



सत्यमेव जयते

POSITION PAPER ON
THE WATER AND SANITATION SECTOR
IN INDIA

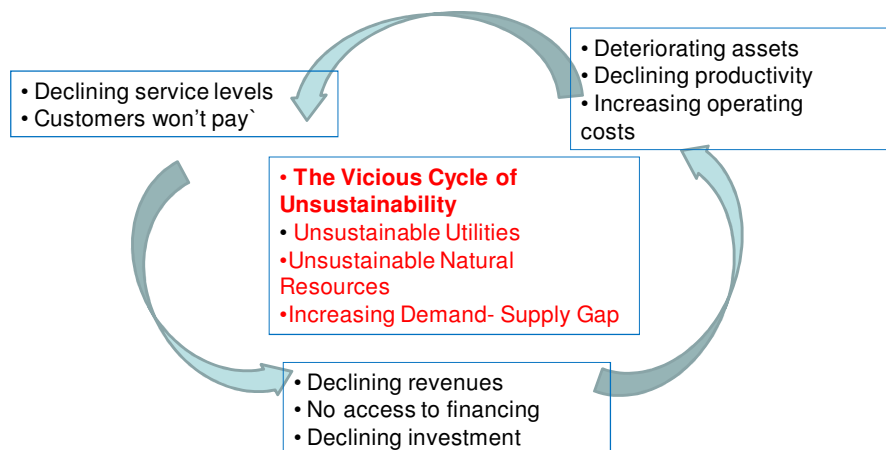
October 2009

Department of Economic Affairs
Ministry of Finance
Government of India

BACKGROUND

1. Rapid urbanisation combined with rapid economic growth has led to urgent requirement of various urban infrastructures namely roads, water & sanitation, solid waste management etc. But years of under investment in these sectors have reached a point where there are capacity constraints in these sectors and due to lack of maintenance nearly 100% investments need to be made in these sectors. Further due to lack of robust institutional structures; poor commercial management- tariff & cost recovery; outdated systems- Finance, Accounts & MIS; have led to these sectors attracting lower capital over the years.
2. Nearly all cities and towns have piped water system but do not function efficiently and characterised by low pressures and frequent breakdowns. In rural areas, most villages have hand pumps, but they remain unoperational for days together. The pressure is inadequate and often the chemical and biological quality of the supplied water is not as per recommended standards. Urban water supply and sewerage is in a downward spiral as illustrated in Exhibit 1.

Exhibit 1: Downward spiral in Water and Sanitation Sector



Due to deteriorating assets, declining productivity has led to increasing operating costs. This in turn has led to declining service levels which encourages customers not to pay leading to declining revenues, lesser access to financing and thus lesser investment in the asset. And the downward spiral continues. This leads to a vicious cycle of un-sustainability- unsustainable utilities, depleting natural resources and increasing demand -supply gap. In this situation Service Providers are in perpetual operational & financial distress. Service expansion is impossible. The poor receive

little service and rely on private informal markets for high cost, low quality water supply and sewerage facilities.

3. Urban Water and Sewerage is a key urban infrastructure. As per the planning commission the sector needs an investment of \$ 48.57 Bn which forms 9.8% of the total investment required in the 11th plan. It is estimated that 97.3% of this requirement will come from Public Sector and only 2.7% from the private sector.
4. Some of the Key statistics of Water Sanitation Sector (World and India) is as below:

Exhibit 2: Global and Indian Statistics on Water and Sanitation Sector

| <i>Parameter</i> | <i>Value</i> |
|---|----------------------|
| <i>World Figures</i> | |
| GDP spent by developed countries on safe water and sanitation | 1% |
| Private sector's global contribution in serving population : | |
| • water services | 6% |
| • sewerage services population | 4% |
| Impact of each \$1 invested in sanitation on productivity, girls education, etc | \$7 |
| Only country having privatized 100% of water supply systems | UK |
| Desalination plants | |
| • Countries where operational | 100 (aprox) |
| • Number operational | 13,080 |
| • Share in global water use | 0.5% |
| • Share of Middle East in location of desalination plants | 50% (approx) |
| Investments estimated for providers by 2010 | |
| • water supply facility | \$1/m ³ |
| • wastewater treatment | \$1.3/m ³ |
| Cost involved in water conservation | \$0.4/m ³ |
| World's population living in chronic water shortages by 2025 (approx) | 3.5 billion (50%) |
| Water scarcity in developing countries | |
| • people without access to safe water | 1.1 billion |
| • without basic sanitation | 2.6 billion |
| If MDG Target 10 for Asia is attained : | |
| • Number of diarrhoea cases that will be averted | 275 million |
| ○ Cases averted with total WSS coverage | 550 million |
| • Per annum savings in health costs | \$2.5 billion |
| ○ Savings with total WSS coverage | \$5.2 billion |
| <i>India Figures</i> | |
| <i>Availability and Access</i> | |
| Present per capita availability of water in India | 1,750 Cu. Mts. |
| Present per capita availability of water in India (FAO Gradation) | Scarcity |
| Percent of Urban population with access to Water in India | 91% |
| Percent of Rural population with access to Water in India | 96% |
| Percent of Urban population without proper sanitation in India | 63% |
| <i>Effects</i> | |
| Percent of diarrhoea-related deaths caused by lack of water and sanitation | 88% |
| Loss of Water in Transmission and Distribution | 40-50% |
| <i>Targets</i> | |
| Water Aid estimates for water and sanitation targets in India by 2015 : | |
| • People needed to be reached each year | 29 million |

| | |
|---|----------------|
| • Shortfall of investment | US\$34 billion |
| <i>Others</i> | |
| 1 st Indian State to set up a regulatory body for water (Water Resources Regulatory Authority Act, 2005) | Maharashtra |
| 2 nd Indian State to set up a regulatory body for water (Water Regulatory Commission Bill, 2006) | Gujarat |

5. The sector continues to rely largely on state subsidies and capital grants supplemented by loans to develop new water sector infrastructure.
6. Political unwillingness, cost recovery, regulatory framework also does not incentivise the private sector participation for water service delivery for investment and operation.
7. The sector faces three challenges on water front namely- water availability due to losses, access to all user, water quality.

