver 1_Dec 2010) appears to fit in these criteria of 'End-of-the-Pipe' and 'Closed-Compound' solution. However, it has particular technical features which are not assessed here. Technical, economic, and financial feasibility and desirability of the DBO model needs to be perfected.

It, however, needs to be clarified here that this does not mean that there should be no support from the central government to the state or local agencies for the projects on collection and conveyance operations or decentralized options for sewage. Such support should, however, be routed through other modes and mechanisms, for example, through JNNURM projects of MOUD of Government of India. The MoEF may consider contributing to such efforts. But it is recommended that, considering the urgency of the chronic problem of pollution in river Ganga, MoEF should primarily be focused on IDT projects, with the 'End-of-the-Pipe' and 'Closed Compound' approach.

4.2.6. Addressing the Political Bottom-Line

The third prong of the strategy, however, attempts to address the fundamental problem of the balance in political-economy which is adverse or counter-productive to the main governance goal, viz., cleaning up of the river Ganga. The political bottom-line, as explained earlier, involves the need to change the balance of political-economy which is adverse to the governance goal of cleaning river Ganga. As mentioned before, political bottom-line cannot be addressed by any type of fixes, including the policy and governance fixes. It can only be addressed by the political processes that would turn the balance in favor of the governance goal. The agents to initiate and work on such political processes will be those whose norms

and interests are conducive to the above-mentioned governance goal. Based on this logic, the core of the third prong of the strategy lies in efforts to create new spaces, opportunities, and mechanisms—in the form of new PIs and GAs—that would help the non-dominant stakeholders, their organizations, CSOs, and Third-party Public-interest Interveners (or TPIs). These new PIs and GAs are expected to help these stakeholders, CSOs and TPIs to be more effective in countering and controlling the actions of the dominant sections which are counter-productive for the goal of cleaning up of river Ganga⁷. The key element of this third prong of the strategy is to create new PIs and GAs with the following guidelines in mind.

- Separation of the tasks of ‘Normative Framing’, ‘Execution of Generic Functions’, and ‘Compliance-Ensuring’ and handing them over to three different sets of organizations at every level⁸
- Making all governance procedures of all these agencies completely and universally transparent and genuinely and universally participatory⁹
- Making the agencies universally accountable in practice
- Preparing the non-dominant-stakeholders, CSOs, and TPIs for effectively using these new PIs and GAs for extracting accountability and participating in governance procedures.

In more concrete terms, it is suggested here that the state-level ‘State Municipal Services Regulatory Authorities’ (or SMSRAs) to be created by enacting special laws in all the states on the banks of river Ganga. In order to make these authorities effective, efficient, and acceptable (to all stakeholders), the following suggestions are made:

- The special state-level laws to establish these authorities should be enacted following the model law provided by the central government or Planning Commission.
- These authorities should regulate all investment, purchases, as well as establishment, operation, and maintenance of all facilities—that are funded by the state and central governments—providing the municipal services under Schedule 12th of the 74th CAA.
- The model law should take the cognizance of the experience and critiques of the existing regulatory authorities in other sectors.
- The PPP projects in the municipal services sector should also be governed by the authority at the entry and operation levels.
- All the funds from the central government and its agencies should be disbursed only after establishment of these authorities by the state as per the model law provided by the Planning Commission or the central government.

This (SMSRA) is not an entirely new idea. The state government of Chhattisgarh has already passed a similar law, while many other state governments are actively contemplating on similar ideas. Appendix II of this report provides some more detailed discussion on such

⁷ Third-party Public-interest Interveners (Or TPIs) are individuals and organizations, who are not stakeholders but who are interested in intervening in the governance process in order to protect and promote the broader public interests. These could include media-persons or media-organizations, civil society organizations, or people’s movements.

⁸ These terms are explained in the previous document from the PLG group.

⁹ Here, the term ‘universally’ implies including all the major stakeholders, TPPIs, CSOs, and all citizens.

authorities. The central government, MoEF, MoUD or the Planning Commission should actively consider helping the states in the Ganga River Basin (GRB) by developing the model law for such an authority.

Thus, in short, the chronic problem of pollution in the river Ganga requires a comprehensive range of solutions that are synergistically supportive of each other. It needs to be noted that the problem essentially is rooted in the governance crisis and no amount of inputs for technical, financial, or capability / knowledge enhancing will be able to reduce these core governance maladies. This is not to deny the need or utility of the technical, financial or knowledge inputs, but to warn against naiveté that prompts a search for simplistic solutions that often serve the vested interests rather than the cause of clean river Ganga. This has been amply demonstrated by the fate that GAP and other previous projects met with.

The limitations of the policy and governance solutions (or 'fixes') are also acknowledged and reiterated here, especially in the face of the 'political bottom-line'. But, the conscious understanding of this bottom-line, coupled with the efforts to create spaces for influencing the bottom-line would help achieve some success in addressing the chronic problem of cleaning up Ganga.

Governing and Regulation of the IDT Projects with ‘Close-Compound’ Approach

1. Introduction

The new approach suggested in the last section of the main report is called the ‘End of the Pipe’ and ‘Close Compound’ approach. This approach essentially involves restricting the intervention only in the operations at the end of the chain, viz., Treatment and Disposal. The first term, ‘End of the Pipe’ refers to this. Because it does not assume proper completion of the previous operations in the chain, viz., the Collection and Conveyance of sewage, the approach has to bring in the operation of interception of all the flows of the sewage that enter into the river water and its diversion towards the treatment facilities. Hence, the ‘Interception and Diversion’—or in other words, mopping-up operation—of the sewage is the integral part of this approach. Similarly, the treated sewage has to be disposed properly. There could be a variety of disposal strategies depending on different parameters. However, for this approach, which is viewed primarily from the P & G analysis, the following three technical operations are integral to the approach: Interception, Diversion, and Treatment (IDT).

Coming to the P & G aspects of the approach, it involves circumvention of the state and local level governing agencies and governance processes. In other words, it requires isolating governance of these IDT projects from the local and state agencies existing in the areas and restricting it only to agencies under the exclusive control of the central government; hence the term ‘Closed Compound’. This is based on the assumption and hitherto experience that while there is political will and normative influences at the central level which are required for cleaning up river Ganga, the political economy and normative influences operating on the governance processes at the state and local levels are counter-productive to the governance goal of eliminating or reducing the pollution of the river Ganga due to urban sewage.

Thus, the governance system for the IDT projects based on the ‘End-of the Pipe and Closed Compound’ (or EPCC) approach is completely controlled by agencies of the central government. Especially the two core governance tasks (pertaining to all the generic governance functions and sub-functions), viz., Normative Framing and Compliance-Ensuring will be handled completely by the central agencies.

Table 6 provides some details of the various generic governance functions and sub-functions and the agencies that would be handling those generic functions.

As the table indicates, two new institutions are envisaged here: (a) IDT Technical Cell (or IDTTC) and (b) IDT Regulatory Board (or IDTRB). The IDTTC, as the name suggests is seen as a

cell composed of experts in the particular technical, economic, and financial matters related to the IDT projects. It is seen as a part of and under full control of the second institution called IDTRB.

The second institution, viz., IDTRB, is also seen as made up of experts. However, it is envisaged as reporting to NGRBA, but has significant level of administrative and financial autonomy which will be legitimized and protected through special provisions in the notification in this regard.

Table 6: Details of the Regulation and Governance Process for IDT Projects with Closed Compound Approach

Tasks	Responsible Agencies	Remarks
<u>Survey and Planning:</u> Preparation of city-wise databases required for feasibility, siting, designing and monitoring IDT(Interception, Diversion, Treatment) projects	IDT Technical Cell (or IDTTC) [This will be specially created cell within the IDTRB]	Step-wise but time-bound coverage of all towns
<u>Technical Design:</u> Decisions on preliminary specifications (Location, Capacities, performance standards, and other)	IDT Technical Cell (or IDTTC) [This will be specially created cell within the IDTRB]	With technical support from CPCB and after web-based process for public participation and scrutiny
<u>Financing and Contracting:</u> Management of Bidding process for IDT projects	IDT Regulatory Board (IDTRB) [a new regulatory agency proposed for the IDT projects only]	IDTRB has to be functionally independent but reporting to NGRBA with certain distinct features
Development and Commencement of IDT projects in time-bound manner	Private Developers, Public Agencies	Continuous or periodic Compliance Ensuring by IDTRB against the contractual terms (especially related to quality assurance and time-delays) coupled with strict monitoring through the TPMA (Third-Party Monitoring Agencies)
Operation and maintenance of IDT projects	Private or Public Operators	Continuous or periodic Compliance Ensuring by IDTRB against the contractual terms, coupled with strict monitoring by TPMA (Third-Party Monitoring Agencies)
Periodic/Continuous monitoring of IDT projects	By Third Party Monitoring with oversight by IDTRB	Based on criteria for monitoring specified at the time of bidding (Web uploading of data every 24 hours)
Grievance redress (both minor & serious)	IDTRB (hierarchical structure starting with its offices at the levels of the state or sub-state regions)	Space and Support for Interventions by Civil Society Organizations (CSOs) and 'Third-Party Public Interest Interveners' (TPPII)
Redress of complaints of breach of contracts	IDTRB (Thorough the state-level offices)	Space and Support for Interventions by Civil Society Organizations (CSOs) and 'Third-Party Public Interest Interveners' (TPPII)
Enforcement of compliance	IDTRB (Thorough the state-level offices)	Provision of criminal proceeding against TPA and/or the developer and operator in case of <i>malafide</i> breach of contracts.

Table continued to next page

... .. Table continued from previous page

Tasks	Responsible Agencies	Remarks
Appeal Mechanism	IDTR, NGRBA, High Court, Supreme Court (in that order)	Hierarchical order does not necessarily mean certain authorities are appellate authorities, or cannot be approached directly. Exceptional cases of direct appeal need to be handled.
Review after 3 to 5 years	NGRBA	Comprehensive and automatic (not at the discretion of any public agency) review of all aspects of the siting, building, operating, monitoring, and compliance-ensuring of IDT projects, after a predetermined period

IDTRB will be mandated with the classical regulatory task or the task of ‘compliance-ensuring’: (a) setting or approving standards, (b) managing and overseeing monitoring of performance, (c) enforcing compliance (or deciding on penalties when there is failure in performance). In addition, it will also carry the function of redressing of grievances of citizens, stakeholders, Civil Society Organizations (CSOs), or ‘Third-Party Public Interest Interveners’ (TPPII) or other bodies.

2. Main Policy and Governance Features of the IDT Regulatory Board (IDTRB)

2.1 Nature and Structure

- Central-level, interstate, quasi-judicial apex body, with adjudicatory in nature of its functioning, but also having a special technical cell for carrying out other functions
- It will have significantly high level of autonomy from the government departments and even from the NGRBA
- It will be duly empowered and its autonomy will be protected through the specially drafted provisions in the notification in this regard.
- It may have offices at the level of state, sub-state or region, and local level for various purposes, including monitoring

2.2 Composition

- Members of the IDTRB shall be professional experts, having experience of at least ten years in the fields of their expertise, and selected by an independent, preferably academic, unbiased selection committee
- Fields of expertise to be covered amongst members of the IDTRB will be all those related to technical, economic, financial, ecological, social, and other aspects of IDT projects
- Term of each member should be 3 years, no more than two terms can be held by a member
- External consultants and third party monitoring agencies shall assist the IDTRB as per need and as per the rules and regulations prescribed.

2.3 Functions

- To develop, review, and amend norms for technical, financial, economic and quality purposes, with support from IDTTC
- To prepare plans and designs of the IDT projects through IDTTC
- To approve techno-economic, financial details of the projects
- To monitor and regulate the bidding process, selection of private / public agencies as project developers
- To monitor development of IDT projects (erection/construction of facilities) directly or through specially appointed agencies if required
- To review operation and maintenance of the projects, especially technical and cost aspects of the functioning
- To monitor quality of the treated sewage
- To ensure full public disclosure of information and data in local and vernacular language in suitable and uncomplicated form and unambiguous manner
- To suggest appropriate policy measures to government in order to improve the overall quality of the IDT projects
- To conduct stakeholder dialogues and deliberations, as per the provisions in the regulations or in response to demands by citizens. CSOs, Stakeholders, or TPPIIs
- To Issue directives to agencies, both public and private including various utilities such as electricity distributors, necessary to ensure smooth, efficient, and effective establishment and operations of the IDT projects
- To intervene, inspect, evaluate, stop the process of development of IDT projects,
- To issue directions for amendments in technical, economic, and financial designs for quality or other reasons and in order to fulfill other requirements such as scale of treatment, availability of finance, modular development of the treatment projects, etc.
- To issue directions to demolish partially or fully completed projects at the developer's / operators expenses if found guilty on techno-economic and quality parameters (depending on the gravity of the issue or extent of offense/non-compliance), to auction developers properties if developer fails to rebuild the project
- To takeover and/ or to rebuild partially or fully completed projects, in the case of defaults of any sort by project developers
- To impose penalties on defaulting developers as well as other agencies and persons who would fail to comply with provisions of the notifications or the norms, parameters, etc. prescribed by IDTRB

2.4 Jurisdiction

- Towns located in Entire Ganga Basin, all rivers/tributaries of Ganga
- Having mandate for regulating interventions/IDT projects of all the Ganga Basin states, restricted to the sewage-IDT projects

2.5 Financial Arrangements

- Diverse financial sources, including central budgetary allocations and fees charged to the developers
- Complete financial autonomy from the central government and NGRBA

2.6 Responsibilities

- All its procedures and processes will be completely transparent, accountable, and participatory, and open for scrutiny by citizens, stakeholders, Civil Society Organizations (CSOs), and 'Third-Party Public Interest Interveners' (TPPII).
- It will involve TPMA (Third-Party Monitoring Agencies) in conducting actual monitoring operations under strict vigil by its lower-level officers.
- After the initial discussion on the salient points made in this proposal, a detailed draft of the notification could be produced for the MoEF to establish and operationalize such a system.

Regulatory Design for Urban Sewage Sector Services

1. Context

The idea of the independent regulator is not entirely new even in the municipal sector in the country. There have been some efforts to regulate some of the governance functions of the municipal services in different states.

The state of Chhattisgarh has already passed a bill for establishing an Independent Regulator for 'Municipal Revenue'. There is every possibility that other states would not only follow the suit, but borrow heavily from the bill. This has been experience in the other sectors.

The Planning Commission is seriously considering coming up with a Model Bill for State Water Regulatory Authorities, which will cover the urban water sector.

The state of Uttar Pradesh has passed a law for establishing UP State Water Resources Regulatory Authority, which will govern many aspects of urban water sector, including issuance of licenses to utilities.

The states of Madhya Pradesh, Bihar, and Delhi have already gone ahead and passed the laws titled 'Public Services Guarantee Acts', which would cover the municipal services (after due notification). There again is every chance that the other states would follow the suit and draw heavily from this law.

It is learnt that Ministry of Urban Development (MoUD) of Government of India (GoI) is seriously considering persuading states to establish a regulator for PPPs in urban sector.

2. Broader Concerns about the IRA Model

In the context of such serious attention and wider acceptance of the idea of an independent municipal regulator, a review of the critiques and concerns of the model of the independent regulatory agencies (or IRAs) is found to be warranted.

There have been many broader concerns about the IRA model brought in by the World Bank (WB) in the electricity and water sectors. There is certain level of experience of functioning of IRAs in both these sectors. Some of these concerns are briefly mentioned in the following bullets.

- There is concern that IRAs will depoliticize the decision-making on the issues that are essentially political and laden with social and political values.
- This depoliticization and expertocratization of decision-making will make it impossible for marginalized sections and civil society to influence the decision-making. At the same

time, it opens the decision-making to the disproportionate influence of the corporate sector and other powerful lobbies.

- State-level IRAs also entail centralization in decision-making in the matters which have immense diversity and are inherently location-specific in both physical and socio-cultural dimensions.
- IRAs also entail emasculation of democratic institutions at the state and local level, subverting the political and democratic processes. This would be especially worrisome in the case of ULBs which have been accepted as a constitutional structure of governance but are yet to get the adequate powers.
- IRAs, dominated by the engineers, economists, and bureaucrats, neither have legitimacy nor have competence to deal with social, political, environmental matters.
- IRAs as per the current designs are focused on technical, economic, and financial concerns, with complete neglect of social, political, cultural, and environmental matters.
- IRAs are found to be concentrating authority in the sectoral governance, as it is expected not only to carry out the classical regulatory function¹⁰ but also make some critical decisions. It needs to be noted here that the IRAs are justified on the argument that there is need to divest the state of some of its governance functions as the state (in the pre-reform situation) has concentrated under its control all the three governance functions of (a) decision-making, (b) implementation, (c) regulation.

Driven by these concerns, many researchers and activists oppose the idea of IRAs. Some go further and oppose the very idea of bringing in any institution other than government to carry out any governance function.

At the same time, most of these researchers and activists agree that the state and especially governments, in the current situation, have become too large, opaque, and unaccountable, which is one of the main reasons underlying the current crisis-like situation. Thus, while rejecting the current IRA model, they end up endorsing continuation of the current state-driven model not by choice but by default.

There is need to think in the 'out-of-box' manner and try to see in what manner new institutional forms and policy innovations could be adapted to make situation somewhat better, if not ideal.

This note attempts to provide some pointers in envisaging a different model for regulatory system for Municipal Services Sector. It is possible to develop these ideas in the form of a Model Bill if the idea of such a bill is found to be useful and if adequate time and resources are devoted. These ideas and pointers are presented in brief manner in the next section of this report.

¹⁰ The classical regulatory function involves three tasks: (a) setting standards for performance, (b) monitoring of output and outcome (or performance) of governance, and (c) enforcing compliance.

3. Towards A Regulatory System for Urban Water Sector: Some Suggestions

3.1 Scope in terms of Governance Functions

First of all, it is suggested that there should not be a separate regulatory system for different sectors such as urban water sector. Rather, it is preferable to have one single Municipal Services Regulatory System (MSRS), covering all the 18 functions mentioned in the 74th CA Act. This is primarily because of two reasons:

- Many of the urban services have close interconnections and interdependencies. For example, urban water conditions are closely linked with conditions of sectors like sanitation and solid waste management, as well as planning of the cities.
- The governing body, or the ULB is common, and it is not possible to 'ring-fence' all dimensions (financial, HR, etc.) of all activities of the ULBs effectively.

Such a Municipal Services Regulatory System (MSRS) will be accompanied with the (State) Water Sector Regulatory System (WSRS). Obviously, there will be interconnections and possibilities of overlap (and hence confusion and conflicts) between the jurisdictions of these two regulators. However, with careful design, such possibilities could be easily avoided.¹¹

Similarly, when all the municipal services are under the ambit of the same MSRS, the system will need to have sectoral competence and understanding to monitor and enforce compliance in all the sectors and services involved. This itself is a tall task, which requires detailed discussion.

3.2 Proper Separation of Governance Functions

In response to the concerns mentioned in Part I, there is need to avoid concentration of governance functions in the hands of the regulatory agency. In other words, the regulatory agency should carry out a limited number of functions; rather it should primarily carry out the classical regulatory function.

Further, another critique of IRAs should also be considered. IRAs are said to be encroaching on the jurisdiction of the democratically elected political bodies, at the state as well as at the local level. Any governing agency or institution should be responsible for type of functions for which it has both, competence and legitimacy. With this logic, the regulatory agency should not make any political decisions. These decisions should be rested with the agencies and institutions that have political competence and legitimacy (or mandate) to make value-laden, 'normative', or 'political' decisions on behalf of the society. Such a 'political' body should be accountable to stakeholders as well as common citizens through

¹¹ There could be lengthy discussion on the appropriate choice between two options: (a) to have a MSRS and WSRS, or (b) to extend the jurisdiction of the WSRS to the urban water sector. For want of space, it is not possible to present all the arguments here. However, the first option is found to be more practical for various reasons.

political mechanisms. The functions of policy-making and planning do involve such political decisions. So, they should not be in the purview of the regulatory agencies per se.

3.3 Decentralization and Subsidiarity

One of the major critiques of the IRA model is concentration of the authority in the hands of one agency and that too at the state level. The issues of diversity and location-specificity in the physical and socio-cultural matters as well as autonomy of the democratic institutions are the main arguments against such centralization.

In response, the alternative design of the MSRS should be decentralized, adhering to the Principle of Subsidiarity, which demands devolution of decision-making to the lowest possible level. The regulatory system could be comprised of hierarchical structure of nested agencies.

3.4 Substantive Scope

The current IRAs and even the regulator envisaged in the Chhattisgarh law look at regulation primarily as regulation of tariff. However, there is a wide range of techno-economic and financial parameters that are intricately linked with each other such as tariff, quality of service, techno-economic efficiency, physical and other losses, financial discipline and prudence, investment and purchases. Restricting regulation only to tariff defeats the very purpose of regulation, while creating suspicion and resistance among other stakeholders especially consumers.

Further, the MSRS should not be restricted to covering only techno-economic and financial objectives. In fact, it should be regulating—in an integrated manner and without any hierarchical preferences—for ensuring the wider set of objectives, primarily, techno-economic efficiency, financial viability, service quality, democratic participation, social equity, and environmental integrity.

3.5 Transitory, Stage-wise Designing of MSRS

All the states are not at the same stages of institutional development / preparedness, policy evolution, economic development, and political culture. So the development of MSRS could be seen as gradual, step-wise process and different structures and processes could be envisioned for different stages of regulatory evolution. Further, this evolution need not be seen as uni-linear, and there could be many parallel tracks for this regulatory evolution.

4. Tentative Suggestions on Structure and Process of MSRS

The following are the elements of the MSRS envisaged as an alternative to current IRA model. (Please first refer to Table 7).

- The agencies of MSRS will have expertise in not only technical and eco-financial areas, but also in socio-cultural, political, environmental areas.
- To begin with, MSRS will have a state-level apex agency, with its regional offices at the various regional headquarters in the state. The state as well as regional (sub-state) level offices will preferably have competencies in all the areas mentioned above.
- State-level agency of the MSRS will develop and finalize a set of Regulations (both Substantive and Process) and Criteria for decision-making and implementation, which will be used for carrying out all the three tasks of the classical regulation function. These Regulation and Criteria will cover techno-economic, financial, social, political, and environmental objectives¹².
- These Regulations and Criteria will govern both the substantive as well as process aspects of various decisions. The criteria would be, general (across sectors and services) as well as sector (or service)-specific. The Regulations and Criteria will be elaborate enough to cover all the aspects of the critical decisions and implementation in the chosen sectors and services. However, at the same time, they will have enough space and flexibility for the ULBs to make their diverse value-driven political decisions as well as to accommodate the location-specificity.

Table 7: Schematic Representation of the MSRS

Level	Decision-Making Function	Regulatory Functions	Grievance Redressal Function
State Level	Legislature will discuss and sanction the criteria for regulation	State Regulatory Agency will prepare the Regulations (both, Substantive and Process) and Criteria and conduct open and participatory process of deliberation on the draft	State Level Regulatory Agencies will act as the second appellate authority against the decisions of the Distinct level Forums for Grievance Redressal of Citizens
Regional (Sub-State) Level		Regional Regulatory Agencies will monitor and review the adherence to criteria by ULBs.	Regional Level Regulatory Agencies will act as the first appellate authority against the decisions of the Distinct level Forums for Grievance Redressal of Citizens
District Level			Distinct level Forums for Grievance Redressal of Citizens
ULB Level	ULBs would use the criteria to make decisions and implement them		

¹² These objectives, for example, would include: techno-economic efficiency, financial viability, service quality, democratic participation, social equity, and environmental integrity.

- These Regulations and Criteria will be finalized after a thorough, state-wide, fully transparent, truly participatory (involving all stakeholders), accountable process in which the democratically elected institutions (at the state as well as local level) will be involved. In this process, the state-level regulatory agency will primarily work as custodian and coordinator of the process.
- Once the Regulations and Criteria are finalized, then the ULBs will use these Regulations and Criteria to make the critical decisions and also strictly follow the processes laid in the Regulations and Criteria. The ULBs will have, as mentioned before, adequate space and flexibility required to retain their autonomy. Thus, the main decision-making function will remain with the democratically elected bodies.
- There will be regional-level agencies within the state regulatory system (MSRS), which will be established at the regional revenue headquarters in the state. These agencies will have all the required competencies, and regional level specificity and special requirements will be considered while forming these entities.
- The ULBs, while making decisions, will keep these agencies informed about adherence to criteria. The regional agency will take independent review of the level of adherence and sue-motto will take cognizance of any failure on this count and guide the ULB accordingly. The absence of any indication of such failure from this agency in a given time frame would mean automatic clearance of the decisions.
- In the case of grievance of any stakeholder or citizens' representative about the adherence to the criteria by any ULBs, the request for review will go first to the regional level regulatory entities for adjudication. The scope of the grievance and adjudication will be limited to ensuring adherence to the criteria. There will be well defined, time-bound process for adjudication.
- Any party to the adjudication which feels aggrieved can go to the state-level regulatory agency in appeal against the decision of the regional regulatory agency. The respective High Court will be the next appellate authority. However, the scope for adjudication will remain only to ensuring adherence to the criteria.
- Either the automatic clearance or green signal after due adjudication by regional or state level agencies would be a pre-condition for the legal validity of the decisions of the ULBs.
- If the function of redress of grievances is given to the regulatory system, then district-level forums could be established to look into the stakeholders' grievances and the regional level and state level regulatory agencies can have sections looking into appeals against the decisions of the district level forums.

It needs to be noted that these elements of the structure and process of decision-making and regulation are illustrative and not claimed to be comprehensive.

Mapping of Legislations *Applicable to the Ganga River Basin*

GRBMP : Ganga River Basin Management Plan

by

Indian Institutes of Technology



**IIT
Bombay**



**IIT
Delhi**



**IIT
Guwahati**



**IIT
Kanpur**



**IIT
Kharagpur**



**IIT
Madras**



**IIT
Roorkee**

Preface

In exercise of the powers conferred by sub-sections (1) and (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government has constituted National Ganga River Basin Authority (NGRBA) as a planning, financing, monitoring and coordinating authority for strengthening the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga. One of the important functions of the NGRBA is to prepare and implement a Ganga River Basin Management Plan (GRBMP).

A Consortium of 7 Indian Institute of Technology (IIT) has been given the responsibility of preparing Ganga River Basin Management Plan (GRBMP) by the Ministry of Environment and Forests (MoEF), GOI, New Delhi. Memorandum of Agreement (MoA) has been signed between 7 IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and MoEF for this purpose on July 6, 2010.

This report is one of the many reports prepared by IITs to describe the strategy, information, methodology, analysis and suggestions and recommendations in developing Ganga River Basin: Environment Management Plan (GRBMP). The overall Frame Work for documentation of GRBMP and Indexing of Reports is presented on the inside cover page.

There are two aspects to the development of GRBMP. Dedicated people spent hours discussing concerns, issues and potential solutions to problems. This dedication leads to the preparation of reports that hope to articulate the outcome of the dialog in a way that is useful. Many people contributed to the preparation of this report directly or indirectly. This report is therefore truly a collective effort that reflects the cooperation of many, particularly those who are members of the IIT Team. Lists of persons who have contributed directly and those who have taken lead in preparing this report are given on the reverse side.

