Policy Shifts in Urban Sanitation and Emerging Thrust on PPPs in India: An Inquiry in Ganga Basin

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1. Introduction

Ganga is one of the most important rivers not only for India, but for the subcontinent on which rests the livelihoods and productive activities of millions of people. River Ganga emerges from the southern slopes of the Himalayan ranges and joins Bay of Bengal traversing 2,500 km through the states of Uttar Pradesh, Bihar and West Bengal. It constitutes around 26% of India's land mass and supports about 43% of population (GoI, 2009a) The basin incorporates the three South Asian neighboring countries and sharing of Ganga waters has been a key trans-boundary contestation sometimes leading to conflicts. However, another important issue of pollution has been mostly reduced to a national debate within India. Substantial abstraction of water for irrigation, industrialization and urbanization has impacted the quantity of flows in the river leading to a serious state of degradation. Ganga has been central to shaping a particular cultural ethos and religious sentiments that still plays a decisive role in the politics of the basin states as well as the union government. The pollution issue is thus beyond its techno-economic dimensions attracting serious policy attention in the last three decades leading to the launching of the Ganga Action Plan (GAP).

Many earlier studies have examined the limitation of the pollution abatement strategies in India especially the GAP (Ahmed, 1985; Divan, 1995; CAG, 2000; Singh, 2001; Biswas, 2002; PAC, 2004; Shaw, 2006). Most of the studies engage with the technical and financial aspects and some of them have examined the institutional aspects. The present study investigates the larger policy and governance aspects of the problem in the background of the arguments in earlier studies that found the responsibility of failure of state led institutional models of pollution abatement, particularly on the capacities of Urban Local

Bodies (ULBs) and para-statals which manage these activities. Following the dominant policy model, the recent prescriptions focus on Public Private Partnerships (PPPs) as an answer to such state failures. This study argues that the root of such failure lie in conceiving pollution abatement through a certain perspective of centralized waste water treatment which is capital, energy and management intensive that forces the need for institutional models like PPPs. Hence, we focus on understanding the larger policy process unfurling in the water sector with particular thrust on Urban Water and Sanitation Services (UWSS) in the light of the ongoing experiences in India to find its reflections and particularities in the Ganga basin.

Section 2 discusses the techno-financial thrust which prevails in the pollution abatement strategy for river Ganga. While understanding the GAP, we focus our attention on the proposed technological solutions and their financial implications. Further, we try to analyze the reasons for failure in implementation of these solutions through state led institutional models which indirectly led to failure of GAP. Hence, in order to understand the larger policy debate of state failure and call for Private Sector Participation (PSP), section 3 discusses the recent trends in policy shifts in UWSS to PPPs. The section then focusses on the issues, consequences and present challenges associated with PPPs on the basis of which certain questions are raised. Section 4 revisits the policy debate and proposes a strategy to explore heterodox technology and institutional options instead of the singular imagination of pollution abatement by centralized treatment of waste water.

2. Ganga Action Plan – A Review

Although the idea of cleaning river Ganga was initiated by Government of India (GoI) in 1979, the GAP could only be initiated in 1985 after a comprehensive survey of the river Ganga and reports on pollution issues by Central Pollution Control Board (CPCB). The GAP was aimed at controlling pollution in a systematic and planned manner to improve

water quality[1] (CPCB, 1982; CPCB, 1984). There exist different issues and problems in different stretches of the river (viz. upper, middle, and lower) which are caused by different types of natural conditions and human interventions (Alley 1994). 75% of the pollution load in the river from all point-sources[2] come from the municipal wastewater generated in twenty-five Class I towns located on the banks, each with a population exceeding 100,000 and the remaining due to untreated industrial effluents (NRCD, 2009). The emphasis under the GAP was given on interception of *nalas* (carrying sewage into the river) and diversion of wastewater and its treatment in Sewage Treatment Plants (STPs), before discharging into the river. This section discusses GAP starting with its rationale and going to specific issues of failure.