Box I: Situation analysis on Water Resources

Declining availability: The assessed gross available and utilisable water resources of the country, based on conventional technology, are therefore 2,384 BCM (billion cubic metres) and 1,086 BCM, respectively. With an estimated population of one billion in 2000, the available and utilisable water resources per capita per year are 2,384 BCM and 1,086 BCM respectively against an estimated availability of 6,008 BCM in 1947. This itself, gives a broad indication of the growing resource scarcity in India in the fifty-five years since independence.

Increasing Demand: The total water withdrawal/utilisation for all uses in 1990 was about 518 BCM or 609 BCM per capita per year. The country's total water requirement by the year 2050 will become 1,422 BCM, which will be much in excess of the total utilisable average water resources of 1,086 BCM. At the national level, it would be a very difficult task to increase the availability of water for use from the 1990 level of approximately 520 BCM to the desired level of 1,422 BCM by the year 2050 as most of the undeveloped utilisable water resources are concentrated in a few river basins such as the Brahmaputra, Ganga, Godavari, and Mahanadi

Water Quality: *High fluoride concentration* in ground water, beyond the permissible limit of 1.5 ppm, has come to stay as a major issue affecting a large segment of rural population to the tune of 25 million spread in over more than 200 districts in 17 states in the country. The population at risk is estimated at around 66 million. The presence of *excess Arsenic in ground water* has been reported from West Bengal. Nearly 13.8 million people in 75 blocks are reported at risk. It is also reported that around 0.2 million people in West Bengal have arsenic related skin manifestations.

(Source: India Assessment 2002-Water Supply and Sanitation- a WHO-Unicef sponsored Study under planning commission)

INVESTMENTS (10th AND 11th PLAN)

8. The 11th Five Year Plan envisages 100% coverage of the Rural drinking water supply by March 2009 and 100 per cent coverage of urban water, urban sewerage and rural sanitation by 2012. However, these targets do not take into account both the quality of water being provided, or the sustainability of systems being put in place.
9. The investments made in last plan (10th Plan) and the projected investments in 11th plan are provided in the following table.

Exhibit 3: Investments in 10th and 11th plan

| Year | Value Rs Crore (USD Bn) | %age of GDP |
|---|----------------------------|-------------|
| Investment in India over 10 th Plan (2002-07) | 64803 (16.20) | 7.44 |
| Investment in India over 11 th Plan (2007-12) | 143730 (35.93) | 6.99 |

10. The investment in Water and Sanitation is likely to see a jump of 221% in the 11th plan over the 10th plan. Following table shows the break-up of investments by Centre, State and Private sector.

Exhibit 4: Water Sector & Sanitation Investments in 10th and 11th Plan

| Year | 10th Plan Rs Crore (USD Mn) | %age of Share | 11th Plan Rs Crore (USD Mn) | %age of Share |
|--------------------------------------|--------------------------------|------------------|-----------------------------------|------------------|
| Projection of investment in India | 64803 (16.20) | 100% | 143730 (35.93) | 100% |
| -by Centre | 42316(10.58) | 65.30% | 42003(10.50) | 29.22% |
| -by States | 21465(5.37) | 33.12% | 96306(24.07) | 67.00% |
| - by Private | 1022(0.26) | 1.58% | 5421(1.36) | 3.78% |

The centre's investment amount in the sector in the 11th plan is unlikely to change much over the 10th plan, though its share will come down drastically from 65% to 29%. The public sector, including the public corporate sector, would continue to play a dominant role in investment for infrastructure. The state's investment amount is likely to go up by over 448%. The private sector investment is also likely to increase by 530% to improve its share from 1.58% to 3.78% through the PPP route. This would be a huge challenge both Central and State Govts to be in a position to attract investments into the sector including facilitating private sector investment. (Source: 11th Plan Document)

11. Large investments are needed to develop and upgrade water supply, treatment and distribution networks. Large opportunities exist for design consultants and material/equipment suppliers of water and sewer mains, pipes, valves, pumps, water and sewage treatment plants and also erection contractors. The investment potential across various sub-sectors is expected to be around Rs 90 billion in 2010 and Rs 170 billion in 2015 with CAGR of 14% in water infrastructure investment. (*Source: Planning Commission and Tata Strategic Analysis*)
12. Jawaharlal Nehru National Urban Renewal Mission (JnNURM) Funding: 63 cities with population of 10 Lakh (2001 Census) are eligible to get capital investment under JnNURM for Water Supply and Sanitation (WSS) sector.

Box I: JnNURM Funding

In the post independent India while population of India has grown three times, urban population has grown five times. The rising urban population has given rise to increase in number of urban poor. In order to cope up with the massive problems that have emerged as a result of rapid urban growth, it has become imperative to draw up a coherent urbanization policy/strategy to implement projects in selected cities in mission mode.

Jnnurm has been launched primarily with this end in view. It is a reform driven, fast track, planned development of identified cities with focus on efficiency in urban infrastructure/service delivery mechanism, community participation and accountability of urban local bodies (ULBs)/parastatals towards citizens.