Dr Vinod Tare
Professor and Coordinator
Development of GRBMP
IIT Kanpur

The Team

- | | |
|--|---|
| 1. Deepa Dube, IIT Kharagpur | <i>dipadube@rgsoipl.iitkgp.ernet.in</i> |
| 2. G N Kathpalia | <i>gnkathpalia@gmail.com</i> |
| 3. Indrajit Dube, IIT Kharagpur | <i>indrajit@rgsoipl.iitkgp.ernet.in</i> |
| 4. Mukesh Khare, IIT Delhi | <i>mukeshk@civil.iitd.ac.in</i> |
| 5. N C Narayanan, IIT Bombay | <i>ncn@iitb.ac.in</i> |
| 6. Paritosh Tyagi, Former Chairman, CPCB | <i>paritoshtyagi@gmail.com</i> |
| 7. Shyam Asolekar, IIT Bombay | <i>asolekar@iitb.ac.in</i> |
| 8. Subodh Wagle, IIT Bombay | <i>subodhwagle@gmail.com, subodh@prayaspune.org</i> |
| 9. Uday Shankar, IIT Kharagpur | <i>uday@rgsoipl.iitkgp.ernet.in</i> |
| 10. Vinod Tare, IIT Kanpur | <i>vinod@iitk.ac.in</i> |

Lead Persons

1. Indrajit Dube, IIT Kharagpur
2. Uday Shankar, IIT Kharagpur
3. Deepa Dube, IIT Kharagpur

Contents

S No		Page No.
1	Preamble	1
2	Mapping of Legislations	1
3	Scheme of the Constitution	2
	3.1 Union List (List I)	2
	3.2 State List (List II)	2
	3.3 Concurrent List (List III)	3
4	Analysis	3
5	Other Legislations	3
6	Upper Stretch	4
7	Middle Stretch	6
8	Lower Stretch	10
9	Analysis of Legislations Applicable in Upper, Middle and Lower Stretches of Ganga	13
	9.1 Part I- Upper Stretch	13
	9.1.1 Uttar Pradesh Municipalities Act (Uttranchal Sansodhan) Act, 2001	13
	9.1.2 The Uttranchal River Valley (Development and Management) Act, 2005	13
	9.2 Part II- Middle Stretch	14
	9.2.1 Sanitation	14
	9.2.2 Agriculture	18
	9.2.3 Commercial Use of Waterways	25
	9.3 Part III- Lower stretch of Ganga	27
	9.3.1 Basin Management	27
	9.3.2 Sanitation	28
	9.3.3 Agriculture	40
	9.3.4 Commercial Water Ways	52
	9.3.5 Dams & Diversions	62
	9.4 Central Legislations	67
	9.4.1 The Environment (Protection) Act, 1986	67
10	Relevant Provisions of State Legislatures in Upper, Middle and Lower Stretch	84
	10.1 Upper Stretch of Ganga	84
	10.2 Middle Stretch of Ganga	86
	10.2.1 Sanitation	86
	10.2.2 Industrial Pollution	87
	10.2.3 Agriculture	88
	10.2.4 Commercial use of Water way	90
	10.2.5 Dam and Diversions	90
	10.3 Lower Stretch of Ganga	91
	10.3.1 Sanitation	91
	10.3.2 Industrial pollution	92
	10.3.3 Agriculture	93
	10.3.4 Dams and Diversion	95
11	Conclusion	96

1. Preamble

The river Ganga is of unique importance ascribed to reasons that are geographical, historical, social-cultural and economic giving the status of National River. The river system is undergoing rapid changes due to human interventions that include excessive use of river resources, discharge of domestic and industrial effluents, encroachment of river space, modifications in river course, etc. In order to bring positive changes in the river system, it is necessary to examine present legislative framework. The concerned Central and State legislations broadly fall into following subjects areas.

- ‘Sanitation’: this is an important aspect in the entire course of Ganga and includes issues like:
 - a) ‘activities of civic bodies’ which also includes all types of domestic waste and religious activities like cremation; and
 - b) ‘industrial wastes’ which lead to river pollution
- ‘Agriculture’: this is a pertinent issue in middle and lower stretches of Ganga. A huge amount of river water gets diverted for the agricultural purpose and channels have been cut from the river for the convenience of the agriculture.
- ‘Industrial pollution’: it is one of the most significant sources of river pollution which is increasing day by day. The Central legislations like Water (Prevention and Control of Pollution) Act, 1974 and Environment Protection Act, 1986 cover issues regarding this area.
- ‘Commercial use of water ways’: the river water is used for many purposes like, fishing, navigation, etc. These issues are most significant in ‘middle and lower stretches’.
- ‘Dams and diversion’: this is an important aspect in the entire course of Ganga affecting the natural flow of the river.

2. Mapping of Legislations

The report is based on different Central and State legislations relating to industrial pollution, sanitation, agriculture and dams. The work touches upon the presence of law and related provisions on the abovementioned aspects of river.

The study is divided upon the flow of Ganga from Up North to Down East and has been categorized as Upper Stretch covering the region of Utrakhand, Middle Stretch covering the regions of UP and Bihar and Lower Stretch covering the region of West Bengal. The categorization is largely based upon the use of Ganga.

Before identifying different legislations touching upon qualitative and quantitative aspects of problems of Ganga, the paper attempts to examine the scheme of the Constitution in order to present holistic view of problem.

3. Scheme of the Constitution

Article 48 A – states that “The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country”.

In furtherance of federal structure of governance, the Constitution has divided subject matter in three different lists limiting the jurisdiction of Central Government and State governments in accordance with the enlisting of subjects.

3.1 Union List (List I)

The list houses the subject matters on which only Centre can legislate. The relevant subject matters are as follow:

- a) Entry 24- Shipping and navigation on inland waterways, declared by Parliament by law to be national waterways
- b) Entry 52- Industries, the control of which by the Union is declared by Parliament by law to be expedient in the public interest
- c) Entry 56- Regulation and development of inter-state rivers and river valleys to the extent to which the regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.
- d) Entry 57- Fishing and ferries beyond territorial waters.
- e) Entry 97- Any other matter not enumerated in List II or List III including any tax not mentioned in either of those lists.

3.2 State List (List II)

The list houses the subject matters on which only State can make laws. The relevant subject matters are as follow:

- a) Entry 5- Local Government, that is to say, the constitution and powers of Municipal Corporation
- b) Entry 6- Sanitation
- c) Entry 10- Burials and burial grounds; cremation and cremation grounds
- d) Entry 13- Communications, that is to say, ferries, and other means of communication not specified in List I...inland waterways...subject to the provisions of List I and List III with regard to such waterways
- e) Entry 14- Agriculture
- f) Entry 16- Ponds
- g) Entry 17- Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provision of entry 56 of List I.
- h) Entry 21- Fisheries
- i) Entry 24- Industries subject to the provisions of entries 7 and 52 of List I.

3.3 Concurrent List (List III)

The list houses subject matter on which both Centre and State governments can make laws. The relevant entries are as follow:

- a) Entry 17 A- Forests
- b) Entry 32- Shipping and navigation on inland waterways as regards mechanically propelled vessels and the rule of the road on such waterways.
- c) Entry 36- Factories

4. Analysis

1. The provision of the Constitution reflects the commitment of States to undertake all necessary steps to preserve and protect environment.
2. Inter-State rivers and river valleys are Central subject whereas subjects such as agriculture, canals, agriculture, water are State subjects. There is a need to bring coherence in laws which touches upon these aspects relating to Ganga River.
3. In the matter of Ground Water, there is an authority established under EP Act for the purpose of regulation and development of groundwater management. It is to be noted that ground water is interconnected with issues of river, irrigation, agriculture.
4. Sanitation as a state subject warrants examining the conflict/uniformity in different legislations.
5. Industry is primarily a state subject; therefore there is a need to examine the conflict/uniformity in different legislations.
6. Local Government is a State subject; however, this institution is primarily responsible for treating sewage and effluents and drainage of pollutants in river. It will be pertinent to examine that the power and function of different municipal corporations regarding sewage treatment and accountability of non-compliance with the rule/norms. Financial support will be another important issue in this regard.

5. Other Legislations

On review of the literature, the legal team decided to concentrate on the handpicked issues in the different life cycles and different stretches of the river. Below is the synoptic view on this:

Stretches	Issues
Upper Stretches	Sanitation including the cremation activities
Middle Stretches	Sanitation including the cremation activities
	Industrial Pollution
	Agriculture
	Dams and Diversions
Lower Stretches	Ecology (Gangetic Dolphin)
	Sanitation including the cremation activities
	Agriculture
	Commercial use of Water Ways and pollution
	Dams and Diversions
	Ecology (Gangetic Dolphin)
	State Border Disputes on change of river Course
Land Encroachment	

Based on the findings of the preliminary issues in the different stretches we were mapping the applicable legislations in the different stretches of river. In doing so, the reports of GAP I and GAP II have been taken into consideration.

6. Upper Stretch

Issues	Relevant Legislations, Regulations and By-laws (soft law)	Comments
	Environment Protection Act 1986 - Umbrella legislation. (Central Legislation)	a. The Act deals with the subject of sanitation by prohibiting discharge of environmental pollutants in excess of the standards and making it mandatory for complying with procedural safeguards in case of hazardous substances.
Sanitation		Being a state subject, State has got a prime responsibility to address issues of sanitations.
	Uttrakhand State Ganga River Conservation Authority, vide SO 1111(E), 14th August 2010- Central Notifications	a. Take measures interalia, and augmentation of sewerage infrastructure, catchment area treatment, decentralized sewage treatment systems and regulation of activities aimed at the prevention, control or abatement of pollution in the river Ganga. b. Monitor and review implementation of various programmes or activities taken up by the implementing agencies for

		<p>prevention, control and abatement of pollution in river Ganga.</p> <p>c. Enter and inspect under sec. 10 of the said Act and power to take sample under sec. 11 d. Issuance of the direction under sec. 5 of the said Act for the purpose of exercising and performing functions envisaged for this Authority</p> <p>d. To combine regulatory and developmental functions keeping in view the powers vested with the State Government and their institutions</p> <p>e. Not exercise power inconsistent with the provision of EP Act</p>
	Uttar Pradesh Municipalities Act (Uttanchal Sansodhan) Act, 2001.	a. The Nagar Panchayat or a Municipal Council is responsible for the acts stated under the legislation.
	The Uttranchal River Valley (Development and Management) Act, 2005	<p>a. For the sustainable development and proper management of river valley, with special reference to the Bhagirathi River Valley, Up and Down stream of Tehri Dam including its catchment and command areas in the State of Uttranchal.</p> <p>b. Formulation and execution of development plan for proper maintenance of river Bhagirathi.</p>

7. Middle Stretch

Issues	Relevant Legislations, Regulations and By-laws (soft law)	Comments
	Environment Protection Act 1986- Umbrella legislation (Central Legislation)	
Sanitation		Being a state subject, State has got a prime responsibility to address issues of sanitation
	Uttar Pradesh State Ganga River Conservation Authority, vide SO 2493(E), 30th Sep. 2009- Central Notifications	The review of these authorities revealed that they are having similar power, functions, institutions, etc that of Uttrakhand State Ganga River Conservation Authority. Therefore, the observation written above under the heading of Sanitation may be read under this heading also.
	Uttar Pradesh Water Supply and Sewerage Act, 1975	<p>a. The Act was enacted to establish the corporation, authorities and organisations for the development and regulation of water supply and sewerage services.</p> <p>b. The authority performs Sewerage Treatment and disposal and treatment of trade effluents on regular basis.</p>
Industrial Pollutions	Environment Protection Act, 1986 (Central Law)	
	Water (Prevention and Control of Pollution) Act, 1974 (Central Law)	<p>a. Provides for the constitution of Central and State Pollution Control Board with the objective to promote cleanliness of streams and wells.</p> <p>b. The Central Board jurisdiction extends to different areas of states whereas the State Board jurisdiction confines to the state only.</p>
	Water (Prevention and Control of Pollution) Rules, 1975	Rules made by the Central Government after consultation with Central Board for the Prevention and Control of Water Pollution.
	Water (Prevention and Control of Pollution) Cess Act, 1977	An Act enacted for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the

		prevention and control of water pollution constituted under the Water. (Prevention and Control of Pollution)
	Water(Prevention and Control of Pollution) Cess Rules,1978	Provides for the control of water pollution.
	The Hazardous Waste (Management and Handling) Rules, 1989 Amendment 2000	<p>a. The Hazardous Waste (Management and Handling) Rules, 1989 have been responsible for proper collection, treatment, transport, storage and disposal of hazardous wastes listed in the schedule annexed to these Rules.</p> <p>b. The principle thrust of the Hazardous Waste (Management and Handling) Rules, 1989 is that every occupier or any other person treated hazardous wastes will do so only with authorization from the State Pollution Control Board (SPCB).</p>
Agriculture		Agriculture is a State subject
	River Board Act, 1956 (Central Law)	<p>a. An Act to provide for the establishment of River Boards for the regulation and development of inter-State rivers and river valleys.</p> <p>b. The Act provides for establishment of River Board by the Central Government for the purpose of advising the governments interested in relations to such matters concerning the regulation or development of an inter-state river and river valley.</p> <p>c. The power of the Board is to advise the Governments on regulation or development and coordination- related to following matters, interalia-</p> <ul style="list-style-type: none"> • Conservation, control and optimum utilisation of water resources of Inter-state River. • Promotion and operation of schemes of agriculture, water supply or drainage, • Promotion and operation of schemes for the development of hydro- electric power.

		<ul style="list-style-type: none"> • Promotion of afforestation and control of soil erosion. • Prevention of pollution of the waters or Inter-state River. <p>The power of the board includes monitoring progress of the work, undertaking research work.</p>
	Bihar Irrigation Act, 1997	<p>a. Aims to provide for and consolidate the law relating to agriculture embankment, drainage, levy & assessment of water rates, better contribution and matters related therewith.</p> <p>b. The Act established an authority called Canal Officer with the following powers, inter alia,</p> <ol style="list-style-type: none"> 1. Entry for enquiry or examination with the application or use of the water of any agriculture work for the purpose of regulation, supply or storage of water. 2. Power to inspect and regulate the water supply on account of which any water rate is chargeable, for the purpose of inspecting or regulating the use of the water supplied, or of measuring the lands irrigated thereby or chargeable with a canal revenue and of doing all things necessary for the proper regulation and management of the agriculture work from which such water is supplied. 3. Further, whenever it appears to the State Government that injury to the public health or public convenience or to any agriculture work or to any land for which irrigation from a canal is available, has arisen or may arise from the encroachment of any river, stream or natural-drainage course, the State Government may prohibit, the formation of any such encroachment, or may order the removal or other modification

		of such encroachment.
	Uttar Pradesh Minor Irrigation Works Act, 1920	The Act provides for the 'Minor Irrigation Work', which means an irrigation, submersion, drainage or protective work, that works natural or artificial of which is constructed and maintained by the State Government.
	Uttar Pradesh State Tube-Wells Act, 1936	The Act provides provisions for the construction, improvement and maintenance on State Tube-well irrigation works by the Government.
	Uttar Pradesh Participatory Irrigation Management Act, 2009	To allow water users association to play effective role in irrigation management
	The UP Fisheries Act, 1948	The Act provides for the prohibition of destruction or attempt to destroy fish by any means and poisoning the water
	Indian Fisheries Act 1897	Subject to the provisions of the General Clauses Act 1887, this Act shall be read as supplemental to any other enactment for the time being in force relating to fisheries in the territories to which this Act extends.

Dam and Diversions

	National Waterway (Allahabad-Haldia Stretch of the Ganga-Bhagirathi, Hooghly River) Act 1982	The Act provides the declaration of the Allahabad-Haldia Stretch of the Ganga-Bhagirathi-Hooghly river to be a national waterway and also to provide for the regulation and development of that river for purposes of shipping and navigation on the said waterway.
	River Boards Act, 1956	As referred in Agriculture
	Prevention of Damage to Public Property Act, 1984	The Act deals with the subject of damage to Public property, where it is clearly mentioned that if any one causes any damages or mischief to the public property then that person should be punished under law.
	Bihar Irrigation Act, 1997	Empower the Canal Officer to make temporary dams

Ecology (Gangetic Dolphin)

	Wildlife Protection Act 1972	Under the Schedule I of the Act the Gangetic Dolphins have been declared as the 'endangered species. Gangetic Dolphins comes under the 'Part I' which comes in the category of the Mammals.
--	------------------------------	---

8. Lower Stretch

Issues	Relevant Legislations, Regulations and By-laws (soft law)	Comments
Sanitations		Being a state subject, State has got a prime Responsibility to address issues of sanitations.
	West Bengal State Ganga River Conservation Authority, vide SO 2494(E), 30th Sep. 2009 – Central Notifications	The review of these authorities reveals that they are having similar power, functions, institutions, etc that of Uttrakhand State Ganga River Conservation Authority. Therefore, the observation written above under the heading of Sanitation may be read under this heading also.
	The Bengal Agricultural and Sanitary Improvement, 1920	<p>a. A law relating to construction of drainage and other works for the improvement of agricultural and sanitary conditions in certain areas of Bengal.</p> <p>b. Collector can take cognizance, on his own or on application from local authorities any person, of work undertaken for improvement or prevention of deterioration of agricultural and sanitary condition in any area.</p>
	The Calcutta Burials Board Act, 1881	Provide for constitution of the Board to regulate, manage and control government burial grounds.
	The Calcutta Metropolitan Water and Sanitation Authority Act, 1966	To provide for the establishment of an Authority for the maintenance, regulation and development of water-supply, sewerage and drainage services and for the collection and disposal of garbage.
	The Howrah Municipal Corporation Act, 1980	The act provides the better administration of the municipal affairs of Howrah by the establishment of Municipal Corporation.
	The Kolkata Municipal Corporation Act, 1980	The Act deals with the municipal affairs as well as the issues relating to solid waste management, drainage and water supply

Agriculture		
	River Board Act, 1956	Refer to the comment given for Middle Stretch
	Bengal Irrigation Act, 1876.	An act to provide for agriculture in the province subject to the lieutenant governor of Bengal. <ul style="list-style-type: none"> • In matters of construction, maintenance and regulation of canals for the supply of water there from and levy of rates for water so supplied
	West Bengal Closing of Canals Act 1959	The Act provides for the collection of Tolls and control of the line, construction and improvement of navigation
	The West Bengal Irrigation (Imposition of Water Rates for Damodar Valley Corporation Water) Act, 1958	The Act provides for the imposition of water rate in areas in West Bengal where the water is supplied by the Damodar Valley Corporation for the purpose of agriculture.
	The WB Irrigation (Imposition of Water Rate) Act, 1974	The Act provides for the imposition of water rate in areas where the water supplied from agriculture works executed, maintained and controlled by the State government.
	The WB State Tube Well and Lift Irrigation Act, 1974	The Act provides for the development of agricultural lands in West Bengal by Tube-well and Lift irrigation projects and for the imposition of levy or levies in respect of lands served by any such irrigation projects
	The West Bengal Fisheries (Requisition and Acquisition) Act 1965	The Act provides the requisition and speedy acquisition of fisheries for the purposes of improvement and development of such fisheries and supplying fish to the public.
	Indian Fisheries Act 1897	Subject to the provisions of the General Clauses Act 1887, this Act shall be read as supplemental to any other enactment for the time being in force relating to fisheries in the territories to which this Act extends.
Dams and Diversions		
	Bengal Embankment Act 1882	To make better provision for the construction, maintenance and management of embankments and water-courses

	Bengal Drainage Act 1880	The Act was enacted for the regulation of embankments and drainage works. This act provided for the better drainage systems and improvement of lands inside the embankments area.
Industrial Pollution		
	Water (Prevention and Control of Pollution Act), 1974. (Central Law)	<p>a. Provides for the constitution of Central and State Pollution Control Board with the objective to promote cleanliness of streams and wells.</p> <p>b. The Central Board jurisdiction extends to different areas of states whereas the State Board jurisdiction confines to the state only.</p>
Ecology (Gangetic Dolphin)		
	Wildlife Protection Act 1972	Under the Schedule I of the Act the Gangetic Dolphins have been declared as the 'endangered species. Gangetic Dolphins comes under the 'Part I' which comes in the category of the Mammals.
State Border Disputes on change of river Course		No established Laws are available. At present there are no disputes
International Border Disputes on change of river Course	1977 Agreement between India and Bangladesh	<p>a. Both the Agreements were made to solve the dispute raised regarding the water supply after the construction of the Farakka Dam. The water supply reduced 50% than the Pre-Farakka.</p> <p>b. In 1977 Agreement, water sharing was based on 75% availability of flow at Farakka from 1948 to 1973.</p>
	1996 Treaty between India and Bangladesh	<p>a. In 1996 Treaty the water flow at Farakka was calculated on the basis of average flow at Farakka for the period 1949 to 1998 and the water sharing decreased to 61%.</p> <p>b. Bangladesh is looking for the revision of some part of the Treaty which discusses the 75% availability of Farakka rather than average of the total flow.</p>

Commercial Water-Ways		
	Bengal Water-Ways Act, 1934	An act to provide for the maintenance and improvement of water-ways in Bengal.
	The WB Fisheries (Requisition and Acquisition) Act, 1965	An Act to provide for the requisition and speedy acquisition of fisheries for the purposes of improvement or development of such fisheries and supplying fish to the public
	The Canals Act, 1864	The Act provides for the amendment and consolidation of the law relating to the collection of tolls on Canals and other lines of navigation, and for the construction and improvement of lines of navigation, within the provinces under the control of the Lieutenant Governor of Bengal.
	The Calcutta Port Act, 1890	The Act deals with the Laws relating to the Port of Calcutta and to the appointment of the Commissioner of the port.

9. Analysis of Legislations Applicable in Upper, Middle and Lower Stretches of Ganga

9.1 Part I- Upper Stretch

9.1.1 Uttar Pradesh Municipalities Act (Uttranchal Sansodhan) Act, 2001

a) Relevant provisions:

Sections 1 and 2

Under the Act the State Government may appoint a Municipal Council or a Nagar Panchayat for the purpose of the Act.

b) Power and functions

The Nagar Panchayat is responsible for the acts stated under the legislation and they may perform any duty require for the purpose of the legislation. The Act applies to the whole state of Uttranchal. It is directly not related with the Ganga Basin management.

c) Analysis

The Act basically deals with the administrative structure and function of the Uttranchal Municipalities.

9.1.2 The Uttranchal River Valley (Development and Management) Act, 2005

a) Relevant provisions

Section 3: Establishment of River Valley Development Authority

Section 8: Functions of the Authority

Section 10: preparation of Master Plan

Section 11: preparation of Sectoral plan and regulation of Development in the River valley

b) How the Law deals with the subject of sanitation

The Uttranchal River Valley Act deals with the sustainable development and proper management of River Valley of the River Bhagirathi within the up and down stream of Tehri Dam which also includes the basin.

c) Power and functions

The River valley authority for the sustainable development and proper management of river valley, regularly maintain the Up and Down stream of Tehri Dam including its catchment and command areas in the State of Uttranchal.

- i) the Authority performs many technical functions, like:
 - a. preparation of master plan, which defines the carrying capacity of basin;
 - b. outline the development schemes;
 - c. implementation of sectoral plan and development of the river valley
- ii) the authority has the power to prohibit any construction and mining in the river valley;

d) Analysis

Though the Act deals with the basin management but it dint cover the area of Basin Contamination Measurement System and Maintenance of minimum flow & Environmental Flow of the River.

9.2 Part II- Middle Stretch

9.2.1 Sanitation

Uttar Pradesh State Ganga River Conservation Authority, vide SO 2493(E), 30th Sep. 2009 – Central Notifications

a) Power and Functions

1. Take measures, augmentation of sewerage infrastructure, catchment area treatment, decentralised sewage treatment systems and regulation of activities aimed at the prevention, creating public awareness, control or abatement of pollution in the river Ganga.
2. Monitor and review implementation of various programmes or activities taken up by the implementing agencies for prevention, control and abatement of pollution in river Ganga.
3. Enter and inspect under sec. 10 of the Environment Protection Act and power to take sample under sec. 11
4. Issuance of the direction under sec. 5 of the Environment Protection Act for the purpose of exercising and performing functions envisaged for this Authority.

5. To combine regulatory and developmental functions keeping in view the powers vested with the State Government and their institutions.

b) Support

The technical and financial support to authority is to be provided by the State Government (Department of Drinking as a Nodal Department).

c) Institutions formed under the law

State Executive Committee: It shall oversee and monitor the implementation of various programmes and projects of the Authority and give necessary directions to the implementing agencies.

The Executive Committee shall exercise the powers and performs such other functions as delegated by the Authority.

d) Analysis

The State Government of Uttar Pradesh constitutes State Executive Committee Authority for the purpose of preserving and conserving Ganga.

Uttar Pradesh Water Supply and Sewerage Act, 1975

a) Relevant provisions

Section 3: establishment of the Jal Nigam

Section 4: constitution of the Jal Nigam

Section 14: Function of the Jal Nigam

Section 15: Power of the Jal Nigam

Section 18: Establishment of Jal Sansthan

Section 20: constitution of Jal Sansthan

Section 24: Function of Jal Sansthan

Section 25: Power of a Jal Sansthan

Section 65: supply of water by Jal Sansthan

Section 71: Prohibition of wastage of water

Section 74: Right of owner or occupier to obtain sewer connection

Section 75: Power to require owner to have sewer connection

Section 77: prohibition of construction of building over sewer

Section 78: power to affix shaft etc, for ventilation of sewer cesspool

Section 79: power to examine and test sewer etc, believed to effective

Section 84: General penalty

Section 85: offence by companies

b) How the law deals with the subject of sanitation

The Act was enacted to establish the corporation, authorities and organisations for the development and regulation of water supply and sewerage services. For the purposes of controlling and managing the water supply and sewerage the Act delegates certain powers to different authorities established under the Act. Jal Nigam (the corporation) and Jal

Sansthan are two authorities constituted by the State Government for the purpose of the Act.

The main power and function of the Authorities include Sewage Treatment and disposal and treatment of trade effluents. Under Section 25(2)(iii) the Jal Sansthan has the power to abstract water from any natural sources and dispose of waste water. In the State of Uttar Pradesh the main source of natural water is River Ganga. Under the Act here it is mentioned the source of natural water and the place of disposal of waste water.

The Act delegates power to authorities to control the sewerage system and water supply of whole Uttar Pradesh (except cantonment area) and the urban cities of U.P like Kanpur, Allahabad, and Varanasi are being situated on the banks of the river Ganga. So the sewerage system of the water is more or less connected with Ganga through Channels, canals, pipes etc. in connection to the project there is an emergence need of analysing this legislation.

c) Institutions formed under the law

The State Government of Uttar Pradesh constitutes Jal Nigam Corporation and Jal Sansthan for the purpose of improvement of water supply and sewerage service in any local area. The Nigam shall appoint a Chairman (appointed by State Government). The other members are-

- i) a Managing Director (appointed by State Government)
- ii) a Finance Director (appointed by State Government)
- iii) the Secretary to the State Government in the Finance Department, ex-officio
- iv) the Secretary to the State Government in charge of the Water Supply Department, ex-officio
- v) the Secretary to the State Government in Planning Department, ex-officio the Director of local bodies (U.P. ex-officio)
- vi) the director of Medical and health service (U.P. ex-officio)
- vii) five elected heads of local bodies in the State (nominated by the State Govt)

Jal Sansthan also constituted a Chairman who shall be the Nagar Pramukh of the Nagar Mahapalika (ex officio), and the other members' are-

- i) a General Manager, appointed by the Nigam , approved to the State Government
- ii) a joint Director of Medical and Health Services to be nominated by the Director of Medical and Health Services, U.P.
- iii) three Sabhasad of the Nagar Mahapalika nominated by the State Government
- iv) two representatives of the Nigam
- v) the Director of local bodies,
- vi) the Mukhya Nagar Adhikari of the Nagar Maha Palika

d) Powers granted under the law

In this Act power has been referred in different modes, power of the Jal Nigam as follows-

- 1) to inspect all water supply and sewerage facilities in the State
- 2) to provide training for its own personnel as well as employees of local bodies.
- 3) Prepare various schemes for water supply and sewerage.
- 4) to lay down the schedule of fees for all services rendered by the Nigam to the State Government
- 5) If Nigam thinks fit for any functions to enter into contract or agreement with any person, firm or institutions
- 6) to adopt its own budget annually
- 7) to approve tariff for water supply and sewerage services applicable to respective local areas of Jal Sansthan

Power of the Jal Sansthan, as follows-

- 1) Exercise all power relating to the water supply, sewerage and sewage disposal of the area which lies within its jurisdictions.
- 2) To carry any water or sewerage works through under or over any highway, road, street, or other place after reasonable notice from to the owner or occupier under any land or building.
- 3) To abstract water from any natural source and dispose of waste water.
- 4) To participate in any contract or agreement with any person or body, if Jal Sansthan thinks necessary
- 5) To adopt its own budget annually
- 6) To maintain tariff for water supply and sewerage services and collected tax also;

Section 81 of this Act deals with the Power of entry, survey etc. any officer of the Nigam or Jal Sansthan has the power to enter upon any premises in order-

- a) to make any inspection, survey, measurement, valuation or inquiry;
- b) to take level;
- c) to dig or bore into sub-soil;
- d) to set out boundaries and intended lines of work;
- e) to mark such levels, boundaries and lines by placing marks and cutting trenches;
- f) to do any other thing for the purposes of this Act.

e) Penalties

Without the complaint of Jal Nigam or Sansthan no court shall take any cognizance of any offence under this Act. If any person or body corporate fails to comply any notice or requisition issued under this Act, shall be punished with fine, which may extend to one thousand rupees and delay of fine extend to fifty rupees every day after the first conviction.

f) Analysis

In this Act no such jurisdictional conflict has been stated. The Act elaborates the sewage treatment and the disposal of untreated effluents but it did not speak about the effect of direct water pollution.