2.1. Rationale of GAP

The GAP attempted to address the most complex dynamics around the issue of river pollution in Ganga basin with a population over 300 million people, out of which a large population live in densely populated cities directly along its banks. [3] Most of the urban centers lack proper sewage treatment facilities (Vajpai, 2005) with average population density of 520 persons per square km compared to the national average of 325. Industries releasing effluents directly in the river were asked to establish in-house as well as common effluent treatment plants (ETPs). The non-point sources were also identified, such as disposal of bodies, surface run-offs from fields containing

[1] 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.

[2] In addition to the point-source, non-point sources were also identified, such as disposal of dead bodies, surface run-offs from fields containing residues of fertilizers and pesticides, and crematorium ash. Works were also undertaken to prevent pollution of the river from the non-point sources. These include: introducing electric crematoriums, improving aesthetics of the *ghats*, and promoting public participation.

[3]During the course of its journey, the river receives municipal sewage from 29 Class-I cities (cities with population over 1, 00,000), 23 Class II cities (cities with population between 50,000 and 1,00,000) and about 48 towns. In addition, effluents from industries and polluting wastes from several other non-point sources are discharged into the river Ganga resulting in its pollution.

residues of fertilizers and pesticides, and crematorium ash and works undertaken also to prevent pollution of the river from these sources. GAP was divided in two phases. Phase-I started in 1985 and covered the then three states, Uttar Pradesh (UP), Bihar and West Bengal (WB). Implementation of GAP I started in 1986 and ended in 2008, delayed by 10 years. Together, GAP-I and GAP-II targeted interception, diversion, and treatment of urban sewage of more than 37 cities with an amount of Rs. 1612.38 crores spent on the schemes until 2011 (MoEF, 2011). In this section we review the GAP experience in terms of its activities and performance.

2,2, Lack of a Institutional Framework and Issues of Implementation

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 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-statals, government-agencies working at various levels). These have caused many problems (as discussed in 2.4.1) for decision-making and implementation of GAP (CDP-Kanpur, 2006).

Many reasons have been cited for inordinate delays in implementation of GAP. The Public Accounts Committee (PAC) came out with the reasons for administrative and other delays. The most common reasons cited by the committee are (PAC, 2004):

- Confusions and tensions among the central and state governments over the issue of funding for assets to be created under GAP. [4]
- The selection of towns under GAP II was completely left to the state-level decision making, which resulted in non-uniformity in the selection as well as delayed the process of preparation of project-proposals.
- Majority states could not acquire or provide land for constructing the sewage treatment plants and pumping infrastructure within the prescribed time which delayed the implementation of the program.
- The state governments could not prepare the Detailed Project Reports (DPRs) in time, and according to the guidelines issued by the MoEF and NRCD that delayed the sanctioning process.
- Problems created by court-cases, contractual issues, and inadequate capacities in the local bodies/implementing agencies came in the way of speedy implementation.
- Cost-overruns and re-sanctioning of the schemes also led to time-wastage and further delayed the process. (PAC, 2004)

2.3. Technology Choice

A major issue of debate in the choice of technology under the GAP was the Up-flow Anaerobic Sludge Blanket (UASB) technology introduced with the Dutch development aid which was an important financial source for the GAP-I. The critics argue that while adopting the technology, the MoEF did not carry out any comparative assessment of the sewage treatment technologies on the criteria of suitability or efficiency (Menon 1988). Further they argue that the choice of UASB was highly influenced by the Dutch aid and resulted into a mere waste of resources.

[4] For GAP-II, initially, the arrangements were 50:50 cost-sharing basis, then it was changed to 70:30 pattern and, finally the central government provided 100% funding (except the land costs). Even after these changes, the funding pattern was again changed many times under the 10th Five Year Plan.