Mission Strategy:

- (i) Planned urban perspective frameworks for a period of 20-25 years (five yearly updates) indicating policies, programmes and strategies of meeting fund requirements would be prepared by every identified city.
- (ii) Cities/Urban Agglomerations/Parastatals will be required to prepare Detailed Project Reports for undertaking Projects under identified areas.
- (iii) Private sector Participation in development, management and financing of Urban Infrastructure would be clearly delineated
- (iv) Funds for the identified cities would be released to the designated State Nodal Agency, which in turn would leverage, to the extent feasible, additional resources from the financial institutions/private sector/capital market

Mission Objectives

- (a) Focused attention to integrated development of infrastructural services in the cities covered under the mission.
- (b) Secure effective linkages between asset creation and asset Management so that the infrastructural services created in the cities are not only maintained efficiently but also become self-sustaining over time.

- (c) Ensure adequate investment of funds to fulfil deficiencies in the urban infrastructural services.
- (d) Planned development of identified cities including peri-urban areas, out growth, urban corridors, so that urbanization takes place in a dispersed manner.
- (e) Scale up delivery of civic amenities and provision of utilities with emphasis on universal access to urban poor
- (f) To take up urban renewal programme, i.e., re-development of inner (old) cities areas to reduce congestion.

Duration of the mission: is seven years beginning 2005-6

Scope of the Mission: The main thrust of the submission on urban Infrastructure and Governance is on Major infrastructure Projects relating to water supply including sanitation, sewerage, SWM, road networks, urban transport and redevelopment of inner city with a view to upgrading infrastructure therein, shifting, industrial/commercial establishments to conforming areas etc.

The mission will be implemented in 63 cities and the cities must have elected bodied in position

Urban Reforms: The main thrust of the revised strategy of urban Governance is to ensure improvement in urban Governance so that the ULBs and parastatal agencies become financially sound with enhanced credit rating and ability to access market capital for undertaking new programmes and expansion of services. In this improved environment, PPP participation would also become feasible. To achieve these objectives, state Governments, urban local bodies and parastatal agencies are required to accept implementation of an agenda of reforms both mandatory and optional and a MOA has also been signed with GOI indicating their commitment to implement the identified reforms.

13. The looming water crisis, both nationally and internationally, is a big challenge. Nevertheless, the private sector needs to realize the mega business opportunity hidden in the crisis, across the entire value chain of water projects.

POLICY FRAMEWORK

14. Water supply and sanitation is a State responsibility under the Constitution of India and following the 73rd and 74th Constitutional Amendments, the States may give the responsibility and powers to the Panchayati Raj institutions (PRIs) and Urban Local Bodies (ULBs). At present, States generally plan, design and execute water supply schemes (and often continue to operate) through their State Public Health Engineering Departments (or as in the case of some states, Panchayati Raj Engineering Departments or Rural Development Engineering Departments) and Water Boards.

National Water Policy

15. National Water Policy was adopted in September, 1987. Since then, a number of issues and challenges have emerged in the development and management of the water resources. Therefore, the National Water Policy (1987) has been reviewed and updated with the issue of National Water Policy 2002 (NPW 2002). The Key salient features of the NPW 2002 are

- The NWP defines water as a prime natural resource, a basic human need and a precious national asset, to be planned, developed, conserved and managed in an integrated and environmentally sound basis, keeping in view the socio-economic aspects and the needs of the States. It recognizes water as a crucial element in developmental planning, to be managed in a sustainable manner and guided by the national perspective. Water as a resource is one and indivisible: rainfall, river waters, surface ponds and lakes and ground water are all part of one system.
- **Private Sector Participation:** It 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 bring in better management practices. All models of private sector participation, viz. build, own, operate and transfer, are acceptable.
- **Emphasis of Asset Utilisation:** It stipulates that there is an urgent need for paradigm shift from creation of new projects to improvement of the performance of existing projects.
- **Practices for Water Conservation:** It acknowledges the importance of all types of practices, the traditional practices like rainwater harvesting, preservation of forests; the modern conventional practices like water shed management, soil

conservation; and the modern non-conventional methods like inter-basin sharing of water, artificial recharge of ground water and desalination of sea water.

- **Multi-pronged Approach:** It emphasizes multi-sectoral, multi-disciplinary planning with participatory approach, for the entire river basin. The water allocation priorities are drinking water, irrigation, hydro-power, ecology, industrial use and navigation, in that order. It specifically stipulates that drinking water requirement shall be first charge on any available water.
- The NWP 2002 is aimed at improving existing strategies to improve water quality and reduce ground water and surface water pollution. Use and application of scientific tools and techniques to improve water resources development has also been emphasised. Further the policy encourages those projects' development and proposals, which account for the sustainable use of surface and groundwater, incorporating quantity and quality as well as environmental considerations.
- There are 24 goals of the National Water Policy 2002 among which key areas related to water supply and sanitation being: Water Resource Planning, Project Planning, Groundwater Development, Drinking Water, Private Sector Participation, Water Quality, Water Zoning, Conservation of Water, Project Monitoring

16. Several state Governments like Maharashtra, Orissa, Madhya Pradesh, Karnataka, Kerala and Himachal Pradesh have enacted their water policies

The National Urban Sanitation Policy 2008

17. The National Urban Sanitation Policy 2008 aims to achieve 100 per cent sanitation coverage under the 11th plan. The policy will generate The Policy will focus on generating awareness about sanitation and its linkages with public and environmental health among communities, encourage behavioural changes to adopt healthy sanitation practices. The policy hopes to achieve sanitised towns and cities ensuring affordable hygiene and sanitation facilities for urban poor and women.

18. To achieve the goal of 100 percent the activities planned include promoting household access to safe sanitation facilities and disposal arrangements, ensuring adequate availability of public sanitation facilities in urban areas along with complete maintenance and upkeep of such facilities. Other activities would include an integrated city wide sanitation movement to strengthen the existing institutions and extend services to poor and uncovered communities, ensuring safe disposal of liquid waste

and proper usage of installed capacities, and strengthening of ULBs to improve service delivery.