9.2.2 Agriculture

Bihar Irrigation Act, 1997

a) Relevant provisions

Section 3: Rights of the State Government in Water,

Section 4: Irrigation work to vest in Government

Section 5: Survey of lands used for obtaining earth for repairs

Section 7: Power to inspect and regulate the water supply

Section 10: Power to make temporary roadway, water channel or dam

Section 13: Prohibition of obstructions

Section 16: Notification for construction of drainage work

Section 17: Execution of drainage schemes

Section 18: Execution of embankment work

Section 48: Divisional Canal Officer may construct field drains on behalf of owners or occupier

b) How the law deals with the subject of agriculture

Bihar irrigation schemes are generally classified into three classes:

- Major and medium schemes, surface schemes irrigating over 2,000 hectares;
- Minor surface schemes diversion or reservoir schemes irrigating less than 2,000 hectares;
- Life schemes – tube well or small river lift irrigation schemes.

Section 4 of the Bihar Irrigation Act, 1997, deals with Agriculture work to vest in Government. Every agriculture work and all land, earth, pathways, gates, beams and hedges belonging to, or forming part of or standing on any such agriculture work and every embarked tow path along the embankment maintained by the State Government shall vest in the State Government.

Section 12 of this Act states about Notification when water to be supplied for public purposes, Water of any river or stream flowing in a natural channel or of any lake or any other natural collection of still water or ground water or part thereof is received for agriculture work constructed by the State Government.

The Act established an authority Canal Officer, he may duly empowered under this Act shall cause public notice to be given at convenient places, stating that the State Government intends to apply or use the water referred to in that sub-section. Where the State Government is of the opinion that in the interest of proper agriculture from any irrigation work constructed or proposed to be constructed it is necessary to control the construction of wells for any purpose other than exclusively domestic use, either on personal or

community basis, in any area or areas the State Government may by notification specify such area or areas, and there upon no person shall within such area or areas construct any such well except with previous sanction of the State Government or other authority authorised by the State Government in this behalf, and subject to such conditions as the State Government or such authority may impose.

State Government when show the interest upon of proper agriculture from any irrigation work constructed or proposed to be constructed it is necessary to regulate the operation of the existing wells for any purpose other than exclusively domestic use, either on personal or community basis, in any area or areas, the State Government may by notification specify such area or areas and impose such conditions as it may deem fit with regard to extraction of water there from. There upon no person shall within such area or areas extract water from such well except according to conditions which the State Government may impose.

c) Institutions formed under the law

Section 6 of this Act deals with entry for enquiry, when it becomes necessary to make any enquiry or examination in connection with a projected irrigation work or its construction or with the maintenance of an existing irrigation work or with the application or use of the water of any irrigation work for the purpose of regulation, supply or storage of water, a Canal officer is appointed and he empowered in his behalf. He may enter upon such land and structure or anything attached to land as he may think necessary for the purpose, he may dig and bore the sub soil , if enquiry cannot completed then cut down and clear away any part of any standing crop, fence or jungle .

d) Powers granted under the law

Section 7 of this Act, deals Power to inspect and regulate the water supply. Any Canal Officer or any person acting under his general or special orders in this behalf may enter upon any land, building, village channel on account of which any water rate is chargeable for the purpose of inspecting or regulating the use of the water supplied, or of measuring the lands irrigated thereby or chargeable with a canal revenue and of doing all things necessary for the proper regulation and management of the irrigation work from which such water is supplied.

Section 9 deals, any Engineer may make repairs and proper maintenance of any irrigation work and other work executed under the provision of this act. Section 10 ,states about Power to make temporary roadway, water channel or dam, if any person desire that any temporary roadway shall made over an irrigation work or water channel should be made over any public embankment or temporary dam should be constructed over any embankment river or public water channel he shall apply to the Executive Engineer in charge.

Whenever take necessary repair any irrigation work, embankment or water channel maintain by the State Government, it shall be lawful for the Executive Engineer, or any person authorised in that behalf, to enter in and upon any land and take possession of,

appropriate and remove any earth or other material there from, and use the same for the purposes of such repairs.

Section 17 of this Act, states about the State Government may cause a scheme for such works to be drawn up and carried into execution, and the Divisional Canal Officer or any officer authorised by the State Government to draw up and execute such scheme may exercise in connection therewith all or any of the powers conferred on canal officers and shall be liable to any or all of the obligations imposed upon canal officers.

Section 18 of Bihar Irrigation Act 1997, deals with Execution of embankment works. Divisional Officer executed the work that any embankment which connects public embankments or forms by function with the part of a line of embankments, or that any embankment or water channel which is necessary for the protection or drainage of the neighboring country, should be taken charge of and maintained by the officers of Government, that any embankment, or any obstruction of any kind, which endangers the stability of a public embankment or the safety of any town or village, or which is likely to cause loss of property by interfering with the general drainage or flood drainage of any tract of lands, should be removed or altered. If any line of public embankment is changed or new embankment constructed or any embankment is constructed for the protection of any land or for the improvement of any water- channel, or that a sluice in any public embankment should be made; any sluice or water channel should be made, or that any public water channel should be altered for the improvement of the public health or for the protection of any village or cultivable land, The concerned Divisional Officer shall cause to be prepared estimates of the cost of such works together with plans and specifications of the same as may be required, he shall also cause to be prepared from the survey map of the district, a map showing the boundaries of the lands likely to be affected by the said acts and work, and he shall cause a general notice to be given on his intention to cause such works to be executed;

Section 48 of this Act, entitled Divisional Canal Officer may construct field drains on behalf of owners or occupier. Divisional Canal Officer may cause a scheme for field drain to be drawn up. Every scheme drawn up under sub-section (1) of sec 16, amongst other matters shall set out the estimated cost thereof, the alignment of the proposed field drain or realignment of the existing field drain, as the case may be, the particulars of the owners or occupiers to be benefited and other persons who may be benefited thereby and sketch plan of the area proposed to be covered by the scheme.

e) Analysis

The Bihar Irrigation Act passed in 1997 aims to provide for and consolidate the law relating to irrigation embankment, drainage, levy & assessment of water rates, better contribution and matters related therewith. The act also empowers the State Government to pass a notification when water is to be supplied for public purposes. The application or use of the said water or the application or use of water of any agriculture work under the management or control of the State Government shall be regulated according to the provisions of this act.

Whenever it appears to the State Government that injury to the public health or public convenience or to any agriculture work or to any land for which irrigation from a canal is available, has arisen or may arise from the encroachment of any river, stream or natural-drainage course, the State Government may prohibit, the formation of any such encroachment, or may order the removal or other modification of such encroachment. A large proportion of the water used eventually goes as recharge into the subsoil layers through the cultivated fields. The entire quantity of water used comes from the net balance amount of the rain water received every year after deduction on account of the loss by evaporation and transpiration. In course of movement of water, either overland or below the surface, various chemical compounds get dissolved in such water. Some of such extraneous chemical constituents are derived from the residues of pesticides and chemical fertilizers, which are added to the soil every year for better yield of crops. Besides irrigation water, fertilizers, insecticides and pesticides are continuously being added to the soils of the Ganga basin.

Uttar Pradesh Minor Irrigation Works Act, 1920

a) Relevant provisions

Section 3: Preliminary order of the State Government.

Section 8: Power of the officer preparing draft scheme.

Section 9: Compensation for damage caused by entry under section 8

Section 15: Appointing Officer-in-charge

Section 16: Power of officer in charge.

Section 32: Offences

Section 39: Compensation relating to water courses.

b) How the law deals with the subject of agriculture

Minor Irrigation Work means an irrigation, submersion, drainage or protective work, that works natural or artificial of which is constructed and maintained by the State Government. The Collector (appointed by the State Government) has to make inquiry whether it is desirable to undertake the construction or maintenance of a minor irrigation work in any local area. The Collector or any other person, who is appointed by the State Government, has to publish a notice in villages for the proposed land for construction and maintenance. all the interested person shall invite to submit any objection or suggestion , after that inquiry proceeding shall started if the officers thinks fit , publish a notification in the directing the preparation of a draft scheme of construction or maintenance.

c) Institutions formed under the law

In this Act the State Government appoint Collector or any other person as a inquiry officer, if the collector and the other person thinks fit then desirable to undertake the construction or maintenance of minor irrigation work of any description in specified local area.

The State Government also appoints an officer to be in charge of the construction or maintenance of a minor irrigation work in respect of which an approved scheme has been published.

d) Powers granted under the law

The State Government appointed an officer who has power to prepare a draft scheme. When a notification by the State Government directing after the publication in a general or special order may allow any other person to enter upon, any land within the specific area or any land (Section 8)

The State Government also appoints an officer-in Charge. The officer-in-charge or his subordinate shall have such powers:

- to exercise with reference to the work
- if any person doing anything in his opinion diminished the efficiency of the work, to prohibit the order
- to require by order in writing any owner or occupier of land within the benefited area where possession is necessary for the preservation or maintenance of the work.
- to authorise any person for any land for the purpose of construction or maintaining the work, or any inspecting or regulating of water supplied or measuring lands irrigated by the work.
- to require, in any urgency matter any owner or occupier of land receiving benefit from the work to assist at market rates such labour as may be necessary for maintenance of the work. When divisional canal officer issues an order to the persons who are using any water course to construct bridges, culverts across any public road, canal or drainage channel in use before the said water course was made or repair any works on the failure of the person to whom order has been issued to comply within a proper time, take the required action and shall be revocable U/S 28.

The State Government under section 47 has power to make certain rules, which are:

1. The nature, scope and extent of works, which is undertaken in this Act
2. Conduct an inquiry relating to preparation of a draft scheme.
3. To publication and service the relevant notice.
4. The relevant documents and particulars submitted with a draft scheme.
5. To collect levy from the owners from the time of payment

e) Penalties

If without proper authority anybody voluntarily does any of the following acts shall be liable on conviction before the Magistrate, to imprisonment not exceeding one month and fine not exceeding fifty rupees or both. The acts are:

- i) Damages, alters, enlarge of any work.
- ii) Any disturbances create on supply of water or create any work.
- iii) Any corruptions and fouls the water of any work.

- iv) Destroy or moves any water mark or water gauge by the authority of the public servant.
- v) Passes any vehicles or animals across any work, contrary rules made under this Act.
- vi) Violate or breach any rules under this Act, is liable for punishment.

f) Analysis

The Act does not deal on the area of restriction on Mining activities on River basin which lead to Soil erosion and also did not provide any specific provision on the amount of usage of water for the purpose of agriculture.

The U.P. Tube- Wells Act, 1936

a) Relevant provisions

Section 4: appointment of tube well officer

Section 7: power to construct underground pipelines etc.

Section 8: notice to owner or occupier of land.

b) How the law deals with the subject of agriculture

In this Act to make provisions for the construction, improvement and maintenance on State Tube-well irrigation works by the Government. Also includes all necessary goods or mechanism which is used on tube well water works. In this Act such application use of underground water for the purpose of State Tube Well.

c) Institutions formed under the law

In this Act State Government of Uttar Pradesh appointed Tube well Officers time to time. He performs within the local limits as an authorised officer. The officer has the power to direct all or any other works imposed to sub ordinate officers (Section 4). The Authority may appoint another officer under the Act, like Superintending Engineer, Divisional Officer, and Sub-Divisional Officer.

d) Powers granted under the law

Section 7 of this Act said about the power to construct underground pipelines etc, the tube well officer who is appointed by the State Government or any other authorised person acting as officer he may serve the order, where the place dig, examine, repair, alter, maintain, or remove the tube well pipeline, and also tube well borrow, pits, under, over or upon any immovable property may, open or break up the soil and any such purposes enter upon such property at any time.

In this Act, under section 9 said about power to make rules.

e) Analysis

No such conflict regarding the jurisdictional matter has been stated. There is no specific provision on water pollution present in this Act.

Bihar Emergency Cultivation & Irrigation Act, 1955

a) Relevant provisions

Section 3: Power of collector to settle cultivable land laying fallow for the purposes of cultivating food crops

Section 8: Power of collector to order land to be irrigated from any irrigation work.

Section 9: Power of collector to order land to be irrigated from any natural stream or river or chaur.

Section 10: Preparation of scheme of irrigation and system of rotation.

Section 13: Penalty

b) How the law deals with the subject of agriculture

The State Government may appoint a district collector or any officer. Agriculture work is any work constructed, altered or maintained artificially for the purpose of securing the supply, removal or storage of water for agriculture purposes, it includes any water courses, channel or reservoir for the supply, removal or storage of water for agriculture purposes. Any work, embankment, structure or supply or escape any channel with such water courses, also includes a head work, dam, weir, outlet and sluices as well as a well or tank which is used for agriculture purpose. The collector has settled the cultivable land purpose of cultivation after the finished all inquiry related to cultivated land.

c) Power and Function

- (i) In this Act the State Government appointed a Collector or any officer, Collector has the power to arrangement the land for cultivation, any cultivable land was laying fallow continuously for during two years, if all the inquires as he think fit, collector was settled that land for cultivation purpose (Section 3).
- (ii) If the collector is satisfied after inquiry of proposed cultivated land and if he thinks fit the land benefited by any irrigation work, he may give the order that such land shall be irrigated from such work, on such subject of terms and conditions. (Sec.8). The Collector assesses the amount as fair and equitable to be paid by the person whose lands will be irrigated from such work to the owner of the irrigation work [Section 8(1)].
- (iii) If the Collector has satisfied after such inquiry as he think fit, that certain land is benefited by agriculture from any natural stream or river or chaur he may make an order that such land shall be irrigated from such stream or river or chaur (Section 9).
- (iv) After that Collector shall prepare a scheme of agriculture or a system of rotation regulating the time of such land shall be irrigated stream or natural stream or chaur or river modify from time to time [Section 10(2)].

d) Penalties

Any person create obstruction an emergency tenant from cultivating the land settled with him or obstruct the irrigation of any land against the order of Collector, shall be punishable with imprisonment which is extend of six months or fine which may extend to two hundred rupees or both.

e) Analysis

The Act deals with the subject matter of agriculture and usage of water from the river. But under the Act there is no specific provision about the water pollution caused by the cultivation wastes.

9.2.3 Commercial Use of Waterways

The U.P. Fisheries Act, 1948

a) Relevant provisions

Section 3: Prohibition and licensing of fishing in selected water by rules

Section 4: Power to prohibit sale of fish

Section 5: Penalties

Section 6: Arrest without warrant for offences under the Act

b) How the law deals with the subject of agriculture

This Act mainly provides the matters relating to the fisheries in the whole state of Uttar Pradesh. Here State Government is the authorised body, and makes such rules for declare the waters to which all or any of them shall apply. The rules are-

- (a) Prohibit or regulate the erection and use of fix engine, the construction, temporary or permanent of weirs, dams and bunds.
- (b) Prohibit the destruction or attempt to destroy fish by gun or bow and arrows and other instrument which is poisoning the river water or pollution of waters by trade effluents.
- (c) Prohibit the fishing except under license, the charges of fees,
- (d) Prohibit fishing in any specified water for specified period.
- (e) Require the owner, mortgage with possession or lease of any tank or jheel for the stocking of such tanks with any class of fishes.

c) Institution formed under the law

In this Act, the State Government means the government of U.P. is the highest authority, the state government appoint the “fishery officer”, this officer carry out all or the purposes of this Act or to do anything required by this Act or any rule made there under. Provided that no police officer below the rank of a sub–inspector shall be appointed in the post.

d) Power granted under the law

In this Act, the State Government appoint fishery officer .any fishery officer or Police officer in minimum sub inspector rank, or any other person specially empowered by the U.P State

Government in his behalf arrest without warrant any person who committing or attempting to commit any fishing offence.

Any police officer who's rank not below the sub-inspector and fishery officer has the same power for any search and investigation relating to fishing offence.

e) Penalties

The breach of any rule which is made under section 3 of this Act shall be punished under the law.

(v) on first conviction with imprisonment of either description for a term which may extend to two months or with fine which may extend to two hundred rupees or both,

(vi) every subsequent conviction with imprisonment with imprisonment of either description for a term which may extend to twelve months or with fine up to five hundred rupees or with both.

f) Analysis

In the U.P. Fisheries Act, 1948 the functions of the Authority are not clearly said and there is no provision stated about Ganga pollution.

The Ganges Tolls Act, 1867

a) Relevant Provisions

Section 3: Rules for measurement of burden.

Section 5: Appointment of Collector of tolls.

Section 8: Payment of tolls how enforced.

Section 14: Power to prohibit construction of bandhels.

Section 15: Penalty for causing obstruction to navigation.

Section 16: rules relating to navigation.

b) How the law deals with the subject of commercial water-ways

The Act discussed about the tolls in various boat, steamer, flats which are navigating on the river Ganges. This Act authorises the levy of the tolls for the improvement of the navigation of the Ganga.

The burden of steamers, boat and flats would be liable to pay the port dues within the limits of the port of city, this method shall be used for determining in mounds, according to actual floatage or displacement, and the boats are liable to pay tolls under this Act.

c) Institutions forms under the Law

In this Act, the State Government of Uttar Pradesh appoints a Toll Collector, and may from time to time remove any such person and appoint another person instead. Every person so appointed shall collect the tolls leviable under this Act by himself, or by an officer in his establishment whom he shall appoint in this behalf.

d) Power and Function

- The person authorised to collect the tolls payable under this Act at any such places, in his own name. The authority may sue for recover, on behalf of the State Government, the amount of any tolls payable to him under this act, by suit in any of the Civil Courts against the owner or master of any steamer, boat or flat is liable.
- The construction of any bandhel or other contrivance for fishing or for any other purpose, in any part of the Ganges below Allahabad, it is cause to obstruction of free and safe navigation of such area, the authorised officer may by notice to be served the owner or person in charge of such bandhel or other contrivance, if owner is not found then to be affix at same conspicuous place in the nearest village, prohibit the construction of such bandhel or other contrivance.

e) Penalties

Anyone who willfully disobey any prohibition or willfully cause or aid in causing any obstruction to the navigation of the Ganges below Allahabad or who willfully omit to remove such obstruction after being lawfully required, shall be punished on conviction before a Magistrate with imprisonment which may extend to one month or with fine extend up to fifty rupees or both.

f) Analysis

The Act stated about mainly on toll and levy of taxes and navigation matters.

9.3 Part III- Lower stretch of Ganga

9.3.1 Basin Management

West Bengal State Ganga River Conservation Authority, vide SO 2494(E), 30th Sep. 2009- Central Notifications

a) Power and functions

- Take measures, *interalia*, and augmentation of sewerage infrastructure, catchment area treatment, decentralised sewage treatment systems and regulation of activities aimed at the prevention, control or abatement of pollution in the river Ganga.
- Monitor and review implementation of various programmes or activities taken up by the implementing agencies for prevention, control and abatement of pollution in river Ganga.
- Enter and inspect under sec. 10 of the E P Act and power to take sample under sec. 11
- Issuance of the direction under sec. 5 of the E P Act for the purpose of exercising and performing functions envisaged for this Authority.
- To combine regulatory and developmental functions ...keeping in view the powers vested with the State Government and their institutions.
- Not exercise power inconsistent with the provision of EP Act.

b) Support

The technical and financial support to authority is to be provided by the State Government (Department of Drinking as a Nodal Department).

c) Institution

State Executive Committee: It shall oversee and monitor the implementation of various programmes and projects of the Authority and give necessary directions to the implementing agencies.

The Executive Committee shall exercise the powers and performs such other functions as delegated by the Authority.

d) Analysis

A dedicated Authority created for the purpose of preserving and conserving Ganga is a welcome step. However, the conflict in functioning of the Authority with the provincial government or institutions like Local Bodies appears to be imminent. Therefore, it is essential to avoid jurisdictional or otherwise overlap or conflict in the legal framework. The extent of overlap or conflict will be examined through field study and analysis of bye-laws/subordinate legislation dealing with the subject matter.

9.3.2 Sanitation

The Sarais Act, 1867

a) Relevant Provisions

Section: 3 - Notice of this Act to be given to keepers of sarais.

Section: 7 - Duties of keepers of sarais,

Section: 9 - Power to shut up, secure, clear and clean deserted sarais.

Section: 14- Penalty for infringing Act or regulations.

b) How the Law Deals With the Subject of Sanitation

The Sarais Act, 1867, Section 2 deals with the meaning of sarai, “means any building used for the shelter and accommodation of travelers, and includes, in any case in which only part of a building is used as a sarai, the part so used of such building. It also includes a purao so far as the provisions of this Act are applicable thereto: The provision lays down that for the regulation of sanitation and drainage works the applicable law will be the law which is for time being regulating the construction and maintenance of public embankments, rivers and outlets.

Section 7 Duties of keepers of sarais

1. When any person in such sarai is ill of any infectious or contagious disease, or die of such disease, to give immediate notice thereof to the nearest police-station:
2. at all times when required by any Magistrate or any other person duly authorized by the Magistrate of the District in this behalf, to give him free access to the sarai and allow him to inspect the same or any part thereof :

3. to thoroughly cleanse the rooms and varandahs, and drains of the sarai, and the wells, tanks, or other sources from which water is obtained for the persons or animals using it, to the satisfaction of, and so often as shall be required by, the Magistrate of the District, or such person as he shall appoint in this behalf :
4. to remove all noxious vegetation on or near the sarai, and all trees and branches of trees capable of affording to thieves means of entering or leaving the sarai:
5. to keep the gates, walls, fences, roofs and drains of the sarai in repair :
6. to provide such number of watchmen as may, in the opinion of the Magistrate of the District, subject to such rules as the State Government . may prescribe in this behalf, be necessary for the safety and protection of persons and animals or vehicles lodging in, halting at or placed in the sarai: and
7. to exhibit a list of charges for the use of the sarai at such place and in such form and languages as the Magistrate of the District shall from time to time direct.
8. Section 9: Power to shut up, secure, clear and clean deserted sarais

If any sarai by reason of abandonment or of disputed ownership shall remain untenanted, and thereby become a resort of idle and disorderly persons, or become in a filthy or unwholesome state, or be complained of by any two or more of the neighbours as a nuisance, the Magistrate of the District, after due enquiry, may cause notice in writing to be given to the owner or to the person claiming to be the owner, if he be known and resident within the district, and may also cause such notice to be put on some conspicuous part of the sarai, requiring the persons concerned therein, whoever they may be, to secure, enclose, clean or

clear the same; and if such requisition shall not be complied with within eight days, the Magistrate of the District may cause the necessary work to be executed, and all expenses thereby incurred shall be paid by the owner of the sarai, and shall be recoverable like penalties under this Act, or, in case of abandonment or disputed ownership of the sarai, by the sale of any material found therein.

Section 14: Penalty for infringing Act or regulations

If the keeper of a sarai offend against any of the provisions of this Act or any of the regulations made in pursuance of this Act, he shall for every such offence be liable on conviction before any Magistrate to a penalty not exceeding twenty rupees, and to a further penalty not exceeding one rupee a day for every day during which the offence continues: Provided always that this Act shall not exempt any person from any penalty or other liability to which he may be subject irrespective of this Act. All penalties imposed under this Act may be recovered in the same manner as fines may be recovered under Section 61 of the Code of Criminal Procedure (25 of 1861).

c) Analysis

Though the Act does not deal with subject of public health and sanitation directly but in the view of social customs and rituals followed The Act enjoined upon a keeper of Serai or an inn to keep a certain quality of water fit for consumption by “persons and animals using it” to the satisfaction of the District magistrate or his nominees. Failure for maintaining the standard entailed a liability of rupees twenty.

The Bengal Agricultural and Sanitary Improvement Act, 1920

a) Relevant provisions

Section 28: Drainage works subject to laws relating to public embankments.

Section 35: Power of Government to make rules.

Section 5: Engineer to prepare Scheme.

Section 17: Report by Engineer on completion of work.

Section 9: Procedure in the case of major schemes Appointment of committee.

Section 2(7): "Major Schemes".

b) How the law deals with the subject of sanitation

The Bengal Agricultural and sanitary improvement act, 1920 under section 28 deals with the subject of sanitation by determining the applicable law for its regulation. The provision lays down that for the regulation of sanitation and drainage works the applicable law will be the law which is for time being regulating the construction and maintenance of public embankments, rivers and outlets.

Section 28 - All outlets and water-channels, natural or artificial, included in a scheme under this Act, whether reconstructed, cleared, altered, enlarged, excavated or cut under this Act or not, and the construction and maintenance of embankments and dams and works therein, or connected therewith, shall be subject to the law for the time being in force regulating the construction and maintenance of public embankments, rivers, channels and outlets.

c) Institutions Formed under the law

Under Section 9 of the Act a commissioner is authorised to appoint a committee. The provision states- "In the case of major schemes, the Collector shall, as soon as possible after the receipt of the scheme, in addition to the publication required by section 6, refer it to the Commissioner, and the Commissioner shall forthwith appoint a committee, to be constituted in the prescribed manner, with the Collector as Chairman, representing the local authorities and the landowning, cultivating and other interests of the area to which the scheme relates."

d) Powers Granted under the law

The act grants power to the government to make rules under section 35. The major powers granted to government relating to sanitation are-

- i) Section 35(f) determining the constitution of the committee referred to in section 9, and regulating the conduct of business at meetings of the committee;

- ii) Section 35(k) prescribing the conditions subject to which lands and works shall vest in a local authority, or person under section, 29;
- iii) Section 35(l) for the maintenance of works under section 30;
- iv) Section 35(m) determining the manner in which the sums referred to in section 31 (for maintenance) shall be administered;
- v) Section 35(n) Prescribing the forms of accounts, surveys, plans, maps, estimates, statements, and reports;
- vi) Section 35(o) regulating the powers and duties of any officer, or person under the Act.

e) Sub-delegation of powers

Under section 5 of the Act, Collector is authorised to direct an engineer to prepare a scheme. The provision is as follows

- Sec 5(1) Whenever it has been decided under section 4 to proceed with any work, the Collector shall direct the Engineer to prepare a scheme.
- 5(2) When the Engineer has prepared any such scheme, he shall forward it to the Collector, who may, subject to such rules as may be prescribed in this behalf, make such modifications therein as he may deem necessary.
- The report so forwarded by an engineer should comply with section 17 which states as under-
 - i) On the completion of any work executed under this Act, the Engineer shall forthwith submit to the Collector a report accompanied by-
 - a) a statement of the items of the cost of the work referred to in sub-clauses (a), (b) and (d) of clause (2) of section 2; and
 - b) a copy of the map prepared in the prescribed manner of the local area benefited by the improvement."

f) Analysis

The act deals with the subject of drainage and sanitation related issues and laws time being in force regulating public embankments etc. The act further talks about appointment of committees in case of major schemes. The term major scheme is defined under section 2(7) as- "major scheme" means scheme

- i) in which the estimated cost of the work involved exceeds the prescribed amount, or
- ii) in which more than one independent local authority is concerned, or which the Collector has certified should be treated, in such circumstances as may be prescribed, as a major scheme;

Further it grants power to government for the formation of rules and delegation of power to engineers to assist them in formation of schemes. Hence, The Bengal agricultural and sanitary improvement act, 1920 lays down a detailed procedure for regulation of sanitation in Bengal.