Environmental Engineers criticize technologies adopted by GAP such as Activated Sludge Processes (ASP) as limited to treating sewage only up to the standards prescribed (such as DO, BOD and COD) to achieve water quality up to the 'B Class-Bathing' standards, that does not remove pathogens and coliform, i.e. the bacterial contamination. [5] Hence the water quality data show high level of presence of pathogens and coliform across all the stretches of the river Ganga, despite implementation of GAP (NRCD 2009). This leads to arguments for adapting different standards for tertiary treatment (the implications of which will be discussed later). One of the reasons for the argument is the technological choices that mostly emerged in the West that is to fit in with conditions in Indian rivers.[6]

The tertiary treatment is thus suggested considering the facts that, the adequate water flow in the river is particularly required for dilution of effluent and also the need for treating the entire sewage and effluent that is diverted or directed to them. This requires effective operation and maintenance of assets, as well as equally effective monitoring and regulation of the same. However, in the case of the assets created under GAP, both these conditions are not met.

2.4. Absence of Sewage Network for Collection and Treatment

The centralized technologies mentioned involve an efficient system for sewage collection, conveyance and treatment systems. Generally the STPs were designed considering the following three main factors (a) population of the cities and towns, (b) projections of the growth of the population, and (c) standards based on per capita sewage generation. In many cases STPs with

[5] For details refer: Compendium of sewage and effluent treatment technologies, could be sourced from www.moef.nic.in

[6] The rivers in Europe and other western countries are snow-fed and have at least 120 days of full flows in their beds in an year, whereas, flows in Indian rivers last merely for 30-35 days after monsoon. Despite having adequate flows for dilution of the discharged effluent, western countries treat water up to the tertiary level, whereas the Indian model of treatment proposes treatment up to secondary level only, despite having lean season of water flows of 10 months. This results in further degradation of the water quality of the river. Thus, the Indian environmental engineers' insistence on tertiary level treatment of the effluent and sewage finds further substantiation due to these experiences with the technologies adapted for removing pathogen and bacteria, and western practices of tertiary level treatment despite adequate flows in the rivers.

large capacities, sufficient amount of sewage could never reach due to inadequacy of the sewer networks as well as the inadequate interception and diversion of sewage flowing through the *nalas* (CSP- Kanpur, 2009). Roughly, it is said that, 80% of the STPs remained 'under-loaded', which resulted in dead-investment on the STPs. Only partial treatment was possible due to issues at different levels, such as: (i) coverage of *nalas* within the cities, (ii) coverage of cities and towns (iii) Coverage of rural population.

(i) *Coverage of nalas within the cities*: In many of the Class-1 cities interception and diversion works did not cover all the *nalas* that discharged sewage into the river. Due to partial coverage, remaining sewage was allowed to be released into the river through *nalas* and, thus pollution continued.

(ii) *Coverage of cities and towns*: The coverage was restricted to only 25 Class-I cities during GAP-I. Later, GAP was expanded to cover 27 more Class-I cities. However, Class-II, III and IV towns were left uncovered as far as collection and treatment of sewage was concerned.

(iii) *Coverage of rural settlements*: The decision not to cover rural settlements was also considered a major hurdle to the success of GAP.

2.5. Weaknesses of Operation, Maintenance and Monitoring

Operation and maintenance of GAP-assets has been the responsibility of state government agencies, which were never consistent in releasing the money for operation and maintenance. Even after court-interventions, states addressed the issue with limited seriousness. Municipal councils faced problems in raising required financial and human resources to ensure proper operation and maintenance (Shaw, 2006). Irregular electricity supply kept the pumping stations in an 'On & Off' mode for many years after installations. As response to a writ petition filed in Allahabad the High-court the state government of UP provided diesel-engine sets to operate pumps during load-shading schedules. This was not effective because of irregular supply of diesel by the state authorities (Biswas, 2002). Suboptimal functioning of ETPs and STPs also has forced the farmers around Kanpur to irrigate their farmlands with partially treated, polluted water casing health problems to the farming dependent population

(Singh, 2001).