19. To achieve the above mentioned objectives, the union government will support and encourage states and cities to prepare state-level sanitation agencies and model city plans based on their local urban context by 2010-11. The States will also be encouraged to formulate state reward schemes. A state level body to monitor the implementation of the state strategy and a nodal agency for planning and implementation will be appointed. A periodic rating of all 423 class I cities will also be undertaken with respect to sanitation services on parameters including recycling and reuse of treated wastewater on non-potable applications, efficient and safe management of storm water, proper O&M practices, outcome related parameters such as improved quality of drinking water, reduction in water borne diseases, etc.

Box II: Water Sector Policy in Karnataka

The Objective: The efforts of the Government of Karnataka and its partner agencies will be to- a) Ensure universal coverage of water and sanitation services that people want and are willing to pay for; b) ensure sustainability; c) Ensure a minimum level of service to all citizens

Institutional Arrangement: The policy lays down Institutional Arrangement for a) GoK to be responsible for policy, Ensuring provision of the bulk of the resources, Regulation, monitoring and evaluation of the efficiency of operations, Setting minimal service standard, Encouraging use of public private partnerships, Promotion of the economic and commercial viability and the exploitation of economies of scale, Institution of necessary incentives, sector reforms, Ensuring co-ordination and collaboration among the various agencies; b) Urban Local Bodies (ULBs) to be responsible for water supply and sewerage services from water catchments to waste water treatment, either directly through public bodies or through appropriate Private Sector Participation (PSP) arrangements; c) KUWS&DB to be responsible for capacity creations and augmentation in all ULBs and O & M in selected ULBs (Medium term) and to become a publicly owned independent provider of technical assistance and management support to ULBs in the longer term.

Tariff: Tariff principles envisaged are -a) for natural resource sustainability and commercial viability of operations the agencies will recover the full cost of providing service from water users, b) in the long term to establish an appropriate cost recovery mechanism through adequate tariff to ensure that revenues cover operations and maintenance costs, debt service plus a reasonable return on capital c) subsidies focused on communities of extreme poverty and large-scale investments with like wastewater treatment; d) to disincentives excessive consumption and wastage of water, whilst ensuring at least a minimum “life line”

supply to the poor; e) to achieve 100 percent metering and volumetric pricing based on long run marginal costs in about five years.

Capital Investment Plan : Calls for –a) A revised demand driven urban water action plan, b) Future capital investments in the sector will be in accordance with this plan; c) Investments will be guided by the principle of optimal utilization of water and water system infrastructure and financial resources and the financial as well as the social returns on investment

Private Sector Participation (PSP): GoK to actively encourage private sector participation improve efficiency in service provision, continuously update technology and ultimately bring in private investment into sector. PSP will necessarily have to be gradual given the current sector status. Preparatory work for PSP in the sector like fostering a culture of commercialization, encouraging out sourcing, building local capacity and most importantly identifying and expediting the necessary legislative institutional and regulatory changes that are necessary of PSP will be undertaken in the meanwhile. GoK will arrange different PSP methods of Service provision and service providers for different sizes of urban areas in the State.

REGULATORY FRAMEWORK

20. Today there is no provision for setting up a State Municipal Regulatory Commission – A.P, Kerala, Tamilnadu, Karnataka, West Bengal (Source: Prof Srinivas Chary paper at ADB Bhopal Conference). Since water and sanitation is a state/ local government subject, there have been no regulators in place unlike in power sector. The regulation of UWSS is being done by the State Governments except in UP (Uttar Pradesh Water Management and Regulatory Commission Act 2008) and Maharashtra (Maharashtra Water Resources Regulatory act 2005). In other states without a regulator, the regulation has to be by contract management.

Box III: Maharashtra Water Resources Regulatory Act, 2005

Formation: Initially funded by the World Bank, the Maharashtra Water Regulator started functioning in 2006.

Institutional Arrangement: Maharashtra Water Resources Regulator facilitates and ensures judicious, equitable and sustainable management of water resources, fixes tariffs for industrial water consumption, drinking water supply and for other uses

Allocation of Water: The Regulator will determine the distribution of entitlements across categories of use as well as the equitable distribution of entitlements within each category based on the terms and conditions prescribed in the state water plan.

Tariff: The Authority shall establish a tariff system for various categories of water use for sustainable management. Water Charges will reflect the full recovery of the cost of administration, and O&M of water resources' projects.

Water Quality: The regulatory authority will support and aid preservation of water quality within the state by following 'polluter pays' principle.

POLICY ON PSP INVESTMENT

21. Currently there are no provisions for private sector participation(psp) and NGOs in Municipal Acts –A.P, Kerala, Tamilnadu, Karnataka, Maharastra, West Bengal (Source: Prof Srinivas Chary paper at ADB Bhopal Conference). It is only recently that in a state like Karnataka, an Urban Drinking Water & Sanitation Policy has been brought out which provides for private sector participation.

PPP INITIATIVES

22. PPP, unlike the common notion, is NOT outright privatization: tariff and water prices are regulated, and moreover, the assets and water resources remain in the hands of the public authorities. Hence, under PPP, water is not privatized, but the service (or supply) is put in private hands. In the recent past, there has been a significant rise in the investments by the private sector in the area of Water related services. While there is some long-term data worldwide to consider and evaluate PPPs in the water sector, in India this sector is still very new. Today, PPP WSS sector has been exploited far below its potential. There are several models of PPP in Water Supply and Sanitation (WSS) sector whose structure and application are explained in Annexure I.

23. The early PPPs in the Water Sector were marked by the private sector investing in setting up basic utilities and infrastructure. That appears to be changing since Year 2000, where the private sector is getting more involved in setting up Water Treatment Plants and Sewerage Treatment Plants and not just investments in basic water utilities. The trend for PPP in the water sector slowed down since some of the initial efforts using this approach failed to deliver desired outcome. Water supply and Sanitation sector in India has seen three phases¹ of PPP.