The Calcutta Metropolitan Water and Sewerage Sanitation Authority act, 1966

a) Relevant provisions

Section 3: Establishment of Authority.

Section 8: The functions of the Calcutta Metropolitan Water and Sanitation Authority.

Section 9: Powers of Calcutta Metropolitan Water and Sanitation Authority.

Section 18: Appointment of General Manger.

Section 21: Delegation of Power by General Manager.

Section 23: vesting of the responsibilities for sewerage services of the Municipality of Howrah in the Authority.

Section 57: Sewage and Drainage.

Section 70: Prosecution.

Section 72: Penalty.

b) How the act is dealing with subject of sanitation

The Calcutta metropolitan water and sanitation authority act, 1966 deals with the subject of sanitation by assigning the function of sanitation and drainage to The Calcutta metropolitan water and sanitation authority under section 8. The provision is as follows:

Section 8- The functions of the Authority shall be the following, namely-

(1) The promotion and operation of schemes for:

- supply of water,
- sewerage,
- drainage,
- sewage treatment and disposal, and
- collection and disposal of night-soil in areas yet to be sewered;

(2) Matters connected with and incidental to the functions mentioned in clause (1);

(3) Such other functions as may be entrusted to the Authority by the State Government by notification.

c) Institutions formed under the law

The Act provides for the establishment of Calcutta metropolitan water and sanitation authority under section 3 and declares it to be a body corporate.

Section: 3

(1) With effect from such date as the State Government may, by notification, appoint in this behalf, there shall be established for the Calcutta Metropolitan District an Authority by the name of the Calcutta Metropolitan Water and Sanitation Authority.

(2) The Authority shall be a body corporate having perpetual succession and a common seal, and shall by the said name sue and be sued.

Further the constitution of the authority is given under section 4(1) as-

(1) The Authority shall consist of-

- i) a Board of Directors, and
- ii) a General Council."

d) Powers granted under the law

Under section 9 of the Act the clauses granting powers to Authority relating to sanitation are-

- i) to take over all existing municipal responsibilities, powers, controls, facilities, services, and administration within the District relating to water-supply, sewerage, drainage, and collection and disposal of night-soil and to manage them so as to provide all the people of the area with water, sewerage and drainage services and services of collection and disposal of night-soil until sewerage constructed throughout the District;
- ii) to extend, expand and develop existing facilities and to construct and operate new ones for providing sewerage and drainage services;
- iii) to adopt schemes for water-supply, sewerage, drainage and night-soil collection and disposal services;
- iv) to prevent pollution of any water including any water source, water-course or channel within the District;
- v) to regulate the treatment of industrial wastes before discharge thereof into any sewer, canal, river or other water channel within the District;

e) Sub-delegation of powers

- 1) The Board of directors so constituting the Authority shall appoint an Engineer as General Manager for carrying out the administrative functions under section 18 of the Act. The board can further delegate its power to the General Manager in compliance of the provision under section 18. It reads as:
- 2) The Board shall appoint for the Authority a General Manager, who shall have administrative experience and be preferably an engineer. He shall have, in addition to the functions and duties specified elsewhere in this Act, such functions and duties as may be provided by regulations.
- 3) The General Manager shall be the chief executive officer of the Authority who shall be accountable to the Board for his actions.
- 4) The Board may appoint such other officers and employees as it considers necessary for the efficient performance of the functions of the Authority: Provided that, in respect of officers and employees whose maximum salary does not exceed Rs. 1,000 per month, the Board may delegate its power to appoint to the General Manager. Further, under sec 21 General Manger can delegate his powers to other employees.

f) Provision in case of non-compliance of the act

The Act provides for prosecution of a person under section 71, only when a complaint is made by an officer authorised by the Authority to do so and not otherwise.

Further the penalty for violation of the provisions of the Act and any rules made under it is defined under section 72 as imprisonment which may extend to one year and fine which may extend to rupees one thousand.

g) Analysis

The act provides for the establishment of an authority to regulate the drainage and sanitation related issues. It also lays down detailed procedure for functioning of the authority and its constitution. The powers and functions of the Act are wide enough to effectively regulate the sanitation of Kolkata Metropolitan Area defined in its Schedule-I.

The Calcutta Burial Boards Act, 1881

a) Relevant Provisions

Section 2: Appointment of Burial Board.

Section 4: Appointment of Chairman by State Government.

Section 8: Power to make rules.

b) How the act is dealing with subject of sanitation

The Act is not dealing with the subject of sanitation directly but it plays an important role in maintenance of sanitation by providing regulations for dead body burials.

In India as river Ganga is considered sacred it is a common practice among some religious communities to drain the dead bodies of their relatives in river Ganga. The Act however provides for regulation of burial in order to curb the pollution of river by drainage of bodies in it.

c) Institutions formed under the law

Under section 2 of the Act the state government may appoint a burial board. The provision is as follows:

The [State Government] of [West Bengal] may, by a notification published in the [Official Gazette], appoint Burial Board for the Town and suburbs of Calcutta

Further section 3 of the act lays down that one of the members of the board is “the [the Executive Officer of the Corporation of Calcutta] the Health officer of Calcutta”.

d) Powers granted under the law

Under section 8 of the Act, the powers of the Board are enumerated

Section 8

The Board may, with the sanction of the [State Government] of '[West Bengal]', from time to time make such rules consistent with the purposes of this Act, as they may think necessary for any of the following purposes; that are to say:

- for regulating the times when the Board shall meet and the procedure to be observed at such meetings;
- for securing the preservation, repair or removal of existing monuments and for regulating the dimensions and erection of new monuments , in any burial-grounds under their charge;

- for regulating the mode of payment of fees, charges and other dues in respect of interments in any such burial-grounds for expenditure of the same;
- for directing the manner in which and the persons by whom all works within any such burial-ground shall be executed; and
- for otherwise carrying out the purposes of this Act; and may from time to time, with the sanction aforesaid vary, alter or revoke any such rules so made.

All rules so made and variations, alterations or revocations of rules shall be published in the official Gazette.

e) Sub-delegation of powers

The Chairman of the Board which will be nominated by the State Government in accordance with section 4 of the Act can further appoint subordinate officers and clerks for carrying out the work under this Act.

Section 7- "The Board may from time to time appoint all such overseers, Subordinate clerks, subordinate officers and servants as they shall think necessary and proper to assist in carrying out the purposes of this Act, and may from time to time remove any of such persons and appoint others in their place."

f) Analysis

Though the Act does not deal with subject of sanitation directly but in the view of social customs and rituals followed in India the role of Burials Board is important in maintaining and regulating the sanitation to some extent on river embankment.

The Howrah Municipal Corporation Act, 1980

a) Relevant provision (effecting sanitation)

Section 3: Municipal Authorities

Section 4(1) & 4(2): The Corporation

Section 5(1): Constitution of Corporation

Section 6 (1): Constitution of Mayor-in-Council

Section 13: Officers appointed by The Corporation

Section 21, 22, 23: Powers of Municipal Authorities

Section 28: Delegation of Powers.

Section 140(1): Public drains to vest in Corporation.

Section 148: No polluting substance to be discharged in water sources.

Section 157(1): Position of Cesspools.

b) How the act is dealing with subject of sanitation

The Act vests all power relating to constructions and maintenance of public drains and drains alongside public streets within municipal area. The Act provides for maintenance and development of sewers and sewage plants in order to promote sanitation and in turn control the pollution of river Ganga.

1. Section 140 of the Act states as under- "Section140 (1) All public drains, and all drains in, alongside or under any public street. Whether made at the charge of the

Municipal Fund or otherwise, and all work, materials and things appertaining thereto which are situate at Howrah, shall vest in the Corporation;

Provided that the Corporation may with the approval of the State Government make over the trunk-sewer, sewage plants, pumping stations and others utilities to a separate and independent agency for maintenance and development and it shall be lawful for such agency to construct trunk sewers, sewage treatment plants, pumping stations or other utilities.”

2. The most important provision under this Act for curbing pollution of river Ganga is section 148 which directly prohibits discharge of any kind of polluting substance in any water source or river. It also provides for setting a treatment standard for wastes before their disposal in a water source. The Provision is as follows-
Section 148 (1) No person shall throw, empty or otherwise discharge into any water source, channel or municipal drain within or outside Howrah any matter, refuse, or trade effluent or waste so as to cause pollution, health Hazard or nuisance prejudicial to environment. Subject to the provisions of any other law for the time being in force the Corporation may by regulation provide for treatment standard to be maintained before discharge of any industrial waste or foul water or refuse into any river, water source, channel or municipal drainage and sewerage system.

3. In addition to this provision another provision dealing with hygiene of water sources and rivers is given under section 157 of the Act. The provision prohibits construction of any kind filth receptacles and cesspools near or around any kind of water source and river. In case any person has contravened the provision and constructed a cesspool he may be directed to fill it up by the commissioner under clause 2 of the section. Section 157 states as under

(a) No person shall construct a cesspool-

- i) beneath any part of any building or within 15 meters of any tank, reservoir, water source or well, or
- ii) upon any site or in any position in Howrah which has not been approved in writing by the Commissioner; or
- iii) upon any site or in any position in Howrah which has not been so approved and is situated within ninety meters of any reservoir used for storage of filtered water to be supplied to Howrah.
- iv) The Commissioner may at any time by a written notice require the owner of the premises in which any cesspool has been constructed in contravention or the provision of sub-section (1) to remove such cesspool and to fill such cesspool with such materials as may be approved by him”.

c) Institutions formed under the law

Under Section 3 of the Act three kinds of authorities have been enumerated to look into the subject matter of the Act.

These Authorities are

1. The Corporation
2. The Mayor - in –Council.
3. The Mayor.

Under section 4(1) of the Act, State government may appoint a Corporation known as Municipal Corporation of Howrah. The Corporation is declared to be a body Corporate. The provision is as follows.

“Section 4(1) with effect from such date as the State Government may, by notification, appoint, there shall be a Corporation charged with the municipal government of Howrah, to be known as the Howrah Municipal Corporation.

(2) The Corporation shall be a body corporate with perpetual succession and a common seal, and may by its name sue and be sued.”

The constitution of the Committee so formed under section 4 of the Act is given under section 5 of the Act as under-

Section 5- “(1) The Corporation shall consist of the following: members, namely:-

- (a) Fifty elected Councilors, and
- (b) Such persons having special knowledge or experience in municipal administration as the State Government may nominate from time to time:

Provided that such persons shall not have the right to vote in the meetings of the Corporation”

The constitution of mayor-in-council is give as under-

Section 6(1) there shall be a Mayor-in-Council consisting of the Mayor, the deputy Mayor and such number of elected members of the Corporation not exceeding five as the State Government may from time to time determine.

d) Powers granted under the law

The powers of the authorities formed under the Act are enumerated under section 21, 22 and 23. The powers so granted are both administrative and executive in nature.

e) Power of Corporation

Section 21- Subject to the provisions of this Act and the rules and the regulations made there under the municipal government of Howrah shall vest in the Corporation.

f) Power of Mayor-in-council

Section 22- (1) Subject to the provisions of this Act and the rules and the regulations made there under, the executive power of the Corporation shall be exercised by the Mayor-in-Council.

(2) All executive actions of the Mayor-in -council shall be expressed to be taken in the name of the Corporation.”

g) Power of Mayor

“Section 23:

- 1) The Mayor shall exercise such powers and discharge such functions as are conferred on him by or under this Act.
- 2) The Mayor shall preside over a meeting of the Mayor-in-Council which shall meet at such place and at such time as the Mayor may direct.
- 3) The matters to be discussed at a meeting of the Mayor-in-Council shall be prepared under the direction of the Mayor and shall be circulated to the members' or the Mayor-in-Council in such manner as the Mayor may determine.
- 4) The Mayor shall allot among the members of the Mayor-in- Council such business of the Corporation and in such manner as he thinks fit.
- 5) The Mayor may, if he is of opinion that immediate execution of any work (which ordinarily requires the approval of the Corporation or the Mayor-in-Council) is necessary, direct the execution of such work. Provided that the Mayor shall report forthwith to the Corporation or the Mayor-in-Council as the case may be, the action taken under this sub-section and the reason there for.”

h) Sub-delegation of powers

The Corporation can sub-delegate its powers to Mayor-in-Council who can further delegate such powers to Mayor and commissioner under section 28 of the Act.

The provision states as under-

“Section 28(1) The Corporation may by resolution delegate, subject to such conditions as may be specified in the resolution, any of its powers or, functions to the Mayor-in-Council

(2) The Mayor-in-Council may by order delegate, subject to such conditions as may be specified in the order, any other powers or functions to the Mayor or to the Commissioner.”

In addition to delegation of powers The Corporation can also appoint the following officers under section 13 to carry on its work-

- The Commissioner,
- The Controller or Finances,
- The Chief Auditor,
- The Chief Engineer,
- The Chief Architect.
- The Health Officer, and
- The Secretary.

i) Analysis

The Howrah Municipal Corporation Act, 1980 is a very comprehensive piece of legislation dealing with the subject of sanitation in detail, complete with all the required measures vital for the maintenance of sanitation and cleanliness of river Ganga. Various provisions of the Act have ruled out any possibility of polluting the river Ganga by not only prohibiting direct waste disposal in Ganga but also prohibiting construction of any filth receptacles or cesspools near the river. But the problem of pollution in Ganga does not end with the enactment of this Act, as we can still observe the reckless disposal of polluting substances in Ganga even after its enactment, due to its poor implementation. Therefore, if the Act is effectively implemented in the lower stretch of the river Ganga which lying in the Bengal region could be cleaned.

Calcutta Municipal Corporation Act, 1980

a) Relevant Provisions

Section 234: Corporations duty to supply water.

Section 257: water pipes etc, not to be placed where water will be polluted.

Section 260: municipal water supply, sewerage and drainage code.

Section 268: power to close or restrict use of water from polluted sources of supply.

Section 277: corporation to provide drainage, sewerage and outfall.

Section 321: rules as to drainage, sewerage, cesspools, privies and urinals.

Section 500: prohibition of public bathing.

Section 502: prohibition of corruption of water by chemicals etc.

b) Analysis

The Kolkata Municipal Corporation (KMC) and the State Irrigation Department locking horns over the maintenance of the city's sewerage system from last few years, the roads were all set to be submerged this monsoon. The rains fell just after Full Moon when tidal upsurges were causing backflow in the Canals and thus disturbing flush out of sewerage water. So the official view is that this disaster was caused by unprecedented heavy rain combined with failure of sewerage system. According to KMC officials, they have done their bit in upgrading the pumping stations, and now it's the turn of the state irrigation department to contribute their share. The Calcutta Municipal Corporation admits the choked canals were a major cause of the prolonged water logging. During the British colonial period when three tiny settlements became Calcutta, the canals served as a means of transport and also drainage. When the Eastern Metropolitan Bypass was being built (in the 1970s) environmentalists had warned that the road would block the natural drainage of the city which slants towards the east.

Today, the catchment area around the Bypass is also the hub of numerous housing colonies, built at the cost of much of the wetlands, and adding to the drainage problem. All private

connection of premises to the service for the corporation of supply water thereto, all pipes, taps and other water fitting used for such supply shall be made, maintained and regulate in accordance with the subject to such regulations as may be made in this behalf and such regulations shall be form a part of a Municipal Water Supply, Sewerage and drainage code.

If Municipal commissioner is of opinion that the water from any tank ,well or other sources of supply not vested in the corporation, which is used for domestic purposes or for the preparation of food or drink for human consumption is become so polluted as to be prejudicial to health , the Municipal Commissioner may, after giving the owner or the occupier of the premises which the sources of supply is situated a reasonable opportunity of being heard , by order direct that the source of supply be permanently or temporarily closed or cut off the water there from be used for certain purposes only or make such order necessary to prevent injury or danger to the health of person using the water or consuming food or drink prepared therewith.

The corporation shall construct and maintain drains sewers and provide a safe and sufficient outfall , in or outside Kolkata for effectual drainage and proper discharge of storm water and sewage of Kolkata in such manner as not to cause any nuisance , whether by flooding any part of Kolkata or of the country surrounding the outfall or in another way.

No person engaged in any trade manufacturer shall willfully cause or suffer to be brought or to flow into any lake, tank or river well, ditch any animal vegetable or mineral matter likely to render the water there of offensive or dangerous to health. The Municipal Commissioner shall provide and maintain in proper and convenient places a sufficient latrines and urinals.

9.3.3 Agriculture

River Boards Act, 1956

a) Relevant provisions

Section 4: Establishment of Boards

Section 5: Composition of Board

Section 13: Matters in respect of which a Board may be authorised to tender advice

Section 14: Function of Board

Section 16: General Powers of Board

Section 24: Delegation of powers

b) How the law deals with the subject of agriculture

The River Boards Act under section 13(a) (vii) empowers a Board to advise the government to take measures for the prevention of water-pollution in interstate rivers.

Section 13- A Board may be empowered under sub-section (1) of section 14 to perform all or any of the following functions, namely:-

(a) advising the Governments interested on any matter concerning the regulation or development of any specified inter-state river or river valley within its area of operation and

in particular, advising them in relation to the coordination of their activities with a view to resolve conflicts among them and to achieve maximum results in respect of the measures undertaken by them in the inter-State river or river valley for the purpose of - (vii) Prevention of pollution of the waters of inter-State river;

Section 13 is the main section under River Boards Act, 1956 dealing with the issue of sanitation. As the Act is a central legislation it is applied to all the states. Its relevance is most in the states where the river Ganga flows as it plays a vital role in regulation of pollution and other activities related to inter-state rivers.

c) Institutions formed under the law

Section 4 of the Act deals with the establishment of River Boards by The Central Government on the request of State Governments. The Act further declares the Board as body corporate with perpetual successions.

“Section 4 (1) The Central Government may, on a request received in this behalf from a State Govt. or otherwise, by notification in the Official Gazette, establish a River Board for advising the Governments interested in relation to such matters concerning the regulation or development of an inter-State river or river valley or any specified part thereof and for performing such other functions as may be specified in the notification, and different Boards may be established for different inter State rivers or river valleys :

Provided that no such notification shall be issued except after consultation with the Governments interested with respect to the proposal to establish the Board, the persons to be appointed as members thereof and the functions which the Board may be empowered to perform.

(2) A Board may be established under such name as may be specified in the notification under sub-section (1).

(3) Every Board so established shall be a body corporate having perpetual succession and a common seal, and shall by the said name sue and be sued.

(4) Every Board shall exercise its jurisdiction within such limits of the river (including its tributaries, if any) or river valley as may be specified in the notification under sub-section (1) and the area so specified shall be called the area of operation of the Board.”

The Act further provides under Section 5 the Composition of Board, which mainly consists of a Chairman and other members with special knowledge in the field of irrigation, electrical engineering, flood control, navigation, water conservation, soil conservation, administration or finance.

d) Powers granted under the law

The board can perform all the functions enumerated under section 13 specially under section 13(a) (vii) dealing with pollution control. Provided that there is a notification by

Central Government regarding such empowerment. This provision is given under section 14 as following-

Section 14 (1) The Central Government, after consultation with the Governments interested, may, by notification in the Official Gazette, empower the Board to perform all or such of the functions under section 13 as may be specified in the notification.

(2) The Board shall exercise its powers and perform all the functions which it is empowered to do by or under this Act within its area of operation.

(3) In performing its functions under this Act, the Board shall consult the Governments interested at all stages and endeavor to secure, as far as may be practicable, agreement among such Governments.

There are certain other general powers of the Board relating to investigation and surveys etc which are necessary for the Board in order to serve its purpose. These general powers are enumerated under section 16 of the Act.

“Section 16 For the purpose of efficiently performing its functions under this Act, every Board may, within its area of operation:-

- acquire, hold and dispose of such property, both movable and immovable, as it deems necessary;
- undertake such preliminary investigation or surveys or other measures as it deems necessary;
- inspect or cause to be inspected any works undertaken by any Government interested concerning the regulation or development of the inter-State river or river valley ;
- conduct and co-ordinate research on various aspects of the conservation, regulation or utilisation of water resources, such as water power generation, irrigation, navigation, flood control, soil conservation, land use and connected structural and design features;
- collect such topographical, meteorological, hydrological and sub-soil water data as it deems necessary;
- publish statistics or other information relating to the various aspects of the regulation or development of the inter-State river or river valley;
- require any Government interested to furnish such information as the Board may require in relation to:
 - i) the measures undertaken by that Government for the regulation or development of the inter-State river or river valley;
 - ii) the topographical, meteorological, hydrological and subsoil water data;
 - iii) Such other matters as may be prescribed.

e) Sub-delegation of powers

The Board can delegate its powers for its proper functioning to the Chairman and any other member through a written order by the virtues of section 24.

“Section 24 The Board may, by general or special order in writing, delegate to the Chairman or any other member or any officer of the Board, subject to such conditions and limitations, if any, as may be specified in the order, such of its powers and functions under this Act as it may deem necessary for the efficient running of the day-to-day administration of the Board.”

f) Analysis

The River Board Act does not deal with the issue of irrigation primarily but it certainly provides for the formation of a River Board empowered to regulate pollution in inter-state rivers. Therefore, it plays a definitive role in control of pollution in River Ganga which covers eight states during its course.

Bengal Irrigation Act, 1876

a) Relevant provisions

Section 4: Exemption from Bengal Embankment Act,

Section 10: Power to require statement as to name and interests; Penalty for failure to comply; Persons require making statements legally bound to do so.

Section 11: Damage for which compensation shall not be awarded. Matter in respect of which compensation may be awarded, compensation for loss of tolls lawfully levied, Diminution in market value to be considered.

Section 12: Compensation for loss of drinking water.

Section 34: Power to inspect and regulate water supply.

Section 35: Power to enter for repairs, and to prevent accident.

Section 37: Compensation for damage to land.

Section 39: Government to provide means of crossing of canals and of drainage.

Section 43: When drainage works necessary, State Government may order scheme to be drawn up and carried out.

Section 93: Offences and Penalties.

b) Law deals with the subject of agriculture

The Bengal Irrigation Act, 1876 under section 4: Nothing contained in the Bengal embankment Act, 1883, shall apply to any canal or flood embankment as defined in this act.

Section 10 deals with power to require statement as to name and interests. Penalty for failure to comply person require to make statements legally bound to do so, the collector may also require any person on whom a notice may be served under the last preceding sec, and who makes a claim for compensation in accordance therewith, to deliver to him a

statement containing, name of other person possessing any interest in the property affected or any part thereof sub proprietor, mortgage, tenant and other rents of profit received or receivable on account thereof for the year next preceding the date of the statement.

If any person shall fail to comply within the fixed by the notice with a requisition made under this section, the collector may impose upon him such daily fine as he think fit, not exceeding fifty rupees. such fine shall be payable daily until the requisition is complied with, and the Collector may proceed from time to time to levy the amount which has become due in respect of any such fine, notwithstanding that an appeal against the order imposing such fine may be pending:

Provided that, whenever the amount levied under any such order shall have exceeded five hundred taka the Collector shall report the case specially to the Commissioner, and no further levy in respect of such fine shall be made otherwise than by authority of the Commissioner.

c) Damage for which compensation shall not be awarded

Under Section 11: No compensation shall be awarded for any damage caused by-

- stoppage or diminution of percolation or floods;
- deterioration of climate or soil;
- stoppage of navigation or of the means of rafting timber or watering cattle

But compensation may be awarded in respect of any of the following matters:

- stoppage or diminution of supply of water through any natural channel to any defined artificial channel, whether above or underground, in use at the date of the issue of the notification under section 6;
- stoppage or diminution of supply of water to any work erected for purposes of profit on any channel, whether natural or artificial, in use at the date of the said notification;
- stoppage or diminution of supply of water through any natural channel which has been used for purposes of irrigation within the five years next before the date of the said notification;
- damage done in respect of any right to a water-course or the use of any water to which any person is entitled under the Limitation Act, 1908, Part IV;
- Any other substantial damage, not falling under any of the above clauses (a), (b) or (c), and caused by the exercise of the powers conferred by this Act, which is capable of being ascertained and estimated at the time of awarding such compensation.

d) Compensation for loss of drinking water

Under Section 12, if any supply of drinking-water is substantially deteriorated or diminished by any works undertaken in accordance with a declaration made by the Government under section 6, the canal-officer shall be bound to provide within convenient distance an adequate supply of good drinking-water in lieu of that so deteriorated or diminished, and no

person shall be entitled to claim any further compensation in respect of the said deterioration or diminution.

e) Power to inspect and regulate water-supply

Under Section 34, such canal-officer or other person may also enter upon any land, building or village-channel on account of which any water-rate is chargeable for the purpose of inspecting or regulating the use of the water supplied, or of measuring the lands irrigated thereby or chargeable with a water rate, and of doing all things necessary for the proper regulation and management of the canal from which such water is supplied.

f) Power to enter for repairs, and to prevent accidents

Under section 35, in case of any accident being apprehended or happening to a canal or flood-embankment, any canal-officer, or any person acting under his general or special orders in this behalf, may enter upon any lands adjacent to such canal or flood-embankment, and may execute all works which may be necessary for the purpose of preventing such accident, or repairing any damage done.

g) Compensation for damage to land

Under Section 37, in every case of entry upon any land or building under section 7, section 33, section 34 or section 35, the canal-officer or person making the entry shall ascertain and record the nature of any crop, tree, building or other property to which damage has been done, and the extent of the damage done to any such property, and shall tender compensation to the proprietors or occupiers for all damage done to the same by the entry or by any works executed.

If such tender is not accepted, the canal-officer shall refer the matter to the Collector, who shall thereupon give notice in writing to the person interested in such land and to the canal-officer, requiring them to attend before him, on a date to be fixed in the notice, for the purpose of making inquiry as to the amount of compensation.

h) Government to provide means of crossing canals and of drainage

Under Section 39, suitable means of crossing canals constructed or maintained at the cost of Government shall be provided at such places as the Government thinks necessary for the reasonable convenience of the inhabitants of the adjacent lands; and suitable bridges, culverts or other works shall be constructed to prevent the drainage of the adjacent lands being obstructed by any canal.

i) When drainage works necessary, Government may order scheme to be drawn up and carried out

Under section 43, whenever it appears to the Government that any drainage works are necessary for the public health, or for the improvement or proper cultivation or irrigation of any lands in districts to which the provisions of the Embankment and Drainage Act, 1952, do not, apply, or that protection from floods or other accumulations of water, or from erosion by a river, is required for any lands, the Government may cause a scheme for such works to be drawn up and carried into execution, and the persons authorized by the

Government to draw up and execute such scheme may exercise in connection therewith all or any of the powers conferred on canal-officers by sections 33, 34 and 35, and shall be liable to any or all of the obligations imposed upon canal-officers by sections 36 and 37.

j) Offences under act penalty

Section 93 reads as “Whoever, voluntarily and without proper authority, does any of the acts following, that is to say:

- 1) damages, alters, enlarges or obstructs any canal or drainage-work;
- 2) interferes with, increases or diminishes the supply of water in, or the flow of water from, through, over or under any canal or drainage-work, or by any means raises or lowers the level of the water in any canal or drainage work;
- 3) being responsible for the maintenance of a village- channel, or using a village-channel, neglects to take proper precautions for the prevention of waste of the water thereof, or interferes with the authorized distribution of the water there from, or uses such water in an unauthorized manner;
- 4) corrupts or fouls the water of any canal so as to render it less fit for the purposes for which it is ordinarily used;
- 5) destroys, defaces or moves any level-mark or water-gauge fixed by the authority of a public servant;
- 6) destroys or removes any apparatus, or part of any apparatus, for controlling or regulating the flow of water in any canal or drainage-work;
- 7) passes, or causes animals or vehicles to pass, in or across any of the works, banks or channels of a canal contrary to rules made under this Act after he has been desired to desist therefore;
- 8) without the permission of the canal-officer causes, or knowingly and wilfully permits, any cattle to graze upon any flood-embankments, or tethers, or causes or knowingly and wilfully permits any cattle to be tethered upon any such embankments, or roots up any grass or other vegetation growing on any such embankments, or removes, cuts or in any way injures or causes to be removed, cut or otherwise injured, any trees, bushes, grass or hedge intended for the protection of such embankment;
- 9) Violates any rule made under the Act, for breach where of a penalty may be incurred. In case the offence shall not amount to mischief within the meaning of the Penal Code, and on conviction before a Magistrate, be liable to a fine not exceeding fifty taka or to imprisonment for a term not exceeding one month, or to both.

k) Analysis

This Act applies to exemption of embankment act, dealings with the Bengal irrigation procedure, village canals, flood embankment, drainage, compensation for loss of drinking water, water supply, compensation of damage land etc.