The data collected hitherto was neither put together in a cohesive manner nor analyzed independently. The Government did not make any arrangements to monitor many important issues such as, erosion, tree cover, sediment yield and sediment deposition on the river bed, as well we some key areas such as watershed development and interaction of surface-water and groundwater. By the end of the first phase, only about 45 per cent of the grossly polluting industrial units had installed ETPs. Over 18 per cent of those did not function properly, and did not meet the technical standards. These units discharged industrial effluent of 2667.16 MLD into the rivers. The NRCD had no mechanism to ensure that the installed plants functioned satisfactorily, other than SPCBs (PAC, 2004). The states were asked to set up Citizen Monitoring Committees to ensure public participation in the schemes. Haryana, Bihar and Delhi governments did not constitute such committees in any of the towns and West-Bengal constituted committees only in 5 out of 42 towns. The constituted committees in West Bengal and Uttar Pradesh met only infrequently. Thus, both at the central and the state level, monitoring of the plan was highly inadequate (CAG, 2000). The participation of stakeholders has not been effective in implementation of the GAP. There were provisions to constitute the citizens monitoring committees; however, in practice, these committees never constituted at all or were functional effectively (PAC, 2004). This situation occurred partly because of the political aspects of constituting committees and partly because of the low repose from the citizens.

3. Technology Choices in Pollution Abatement

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. Coming to the technological aspects, 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). 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). The choice of technology for sewage treatment under the GAP was discussed earlier with the suggestions for tertiary treatment. Hence, in some recent proposals, technological suggestions like Zero-Liquid-Discharge (ZLD) has been suggested which needs tertiary treatment for recycle and reuse. Such suggestions demand the state of the art technology which are more expensive and lead to vicious cycle of non performance as argued in figure 1 later. 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). ADD LIMITATIONS OF CENTRALISED MODELS

4. Financial Demands for the Centralised Technical Models

Urban Population rise and need for increased investments has been a repeated argument for the need for increased investment. India's urban population is expected to reach 600 million by 2031. 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 STPs that involve 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. (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 sectors[7] 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, 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 cost[8] 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, given that the costs of water and sewage treatment this might be an underestimation. The cost of building sewage treatment systems and networks under the Union government's revamped Ganga programme averages over Rs. 5 crore per mld – with small cities like Munger in Bihar getting as much as Rs. 7 crore per mld (GoI, 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 thus required just to build STPs to treat the currently generated waste water is thus about Rs. 57000 crore (assuming Rs. 5 crore per mld).

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

[8] 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.

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 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 investment needs for capital and O&M.

5. Institutional Problems in State-Led Implementation

The institutional model of implementing the centralised technological option also merits discussion. In GAP, different para-statal agencies were brought in at the state level to actually carry out physical implementation of the drainage interception and diversion work, as well as building, operation and maintenance of treatment plants with multiple institutions responsible for monitoring of the operations of sewage treatment. An important issue of this state led institutional model was that of governance. Dedicated and specialized institutional structure was created at all levels - the Central Government, the State Governments and local governments to implement, monitor and evaluate the pollution abatement strategy. However, these institutions were plagued with 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 the gaps in policy and program design. The weakness in program planning, implementation, monitoring, evaluation, center-state coordination, state-ULB coordination, etc. have been well documented. (Ahmed, 1985; Divan, 1995; CAG, 2000; Singh, 2001; Biswas, 2002; PAC, 2004; Shaw, 2006). 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 and inturn weaknesses of the GAP itself (Ahmed, 1985; Divan, 1995). 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. The governance issues associated with the pollution abatement strategies have led to arguments of 'state failure' that reflect the paradigm shift in policy debates over the past two decades. Such suggestions also put forward the need for private sector participation 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). Our earlier case study of GAP in Kanpur city 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 regulating[9]. 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.