- In Mid 1990s - when several international projects were taken up but they failed
- Around 2000 – the pace of PPP in water and sanitation subsided
- Post 2005 – there are some early successes

24. These PPP projects in the three phases mainly fall under four segments of the water value chain namely- a) Bulk Water Generation, b) Treatment (Desalination, Waste water), c) Distribution of Water d) Network Rehabilitation.

25. A comparison of the risks assumed and impact there of is presented in table below for a conventional project vis-à-vis a PPP project.

26. Exhibit 5: Risk Sharing in Conventional Vs PPP procurement

| Risks | Conventional Projects | PPP Projects |
|-----------------------------|-----------------------|--------------|
| Investment (Cash Flow) Risk | Authority's | Developer's |

¹ Crisil Presentation at ADB Bhopal Conference on Water and Sanitation

| | | |
|--|--|---|
| Design Risk | Authority's | Developer's |
| Construction (Cost & Time Over run) | Authority has no control over it | Developer has inherent incentive to control time & cost |
| O&M (Operations) | Authority invests substantial time and manpower | Independent Engg-monitoring Developer bears the risk of operations |
| O&M Performance Standard | The contractor is already paid for, hence no control | Future payments to developer are linked to the performance |
| Collection Risk | Rests with Authority | PPP (Annuity)- with Authority PPP (User Fee) – with the developer |
| Tariff Risk | Rests with Authority | PPP (Annuity)- with Authority PPP (User Fee) – with the developer |
| Financial Risk (Exchange Rate, Interest Rate) | Authority | Lenders |
| Technical Risk | Authority | Developer |
| Political Risk (expropriation, political violence, currency convertibility) | Authority | Authority |
| Contractual Risk [Regulatory Risks] | Authority | Authority |
| Macroeconomics Environment -- Volatility Risk (exchange rate, inflation) | Authority | Authority/ Developer |

| | | |
|--|-----------|-----------|
| Legal Environment (rule of law, i.e., judicial system, regulatory procedures and arbitration) | Authority | Authority |
|--|-----------|-----------|

In the early projects in India, the risk assumed by PPP operator (mainly a) Investment, b) Design, c) Construction, d) O&M, e) Collection, f) Tariff) analysed in later paras.

27. A quick profile of the PPP projects that were taken up in the initial days and have since failed are provided in table below.

Exhibit 6: Quick Project profiles of failed projects

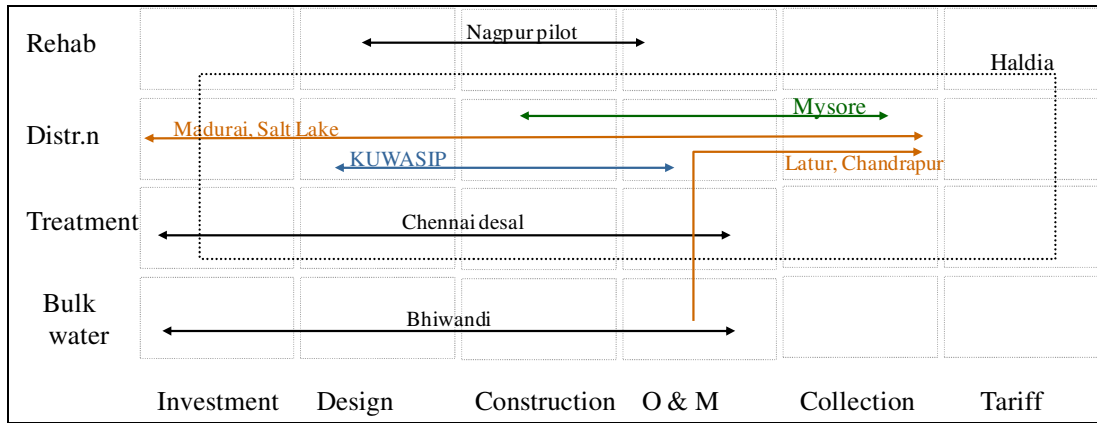
| Project | Operator | Value Chain (VC)/ Operators' (Risk) | Status | Reasons for failure |
|----------------|-----------------|---|--|---|
| Bangalore | Bi Water | VC: Bulk Water Risk: Investment, Design, Construction and O&M | <ul style="list-style-type: none"> Negotiations with Bi water abandoned | <ul style="list-style-type: none"> Bulk water tariff unaffordable Project generated controversy |
| Hyderabad | NA | VC: Bulk Water Risk: Investment, Design, Construction and O&M | <ul style="list-style-type: none"> Project abandoned | <ul style="list-style-type: none"> Bulk water tariff unaffordable Credit quality of the water board |
| Pune | NA | VC: Distribution, Treatment, Bulk Water Risk: Investment, Design, Construction and O&M | <ul style="list-style-type: none"> Project abandoned after some degree of preparation | <ul style="list-style-type: none"> High political opposition to the project |
| Goa | NA | VC: Bulk Water Risk: Investment, Design, Construction and O&M | <ul style="list-style-type: none"> Project abandoned after bidding | <ul style="list-style-type: none"> High bulk water tariff Project need questioned |
| Sangli | NA | VC: Distribution, Treatment & Bulk | <ul style="list-style-type: none"> Project abandoned after some level of preparation | <ul style="list-style-type: none"> Council decided against the project |

| | | | | |
|--|-------------------|--|---|--|
| | | Water Risk: O&M, Collection | | |
| Bangalore Delegated Management Contract | Hydro Com P | VC: Rehabilitation and Distribution Risk: O&M, Collection | • Project abandoned after two international firms submitted their proposals | • Lack of project preparation |

However, it is important to realize that these projects failed not because of drawbacks of PPP per se, but because of the drawbacks of the processes that were followed or the lack of enablers being in place. If properly followed, the PPP mode of procurement has the potential of delivering the goods. The international experience of Manila Water Case (Annexure II) explains that water projects can be highly successful.