Bengals Canal Act, 1864

a) Relevant provisions

Section 2: What navigable channels may be rendered subject to provisions of Act;

Section 3: By whom navigable channels may be made

Section 4: Bar of suit against Government

Section 6: State Government may fix and alter rates of tolls.

Section 9: Payment of tolls how enforced

Section 10: Penalty for evasion of toll

Section 11: Rules relating to lines of navigation

Section 13: Appointment of supervisor with power to remove obstruction

Section 14: Mode of exercising such power.

Section 15: Supervisor may forbid construction of bandels, etc.

Section 18: Offences by whom punishable

b) Law deal with the subject of agriculture

The Canals Act under section 2 and 3 empowers Board to advise the government to take measures for the prevention of water-pollution in interstate rivers.

Section 2, It shall be lawful for the Government from time to time, by notification to that effect published in the official Gazette, to declare that the provisions of this Act shall apply to any navigable channel specified in such notification; and from and after such publication the provisions of this Act shall apply to, and be in force as regards, such navigable channel.

Section 3, It shall be lawful for the Government from time to time, to authorize any person to make and open any navigable channel, or to clear and deepen any navigable channel, and to stop any watercourse, or make any tracking path, or do any other act necessary for the making or improvement of any such channel; and any navigable channel made under this section shall be rendered subject to the provisions of this Act in the manner prescribed in the last preceding section.

c) Institutions formed under the law

Section 4, No action or suit shall be brought against the Government in respect of any injury or damage caused by, or resulting from, any act done under the last preceding section.

Section 5 says Tolls, at such rate as shall be fixed in manner hereinafter mentioned, shall be paid in respect of all vessels entering upon, or passing along, any of the lines of navigation subject to the provisions of this act, provided that such tolls shall be payable only so long as such line of navigation shall be open.

Section 6, the Government may fix, and from time to time alter the rates at which such tolls shall be levied, provided that no toll shall be levied, and no alteration of any rate of toll shall have effect, until notice shall have been published in the official Gazette, for such period as the Government may fix, of the intention to levy or alter such tolls, and of the rate or place at which such toll is to be levied.

d) Power granted under the law

- Section 11, It shall be lawful for the Government from time to time to make rules not repugnant to any law in force, and to repeal, alter and amend the same, for the management of any line of navigation subject to this Act, and for regulating the conduct of persons employed for any of the purposes of this Act; and the Government may affix fines as penalties for the infringement of such rules not exceeding fifty taka for any one infringement, or five taka a day for any continuing infringement.
- Such rules may contain directions for any of the following amongst other matters: for determining the tonnage of vessels and their measurement; for fixing the number and the width of vessels to be allowed to pass into, or out of, or through, any line of navigation at one time or abreast; for determining the length of time during which vessels may remain stationary on any line of navigation and the amount of demurrage to be paid by vessels remaining stationary beyond such time; for regulating the mode in which and the places at which tolls are to be levied under this Act; for the removal of sunken vessels and obstructions; and for the storing and disposal of the cargo of vessels seized under this Act.
- Section 14, Whenever such supervisor shall consider that the cutting down and removal of any tree or the removal of any other obstruction is necessary he may in cases of emergency at once remove the same, and may for that purpose enter on any private property.
- In cases not of an emergent nature, he shall serve a notice in writing on the owner or occupier of such private property, directing him to remove the same within a reasonable time.
- If the owner or occupier cannot be found, notice may be served by notification to be affixed in some conspicuous place in the nearest village. If the owner or occupier shall not remove the obstruction within the time given in the notice, the supervisor may proceed to remove it himself and may for that purpose enter on any private property. Payment of all expenses of such removal may be enforced by the sale of the thing removed in the manner provided for the recovery of tolls in section 9 of this Act.

e) Sub delegation of powers

- Section 13, It shall be lawful for the Government to appoint any person to be the supervisor of any line of navigation subject to the provisions of this Act; and such person shall be empowered to cut down and remove any tree which may have fallen or may be likely to fall into such line of navigation, and to remove any sunken vessel, and to prevent or remove any other nuisance or obstruction to navigation, of whatever description, whenever he may think it necessary.
- Section 15, Whenever in the opinion of such supervisor the construction of any bandel or other contrivance for fishing, or for any other purpose, in any line of navigation is likely to cause obstruction to the free and safe transit of such line of navigation, he may,

by a notice in writing to be served on the owner or person in charge of such bandel or other contrivance, or (if such owner or other person cannot be found) to be affixed at some conspicuous place in the nearest village, forbid the construction of such bandel or other contrivance.

- Section 15 A, Notwithstanding anything contained in this act, the engineer or the supervisor or any other person duly authorised by the Engineer or the supervisor ,as the case may be, in this behalf may remove, dismantle or demolish any embankment, fishery, fishing contrivance, huts, buildings, sluices, obstructions encroachments or any other construction, in the opinion of the engineers or the supervisors is likely to interfere with, counteract or impede any canal, line of navigation any manner.

f) Provisions in case of non compliance of the act

- Section 16, Any person who shall willfully cause or shall aid in causing any obstruction to any line of navigation, or any damage to the banks or works of such line of navigation, or who shall willfully omit to remove such obstruction after being lawfully required so to do, shall be punished on conviction before a Magistrate with simple imprisonment which may be extend to one month, or with fine which may extend to fifty taka, or with both, and shall also be liable to pay such fine as may be sufficient to meet all reasonable expenses incurred in abating or removing such obstruction, or in repairing such damage.
- Section 18, If any person shall be guilty of an offence against the provisions of this Act on any line of navigation subject to this Act, such offence shall be punishable by any Magistrate having jurisdiction over any district or place adjoining such line of navigation, or adjoining either side of that part of the line of navigation in which such offence shall be committed; and, such Magistrate may exercise all the powers of a Magistrate under this Act, in the same manner, and to the same extent, as if such offence had been committed locally within the limits of his jurisdiction, notwithstanding the offence may not have been committed locally within such limits; and, in case any such Magistrate shall exercise the jurisdiction hereby vested in him, the offence shall be deemed, for all purposes, to have been committed locally within the limits of his jurisdiction.

g) Analysis

The act provides for the establishment of an authority to regulate the obstruction, navigation issues. It also lays down detail about water ways procedure for functioning of the authority and construction.

West Bengal Closing of Canals Act, 1959

a) Relevant provisions

Section 3: Closing and filling up of canals and closing up of canal side roads to traffic.

Section 4: No compensation for damage.

b) Analysis

Canal means a circular canal or new cut canal. Circular canal is the still water locked canal commencing from its junction with the river Hooghly across the Chitpur lock in the eastern water line of the Hooghly and terminating as its junction with the new cut canal near dhapa, together with the whole of the canal more or less 1,328 feet in length commonly known as the "Orange Soorah" and includes all lands on the banks of the canal which have been acquired by the State Government for the purpose of the canal.

New cut canal is the line of navigation which takes off from the circular canal at ultadanga and terminates at its outfall into the central lake channel near dhapa lock and includes all land on the banks of the canal which have been acquired by the state govt. for the purpose of canal. Ganga is the most important river of the country and beyond doubt is closely connected with the history of civilization as can be noticed from the location of the ancient cities of Hardwar, Prayag, Kashi and Patliputra at its bank. To millions of people it is sustainer of life through multitude of canal system and agriculture of the wasting load. Hundreds of the villages and even the big cities depend for their drinking water on this river. It is believed, a fact which has also been observed, that the water of Ganga never decays even for months and years when water of other rivers and agencies begins to develop bacteria and fungi within a couple of days.

This self purification characteristic of Ganga is the key to the holiness and sanctity of its water. There has been a steady deterioration in the quality of water of Indian rivers over several decades. India's fourteen major, 55 minor and several hundred small rivers receive millions of liters of sewage, industrial and agricultural wastes. Most of these rivers have been rendered to the level of sewage flowing drains. There are serious water quality problems in the cities, towns and villages using these waters. Water borne diseases are rampant, fisheries are on decline, and even cattle are not spared from the onslaught of pollution. It is expedient for the public interest to close and fill up the circular canal and new cut canal for the promotion of public health in the city of Calcutta and neighboring area.

Notwithstanding anything contained in any other law for time being any force or contract, custom or usage having the force of law , it shall be lawful for the state govt. at any time after the expiry of one month from the date of commencement of this Act, any canal or part there be permanently closed and filled up by such agency as the Stat Govt. may think fit to employ and the roads by the side of such canal or part ,which are the property of the State Govt. be closed to traffic either permanently or temporarily .

No suit or other legal proceeding shall lie against the State Govt. in respect of any injury or damaged caused by or resulting from stoppage of navigation in the canals or use of canal side road or any act done under this Act.

West Bengal Irrigation (Imposition of Water Rates for Damodar Valley Corporation Water) Act, 1958

a) Relevant provisions

Section 4: imposition of water rates

Section 5: liability for payment of the water rate.

Section 9: free passage of water for agriculture or drainage to be afforded through or over all lands.

Section 10: penalty for diversion of normal flow of canal water by obstruction, etc.

Section 12: proceeds of water rate to be distributed between the state Government and the Corporation.

b) Analysis

The rapid growth of population and industry has caused large-scale pollution of the rivers and other water bodies of India. Kanpur, the largest city in Uttar Pradesh, has been called the “Manchester of the East” due to the large number of industries that it supports especially cotton and textile industries. The leather industry is particularly important in Kanpur and Calcutta, there are approximately 350 leather industries concentrated mainly in the Jajmau area, many of which release their effluent directly into the Ganga. Leather industries produce a large amount of effluent concentrated with pollutants, particularly the toxic heavy metal Chromium. In addition, the Jajmau tanneries produce about 400 tonnes of solid waste daily, contaminated with toxins from the leather making process and this waste is improperly disposed of.

Ganga, which is considered to be the lifeline of millions and the holiest river in the world, has become the victim of industrial development, growth of civilization along the riverbank and its own religious significance. In addition to the industrial pollutants described above, Ganga is the recipient of large amounts of untreated sewage and human waste, and subject to a high intensity of agriculture (43% of the total irrigation in India takes place in the Ganga basin). Practically the entire dry weather flow is diverted to the Upper Ganga canal at Haridwar, and whatever flow is regenerated between Haridwar and Aligarh is again diverted to the Lower Ganga Canal near Aligarh. As a result, the heavy inflow of pollutants at Kanpur meets a very slow flowing river during the dry season. The polluted water directly or indirectly enters the human system through the food chain causing health hazards like cancer, respiratory disease, renal failure and much other water borne or water related diseases.

Whenever State Government said about the lands in any area within the limits of the Damodar valley or within the area of operation of the corporation are benefited by agriculture during kharif season and Rabi season. water supplied through canals the State Govt. by notification declare its intention to impose such area a water rate for rupees thirty two for an area of .4047 hectares for kharif season , rupees forty eight for an area of .4047 hectares for rabi season and rupees one hundred and sixty for an area of .4047 hectares for summer season. The imposition of water rate within one month of publication of

notification or the rate is intended to be imposed or to the inclusion of such land in the area in respect of which the declaration has been made.

That such rate shall, in respect of any land for which water is obtained for irrigation by lift agriculture arrangement maintained and operated by the occupier thereof, be one half of the rate specified in the notification.

Notwithstanding anything to the contrary contained in any other law for the time being in force or in any custom, usage or contract, the liability for payment of the water rate shall be on the occupiers of the lands included in the notified area. Provided further that when water rate is paid by the owner of any land cultivated by a bargadar, the owner shall be entitled to recover from the bargadar half of the amount paid by him as water rate.

Sec. 9 of this Act said that for the purpose of agriculture or drainage of land in the notified area the owners or occupiers of such lands shall be bound to afford free passage for water through or over all lands in their possession or under their control and for that purpose to allow, when so required by the Collector by order made in this behalf, the construction and maintenance of such channels as may be necessary, without causing unnecessary loss or damage to such lands.

If any person refuses to comply with an order the collector may cause the channel to be constructed or maintained and may recover the costs thereof from such person as a public demand.

Notwithstanding anything contained in any other law for the time being in force, no person shall be entitled to claim any compensation for any damage or loss which may be caused as a result of the construction or maintenance of any channel .

If any obstruction is put in any channel referred to in sec 9 or other canal or any cut is made on the bank thereof then the normal flow of water through such channel or canal is diverted for the purpose of agriculture any land , collector take such measure as he may consider necessary to remove such obstruction or to close such cut, and provision of sec 7 impose penalty, which may extend to ten times the water rate assessed for kharif season, rabi season or summer season, as the case may be.

Any person aggrieved by an order imposing a penalty on him may within thirty days from the date of the order appeal to such appellate authority as may be prescribed by rules made under this Act and the decision of the appellate authority in such appeal shall be final.

9.3.4 Commercial Water Ways

Bengal Water Ways Act, 1934

a) Relevant provisions

Section 6: The Chairman.

Section 7: The Chairman or the Port Commissioners.

Section 40: The Board to control and administer navigable channels and navigation works with lands, etc., appertaining to them.

Section 41: Powers of the Board in regard to navigable channels.

Section 42: Power of State Government to control channel in certain cases.

Section 45: Power to acquire land under the Land Acquisition Act, 1894.

Section 47: Formation of a district committee.

Section 48: Appointment of member in place of Water ways Executive Engineer

Section 73: The Canals Act, 1864, to apply to navigable channels.

Section 74: The Board to discharge certain functions under the Canals Act, 1864

Section 150: Penalty for obstruction to line of navigation

b) How law deals with the subject of commercial water ways

This Act provides for the maintenance and improvement of water ways in Bengal.

Section 2(c) said, channel includes any river, beel, khal, nulla or water ways whether natural or artificial. Section 2(g), line of navigation means any navigable channel subject to the provisions of this act or canal act 1864. Section 2 (i) deals with navigable channel, it means any channel which is navigable during the whole or part of the year by a vessel of two foot draught or over, section 2(o) said about vessel , it includes any raft or craft ,timber, bamboos or floating materials ,propelled in any manner.

Section 40 deals with, 40.

The Board shall take charge of such machinery, tools, dredgers, vessels and their equipment as the [State Government] may make over to them free of cost, subject to such restriction as regards sale or disposal thereof as may be determined by the [State government], and subject to such financial arrangements as may be made between the Board and the [state government] as regards maintaining, or repairing the same. The Board shall there upon bear all necessary expenses in maintaining, repairing, altering, improving or working the same.

Provided that

1. The board shall not be liable to pay any interest on the capital cost of such articles or to repay any loan incurred by the '[stale Government]' for the purchase thereof.
2. If any such articles are employed on work Tor the [State Government], it shall pay to the Board only the actual working expenses incurred by them.
3. The [State Government] may, by notification, declare which of the navigable channels, other than canals as defined in the Bengal Irrigation Act. 1876, and the navigation works and the lands, buildings, locks, sluices and other works appertaining thereto held by or under the control of administration of the [State Government] shall, for the purposes of this Act, be controlled and administrated by the board Provided that no navigable channel within such limit as may have been declared under the Indian Ports Act, 1908, to be the limits of the '[Port of Calcutta]', and of the navigable rivers and channels leading to the [said port] shall be placed under the control and administration of the Board.

c) Institution formed under the law

Section 6 of this Act deals with, The first Chairman shall be appointed by the [State Government] The by notification and subsequent Chairman shall be appointed by the [State Government] after consultation with the Board: Provided that when the [State Government] appoints an official, he shall be an officer drawing a salary of not less than one thousand five hundred rupees a month. Section 7 Said about, The Chairman or the Port Commissioner shall be a Trustee ex- officio. With the consent, of the Port Commissioners, he may appoint another person in his place to perform his duties as a Trustee.

District Committee also formed in this Act. Section 47 deals with the formation of district committee, in every district in which the '[State Government]' as direct as district committee all be formed, consisting of the following members, namely: -

- i) the District Magistrate, ex-officio
- ii) the Chairman of the district board, ex-officio.
- iii) the District Engineer, ex-officio
- iv) the Water ways Executive Engineer, ex-officio, or a person appointed under section 48;
- v) not more than three members to be appointed by the (State Government);
- vi) four member to be elected in the manner prescribed by the rules made under section 129 by the district board to whom two shall be member of union board in the district who are not member of district board
- vii) If the districts contains any municipality which includes any navigable channel within its limits, one member to be elected. In the manner prescribed by the rules made under section 129, by the commissioner of such municipalities or municipality

Provided that the [State government] may direct that the number of municipal representatives to be elected shall be increased from one, two or three. Section 48 deals with the consent of the Board, the Water ways Executive Engineer may appoint another person perform his duties as a member of the committee.

d) Powers granted under the law

The act grants power to the government to make rules under section 41. The Board may-

with the previous sanction of the [State government] assume the control and administration of any other channel not being a canal as defined in the Bengal irrigation act- 1876, and not held by or under the control or administration of the [State government], and maintain it for the purposes of the act. Provided that if, under the provisions of the Canals Act, 1861, any local authority or person has constructed or improved a navigable channel or has been appointed to collect tolls on any line of navigation.

The Board on assuming control of such navigable channel or line of navigation shall pay such compensation to the local authority or person as the Collector may decide and shall

thereupon become entitled to collect such tolls Provided further that an appeal, shall lie to the Commissioner from a decision of the Collector on the question or compensation within sixty days from the date thereof and subject to the result of such appeal the decision of the collector shall be final.

For the purposes of this Act-

Make and open new navigable channel:

- i) Clear, widen deepen, divert or otherwise improve existing channels which are under the control and administration of the Board,
- ii) Construct locks, Sluices, Wharves, jellies, landing stages, warehouses, sheds, sidings, towpaths and other works, whether protective or otherwise

Provided dredgers and other plant,

- iii) Clear or destroy water-hyacinth in any district where there are navigable channels under the control and administration of the Board, and
- iv) Do all other acts necessary for the making and maintenance of such channels or for the safety and convenience of navigation or for improvement of waterways:

Provided that the [State government] may prohibit any such action if it considers that it is likely to cause damage or to be detrimental to agriculture or public health:

Provided also that the board shall not to do any act in contravention of the provisions of section 76 of the Bengal Embankment Act, 1882, without the previous sanction of the officer mentioned therein

- i) With the previous sanction or the [State Government], turn, divert, abandon or close any channel under the control and administration of the Board;
- ii) Construct, purchase, or hire offices, roll-houses, quarters for officers and servants and any other building required for the operations of the Board;
- iii) Control navigation and traffic upon lines of navigation which are under the control and administration of the board and employ such establishment as may be necessary for the purpose.
- iv) Contribute towards the cost of any work which is executed or to be executed by another authority and is likely to improve a line of navigation under the control of the board or to benefit navigation.

Section 42 deals with, if the State Government is of opinion that any channel which is under the control and administration or the Board under section 40 or section 41 should be under the control and administration of the State government for any purpose other than navigation, it may-

- i) Withdraw such channel from the control and administration of the Board and assume control thereof for navigation and such other purpose, or
- ii) Impose conditions for the purpose for regulating and restricting the powers of the board in respect of any channel.

- iii) Section 45 of this act states about, the board may with the previous sanction of that State Government acquire land under the provision of land acquisition Act, 1894 for carrying out any of the purposes of this act.

e) Penalties

Section 150 of this Act deals with, any person who willfully causes or aids in causing any obstruction to any line of navigation , or any damage to the banks or works of such line of navigation or who willfully omits to remove such obstruction after being lawfully required so to do , shall be punished with simple imprisonment which may extend to one month , or with fine which may to extent fifty rupees or with both and shall also be liable to pay such amount may be sufficient to meet all reasonable expenses incurred in abating or removing such obstruction or in repairing damage and such amount shall be recovered as fine.

f) Analysis

Bengal water ways Act mainly provide for the maintenance and improvement of water ways. In this act said about how a district committee is formed and their duties and liabilities and also said about the powers. How the board formation and how they work on the navigable channel and navigable works. Whereas it expedient to make better provisions for the maintenance and improvement of water ways in Bengal for purposes of navigation.

Bengal Ferries Act, 1885

a) Relevant provision

Section 6: Power to declare, establish, define and discontinue public ferries.

Section 15: Power to make rules in regard to public ferries.

Section 16: Private ferry not to ply within two miles of public ferry without sanction.

Section 27: Penalties on passengers offending.

Section 30: Penalty for rash navigation and stacking of timber.

Section 32: Magistrate may assess damage done by offender.

b) How the law deals with the subject of maintenance and improvement of water ways in Bengal

The Bengal Ferries Act, 1885 under section 6 of this act power to declare as a public ferries and the respective district in which, for the purpose they shall be deemed to be situated. Take possession of a private ferry and declare it to be a public ferry. establish a new public ferries where ,in opinion they are needed , it shall be define the limits of any public ferry and also change the course of any public ferry and discontinue any public ferry which deems unnecessary.

The law relating to administration of ferries in Bengal, the regulation vests the control of ferries in the Magistrates and joint magistrates and given them the exclusive power of framing rules for their management fixing rates of toll and appointing the superintendent persons.

c) Institutions formed under the law

Under Section 15 deals with the power to make rules in regard to public ferries. The Magistrate or the district, with the approval of the Commissioner, may from time to time make rules consistent with this Act:

- i) for the management of all public ferries within such district, and for regulating the traffic at such ferries;
- ii) for regulating the time and manner at and in which the terms in which, and the person by whom, the tolls of such ferries may be leased by auction;
- iii) for compensating persons who have compounded for tolls payable for [the use of any such ferry when such ferry has been discontinued before the expiration of the period compounded for; and generally, to carry out the purposes of this Act: And, when the tolls of a ferry have been leased under section 9, such Magistrate may, from time to time, with such approval as aforesaid, make additional rules consistent with this Act;
- iv) for collecting rents payable for the tolls of such ferries;
- v) for regulating the returns of traffic to be, from time to time, submitted by the lessee of such ferries;
- vi) in cases in which the communication is to be established by means of a bridge of boats, pontoons or rafts, or a swing bridge, flying-bridge or temporary bridge, [or regulating the time and manner at and in which such bridge shall be constructed and maintained, and opened for the passage of vessels and rafts through the same, and in cases in which the traffic is conveyed in boats, for regulating the number and kinds of such boats and their dimensions and equipment the number of the crew to be kept by the lessee or each boat; the maintenance of such boats in good condition; the hours during which, and the intervals within which, the lessee shall be bound to ply; and the number of passengers, animals and vehicles, and the bulk and weight of other things & that may be carried in each kind of boat at one trip; and may, from time to time, with such approval as aforesaid, repeal or alter such rules. Rules made under this section shall be subject to the control of the [State Government], and shall be published in the [Official Gazette] in such manner as the [State Government] directs and shall thereupon have the Force of law.

d) Power to make rules

Section 16 of this act deals with the, No person shall, except with the sanction of the Magistrate of the district, maintain a ferry to or from any point within a distance of two miles from the limits of a public ferry: Provided that, in the case of any specified public ferry. the State Government may, by notification, reduce or increase the said distance of two miles to such extent as it thinks fit: Provided also that nothing herein before contained shall prevent persons keeping boats to ply between two places, one of which is without, and one within, the said limits, when the distance between such two places is not less than three miles, or shall apply to boats which [the Magistrate of the district expressly exempts from the operation of this section.

e) Penalties

Section 27 of this Act deals with penalties on passengers offending, section said that, Every person crossing by any public ferry who refuses to pay Penalties on the proper toll, and every person who, with intent to avoid payment of such , fraudulently or forcibly crosses by any such ferry without paying the toll, or who obstructs any toll-collector, or lessee of the tolls of any public ferry, or any of his assistants in any way in the execution of their duty under this Act, or who, after being warned by any such toll-collector, lessee or assistant not to do so, goes, or takes any animals, vehicles or other things, into any ferry-boat. or upon any bridge at such a ferry, which is in such o l state or so loaded as lo endanger human life or property, or who refuses or neglects to leave, or remove any animals, vehicles are goods from any such ferry-boat or bridge on being requested by such roll-collector, lessee or assistant to do so, or who moors any boat, raft or other substance to, or in any way obstructs, any pan of a public ferry, I shall be punished with fine which may extend to fifty rupees.

Section 30 said about the penalty for rash navigation and stacking of timber, whoever navigates, anchors. moors or fastens any vessel or raft, or stacks any timber, in a manner so rash or negligent a to damage a public ferry, shall be punished with imprisonment for a term which may extend to three months, or with fine which may extend lo five hundred rupees, or with both; and the toll-collector or lessee of the tolls of such ferry, or any of his assistants, may seize and detain such vessel, raft or timber pending the inquiry and assessment hereinafter mentioned.

Section 32 of this act deals with penalty on Magistrate may assess damage done by offender, in every magistrate or bench of magistrate trying any offence inquire into and assess the value of the damage done or causes by the offender to the ferry concerned ,and shall order the amount of such value to be paid by him in addition to any fine imposed upon him under this act , and the amount so ordered to be paid shall be leveable as if it were a fine or when the offence is one under section 30 of by the sale of the vessel ,raft or timber causing the damage , and of anything found in or upon such vessel or raft.

The commissioner may, on the appeal of any person deeming him aggrieved by an order under this section, reduce or merit the amount payable under such order.

f) Analysis

This act mainly provide for the maintenance and improvement of waterways in Bengal. The water ways indirectly relate with the Ganga pollution. Ferries include a bridge of boats, pontoons or rafts, a swing-bridge, a flying bridge, and a temporary bridge, and a landing stage. In that case when making on any flying bridge or swing bridge or any other kind of ferries, the ingredients and the other hazards substances through to the river or mix with river water it becomes water polluted and also other materials which is dilute with the water it occurs pollution.

The West Bengal Fisheries (Requisition and Acquisition) Act, 1965

a) Relevant Provisions

Section 4: Power to requisition.

Section 5: Power to acquire requisition fishery and land.

Section 12: Power of state government over fishery and lands requisitioned or acquired.

Section 13: Power to enter upon fishery, etc.

Section 14: Penalty.

b) How the law deals with the subject of fisheries

Fishery means any land where on water is confined naturally or artificially whether periodically or throughout the year for Pisciculture or for fishing and includes a tank fishery as defined in the Explanation to clause (e) of sub-section (1) of section 6 of the West Bengal Estate acquisition Act, 1953, as also the fish in such fishery or tank –fishery, but does not include a tank not exceeding one acre in area adjoining a homestead and used for purposes of irrigation or domestic purpose.

Section 4 of this Act said about (1) if the State Government is of the opinion that any fishery with or without the adjoining lands in any area is needed or is likely to be needed for a public purpose, the state Govt. may, by order in writing, requisition such fishery and all lands within the area and may make such further order or orders as appear to it to be necessary or expedient in connection with the requisition. (2) A collector, when authorised by the State Government in this behalf, may exercise within his jurisdiction the powers conferred by subsection (1). (3) An order under sub section (1) shall be served in the prescribed manner on all owners and occupiers of the fishery and the lands. (4) if any person fails to comply with an order made under sub-sec(1), the collector or any person authorised by him in writing in this behalf ,shall execute the order in such manner as he considers expedient and may- (a) if he is a Magistrate ,enforce the delivery of possession of the fishery and the lands in respect of which the order has been made , to himself, or, (b) if he is not a Magistrate ,apply to a Magistrate and such Magistrate shall enforce the delivery of possession of such fishery and lands to him.

c) Powers Granted Under the Law

Section 5 of this act said about the power to acquire requisitioned fishery and lands, the section provides:

(1) the state government may, at any time when any requisitioned fishery with or without any lands continues to be subject to requisition under section 4, acquire such fishery and by publishing in the official gazette a notice to the effect that such Government has decided to acquire such fishery and lands in pursuance of this section. Provided that before issuing such notice, the State Government shall call upon the owner and any other person who may be interested in such fishery and lands, to show cause within forty five days why the fishery and the lands should not be acquired and after considering the cause, if any, shown and after giving the parties an opportunity of being heard , the state government may pass such order as it deems fit.