[9] 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))

6. Paradigm Shifts in the Institutional Model

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 affected the 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) that 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 management 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 (GRBEMP, 2011).

6.1. Neo Liberal Policy Shifts

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 to sensitize State Governments and ULBs to the policy and procedural issues to 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 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). 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. 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 infrastructure companies. There is also a proposal for 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 innovative concept such as 'Zero-Liquid Discharge' (ZLD) and to bring in the much needed finances and expertise which are inadequate with Urban Local Bodies (ULBs)[10]. However, there are number of studies from donor and multilateral agencies (GoI-ADB, 2010; Prasad, 2006; WB, 2008) civil society organizations (Dwivedi, 2010; Bhatnagar & Zeug, 2011; CSE, n.d[11]) as well as government (GoI, 2009a; MoUD&PA, 2004) that evaluates the performance of the institutional option of PPP in UWSS.

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 enablers[12]. 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 with lack of technical and monitoring capacity to implement. (Dwivedi et al., 2007; Bhatnagar & Zeug, 2011; Dwivedi, 2010; GoI, 2009a; Working Group on UIWSS, 2011)

[10] DBFO Model - Source: http://gangapedia.iitk.ac.in/sites/default/files/Vinod%20Tare_Model-Projects_PPP.pptx

[11] Reports on http://www.cseindia.org/taxonomy/term/20237/menu

[12] 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.

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.

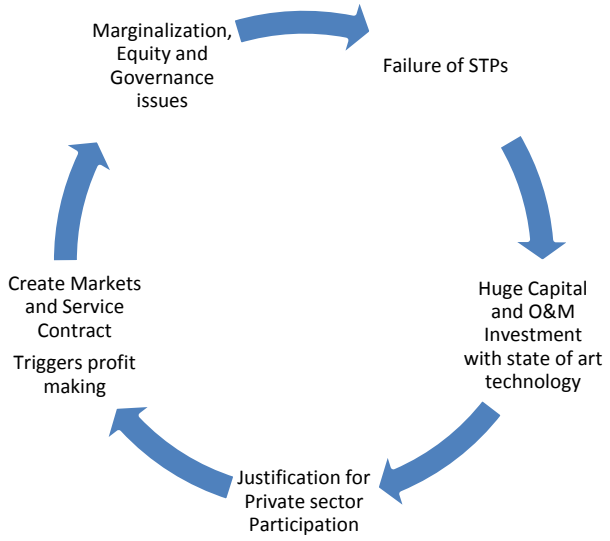

Figure 1: A new vicious cycle of high-tech non-performance

While analyzing the features of PPP 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 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. JNNURM does not give money for land acquisition but expects ULBs/states

to fund land costs through other means. This has been probably the single biggest reason for delays in project implementation and faulty design/functioning (if land isn't available in the right location) (Mahadevia, 2011; Kamath, 2012).

6.2. Concerns Regarding PPP as Institutional Solution and Implications for Ganga Basin

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. 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. 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.

Even for the neat PPP 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 PPP 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. Some suggestions from government like a shift from “PPP” to LB-centric approach (GoI, 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).

6.3. Questions on PPP to be Answered

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 PPP proposed for waste water management in the Ganga Basin 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 the 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 'PPP – PPP' has to be reconsidered. It is clear from the discussion that for the proposed PPP 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 PPP 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.

7. Conclusions

With primary focus on governance issues, the working group of Planning Commission has pointed out 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).

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 is to be ensured by a political commitment by the state through an upfront agreement and clearly a call to commoditize water. 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.

The National Ganga River Basin Authority (NGRBA) has proposed a river basin treatment strategy that clerly staes, "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 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) 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. The renewed policy debate in UWSS has two strands: one that argues for huge financial inducement thrust into the sector like the report 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 (Working Group on UIWSS, 2011: 44).

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.

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