28. A summary of 10 projects which have seen some success are mapped on the dimensions of PPP ‘value chain’ covered and the ‘operator’s risk’ in the pictorial representation below².

Exhibit 7: Mapping WSS projects against Water Value chain and shared operator risk



Quick profiles of these PPP projects are provided in table below.

² Crisil Presentation at ADB Bhopal Conference on Water and Sanitation

Exhibit 8: Quick Project profiles of successful projects

| Sl No/ Project Name | Operato r | Size | Duratio n/ PPP Scope | Value Chain (VC)/ Operator's (Risk) | Reasons for Success/ Key Risk of Operator |
|---------------------------|---------------|---------------------|---|--|--|
| 1. Chandra pur | Gurukrip a | 3 lakh popl | 10 years; O & M of city network | VC: Distribution, Treatment & Bulk Water Risk: O&M, Collection | <ul style="list-style-type: none"> • Operator does not have an investment risk • Tariff curve is pre-fixed prior to bidding • All commercial risks with operator |
| 2. Latur | Hydro Comp | 3.5 lakh popl | 10 years; O & M of city network | VC: Distribution, Treatment & Bulk Water Risk: O&M, Collection | <ul style="list-style-type: none"> • Capital investment completed by Govt utility • Favourable metering and tariff policy • Tariff curve for ten years fixed before bidding • All commercial risks with operator |
| 3. KUWAS IP | Veolia | 18,000 conn | 3.5 years; Upgrada tion and O & M | VC: Distribution Risk: Design, Construction & O&M | <ul style="list-style-type: none"> • Capital investments funded publicly, • Managed by operator • Performance based fee model for the operator • Operator assumes purely technical risks |
| 4. Nagpur | Veolia | 10,000 conn | 5 years; Upgrada tion and O & M | VC: Rehabilitation and Distribution Risk: Design, Construction, O&M | <ul style="list-style-type: none"> • Capital investments funded (Not by operator) • Performance risk to the operator |
| 5. Salt | JUSCO | 14 mld | 30 years; | VC: Distribution | <ul style="list-style-type: none"> • Institutional clients with high credit quality. |

| | | | | | |
|-----------------------------------|------------------|-----------------|--|--|--|
| Lake | | | BOT (WS & S) | Risk: Design, Construction, O&M, Collection, Tariff | <ul style="list-style-type: none"> • High growth area • Capital Investment- JnNURM • Operator takes all commercial risks |
| 6. Haldia | JUSCO | 230 mld | 25 years, BOT | VC: Rehabilitation, Distribution & Treatment Risk: Investment, Design, Construction, O&M, Collection, Tariff | <ul style="list-style-type: none"> • Institutional clients with high credit quality. • Industrial Water Supply |
| 7. Madurai | Hydro Comp | 10,000 conn | Upgrada tion and O & M | VC: Distribution, Treatment & Bulk Water Risk: O&M, Collection | <ul style="list-style-type: none"> • Capital investment completed by Govt utility • Favourable metering and tariff policy • Tariff curve for ten years fixed before bidding |
| 8. Mysore | JUSCO | 9 Lakh popln | 6 years; Upgrada tion and O & M | VC: Distribution Risk: Construction, O&M, Collection | <ul style="list-style-type: none"> • Investment from JnNURM • Construction cost risk to Operator - Cost of construction can change |
| 9. Chennai desalinat ion | IVRCL- Befasa | 100 mld | 25 years; Bulk water BOT | VC: Bulk Water Risk: Investment, Design, Construction, O&M | <ul style="list-style-type: none"> • Only production risks |
| 10. Bhiwand i | SPML | 6 lakh popln | 30 years; Bulk water + mgmt | VC: Bulk Water Risk: Investment, Design, | <ul style="list-style-type: none"> • Only production risks |

| | | | | | |
|--|--|--|--|----------------------|--|
| | | | | Construction, O&M | |
|--|--|--|--|----------------------|--|

Further details on these successful projects (Sl No 2, 3, 4, 5, 6 & 8 of Exhibit 8) have been brought out in Annexure III.

29. More and more PPP Projects are focussing on distribution improvements, unlike in the earlier years when capacity addition and bulk water was the focus. Today, the expectation from private sector is on improvement of service delivery and not only the infusion of capital.

Profile of Operators

30. Home-grown companies (Gurukripa, JUSCO,IVRCL and SPML) are gradually taking more interest in water PPPs and the success rate with these domestic operators is on the upswing. It has been observed that international operators are aligning with domestic operators in bidding for projects.

31. The Indian companies are somewhat more comfortable with risks involved in user fee collection than the international ones. They also have a higher political acceptability, in general. Besides, NGO activism and opposition could be less vocal with Indian companies as compared to international operators. This explains the growing role and importance of Indian Water Sector Companies in PPPs related to this Sector.

International Experience

32. While developed countries are introducing private sector participation to improve efficiency and effectiveness of water supply systems, developing countries such as China, Thailand, Malaysia, Argentina, and Philippines are looking towards private participation in building their water infrastructure / assets in addition to improving the efficiencies. There are different drivers for investment in different regions.

- In the Middle East, it is scarcity, population growth and broad economic development, necessitating desalination and greater reuse of treated wastewater.
- In China, it is an efficient management of water resources to satisfy a growing population, coupled with a need to upgrade wastewater facilities
- In Eastern Europe, new entrants to the European Union are trying to comply with water and wastewater standards of EU

Box IV: Manila Water Supply (Philippines)

Since the implementation of PPP methodology at Manila Water Supply in 1997 there has been several significant benefits

- Reduction of NRW from 63% to 25% (1997-2007)
- Commercial Reorientation of employees on the value of quality service, business focus, and accountability for performance
- Increased billed volume from 440 MLD to over 700 MLD (+70%)
- Service area receiving 24-hour water supply expanded from 15–20% to over 60%
- Served customers went up from 65% to 88% of the population

(Refer Annexure II for details)

CONSTRAINTS

33. This sector faces several challenges in demand and supply side of PPP project structuring and; addressing them (Mitigation Measures) would facilitate private investment in the WSS sector in India. They are captured as below.