(2) When a notice as aforesaid is published in the official gazette, the requisitioned fishery and the lands, if any, shall, on and from the beginning of the day on which the notice is so published, vest absolutely in the State Government free from all encumbrances and the period of requisition of such fishery and lands shall end.

(3) a collector when authorised by the State Government in this behalf, may exercise within his jurisdiction the powers conferred by sub-sec (1)

Sub-Delegation of Powers-

In this Act, section 12, deals with powers of State Government over fishery and lands requisitioned or acquired. The section provide, subject to the provisions of any rule made in this behalf ,on requisition or acquisition of any fishery and lands under this Act, the State Government may use or deal with such fishery and lands for such public purpose or anything ancillary or incidental thereto, as may appear to it to be expedient.

Under Section 13 deals with power to enter upon fishery, etc, the provision states that, the State Government may, with a view to requisitioning any fishery or land or for the purpose of determination by the Collector of the amount of compensation payable under this act, by order- (a) require any person to furnish to such authority as may be specified in the order such information in his possession relating to the property as may be specified. (b) Authorise any person to perform in respect of any fishery or land all or any of the functions referred to in sub-sec (2) of section 4 of the Land Acquisition Act, 1894.

d) Penalty

Section 14 of this Act, deals with Penalty, if any person contravenes any order made under this Act shall be punishable with imprisonment for a term which may extend to one year or with fine which may extend to two thousand rupees or with both.

e) Analysis

This Act provides for the requisition and speedy acquisition of fisheries for the purpose of improvement or development of such fisheries and supplying fish to the public therein. Rapid urbanization, industrialization, and intensification of agriculture have all affected the rivers in different ways in India. Most Indian rivers, at present are highly regulated. Hundreds of multi-purpose reservoirs for water supply, irrigation, hydropower and fisheries have been constructed as well as numerous barrages for water diversion. Many floodplains have been cut out from rivers by embankments and the remaining riparian lands are under intensive agriculture and grazing pressure. Human settlement, deforestation, mining and other activities have degraded the river catchments and increase sediment loads of all rivers. The impact of water abstraction and consequent reduced stream flow has affected breeding and recruitment of fishes. Along the bank of Ganga thousand of villages are situated. Municipal sewage constitutes 80 percent by volume of the total waste dumped into the Ganges, and industries contribute about 15 percent. 'The majority of the Ganga pollution is organic waste, sewage, trash food and human and animal remains. The National

water policy of India stipulates that Minimum water flow should be ensured in the perennial streams for maintaining ecology and social considerations.

The Calcutta Port Act, 1890

a) Relevant Provisions

Section 68: Calcutta Corporation may be required to light, cleanse and water road.

Section 82: Powers with respect to bathing ghat and landing places.

Section 83: wharves etc not to be erected by private person without assent of Central Government.

Section 84: penalty for unlawfully erecting wharves etc.

Section 86: Commissioners provide wharves etc for use of public.

Section 87: Commissioners provide wharves etc for use of custom officers.

Section 90: Commissioner to provide for landing etc goods for sea going vessels.

Section 94: penalty for landing of shipping goods in contravention of order.

b) Analysis

The Commissioners may, without parting with the control of any road or thoroughfare which is open to the public or of the road of any dock. Wharf or jetty, call upon the Corporation of Calcutta, to light, cleanse and, if necessary, water such road ; and then forward the Corporation of Calcutta shall light, cleanse, and, if necessary, water such road.

It shall be law full for the commissioner in meeting if they consider it necessary for the purpose of this Act, to occupy or remove any bathing ghat or landing place within the port and thereafter to prohibit the public from resorting to or using the same because of the bathing ghat increase the number of people increase for bathing purpose and it directly effect from the pollution. It shall not be law full for any person or persons , save the commissioner to make ,erect or fix high watermark within the port any wharf, jetty, stage, pier erection or moving unless the assent of the central government shall have been first obtained. And the person who shall have so made erected or fixed any such matter or thing shall be liable on conviction to a fine which may extend to one hundred rupees and to a further fine which may be extend to one thousand rupees for every day during which such matter thing shall have been permitted to remain so made erected or fixed after notice to remove the same shall have been given to him, if destroy such wharf, jetty, stage, pier, erection then its directly relate with the pollution of river Ganga.

When the Central Government all, under the provisions of any Act for the regulation of duties of customs, appoint any wharf, quay, stage. Jetty or pier erected or acquired under this Act for the use of sea-going vessels to be a wharf for the landing of goods within the meaning of such enactment, the commissioner shall maintain and secure on such jetty, wharf, pier etc. In case any damage or mischief shall done any dock , wharf, pier, stage, jetty constructed or acquired by the commissioners under the provisions of this Act, by any vessel through the negligence of any person having the guidance or command and therefore if they occurred any pollution it shall be law full any Magistrate having jurisdiction in the

place where such damage or mischief occurred is alleged to have been committed on the application of the Commissioner to issue a summons to the master or agent or vessels.

9.3.5 Dams & Diversions

The Bengal Embankment Act, 1882

a) Relevant Provisions

Section 4: Deals with public embankment, etc.

Section 7: Power of collector

Section 15: Special powers which may be conferred by State Government

Section 18: Application for new sluices, embankments or drainage

Section 38: Compensation for consequential damage

Section 76: Penalty for unauthorised interference with embankments or drainage

Section 78: Penalties for diverting rivers or permitting cattle to graze on embankments, etc.

b) How the act deal with the subject of drainage issues

The Bengal Embankment Act, 1882 under section 3 embankment includes – every bank, dam wall and dyke made or used for excluding water from, or for retaining water upon any land. Every sluice, spurs, groyne, training wall, or other work annexed to or portion of, any such embankment. Every bank, dam, dyke, wall, groyne or spur made or erected for the protection of any such embankment or of any land from erosion or overflow by or of rivers, tides, waves or waters. Water course includes a line of drainage, weir, culvert, pipe, or other channel, whether natural or artificial for the passage of water.

Section - 4 deals Public embankment, etc. to vest in Govt., every public embankment and every public water course and all land, earth, pathways, gates, berms and hedges belonging to, or forming part of or standing on any such embankment or water courses and all land, earth, pathways, gates, berms, and hedges, belonging to or forming part of or standing on any such embanked two path maintained, shall vest. The embankment mentioned in schedule D annex to Bengal Act 6 of 1873 and every embankment and water- course which may be included in such schedule under sec. 43 of this act, and every embanked two path as aforesaid, shall be held on behalf and all other public embankments and water- courses shall be held on behalf of the persons interested in the lands to be protected or benefited by such embankments or water-courses, subject to the provisions of sections 87 and all moneys received on account of such lands shall be credited to the cost of the construction and maintenance of such embankments and water – courses respectively.

Section 7, power of collector,

- 1) that any embankment which connects public embankments, or forms by junction with them part of a line of embankments, or that any embankment or water-courses which is necessary for the protection or drainage of the neighboring country, should be taken charge of and maintained by the officers of Govt.

- a) That any embankment which connects public embankments or forms by junction with them part of a line of embankments or is necessary for the protection of the neighboring country should be repaired.
- 2) that any embankment or any obstruction of any kind, which endangers of stability of a public embankment or the safety of any town or village, or which is likely to cause loss of property by interfering with the general drainage or the flood drainage of any tract of land, should be removed or altered.
- 3) that the line of any public embankment should be changed or lengthened, or that any public embankment should be renewed, or that a new embankment should be constructed instead of any public embankment, or that any embankment should be constructed for the protection of any lands or for the improvement of any water-course, or that a sluice in any public embankment should be made.
- 4) That any sluice or water-course should be made or that any public water-course should be altered for the improvement the public health, or for the protection of any village or cultivable land.
- 5) That any road which interferes with the drainage of any tract of land should be altered, or that any water-course under or through such road should be constructed.

c) Powers granted under the law

Sections 15 said that Special powers which may be conferred on State Government. It reads “Notwithstanding anything contained in this part, the may be a special order passed in respect of any act or work specified in section 7, or by a general order in respect of any class of such acts or works, authorize the Collector, after holding such inquiry as is prescribed in section 10, without previous reference to any superior authority, to pass an order that such act or work or any modification thereof may be done or executed or the State Government may authorize the Commissioner to pass such order without previous reference to any superior authority”.

Section 18 said, Application for new sluices, embankments or drainage, (a) If any person desires that a sluice by made in any public embankment for the purpose of drainage or irrigation. Or, (b) if within any tract of country which has been included within a notification under section 6, any person desires that any new embankment be created, that any existing embankment be lengthened, enlarged, repaired or removed, or that that line of any embankment be altered, or that any new water-course be made, or that any water-course be obstructed or diverted.

He may make an application in writing to the Collector. The application shall contain such particulars of the land likely to be affected by the work as may enable the Collector to judge of the advantage which may be derived from the project.

If it should appear to the Collector that the work applied for is one which may probably be executed with advantage the procedure mentioned in the 7th and following section of this Act shall be followed in respect of the proposed work.

Sec. 21 deals State Government may appoint Embankment Committee, The State Government may, if think fit, appoint the Embankment committee for any district and may from time to time appoint and accept the resignation of the members of such committee, and direct that any person shall cease to be a member thereof.

Compensation for consequential damage-

Section 38 of this act said about the compensation for damages. Subject to the provisions of section 5, whenever any land other than land required or taken by the Engineer, or any right of fishery, right of drainage, right of the use of water or other right or property, shall have been injuriously affected by any act done or any work executed under the due exercise of the powers or provisions of this Act, the person in whom such property or right is vested may prefer a claim by petition to the Collector for compensation.

Provided that the refusal to execute any work for which application is made, and the refusal of permission of the collector or any other authority is required under this act, shall not be deemed acts on account of which a claim for compensation can be preferred under this section.

d) Penalties

Section 76 of that act said about Penalty for unauthorised interference with embankments or drainage

- i) Every person, who in any of the territories to which this Act extends, without the previous permission of the Collector, shall erect, or cause or willfully permit to be created, any new embankment or shall add to nay existing embankment, or shall obstruct or divert, or cause or willfully permit to be obstructed or diverted, any water-course. If such act is likely to interfere with, counteract or impede any public embankment or any public water-course.
- ii) Every person who, within the limits of the tract included in any prohibitory notification under section 6, without the previous permission of the Collector, shall erect, or cause or willfully permit to be erected, any new embankment, or shall add to any existing embankment, or shall obstruct or divert, or cause or willfully permit to be obstructed or diverted any water-course and
- iii) Every person who shall abet any such act as is mentioned in clauses (a) and (b). Section 78 deals with the penalties for diverting rivers or permitting cattle to graze on embankments, etc. Every person who shall make any dam or other obstruction for the purpose of diverting or opposing the current of a river or water-course wherein or whereon there are public embankments, without the permission of the officer in immediate charge of the embankments. Or shall refuse or neglect to

remove any such dam or obstruction so made by him when required to remove it by the Engineer, or without the permission of the Engineer previously obtained shall cut or otherwise alter the banks of any embanked river or water-course, or remove the earth from any public embankment, or drive stakes into it, or by any other willful act destroy or diminish the efficiency of such embankment

- iv) And every person who without such permission shall cause or knowingly and willfully permit any cattle to graze upon any such embankment or tether or cause or willfully permit any cattle to be tethered upon any such embankment, or root up any grass or other vegetation growing on any such embankment.

e) Analysis

This act was applicable to the states of West Bengal, Bihar and parts of Orissa. It provided for the construction, maintenance and management of embankments and watercourses. The Act vests certain powers in the Collector such as:

- Removal or alteration of any embankment or obstruction of any kind which is likely to cause loss of property by interfering with the general drainage or the flood drainage of any tract of land;
- Construction of any sluice or water course, or alteration or improvement of any public water course for the improvement of public health or protection of any village or cultivable land;
- Alteration of any road which interferes with the drainage of any tract of land or construction of any watercourse under or through such a road.
- The Collector is required to prepare estimates of the cost of such works, including the cost of establishment charges. Before execution of the work, a public notice to this effect must be given. After hearing the parties and making the appropriate inquiries, the Collector is required to submit a report to the Commissioner.

The state government may consider the report put up by the Commissioner and notify its orders in the official gazette; in the case of imminent danger to life and property, the work may begin, pending the above proceedings. The Act also provides that any person desiring a sluice to be made in any public embankment for the purposes of drainage or irrigation, or a new embankment to be erected, or existing ones to be improved, repaired or enlarged may make an application to the Collector, who decides whether the said work should be executed or not. An interesting feature of the Act is the appointment of embankment committees at the district level. The state government may direct that such a committee shall be consulted by the Collector in the discharge of any function. In the case of a difference of opinion with the committee, the Collector is required to submit the matter to the Commissioner of the division for a decision. The Act also contains elaborate provisions for recovery of costs of works from persons benefited or protected by the works or repairs executed.

Bengal Drainage Act, 1880

a) Relevant provisions

Section 4: State Government to appoint Commissioner.

Section 14: Commissioners how to ascertain that proprietors have assented.

Section 18: Power to proceed with portion of scheme.

Section 20: Power to reconsider scheme and modify it.

Section 24: Claim to compensation for damage caused in carrying out scheme or works.

Section 46: Drainage work to be subject to the laws relating to embankment

b) How the law deals with the subject of drainage and improvement of land

The Bengal Drainage Act, 1880 under section 46 deals with the subject of embankment by determining the applicable law for its regulation. The provision lays down that for the regulation of embankments and drainage works the applicable law will be the law which is for time being regulating the construction and maintenance of public embankments, rivers and outlets.

Section 46- All outlets and water channels, natural or artificial, which shall be altered, enlarged, excavated or cut under the provisions of this Act, and the construction and maintenance of embankments and of dams and works therein or connected therewith, shall, save as herein after provided, be subject to the law for the time being in force regulating the construction and maintenance of public embankments and public rivers, channels and outlets.

c) Institutions formed under the law

Under Section 4 of the Act a commissioner is authorised to appoint. The provision states- whenever it appears expedient to the Government to carry out any scheme and plans for the drainage and improvement of any tract of land, the Govt. may appoint any number of persons, not less than seven, of whom the majority shall be qualified by being holders of land to be affected by the works mentioned in the said scheme and plans, or managers behalf of such holders to be Drainage Commissioners for carrying out the provisions of this Act.

d) Powers granted under the law

The act grants power to the government to make rules under section 18. The power to proceed with portion of scheme, if the land holders of half of the area to be reclaimed and improved do not assent to such scheme, but the landholders of half of the area to be affected by some portion of such scheme assent thereto, the Commissioners may re- submit such portion of the scheme to the Govt. and may with approval proceed thereupon in manner aforesaid.

Under Section 20 of the Act, Power to reconsider scheme and modified. The provision as follows-

- 1) The commissioner may, with the previous assent of the Govt. at any time reconsider any scheme, plans or estimates adopted by them, and add to alter or modify the same. When any addition, alteration or modification has been adopted by them, they shall cause the same to be laid before the Govt. Government may sanction such addition, alteration or modification or any portion thereof, as may think fit.
- 2) The provisions of this act shall apply to such addition, alteration or modification as if had been a portion of the original scheme, plans or estimate and every such addition, alteration or modification, after it has been adopted, shall be published by the commissioner as to them shall seem fit.
- 3) No addition, alteration or modification, under clause (1), to or of any scheme which affects any lands other than those which would be affected by some scheme therefore published, shall be adopted by the commissioner until the same has been published, for not less than fifteen days, according to the provisions of section 12, in every village in which may be situate any portion of the lands to be affected by such addition, alteration or modification.

e) Compensation for damage caused carrying out scheme

Section 24 of this Act, deals with any person who alleged that damage has been caused to his property by scheme or works commenced or carried out under this act may, at any time before the expiry of the three years mentioned in clauses (1) of section 28, prefer to the commissioner a claim for compensation in respect of such damage actually caused, and of all future damage likely to be caused, to such property by such scheme of works.

f) Analysis

The act subjects the drainage and embankment related issues to laws time being in force regulating public embankments etc. The act further talks about appointment of commissioner, committees and drainage schemes. This act provided for the better drainage and improvement of lands.

9.4 Central Legislations

9.4.1 The Environment (Protection) Act, 1986

a) Relevant Provisions

Section 3: Power of central government to take measures to protect and improve environment

Section 4: Appointment of officers and their powers and functions

Section 5: power to give directions

Section 7: persons carrying on industry operation, etc., not to allow emission or discharge of environmental pollutants in excess of the standards

Section 8: persons handling hazardous substances to comply with procedural safeguards

Section 11: power to take sample and procedure to be followed in connection therewith

Section 15: penalty for contravention of the provisions of the act and the rules, orders and directions

Section 18: protection of action taken in good faith

Section 19: cognizance of offences

Section 23: powers to delegate

Section 25: power to make rules

b) How the law deals with the subject of sanitation

The Act deals with the subject of sanitation by prohibiting discharge of environmental pollutants in excess of the standards and making it mandatory for complying with procedural safeguards in case of hazardous substances.

The concerned provisions of the Act are section 7 & 8 which state as under:

“Section 7- No person carrying on any industry, operation or process shall discharge or emit or permit to be discharged or emitted any environmental pollutants in excess of such standards as may be prescribed.”

“Section 8- No person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed.”

c) Institutions formed under the law

The Act provides for the constitution of authorities by Central Government for serving its purpose under Section 3(3).

Section 3(3) states as under-

“The Central Government may, if it considers it necessary or expedient so to do for the purpose of this Act, by order, published in the Official Gazette, constitute an authority or authorities by such name or names as may be specified in the order for the purpose of exercising and performing such of the powers and functions (including the power to issue directions under section 5) of the Central Government under this Act and for taking measures with respect to such of the matters referred to in sub-section (2) as may be mentioned in the order and subject to the supervision and control of the Central Government and the provisions of such order, such authority or authorities may exercise and powers or perform the functions or take the measures so mentioned in the order as if such authority or authorities had been empowered by this Act to exercise those powers or perform those functions or take such measures.”

d) Powers granted under the law

Powers of the Central Government under this Act is given under section 3.

Section 3: Power of central government to take measures to protect and improve environment

(1) Subject to the provisions of this Act, the Central Government shall have the power to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing controlling and abating environmental pollution.

(2) In particular, and without prejudice to the generality of the provisions of sub-section (1), such measures may include measures with respect to all or any of the following matters, namely:--

- i) Co-ordination of actions by the State Governments, officers and other authorities--
 - (a) Under this Act, or the rules made there under, or
 - (b) Under any other law for the time being in force which is relatable to the objects of this Act;
- ii) Planning and execution of a nation-wide programme for the prevention, control and abatement of environmental pollution;
- iii) Laying down standards for the quality of environment in its various aspects;
- iv) Laying down standards for emission or discharge of environmental pollutants from various sources whatsoever;

Provided that different standards for emission or discharge may be laid down under this clause from different sources having regard to the quality or composition of the emission or discharge of environmental pollutants from such sources;

- v) restriction of areas in which any industries, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards;
- vi) laying down procedures and safeguards for the prevention of accidents which may cause environmental pollution and remedial measures for such accidents;
- vii) laying down procedures and safeguards for the handling of hazardous substances;
- viii) examination of such manufacturing processes, materials and substances as are likely to cause environmental pollution;
- ix) carrying out and sponsoring investigations and research relating to problems of environmental pollution;
- x) inspection of any premises, plant, equipment, machinery, manufacturing or other processes, materials or substances and giving, by order, of such directions to such authorities, officers or persons as it may consider necessary to take steps for the prevention, control and abatement of environmental pollution;
- xi) establishment or recognition of environmental laboratories and institutes to carry out the functions entrusted to such environmental laboratories and institutes under this Act;
- xii) collection and dissemination of information in respect of matters relating to environmental pollution;
- xiii) preparation of manuals, codes or guides relating to the prevention, control and abatement of environmental pollution;

xiv) such other matters as the Central Government deems necessary or expedient for the purpose of securing the effective implementation of the provisions of this Act.

e) Power of Central Government to appoint officers for the purpose of the Act

“Section 4: (1) Without prejudice to the provisions of sub-section (3) of section 3, the Central Government may appoint officers with such designation as it thinks fit for the purposes of this Act and may entrust to them such of the powers and functions under this Act as it may deem fit.

(2) The officers appointed under sub-section (1) shall be subject to the general control and direction of the Central Government or, if so directed by that Government, also of the authority or authorities, if any, constituted under sub-section (3) of section 3 or of any other authority or officer.”

f) Power of Central Government to give directions

“Section 5: Notwithstanding anything contained in any other law but subject to the provisions of this Act, the Central Government may, in the exercise of its powers and performance of its functions under this Act, issue directions in writing to any person, officer or any authority and such person, officer or authority shall be bound to comply with such directions.

Explanation--For the avoidance of doubts, it is hereby declared that the power to issue directions under this section includes the power to direct--

(a) the closure, prohibition or regulation of any industry, operation or process; or

(b) stoppage or regulation of the supply of electricity or water or any other service.”

In addition to these powers under section 11, the Central Government or any other officer empowered by it in this behalf, shall have power to take, for the purpose of analysis, samples of air, water, soil or other substance from any factory, premises or other place in such manner as may be prescribed.

It is pertinent to note the powers of Central Government to make rules on the matters so enumerated under section 25(2). The matters affecting sanitation include-

(a) the standards in excess of which environmental pollutants shall not be discharged or emitted under section 7;

(b) the procedure in accordance with and the safeguards in compliance with which hazardous substances shall be handled or caused to be handled under section 8;

(c) the authorities or agencies to which intimation of the fact of occurrence or apprehension of occurrence of the discharge of any environmental pollutant in excess of the prescribed

standards shall be given and to whom all assistance shall be bound to be rendered under sub-section (1) of section 9;

(d) the manner in which samples of air, water, soil or other substance for the purpose of analysis shall be taken under sub-section (1) of section 11;

(f) the functions of the environmental laboratories, the procedure for the submission to such laboratories of samples of air, water, soil and other substances for analysis or test; the form of laboratory report; the fees payable for such report and other matters to enable such laboratories to carry out their functions under sub-section (2) of section 12.

g) Sub-Delegation of Powers

The Central Government can delegate its power to state government or any other authority or officer under section 23.

“Section 23: Without prejudice to the provisions of sub-section (3) of section 3, the Central Government may, by notification in the Official Gazette, delegate, subject to such conditions and limitations as may be specified in the notifications, such of its powers and functions under this Act [except the powers to constitute an authority under sub-section (3) of section 3 and to make rules under section 25] as it may deem necessary or expedient, to any officer, State Government or other authority.”

h) Penalties

On failure to comply with the provisions of this Act, or the rules made or orders or directions issued there under, the person who is in non-compliance will be punishable with imprisonment for a term which may extend to five years and with fine which may extend to one lakh rupees, or with both, and in case the failure or contravention continues, an additional fine may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention. Further, if the failure or contravention referred to in sub-section (1) continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term which may extend to seven years. Such provision is made under section 15 of the Act.

Under section 18 no suit, prosecution or other legal proceeding shall lie against the Government or any officer or other employee of the Government or any authority constituted under this Act or any member, officer or other employee of such authority in respect of anything which is done or intended to be done in good faith in pursuance of this Act or the rules made or orders or directions issued there under.

As per section 19, no court shall take cognizance of any offence under this Act except on a complaint made by-

(a) The Central Government or any authority or officer authorised in this behalf by that Government, or

(b) Any person who has given notice of not less than sixty days, in the manner prescribed, of the alleged offence and of his intention to make a complaint, to the Central Government or the authority or officer authorised as aforesaid.

i) Analysis

The Environment (Protection) Act, 1986 is a general Act dealing with regulation and control of pollution of environment. Though the Act does not directly refer to the matter of pollution of water sources or specifically river Ganga, it has direct applicability on it. Therefore, the Act being a central legislation serves as an umbrella legislation aiding in the regulation and control of pollution in all water sources including river Ganga.

Water (Prevention and Control of Pollution) Act, 1974

a) Relevant Provisions

Section 3: Constitution of Central Board.

Section 4: Constitution of State Boards.

Section 11 A: Delegation of powers to Chairman

Section 16: Functions of Central Board

Section 17: Function of State Board.

Section 19: Power of State Government to restrict the application of the Act to certain areas

Section 20: Power to obtain information.

Section 21: Power to take sample of effluents and procedure to be followed in connection therewith.

Section 24: Prohibition on use of stream or well for disposal of polluting matter. etc.

Section 25: Restrictions of new outlets and new discharges.

Section 26: Provision regarding existing discharge of sewage or trade effluent.

Section 32: Emergency measures in case of pollution of stream or well.

Section 33: Power of Board to make application to courts for restraining apprehended pollution of water in streams or wells.

Section 33A: Power to give directions.

b) How the Act is dealing with Subject of Sanitation

The Act deals with the subject of sanitation by under chapter V where it provides for various regulations and directions for disposal of wastes and effluents in water streams. The Act empowers the State government to restrict the application of this Act to certain areas within the state under section 19. Further, the state government is also empowered to obtain information regarding any abstraction of water from a stream or disposal of waste in it, maintenance of any gauge or any other apparatus relating to a stream and survey the stream under section 20 of the Act.

The most important provision under water (prevention and control of pollution) act, 1974 regulating the pollution in water streams (river Ganga) is Section 24(1). The provision prohibits any intentional act of pollution in any water stream.

The provision states as under

“Section 24 (1) Subject to the provisions this section

- (a) no person shall knowingly cause or permit any poisonous, noxious or polluting matter determined in accordance with such standards as may be laid down by the State Board to enter (whether directly or indirectly) into any 3[stream or well or sewer or on land];
or
- (b) no person shall knowingly cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a manner leading or likely to lead to a substantial aggravation of pollution due to other causes or of its consequences.”

The major drawback of this provision is that it prohibits only acts done knowingly, this particular clause in the provision can be misused by the people. It is possible for people to pollute a water stream and save themselves from liability by pleading that the act was done unknowingly. To curb pollution in more effective way the Act should out rightly prohibit any act of disposal of waste whether done knowingly or unknowingly in any water stream.

Section 24 further enumerates certain exempted activities in its sub-section 2 which do not attract the application of sub-section 1. Also under 24(3) The State Government may, exempt, by notification in the Official gazette, any person from the operation of sub-section (1).

Another important provision dealing with the issue of sanitation is under section 25 which prohibits the establishment of industry operation or any other process which is likely to discharge sewage or trade effluent in water stream without the consent of State Board. The entire provision deals elaborately with the procedure to grant consent for establishment and safeguards used before such a grant. It also deals with the situation when any establishment is made without the consent of the State Board.

“Section-25- (1) Subject to the provisions of this section, no person shall, without new outlets and the previous consent of the State Board,-

- (a) Establish or take any steps to establish any industry operation or process, or any treatment and disposal system or an extension or addition thereto, which is likely to discharge- sewage or trade effluent into a stream or well or sewer or on land (such discharge being hereafter in this section referred to as discharge of sewage); or
- (b) Bring into use any new or altered outlets for the discharge of sewage; or
- (c) Begin to .make any new discharge of sewage:

Provided that a person in the process of taking any steps to establish any industry, operation or process immediately before the commencement of the Water (Prevention and Control of Pollution) Amendment Act, 1988, for which no consent was necessary prior to such commencement, may continue to do so for a period of three months from such

commencement or, if he has made an application for such consent, within the said period of three months; till the disposal of such application,

(2) An application for consent of the State Board under sub-section (1) shall be made in such form, contains such particulars and shall be accompanied by such fees as may be prescribed.