Exhibit 9: Constraints facing WSS sector and suggested Mitigation Measures

| 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 |

WAY FORWARD

34. Reflecting on the PPP projects which have taken-off and the current investment climate and enablers in Water Supply and Sanitation(WSS) sector, the following three Models are suggested.

Exhibit 10: Suggested Models for implementation

| Model; Project Initiatives | Duration | Value Chain(VC)/ Operator's Risk | Reasons for Success |
|---|-------------------------------|---|---|
| Model I: O&M with Limited Investment (Chandrapur, Latur, Madurai, Mysore) | Upto 10 years | VC: Distribution, Treatment & Bulk Water Risk: O&M, Collection | <ul style="list-style-type: none"> • Operator does not have an investment risk • Tariff curve is pre-fixed prior to bidding • All commercial risks with operator |
| Model II: BOT for Industrial Water Supply- Haldia | 25 years, BOT | VC: Rehabilitation, Distribution & Treatment for Industrial Water Supply Risk: Investment, Design, Construction, O&M, Collection, Tariff | <ul style="list-style-type: none"> • Institutional clients with high credit quality. • Industrial Water Supply |
| Model III: Bulk Water Supply- Chennai desalination, Bhiwandi | 25-30 years Bulk water BOT | VC: Bulk Water Risk: Investment, Design, Construction, O&M | <ul style="list-style-type: none"> • Only production risks |

Key recommendations

35. **Models to Adopt:** Based on earlier sections and the analysis of the projects undertaken so far in WSS in India the following Key recommendations need to be adopted for a better PPP environment in WSS.

Exhibit 11: Key Recommendations in Brief

| SI No | Area | Recommendation |
|-------|----------------------|---|
| 1 | Policy Level | <ul style="list-style-type: none"> • Due to investor unwillingness to commit large investments, Public funding is necessary for network rehabilitation • Clarity in Tariff policy based on metering and volume of consumption • Not very high Bulk water tariff • State support through govt machinery where the private players are unwilling to enter like collection • Clarity in performance outcomes and their regulation • Customer Education |
| 2 | Project Level | <ul style="list-style-type: none"> • Appropriate project structuring based on risk appetite, financial analysis |
| 3 | Enabling Environment | <ul style="list-style-type: none"> • Water and Sanitation Policy favoring PPP • State Support for Private partner performance • Regulation by contract with clear defined role of Regulator • Strong Communication channel with all stakeholders |
| 4 | Utility Level | <ul style="list-style-type: none"> • Capacity Building • Standardisation in documentation • Improving Information availability and accuracy |

Rationalisation of water tariff

36. Rationalisation of water tariff in the domestic sector is a politically sensitive issue and will be the real challenge in Water PPPs. For uninterrupted and quality water, public awareness through sustained efforts needs to be built to pay for water. This, in turn, will lead to rationalized domestic tariffs in urban areas, that too in the long term. Tariff should move in a multi-year defined formula from meeting at least the O&M cost in the near term to full cost recovery in 5 years.

Financing

37. JnNURM funding can be tapped for cities which have above 10 lakh population to meet the capital investment. Aid can also be sought from multi-lateral aid agencies for meeting the capital cost.
38. Low credibility of ULBs/ agencies, has constrained the evolution of the market based financing. New potential ULBs would need technical assistance to develop their financial plans, build relationships with capital markets, make investor aware of issuer profiles, and establish familiarity with market intermediaries and the regulatory environment.
39. Govt further develop the Municipal Bond market in order to meet the debt requirement of the sector which had improved in the past with few ULBs accessing the market.

Regulation

40. The private player can not be exposed to the Regulatory risks (as the water regulator is absent or yet to evolve) and hence the regulation have to be through a contract where only interpretations, performance monitoring as per contract, approval of capital expenditure and dispute resolutions come under the regulatory purview.

Role of the Government

41. The Government needs to create an enabling environment to encourage PPPs in Water, with clearly-defined parameters for :
 - **Policy** : What needs to be done. The Policy Principles need to offer high-level representatives and decision makers a framework for policy dialogue and sustainable partnerships
 - **Implementation** : How it can be done. The procedural, action oriented Implementation Guidelines are supposed to provide the options and guidance to design the overall process (not just focusing on single issues) of implementing PPP approaches
 - **Tools** : What Knowhow is available. The Instruments like Model Concession Agreements, (MCA) and other bidding documents will smoothen cooperation between sector specialists, private companies and other stakeholders

CONCLUSION

42. There is a need to find an approach to PPP projects in WSS sector based on past mistakes and by improving risk sharing so that private sector feel more confident in participation. There is a need to evolve a PPP process flexible enough to accommodate the concerns of all the stakeholders which is robust enough to comply with a transparent processes.