(3) The State Board may make such inquiry as it may deem in respect of the application for consent referred to in sub-section (1) and in making any such inquiry shall follow such procedure as may be prescribed.

(4) The State Board may-

(a) grant its consent referred to in sub-section (1), subject to such conditions as it may impose, being-

- i) in cases referred to in clauses (a) and (b) of sub-section (J) of section 25, conditions as to the point of discharge of sewage or as to the use of that outlet or any other outlet for discharge of sewage;
- ii) in the case of a new discharge, conditions as to the nature and composition, temperature, volume or rate of discharge of the effluent from the land or premises from which the discharge or new discharge is to be made; and
- iii) that the consent will be valid only for such period as may be specified in the order, and any such conditions imposed shall be binding on any person establishing or taking any steps to establish any industry, operation or process, or treatment and disposal system or extension or addition thereto, or using the new or altered outlet, or discharging the effluent from the land or premises aforesaid; or

(b) Refuse such consent for reasons to be recorded in writing.

(5) Where, without the consent of the State Board, any industry operation or process, or any treatment and disposal system or any extension or addition thereto, is established,' or any steps for such establishment have been taken or a new or altered outlet is brought into use for the discharge of sewage or a new discharge of sewage is made, the State Board may serve on the person who has established or taken steps to establish any industry, operation or process, or any treatment and disposal system or any extension or addition thereto, or using the outlet, or making the discharge, as the case may be, a notice imposing any such conditions as it might have imposed on an application for its consent in respect of such establishment, such outlet or discharge.

(6) Every State Board shall maintain a register containing particulars of conditions imposed under this section' and so much of the register as relates to any outlet, or to any effluent, from any land "or premises shall be open to inspection at all reasonable hours by any person interested in, or affected by such outlet, land or premises, as the case may be, or by any person authorized by him in this behalf and the conditions so

contained in such register shall be conclusive proof that the consent was granted subject to such conditions.

(7) The consent referred to in sub-section (1) shall, unless given or refused earlier, be deemed to have been given unconditionally on the expiry of a period of four months of the making of an application in this behalf complete in all respects to the State Board.

(8) For the purposes of this section and sections 27 and 30,-

(a) the expression "new or altered outlet" means any outlet which is \wholly or partly constructed on or after the commencement of this act or which whether so constructed or not) is substantially altered after such commencement;

(b) the expression "new discharge" means a discharge which is not, as respects the nature and composition, temperature, volume, and "rate of discharge of the effluent substantially a continuation of a discharge made within the preceding twelve months (whether by the same or different outlet), so however that a discharge which is in other respects a continuation of previous discharge made as aforesaid shall not be deemed to be a new discharge by reason of any reduction of the temperature or volume or rate of discharge of the effluent as compared with the previous discharge."

Further if any discharge of effluents is been carried out by any person before commencement of this Act then he has to apply for consent in accordance with section 25(2) within a specified period.

In case a river or a water stream gets accidentally polluted, section 32 comes into operation-

"Section 32(1) Where it appears to the State Board that any poisonous, noxious or polluting matter is present in any stream or well or on land by reason Of the discharge of such matter in such stream or well or on such land] or has entered into that stream or well due to any accident or other unforeseen act or event, and if the Board is of opinion that it is necessary or expedient to take immediate action, it may for reasons to be recorded in writing, carry out such operations as it may consider necessary for all or any of the following purposes, that is to say,-

(a) removing that matter from the stream or well or on land]and disposing it of in such manner as the Board considers appropriate;

(b) Remedying or mitigating any pollution caused by its presence in the stream or well;

(c) issuing orders immediately restraining or prohibiting the persons concerned from discharging any poisonous, noxious or polluting matter into the stream or well or on land or from making in sanitary use of the stream or well.

(2) The power conferred by sub-section (1) does not include the power to construct any works other than works of a temporary character, which are removed on or before the completion of the operations."

c) Institutions formed under the law

1. Central board

The Central government has constituted a central Board in the below enumerated states, under section 3 of the Act and declared the same as a body corporate with perpetual succession.

“Section 3 (1) The Central Government shall, with effect from such date (being a date not later than six months of the commencement of this Act in the States--of Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Prudish, Rajasthan, Tripura and West Bengal and in the Union territories) as it may, by notification in the Official Gazette, appoint, constitute a Central Board to be called the Central Pollution Control Board to exercise the powers conferred on and perform the functions assigned to that Board under this act.”

Constitution of Central Board: The constitution of Board under sub-section 2 is as follows

1. A full-time chairman, being a person having special knowledge or practical experience in respect of matters relating to environmental protection, nominated by the Central Government;
2. Maximum five officials, nominated by the Central Government to represent that Government;
3. Maximum five members of state board nominated by the Central Government, of whom not exceeding two shall be from those referred to in clause (c) of sub- section (2) of section 4;
4. Maximum three non-officials nominated by Central Government, representing the interests of agriculture, fishery or industry or trade or any other interest which, in the opinion of the Central Government, ought to be represented;
5. Two persons to representing companies or corporations owned, controlled or managed by the Central Government, to be nominated by that Government;
6. A full-time member-secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the Central Government.

2. State Boards

Under Section 4(1) the State Government has constituted a State Pollution Control Board and declared it to be a body corporate.

The constitution of such a Board is as follows-

- (a) A chairman (either full-time or Whole-time) being a person having special knowledge or practical experience in respect of matters relating to environmental protection, nominated by the State Government;
- (b) Maximum five officials, nominated by the State Government to represent that Government;
- (c) Maximum five members of local authorities functioning within the state, nominated by the State Government.
- (d) Maximum three members representing the interest of agriculture, fishery or industry or trade or any other interest which, to be nominate by State Government.
- (e) Two persons to represent the companies or corporations owned, controlled or managed by the State Government, to be nominated by that Government;
- (f) A full-time member-secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the State Government.

d) Powers granted under the law

A. Functions of Central Board as per section 16

- (1) To promote cleanliness of streams and wells in different areas of the States.
- (2) Without prejudice to the generality of the prior function, the Central Board may perform all or any of the following functions, namely:-
 - (a) Advise the Central Government on any matter concerning the prevention and control of water pollution;
 - (b) Co-ordinate the activities of the State Boards and resolve dispute among them;
 - (c) provide technical assistance and guidance to the State Boards, carry out and sponsor investigations and research relating to problems of water pollution and prevention, control or abatement of water pollution;
 - (d) plan and organize the training of persons engaged or to be engaged in programmes for the prevention, control or abatement of water pollution on such terms and conditions as the Central Board may specify;
 - (e) Organise through mass media a comprehensive programme regarding the prevention and control of water pollution and perform such of the functions of any State Board as may be specified in an order made under sub-section (2) of section 18
 - (f) collect, compile and publish technical and statistical data relating to 'water pollution and the measures devised for its effective prevention and control and prepare manuals, codes or guides relating to treatment of water ,works for the purification thereof and the system for the disposal of sewage or trade effluents and disseminate information connected therewith;

- (g) lay down, modify or annul, in consultation with the State Government concerned, the standards for a stream or well.

Provided that different standards may be laid down for the same stream or well or for different streams or wells, having regard to the quality of water, flow characteristics of the stream or well and the nature of the use of the water in such stream or well or streams or wells;

- (h) plan and cause to be executed a nation-wide programme for the prevention, control or abatement of water pollution;
- (i) perform such other functions as may be prescribed.

The Board may also establish or recognize a laboratory or laboratories to enable the Board to perform its functions under this section efficiently, including the analysis of samples of water from any stream or well or of samples of any sewage or trade effluents.

B. Functions of State Board as per section 17

- (a) to plan a comprehensive programme for the prevention, control or abatement of pollution of streams and wells in the State and to secure the execution thereof;
- (b) to advise the State Government on any matter concerning the prevention, control or abatement of water pollution;
- (c) to collect and disseminate information relating to water pollution and the prevention control or-abatement thereof;
- (d) to encourage, conduct and participate in investigations and research relating to problems of water pollution and prevention, control or abatement of water pollution;
- (e) to collaborate with the Central' Board in organizing the training of persons engaged or to be engaged in programmes relating to prevention, control or abatement of water pollution and to organize mass education programmes relating thereto;
- (f) to inspect sewage or trade effluents, works and plants for the treatment of sewage and trade effluents and to review plans, specifications or other data relating to plants set up for the treatment of water, works for the purification thereof and the system for the disposal of sewage or trade effluents or in connection with the grant of any consent as required by this Act;
- (g) lay down, modify or annul effluent standards for the sewage and trade effluents and for the quality of receiving waters (not being water in an inter-State stream) resulting from the discharge of effluents and to classify waters of the State;
- (h) to evolve economical and reliable methods of treatment of sewage and trade effluents, having regard to the peculiar conditions of soils, climate and water resources of different regions and more especially the prevailing flow characteristics of water in streams and wells which render it impossible to attain even the minimum degree of dilution;
- (i) To evolve methods of utilization of sewage and suitable trade effluents in agriculture;

- (j) to evolve efficient methods of disposal of sewage and trade effluents on land, as are necessary on account of the predominant conditions of scant stream flows that do not provide for major part of the year the minimum degree of dilution;
- (k) to lay down standards of treatment of sewage and trade effluents to be discharged into any particular stream taking into account the minimum fair weather dilution available in that stream and the tolerance limits of pollution permissible in the water of the stream, after the discharge of such effluents;
- (l) to make, vary or revoke any order-
 - (i) for the prevention, control or abatement of discharges of waste into streams or wells;
 - (ii) requiring any person concerned to construct new systems for the disposal of sewage and trade effluents or to modify, alter or extend any such existing system or to adopt such remedial measures as are necessary to prevent control or abate water pollution;
- (m) to lay down effluent standards to be complied with by persons while causing discharge of sewage or sludge or both and to lay down, modify or annul effluent standards for the sewage and trade effluents;
- (n) to advise the State Government with respect to the location, of any industry the carrying on of which is likely to pollute a stream or well
- (o) to perform such other functions as may be prescribed or as may, from time to time be entrusted to it by the Central Board or the State Government.

The Board may also establish or recognize a laboratory or laboratories to enable the Board to perform its functions under this section efficiently, including the analysis of samples of water from any stream or well or of samples of any sewage or trade effluents.

Powers

- 1) Power of Board under section 33 to make application to courts for restraining apprehended pollution of water in streams or wells.

“Section 33(1) Where it is apprehended by a Board that the water in any stream or well is likely to be polluted by reason of the disposal or likely disposal of any matter in such stream or well or in any sewer, or on any land, or, otherwise, the Board may make an application to a court, not inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of the first class, for restraining the person who is likely to cause such pollution from so causing.”

- 2) Power of Boards to give directions under section 33(A)

The power to issue directions under this section includes the power to direct-

- (a) the closure, prohibition or regulation of any industry, operation or process; or
- (b) the stoppage or regulation of supply of electricity, water or any other service.

e) Penalties

Punishment for non-compliance under this Act mainly affecting water pollution is under section 41.

“Section 41 (1) Whoever fails to comply with any direction given under sub- section (2) or sub-section (3) of section 20 within such' time as may be specified in the direction shall , on conviction, be punishable with imprisonment for a term which may extend to three months or with fine which may extend to ten thousand rupees or with both and in case the failure continues, with an additional fine which may extend to five thousands rupees for every day during which such failure continues after the conviction for the first such failure.”

f) Analysis

The Water (Prevention and Control of pollution) Act, 1974 is a very comprehensive piece of legislation dealing extensively and particularly with the subject of water pollution. Hence it is one of the most important legislations affecting the sanitation of river Ganga. One of the major drawbacks of the Act is the quantum of penalty imposed on persons who violate its provision. In prevailing era a penalty of Rupees ten thousand is highly insufficient and plays hardly any prohibitive role in control of water pollution when compared to the large benefits and profits gained by polluters who indulge in various industrial operations. Hence for more effective observance of this Act severe and prohibitive penalties are to be imposed on the violators.

The Water (Prevention and Control of Pollution) Cess Act, 1977

a) Relevant provisions

Section 3: levy and collection of cess

Section 8: crediting proceeds of cess to consolidated funds of India and application thereof

Section 9: Power of Entry

Section 11: Penalty of Amount due Under the Act

Section 14: Penalty

Section 15: Offences by Companies

Section 17: Power to Make Rules

b) Deal within the subject of Water Prevention and Control of Pollution

The Act deals with the subject of Water prevention and how to control pollution. Sections 3, 5, 6, 7 provide for various regulations and directions. There shall be levied and collected a cess for the purpose of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and utilisation there under. (2) The cess under sub-section (1) shall be payable by- (a) every person carrying on any specified industry; and (b) every local authority, and shall be calculated on the basis of water consumed by such person or local authority, as the case may be, for any of the purposes specified in column (1) of Schedule II, at such rate, not exceeding the rate specified in the corresponding entry in column (2) thereof, as the Central Government may, by notification in the Official Gazette, from time to time, specify.

[(2A) Where any person carrying on any specified industry or any local authority consuming water for domestic purpose liable to pay cess fails to comply with any of the provisions of section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) or any of the standards laid so down by the Central Government under the Environment (Protection) Act, 1986, cess shall be and payable at such rate, not exceeding the rate specified in column (3) of Schedule II, as the Central Government may, by notification in the Official Gazette, from time to time specify.]

(3) Where any local authority supplies water to any person carrying on any specified industry or to any other local authority and such person or other local authority is liable to pay cess under sub-section (2) or sub-section (2A) in respect of the water so supplied, then, notwithstanding anything contained in that sub-section, the local authority first mentioned shall not be liable to pay such cess in respect of such water.

Explanation--For the purpose of this section and section 4, "consumption of water" includes supply of water.

In section 15 Offences by Companies:

(1) Where an offence under this Act has been committed by a company, every person who, at the time the offence was committed, was in charge of and was responsible to, the company for the conduct of the business of the company as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly:

Provided that nothing contained in this sub-section shall render any such person liable to any punishment, if he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

c) Institutions formed under the law

Section 9: Any officer or authority of the State Government specially empowered in this behalf by that Government may,-

(a) with such assistance, if any, as he or it may think fit, enter at any reasonable time any place which he or it considers it necessary to enter for carrying out the purposes of this Act including the testing of the correctness of the meters affixed under section 4;

(b) do within such place anything necessary for the proper discharge of his or its duties under this Act; and

(c) exercise such other powers as may be prescribed

Section 11: Penalty of amount due under the act,

If any amount of cess payable by any person carrying on any specified industry or any Local authority under section 3 is not paid to the State (government within the date specified in the order of assessment made under section 6, it shall be deemed to be in arrears and the authority prescribed in this behalf may, after such inquiry as it deems fit, impose on such person Of, as the case may be, Local authority, a penalty not exceeding the amount of cess in arrears:

Provided that before imposing any such penalty, such person or, as the case may be, the local authority shall be given a reasonable opportunity of being heard and if after such hearing the said authority is satisfied that the default was for any good and sufficient reason, no penalty shall be imposed under this section.

d) Power granted under the law

(1) The Central Government may, by notification in the Official Gazette, add to Schedule I any industry having regard to the consumption of water in the carrying on of such industry and the consequent discharge thereof resulting in pollution of any stream and thereupon Schedule I shall, subject to the provisions of sub-section (2), be deemed to be amended accordingly.

(2) Every such notification shall be laid before each House of Parliament, if it is sitting, as soon as may be after the issue of the notification and if it is not sitting, within seven days of its re-assembly and the Central Government shall seek the approval of Parliament to notification by a resolution moved within a period of fifteen days beginning with the day on which the notification is so laid before the House of the People, and if Parliament makes any modification in the notification or directs that the notification should cease to have effect, the notification shall thereafter have effect only in such modified form or be of no effect, as the case may be, but without prejudice to the validity of anything previously done there under.

Section 17, deals with power to make rules, (1) The Central Government may make rules for carrying out the purposes of this Act. (2) Without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:-

- (a) the standards of the meters to be affixed and the places at which such meters are to be affixed under sub-section (1) of section 4;
- (b) the returns to be furnished under section 5, the form in which and the intervals at which such returns are to be furnished, the particulars which such returns contain and the officer or authority to who or which such returns shall be furnished;
- (c) the manner in which and the time within which the cess collected shall be paid to the Central Government under sub-section (4) of section 6;

- (d) the date from which any person or local authority liable to pay cess shall be entitled to the rebate 8[and the maximum quantity of water in excess of consumption whereof any person or local authority shall not be entitled to the rebate] under section 7.
 - (e) the powers which may be exercised by the officer or authority under section 9;
 - (f) the authority which may impose penalty under section 11;
 - (g) the authority to which an appeal may be filed under sub-section (l) of section 13 and the time within which and the form and manner in which such appeal may be filed;
 - (h) the fees which shall accompany an appeal under sub-section (2) of section 13; and
 - (i) any other matter which has to be or may be prescribed.
- (3) Every rule made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament while it is in session for a total period of thirty days which may be comprised in one session or in two successive sessions and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

e) Penalties

Section 14:

- (1) Whoever, being under an obligation to furnish a return under this Act, furnishes any return knowing, or having reason to believe, the same to be false shall be punishable with imprisonment which may extend to six months or with fine which may extend to one thousand rupees or with both.
- (2) Whoever, being liable to pay cess under this Act will fully or intentionally evades or attempts to evade the payment of such cess shall be punishable with imprisonment which may extend to six months or with fine which may extend to one thousand rupees or with both.
- (3) No court shall take cognizance of an offence punishable under this section save on a complaint made by or under the authority of the Central Government.

f) Analysis

This Act provides for the levy and collection of cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

10. Relevant Provisions of State Legislatures in Upper, Middle and Lower Stretch

10.1 Upper Stretch of Ganga

India's national River "Ganga" originates from Gangotri. "Ganga" is a trans-boundary river of India and Bangladesh. The 2,525 km (1,569 mile) river rises in the western Himalayas in the Indian state of Uttarakhand, and flows south and east through the Gangetic Plain of North India into Bangladesh, where it empties into the Bay of Bengal. By discharge it ranks among the world's top 20 rivers.

The Ganges basin is the most heavily populated river basin in the world, with over 400 million people and a population density of about 1,000 inhabitants per square mile (390/km). The Bhagirathi is considered to be the true source of Ganga and it rises at the foot of Gangotri Glacier, at Gaumukh.

The flow of Ganga in Uttaranchal is considered as the upper stretch of Ganga and Legislations has been identified which are considered as relevant to the Ganga Basin in Uttaranchal. In upper stretch the main issue of Ganga Basin is "Sanitation including the cremation activities and religious activities".

Further 'Authorities'¹ under all such legislations pointed out and their power function and jurisdictions have been discussed. The following Authorities established under the various legislations of this stretch have been examined:

1. Municipal Council or Nagar Panchayat [Uttar Pradesh Municipalities Act (Uttaranchal Sanshodhan) Act, 2001], Act {U.S- 1}
2. Gram Panchayat and State Government [The Uttar Pradesh Panchayat Raj Act 1947 (Uttaranchal Amendment) Act, 2002], Act {U.S- 2}
3. Executive Committee and Development Agency [The Uttaranchal River Valley (Development and Management) Act, 2005], Act {U.S- 3}
4. Bhagirathi River Valley Authority [The Uttar Pradesh Bhagirathi River Valley Authority Act, 1999], Act { U.S- 4}

Legislation Identification	Subject Covered	Gap
Act U.S- 1	1. Under the Act duties of the authority has not been clearly mentioned.	
Act U.S- 2	1. The duty of the Gram Panchayat is not mentioned under the Act.	

¹ "Authorities" means agency or body or individuals entrusted with the responsibility under any of the legislations.

Act U.S- 3	<ol style="list-style-type: none"> 1. The authority is empowered to look after the basin (the entire catchment area of the Valley). 2. The authority may establish botanical garden to maintain its flora and fauna 3. The authority is in process to implement water quality monitoring system 	<ol style="list-style-type: none"> 1. Basin Contamination Measurement System 2. Maintenance of minimum flow & Environmental Flow 3. Issues relating to Hydrology
Act U.S- 4	<ol style="list-style-type: none"> 1. The authority after consultation with the Ministry of Forest and Environment, appoint expert technical advisors in the fields of: <ul style="list-style-type: none"> • Environment Management • Environment Geology • Eco-System Planning • Integrated Energy Planning • Social Science • Forest Ecology 2. Preparation of a 'Master plan', which includes: <ul style="list-style-type: none"> • the carrying capacity of the basin • outline the development schemes with alternative schemes for the development of the basin • demarcate the land for various use and purposes; 	

Interestingly, the Authorities under Uttranchal River Valley Act are working on a Development Plan to achieve the optimum utilisation of natural resources and sustainable development of the River Basin. Further, they are controlling the management of the Soil erosion in the river basins of Uttranchal. The commercial mining in the catchment area of river basin, without the permission of Authority, has been prohibited. Further it has been found that no suit, prosecution or other legal proceeding shall be laid against the Authority or any member or officer thereof in respect of anything which is in good faith done or intended to be done in pursuance of the Uttar Pradesh Bhagirathi River Valley Authority Act, 1999.

Jurisdictional Aspect

As such there has not been any jurisdictional conflict recorded among the above mentioned Legislation.

To conclude, there is an attempt to legislate on the issues, relating to development, soil erosion, etc., it is highly desirable to enact a law on preservation and protection of Ganga.

10.2 Middle Stretch of Ganga

The middle stretch of Ganga flows through the States of Uttar Pradesh, Bihar and Jharkhand. The local legislations of the above mentioned States are analysed in the Middle stretch. The Legislations which have been discussed in the 'report' were chosen on the following grounds:

- Sanitation
- Industrial pollution
- Agriculture
- Commercial use of Water ways
- Dams and Diversion

'Authorities'² under all such legislations have been pointed out and their powers, functions and jurisdictions have been discussed. The following are the various 'Authorities' under all Legislations of Uttar Pradesh and Bihar.

10.2.1 Sanitation

Central Legislation

1. Central Government [The Environment (Protection) Act, 1986]

State Legislations

2. Uttar Pradesh State Ganga River Conservation Authority consisting of the Ministers of the State [Uttar Pradesh State Ganga River Conservation Authority, vide SO 2493(E), 30th Sep. 2009- Central Notifications], Notification {M.S- 1}
3. Jal Nigam and Jal Sansthan [Uttar Pradesh water Supply and Sewerage Act, 1975], Act {M.S- 2}

Legislation Identification	Sanitation Subject Covered	Gap
Notification M.S- 1	1. Authority covers the area of "sewage infrastructure, sewage treatment system and control of pollution in River Ganga".	1. Issues relating to Hydrology 2. Basin flow Monitoring System 3. Restriction of usage of basin for religious and

² "Authorities" means agency or body or individuals entrusted with the responsibility of execution under any of the legislations.

		cultural activities 4. Prevention of obstructions on flow of River
Act M.S- 2	<ol style="list-style-type: none"> 1. The authority inspects all water supply and sewerage facilities in the State 2. It may carry any water or sewerage works through, under or over any highway, road, street, or other place after reasonable notice from the authority to the owner or occupier under any land or building 3. Authority has the power to abstract water from any natural source and dispose of waste water 	1. Basin Contamination Measurement System

10.2.2 Industrial Pollution

Central legislation and Delegated legislation

1. Central and State Board [Water (Prevention and Control of Pollution) Act, 1974]
2. Assessing Authority and State Government [Water (Prevention and Control of Pollution) Cess Rules, 1978]
3. Central Pollution Control Board and State Government, [The Hazardous Waste (Management and Handling) Rules, 1989 (Amendment 2003)]

An important case in this regard has been discussed below:

M C Mehta v/s. Union of India³ (Kanpur Tanneries)

This is one of the most significant water pollution cases till date.

Fact of the case: In 1985 a writ petition has been filed under Article 32 of the Indian Constitution against the tanneries to stop polluting the Ganga with sewage and trade effluents. It was found that there were hundreds of polluters discharging their untreated wastes in the Ganga every day at Jajmau near Kanpur. The issues which rose during the case were:

- a) The polluted condition of river Ganga more than two decades after the enactment of Water Act;
- b) The basis for the court's jurisdiction under Article 32;

² AIR 1988 SC 1037

Legislations and Provisions mentioned

- Water (Prevention and Control of Pollution) Act, 1974 – sections 3, 4, 16, 20, 21, 23, 24, 32
- The Environment (Protection) Act, 1986- section 17
- Uttar Pradesh Nagar Mahapalika Adhiniyam Act, 1959- sections 3, 114, 251, 388, 396, 297, 398, 405, and 407

Judgment: Finally, the court ordered “a tannery which cannot set up a primary treatment plant couldn’t be permitted to continue to be in existence. The financial capacity of the tanneries was to be considered as irrelevant while requiring them to establish primary treatment plants. The tanneries which failed to take minimum steps required for the primary treatment of industrial effluent were closed down by Court order. This case emphasized on the protection of environment over the economic interests and creates high standards of accountability for the concerned statutory bodies.

In the year 2009, in a newspaper it has been found that several teams constituted by the UP Pollution Control Board inspected 44 tanneries in Kanpur district. The teams were constituted by the UPPCB as a follow-up to an order passed by the Allahabad High Court early in November 2009⁴.

10.2.3 Agriculture

State legislations

1. A Betterment Levy officer, a Collector, a Block development officer, Engineer, Canal Officer [Bihar Irrigation Act, 1997], Act {M.S- 3}
2. A Tube-well Officer, Superintending Engineer, Divisional Officer, Sub-Divisional Officer [The Uttar Pradesh State Tube-Wells Act, 1936], Act {M.S- 4}
3. The Collector, the Officer-in-Charge [The Uttar Pradesh Minor Irrigation Works Act, 1920], Act {M.S- 5}
4. The Collector [Bihar Emergency Cultivation & Irrigation Act, 1955], Act {M.S- 6}
5. The Fishery Officer, a Police Officer not below the rank of Sub-Inspector as a Official [The U.P Fisheries Act, 1948], Act {M.S- 7}

Legislation Identification	Agriculture Subject Covered	Gap
Act M.S- 3	<ol style="list-style-type: none"> 1. The authority controls the drainage channels and water logging within the State. 2. The Authority has the power to repair any existing irrigation work and construct any new work. 	<ol style="list-style-type: none"> 1. Restriction on usage of water from River Basin in Agriculture.

⁴ Available at <http://www.indiaenvironmentportal.org.in/category/thesaurus/kanpur-tannery-case>

	3. Authority controls the navigation as well as the flow of the village channels.	
Act M.S- 4	1. Authority may time to time place, dig, examine, repair, alter, maintain or remove a tube-well pipe line (including inter-sump, pipe stand, value chamber and outlet) earthen barrow piys, under, over, along, across, in or upon any immovable property.	
Act M.S- 5	1. The Officer-in-charge is empowered to inspect the construction and maintenance of the minor irrigation work within the state.	<ul style="list-style-type: none"> 1. Restriction on Mining activities on River basin which lead to Soil erosion 2. Restriction on usage of water from River Basin in Agriculture.
Act M.S- 6	1. The Canal Officer on the behalf of State govt has power to regulate and inspect the irrigation work of any land, building or village and village channel.	1. Restriction on usage of water from River Basin in Agriculture.
Act M.S- 7	<ul style="list-style-type: none"> 1. The authority may prohibit the destruction or attempt to destroy fish by gun or bow and arrows and other instrument which may poison the river water or pollution of waters by trade effluents. 2. Prohibit the fishing except under license. 3. Prohibit fishing in any specified water for specified period for the sake of environment balancing. 	<ul style="list-style-type: none"> 1. Issues relating to Hydrology 2. Restriction on usage of Ecological and Marine Resources

10.2.4 Commercial use of Water way

State legislation

1. The Deputy Collector, the Toll Collector, the other Officer [The Ganges Tolls Act, 1867], Act M.S- 8

Legislation Identification	Commercial use of waterways Subject Covered	Gap
Act M.S- 8	<ol style="list-style-type: none">1. The authority is empowered to look after the navigation in Ganges.2. The authority has power to remove and stop any construction or fishing activities cause obstruction to the flow of River	<ol style="list-style-type: none">1. Basin Contamination Measurement System2. Basin flow Monitoring System

10.2.5 Dam and Diversions

State legislation

1. A Betterment Levy officer, a Collector, a Block development officer, Engineer, Canal Officer [Bihar Irrigation Act, 1997], Act M.S- 9 {discussed under the previous heading of Irrigation}

Some of the above mentioned 'Authorities' have similar functions however they are assigned powers under different Legislations. One such authority is "Collector". The common function of the "Collector" goes like: under some Legislation he has the power to inspect and regulate the water supply and also the power to enter into any land and inquire about the construction or maintenance of the work. Only in the Ganges Tolls Act, the Collector additionally performs the duty of collection of tolls within such prescribed area.

Apart from Collector, another potential Authority in Uttar Pradesh is U P Water Supply and Sewerage Authority. The Jal Nigam and the Jal Sansthan have been formed under the Legislation mainly to inspect all water supply and sewerage of the State of Uttar Pradesh.

Their power also extends to the disposal of the wastes and collection of water taxes.

Jurisdictional Aspect

No disputes in jurisdictional issues are located till now.

On analysis of the legislations it can be concluded that, there are some questions with regard to the efficacy of the divergent laws in preventing pollution and protecting the River Basin in the middle stretch.

10.3 Lower Stretch of Ganga

The mapping of the legislations in the lower stretch of Ganga has been done, wherein it has been revealed that there are several legislations enacted during the British raj which are still in force. These legislations were enacted generally for the purpose of approving, sanctioning and monitoring the activities either within the River beds or issues incidental thereto. After independence, the state governments have enacted several laws regarding urban sanitation and municipal activities, water supply, sewerage and irrigations etc,

Legislation, pre and post constitution, enacted by the State of West Bengal has been analysed. The following factors considered for identifying legislations in the lower stretch.

- Sanitation (including cremation activities)
- Industrial pollution
- Agriculture
- Commercial use of Water ways and Pollution
- Dams and Diversion

Further ‘Authorities’⁵ under all such legislations have been pointed out and their powers functions and jurisdictions have been discussed. The following are the various ‘Authorities’ under all Legislations of West Bengal.

10.3.1 Sanitation

State legislations

1. One Burial Board [The Calcutta Burial Board Act 1881], Act {L.S- 1}
2. The Calcutta Metropolitan Water and Sanitary Board, A Board of Directors (3 out of 6 should be whole time) and a General Council (total 17 members), [The Calcutta Metropolitan Water and Sanitation Act, 1966], Act {L.S- 2}
3. The Corporation, The Mayor and The Mayor-in-Council [The Howrah Municipal Act, 1980], Act {L.S- 3}
4. The Mayor, The Mayor-in-Council and the Corporation [The Kolkata Municipal Corporation Act, 1980], Act L.S- 4

Legislation Identification	Sanitation Subject Covered	Gap
Act L.S- 1	1. The Board has the power of preservation, repair or removal of existing monuments and for regulating the dimension and erection of new monument, in any Burial Grounds.	1. Basin Contamination Measurement System 2. Prevention of Soil Pollution

⁵ “Authorities” means agency or body or individuals entrusted with the responsibility of execution under any of the legislations.

Act L.S- 2	<ol style="list-style-type: none"> 1. The Water and sanitary Board is empowered to look into various schemes of water supply and proper Drainage system. 2. The authority has the power of collection and disposal of Night-soil within the district. 3. Authority entitled to regulate the treatment of industrial wastes before discharge into any sewer, canal, river or other water channel within the District; 4. Board also covers the area of Sewage treatment and disposal of wastes. 	1. Basin Contamination Measurement System
Act L.S- 3	<ol style="list-style-type: none"> 1. The authority is empowered to collect and dispose of Sewages on daily basis. 2. The Act covers the Disposal of Solid wastes, both domestic and industrial 	1. Basin Contamination Measurement System
Act L.S- 4	<ol style="list-style-type: none"> 1. The authority is entitled to look after all operation of Water Works within the district. 2. The Corporation covers up the Solid Wastes Management and disposal of waste outside the city. 3. Municipality has the power of scavenging, removal and disposal of filth, rubbish and other obnoxious polluted matters; 	<ol style="list-style-type: none"> 1. Basin Contamination Measurement System 2. Restrictions on Industrial usage of River water.

10.3.2 Industrial pollution

The following case can be referred regarding the above mentioned issue

M C Mehta v/s. Union of India⁶ (Calcutta Tanneries)

Fact of the Case

After the case of Kanpur tanneries the court issued various directions in relation to the Kanpur tanneries. While monitoring the said directions, the scope of the petition was enlarged and the industries located in various cities on the banks of River Ganga were called upon to stop discharging untreated effluent into the river. In Calcutta the most of the tanneries located at Tangra, Tiljala, Topsia and Pagla Danga. These areas accommodate

⁶ AIR 1985 SC 3727

about 550 tanneries. According to the examination report dated 30-9-1995 by the National Environmental Engineering Research Institute (NEERI), ninety per cent of the Calcutta tanneries use chrome based tanning process, while the remaining utilise vegetable tanning process. The observations of the NEERI were:

- Tannery units are located in highly congested habitations, offering little or no scope for future expansion, modernisation or installation of ETP(s)
- Surroundings of the tanneries are extremely unhygienic due to discharge of untreated effluents in open drains, stagnation of wastewater in low-lying areas around the tannery units, and accumulation of solid waste in tanneries

Legislations and Provisions mentioned

- Water (Prevention and Control of Pollution) Act, 1974 – sections 3, 4, 16, 20, 21, 23, 24, 26
- The Environment (Protection) Act, 1986

Judgment: In this case, the Precautionary Principle and the Polluter Pays Principle have been accepted as part of the law of the land by the court.

- Court further instructed the Calcutta tanneries to relocate themselves from their present location and shift to the new leather complex set up by the West Bengal Government. The tanneries which decline to relocate were prohibited to function at the present sites.
- The Calcutta tanneries deposited 25% of the price of the land and the subsequent instalments were paid in accordance with the terms of the allotment letters issued by the State Government.
- The tanneries who failed to deposit 25% of the price of the land as directed by court were closed from all his operation.

10.3.3 Agriculture

State legislations

1. Canal Revenue Officer and Collector [The West Bengal Irrigation (Imposition of Water Rates) Act 1974], Act L.S- 5
2. Collector and Canal Officer [The Bengal Irrigation Act, 1876], Act L.S- 6
3. Corporation, i.e., Damodar Valley Corporation and Collector [The West Bengal Irrigation (Imposition of Water Rates for Damodar Valley Corporation Water) Act, 1958], Act L.S- 7

Legislation Identification	Agriculture Subject Covered	Gap
Act L.S- 5	<ol style="list-style-type: none"> 1. The authority may grant of free passage for the purpose of Irrigation within the water course or channels. 2. The State Government may impose water rates for specific area of land in different seasons. 	<ol style="list-style-type: none"> 1. Basin flow Monitoring System
Act L.S- 6	<ol style="list-style-type: none"> 1. The State Government may prohibit any kind of formation of obstruction in the drainage limit of particular area. 2. Any authority may enter on any land and remove any obstructions, and may close any channels, and do any other thing necessary for such application or use of the said water. 	<ol style="list-style-type: none"> 1. Restriction on usage of water from River Basin in Irrigation 2. Prevention of obstructions on flow of River
Act L.S- 7	<ol style="list-style-type: none"> 1. The Corporation has the power to remove any obstruction causing the diversion of the original flow of the River. 	<ol style="list-style-type: none"> 1. Restriction on usage of water from River Basin in Irrigation 2. Basin Contamination Measurement System 3. Basin flow Monitoring System

Commercial use of Water ways and Pollution

State legislation

1. The Board (consist of 12 Trustees), [Bengal Waterways Act, 1934], Act L.S- 8
2. Commissioner [Bengal Ferries Act, 1885], Act L.S- 9
3. State Government and the Collector [The Bengal Fisheries (Requisition and Acquisition) Act, 1965], Act L.S- 10
4. The Calcutta Port Commissioner [The Calcutta Port Act, 1890], Act L.S- 11

Legislation Identification	Commercial use of Waterways Subject Covered	Gap
Act L.S- 8	<ol style="list-style-type: none"> 1. The Board controls the cleaning, diverting and improving any existing channel which are under control of the Authority 2. The authority looks after the maintenance of the Channel for better navigation 	1. Restriction on Construction over River Flood Plain
Act L.S- 9	1. The authority has the power of maintenance of the public and private ferries for navigation	1. Basin flow Monitoring System
Act L.S- 10	1. The collector may control the requisition and acquisition of land for the purpose of Fishery	
Act L.S- 11	1. The Port authority may acquire land and building for the purpose of the Act	1. Restriction on Construction over River Flood Plain

10.3.4 Dams and Diversion

State legislation

1. Collector and the Engineer [The Bengal Embankment Act, 1882], Act L.S- 1

Legislation Identification	Dams and Diversion Subject Covered	Gap
Act L.S- 12	<ol style="list-style-type: none"> 1. The authority is empowered to remove any embankment or obstruction endangering the natural flow and embankment of the River 2. The collector may establish any water course and embankment for the protection of the cultivable land 	<ol style="list-style-type: none"> 1. Prevention of obstructions on flow of River 2. Restriction on usage of water from River Basin in Irrigation

Under the above legislations, the Collector is the common authority empowered to deal with different aspects of River Basin. The common function of the “Collector” includes: the power to create an obstruction in the normal flow of the River or channels for the purpose of irrigation. Also the Collector has the power to enter and inspect any area and levy charges where require. It has been found that the functions of “Collector” basically relate to irrigation and most of the functions are quite similar. The other authority is the “Corporation”. The Mayor and the Mayor-in-Council also have some similar functions

regarding the sewerage and drainage works and regarding removal, disposal and recycling of solid wastes.

The main issue in lower stretch is, sanitation including cremation activities, agriculture, commercial use of waterways and pollution and change of water course. It has been found that the Authorities are performing such functions regarding the above mentioned issues. But after a detailed study, some gaps have been identified and to conclude, there are a few areas which require a further study such as:

- Under the 'Sanitation Issue' a common problem is 'disposal and recycling of solid wastes. But the legislation does not clarify the process involved therein.
- Then under 'agriculture' issue, the problem which has been identified, is the 'change and alteration of river course' for the purpose of agriculture. In various legislations the Authorities are allowed to cut a new canal or change the course of existing Canals under their supervision.
- No specific State Legislation or delegated legislation on prevention or abatement of pollution in lower stretch of Ganga.

11. Conclusion

In conclusion, it can be said that all the legislations of the three stretches of Ganga have covered some areas, like:

- In 'upper stretch', the basin as well as the catchment area of entire valley has been taken care of.
- In 'middle stretch' under the subject of sanitation, most of the legislations speak about the sewage treatment plans and disposal of waste waters. In agriculture the legislations speak about water channels, use of water for agricultural purpose and construction on water course. Other areas which the legislations cover are: 'removal of obstruction on the water course affecting the natural flow of the river', 'prohibition of fishing in restricted areas' etc.
- The issues on which the legislations speak about in 'lower stretch' of Ganga are much alike the 'middle stretch' of Ganga. Under sanitation, most of the legislations speak about the sewage treatment, water supply and proper drainage system and disposal of Solid wastes, both domestic and industrial. Under the subject of agriculture the common findings are: 'free passage for the purpose of agriculture within the water course or channels', 'use of water for the purpose of agriculture', 'removal of any obstruction causing the diversion of the original flow of the River'. The areas which are covered in 'commercial use of waterways' are: 'cleaning, diverting and improving any existing channel which are under control of the Authority appointed under the Act', 'maintenance of the public and private ferries for navigation' and 'requisition and acquisition of land for the purpose of Fishery', etc.

On analysis of the legislations, it can be concluded that there are some questions with regard to the efficacy of the divergent laws in preventing pollution and protecting the Ganga River Basin. In all three stretches of Ganga River, some common deficiencies have been identified and those are mostly regarding the role of the Authorities:

- Most of the legislations do not specify its role regarding water pollution and protection of river basin.
- The jurisdictions of the Authorities are not stated clearly and none of the legislations speak about “whether there is any dispute regarding the jurisdiction among the authorities or not”.
- The legislations under the subject of ‘commercial use of waterways’ speak mainly about collection of tolls and levy of taxes on navigation matter. There is no specific provision on water pollution by the process of navigation.
- A few legislation have been mapped where, there is a need to look after some issues like: disposal of agricultural wastes, soil erosion, excessive public use of river water.
- Legislations like The Kolkata Municipal Corporation Act 1980, speaks about the Solid waste management but there are no provisions which explains how the corporation is managing the wastes or recycling the wastes and also no initiative has been taken on environment management and awareness in the domestic areas, especially the localities situated near the river basin.

Under most of the legislations, the Authorities perform the necessary functions stated under the law, but interestingly no authorities are entitled to play a role in prevention of river pollution.

The concerns which arise after analysing the Authorities are:

- the efficacy of the Authorities and effectiveness of legislations;
- Their role in handling social, economical and technical matters pertaining to Ganga.

It has also been observed that no such relevant judicial opinion has been recorded under these State legislations. Finally, it can be said that with a new legislation all the issues affecting the Ganga can be reduced. A specific legislation will include all the aspects regarding the river Ganga and its basin. Then divergent central and state legislations would not be required.

PROJECT MANAGEMENT BOARD [PMB]

Expert Members:

- Sri Swami Avimukteshwaranand Saraswati
- Dr Madhav AChitale
- Dr Bharat Jhunjhunwala

PROJECT IMPLEMENTATION AND COORDINATION COMMITTEE [PICC]

Representatives from IIT Consortium:

- Dr ShyamAsolekar, IIT Bombay
- Dr A K Mittal, IIT Delhi
- Dr Mohammad Jawed, IIT Guwahati
- Dr Vinod Tare, IIT Kanpur
- Dr D J Sen, IIT Kharagpur
- Dr Ligy Philip, IIT Madras
- Dr I M Mishra, IIT Roorkee

Thematic Group Leads:

- Dr Purnendu Bose, Environmental Quality and Pollution (EQP)
- Dr A K Gosain, Water Resources Management (WRM)
- Dr R P Mathur, Ecology and Biodiversity (ENB)
- Dr Rajiv Sinha, Fluvial Geomorphology (FGM)
- Dr Vinod Tare, Environmental Flows (EFL)
- Dr S P Singh, Socio Economic and Cultural (SEC)
- Dr N C Narayanan and Dr Indrajit Dube, Policy Law and Governance (PLG)
- Dr Harish Karnick, Geospatial Database Management (GDM)
- Dr T V Prabhakar, Communication (COM)

COMPOSITION OF

1. Environmental Quality and Pollution (EQP)

Lead: Purnendu Bose, IIT Kanpur

Members: Shyam R Asolekar, Suparna Mukherjee (IIT Bombay); A K Mittal, A K Nema, Arun Kumar, T R Sreekrishnan (IIT Delhi); Ajay Kalmhad (IIT Guwahati); Saumyen Guha, Vinod Tare (IIT Kanpur); A K Gupta, M M Ghanrekar, Sudha Goel (IIT Kharagpur); Ligy Philip, Mukesh Doble, R Ravi Krishna, S M Shrivnagendra (IIT Madras); A A Kazmi, B R Gurjar, Himanshu Joshi, Indu Mehrotra, I M Mishra, Vivek Kumar (IIT Roorkee); Anirban Gupta (BESU Shibpur); P K Singh (IIT BHU); Rakesh Kumar (NEERI Nagpur); S K Patidar (NIT Kurukshetra); Sanmit Ahuja (ETI Dynamics, New Delhi)

2. Water Resources Management (WRM)

Lead: A K Gosain, IIT Delhi

Members: Rakesh Khosa, R Maheswaran, B R Chahar, C T Dhanya, D R Kaushal (IIT Delhi); Subashisa Dutta, Suresh Kartha (IIT Guwahati); Shivam Tripathi, Gautam Rai, Vinod Tare (IIT Kanpur); Anirban Dhar, D J Sen (IIT Kharagpur); B S Murty, Balaji Narasimhan (IIT Mdras); C S P Ojha, P Perumal (IIT Roorkee); S K Jain (NIH, Roorkee); Pranab Mohapatra (IIT Gandhi Nagar); Sandhya Rao (INRM, New Delhi)

3. Fluvial Geomorphology (FGM)

Lead: Rajiv Sinha, IIT Kanpur

Members: Vinod Tare (IIT Kanpur); Vikrant Jain (IIT Gandhi Nagar); J K Pati (Allahabad University); Kirteshwar Prasad, Ramesh Shukla (Patna University); Parthasarathi Ghosh, Soumendra Nath Sarkar, Tapan Chakraborty (ISI Kolkata); Kalyan Rudra (WBPCB); S K Tandon, Shashank Shekhar (University of Delhi); Saumitra Mukherjee (JNU Delhi)

4. Ecology and Biodiversity (ENB)

Lead: R P Mathur, IIT Kanpur

Members: A K Thakur, Vinod Tare (IIT Kanpur); Utpal Bora (IIT Guwahati); M D Behera (IIT Kharagpur); Naveen Navania, Partha Roy, Pruthi Vikas, R P Singh, Ramasre Prasad, Ranjana Pathania (IIT Roorkee); Sandeep Behera (WWF-India)

THEMATIC GROUPS

5. Socio Economic and Cultural (SEC)

Lead: S P Singh, IIT Roorkee

Members: Pushpa L Trivedi (IIT Bombay); Seema Sharma, V B Upadhyay (IIT Delhi); P M Prasad, Vinod Tare (IIT Kanpur); Bhagirath Behera, N C Nayak, Pulak Mishra, T N Mazumder (IIT Kharagpur); C Kumar, D K Nauriyal, Rajat Agrawal, Vinay Sharma (IIT Roorkee)

6. Policy Law and Governance (PLG)

Lead: N C Narayanan, IIT Bombay and Indrajit Dube, IIT Kharagpur

Members: ShyamAsolekar, Subodh Wagle (IIT Bombay); Mukesh Khare (IIT Delhi); Vinod Tare (IIT Kanpur); Deepa Dube, Uday Shankar (IIT Kharagpur); G N Kathpalia, Paritosh Tyagi (IDC, New Delhi)

7. Geo-Spatial Database Management (GDM)

Lead: Harish Karnick, IIT Kanpur

Members: N L Sharda, Smriti Sengupta (IIT Bombay); A K Gosain (IIT Delhi); Arnab Bhattacharya, Kritika Venkatramani, Rajiv Sinha, T V Prabhakar, Vinod Tare (IIT Kanpur)

8. Communication (COM)

Lead: T V Prabhakar, IIT Kanpur

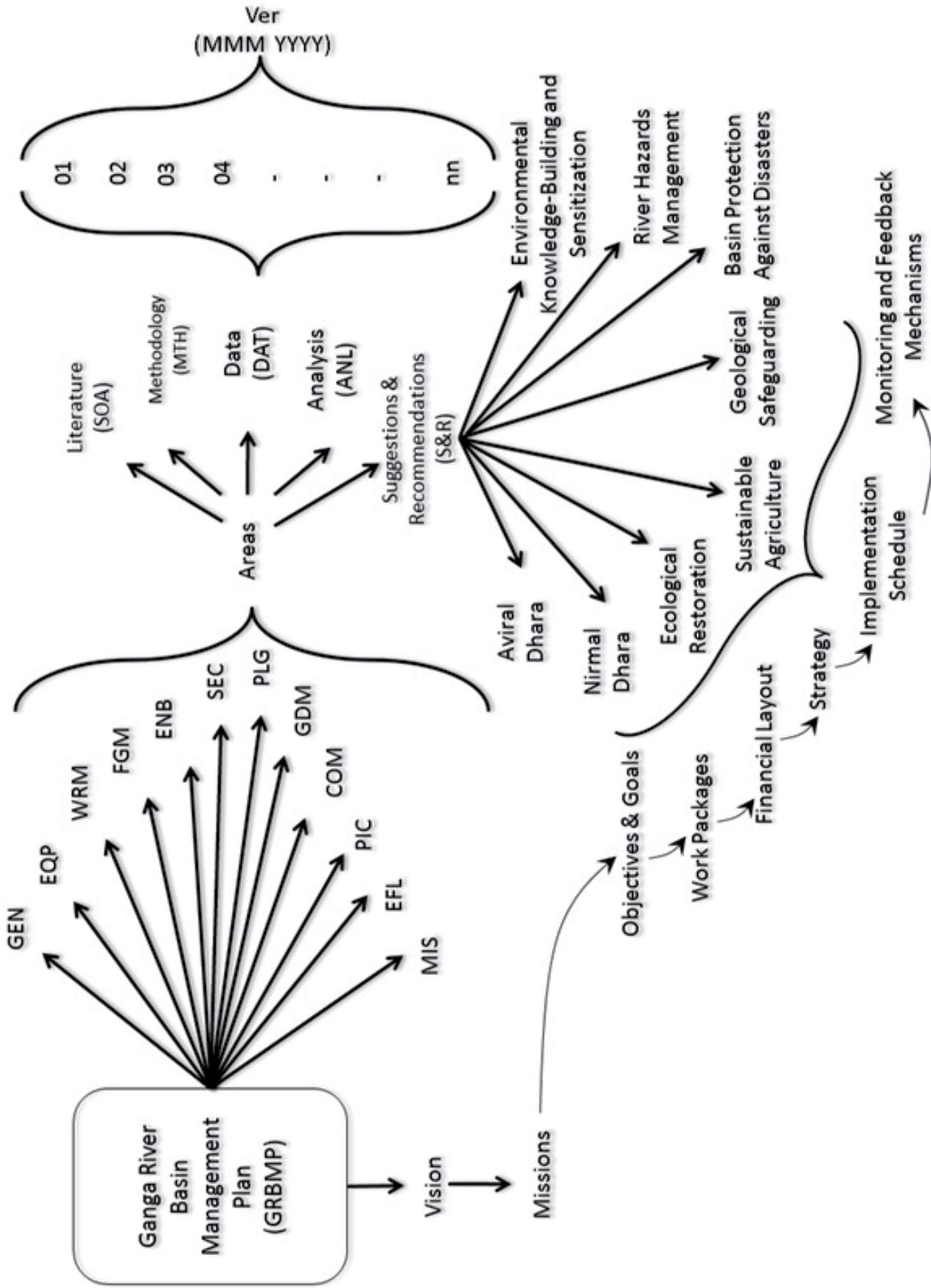
Members: Purnendu Bose, Rajiv Sinha, Vinod Tare (IIT Kanpur)

9. Environmental Flows (EFL)

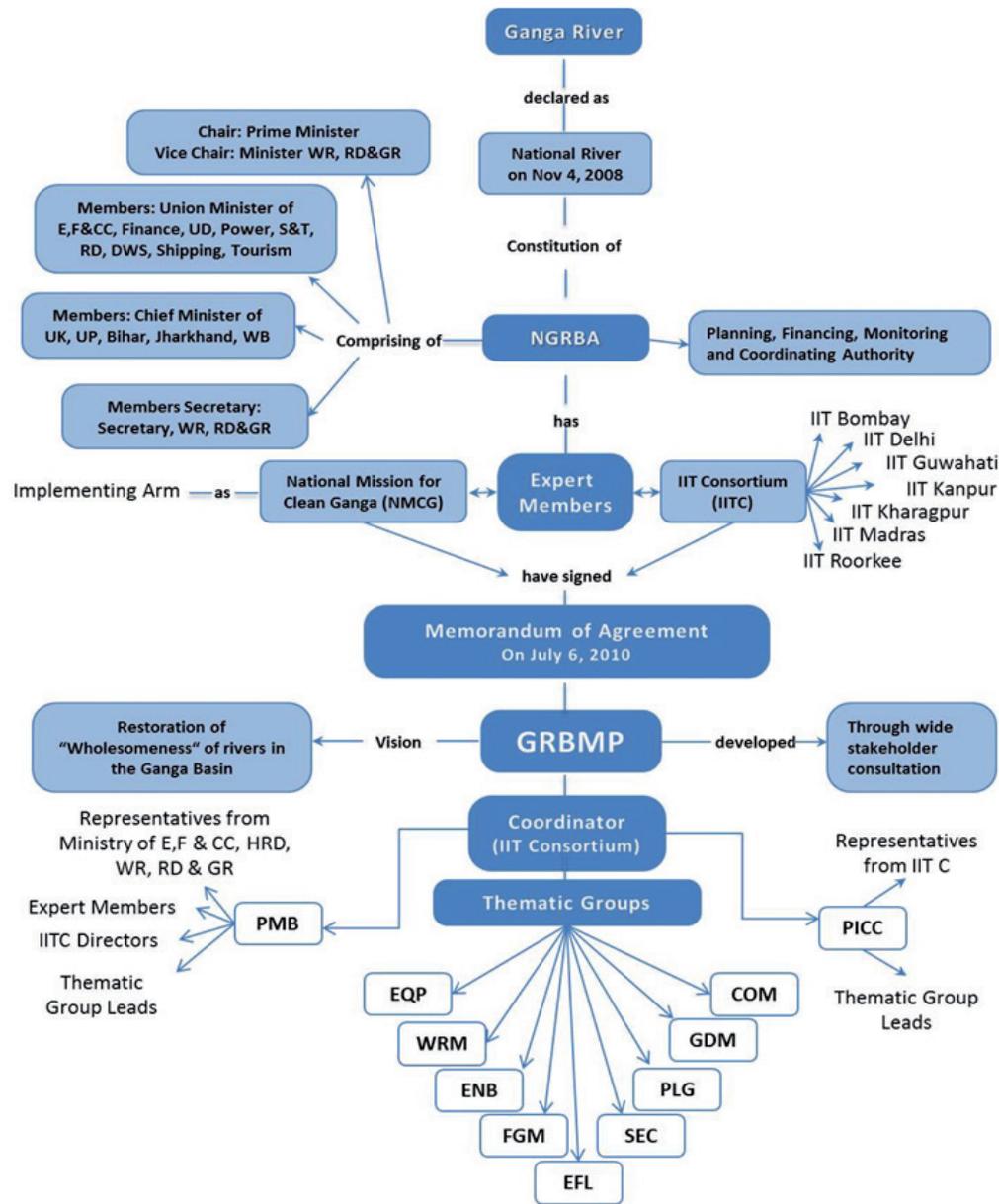
Lead: Vinod Tare, IIT Kanpur

Members: ShyamAsolekar (IIT Bombay); A K Gosain (IIT Delhi); P M Prasad, R P Mathur, Rajiv Sinha, Shivam Tripathi (IIT Kanpur); M D Behara (IIT Kharagpur); B S Murthy, N Balaji (IIT Madras); Pranab Mohaparta, Vikrant Jain (IIT Gandhinagar); S K Jain (NIH Roorkee); Nitin Kaushal (WWF-India, New Delhi); Sandeep Behera (NMCG, MoWR, RD & GR, New Delhi); A P Sharma K D Joshi (CIFRI, Barrackpore); Ravindra Kumar (SWaRA-UP); Ravi Chopra (PSI, Dehra-
doon); Paritosh Tyagi, (IDC, New Delhi)

GRBMP WORK STRUCTURE



ORGANIZATIONAL STRUCTURE FOR PREPARING GRBMP



NGRBA: National Ganga River Basin Authority

NMCG: National Mission for Clean Ganga

MoEF: Ministry of Environment and Forests

MHRD: Ministry of Human Resource and Development

MoWR, RD&GR: Ministry of Water Resources, River
Development and Ganga Rejuvenation

GRBMP: Ganga River Basin Management Plan

IITC: IIT Consortium

PMB: Project Management Board

PICC: Project Implementation and Coordination Committee

EQP: Environmental Quality and Pollution

WRM: Water Resources Management

ENB: Ecology and Biodiversity

FGM: Fluvial Geomorphology

EFL: Environmental Flows

SEC: Socio Economic and Cultural

PLG: Policy Law and Governance

GDM: Geospatial Database Management

COM: Communication



Centre for Ganga River Basin Management and Studies

© cGanga and NMCG 2019