ANNEXURE-I: PPP Modalities and their application

Over the past few years, the common PPP arrangements modalities in Water Sector in developing countries are summarised here:

- **Service Contracts** : under which the private firm partner is responsible only for a particular function like billing, collection etc of a fee from ULB usually related to performance in that function. Service contracts are at best a cost-effective way to meet special technical needs, but their benefits are limited
- **Management Contract** : under which the private firm partner is responsible only for the management, operation & maintenance of the system, in exchange of a fee from ULB usually related to performance. (duration approx 5 years). Management contracts are a good first step, and are most likely to be useful where the main objective is to rapidly enhance a utility's technical capacity and its efficiency in performing specific tasks, or to prepare for greater private involvement
- **Lease Contract** : under which the private firm partner, maintains & operates the assets at its own commercial risk, deriving revenue from the tariff; project is financed and implemented by the public sector. (duration of 6-10 years). Leases are an efficient way to pass on commercial risk and are most appropriate where there is scope for big gains in operating efficiency but only limited need or scope for new investments
- **Concession** : Private partner acquires the right to provide a service at a given standard or specification for a fixed time. The private company operates, manages and makes the investments, carrying the commercial risks (Revenue and collection) during the concession of around 20-30 years. Concessions have advantages in that they pass full responsibility for operations and investment to the private sector and so bring to bear incentives for efficiency in all the utility's activities
- **Build-Operate-Transfer (BOT)**: Normally done for new investments, usually the construction of new water or wastewater treatment plants. The contract involves the private partner constructing the plant and then running it for a number of years (20-30 Years) before handing it over to the public sector.

ANNEXURE-II: INTERNATIONAL EXAMPLE
MANILA WATER SUPPLY (PHILIPPINES)

At the time of PPP implementation in 1997, Metropolitan Waterworks and Sewerage System (MWSS) supplied potable water to 60% of the 10.6 million inhabitants. The PPP at MWSS was expected to result in the following benefits:

- Huge capital investments and operational efficiencies, expanding service coverage (water and sewerage and sanitation).
- Relieve the Government of the financial burden to improve MWSS facilities.
- Ensure 24-hour water supply
- Reduce NRW to an acceptable level.

Basic Features :

- PPP Mode : Concession (in consultation with the IFC)
- Franchise area divided into 2 zones (East and West Zone) to ensure competitive benchmarking
- Thus, two 25-year concessions were awarded through competitive bidding
- Scope : water treatment, distribution, tariff collection, facility improvement, and overall management
- MWSS retained its ownership of water facilities, including real estate properties
- MWSS maintained a regulatory function over water rates.
- The concessionaires were to pay concession fees amounting to about 30 billion pesos (1.2 billion dollars in 1997) over the concession period.
 - This amount represents debt service payments for existing foreign debt obligations of MWSS
 - The concession fee can also be viewed as a rental or lease for the use of MWSS facilities

Prequalification of bidders, the bidding process, and results

The Government imposed a strict set of criteria for short-listing potential bidders. These criteria included but were not limited to the following:

- The interested bidder or consortium should be composed of a “local sponsor” and an “international operator,” and
- The “international operator” should show proven experience and expertise in the provision of water supply and sanitation services
- The initial list of prospective participants : 50
- List shortened to : 7
- Final short-listings : 4
- International operators included :
 - Campagnie Generale des Eaux (later Vivendi)
 - Lyonnaise des Eaux (later Ondeo)
 - Anglian Water International (UK)
 - North West Water (UK)
- Local sponsors included :

- Ayala Corporation
- Benpres Holdings Corporation
- Metro Pacific Corporation
- Aboitiz Holdings Corporation
- Bidders were to quote bids for the 2 concession areas
- The bids were coefficients representing discounts against existing average tariff of MWSS (estimated at 8.78 pesos per m³ in January 1997)
- MWSS stipulated that no single bidder could win both concessions (the winning bids are shown in Table A2.2).

| Winning Consortia | (a) Discounts | (b) Existing Tariffs (pesos/m³) | (a) x (b) Bid Tariffs (pesos/m³) |
|---|----------------------|---|--|
| West Zone Operator Maynilad Water Services, Inc. Local Sponsor: Benpres Holdings Corp. International Operator: Lyonnaise des Eaux | 0.566 | 8.78 | 4.97 |
| East Zone Operator Manila Water Company, Inc. Local Sponsor: Ayala Corporation International Operator: North West Water | 0.264 | 8.78 | 2.32 |

- The concession agreement with concessionaires (Maynilad Water Services, Inc. and Manila Water Company, Inc.) had the following key provisions:
 - creation of a regulatory office
 - key service obligations
 - other obligations of the concessionaires
 - rate setting procedure
 - dispute resolution
- Role of the MWSS regulatory office :
 - to implement a system to protect customers' interests
 - to conduct tariff rate determinations
 - to monitor concessionaires' performance relative to service obligations
- The annual operating budget of the regulatory office and MWSS :
 - 200 million pesos (about 4 million dollars)
 - Amount obtained from the concession fee payments
 - Budget was adjusted for inflation every year.
- Key service obligations of the concessionaires :
 - *Provision of water supply.* Provide uninterrupted 24-hour supply at acceptable (16 psi) pressure. Sufficient connections were to be made to meet the service coverage targets (percentage of population residing in a municipality with access to piped water) set in the contract
 - *Provision of sewerage and sanitation services.* Less than 10% of the households in Metro Manila were connected to a sewerage network. Hence, contract also required provision of sewerage services to customers

currently connected to the water supply network. Since this would have taken time and significant capital investment, in the meantime the concessionaires were to provide sanitation services, including the cleaning of septic tanks and desludging, to the majority of households with septic tank systems

- *Provision of better customer service.* The concessionaires were to provide prompt responses to customer complaints and inform customers of water and sewerage charges

Rate setting procedure

The contract specified 3 mechanisms to adjust tariff rates from time to time.

- Consumer Price Index Adjustment, used every year (referred to as the "C" factor)
- Extraordinary Price Adjustment, used to counter "unforeseen events" ("E" factor)
- Rate Re-basing Adjustment, used every 5 years ("R" factor)

Any tariff adjustment determined by the Regulatory Office that could exceed the 12% RORB19 required under the law was treated as an expiration payment in favor of the concessionaire at the end of the 25-year concession. This mechanism ensured that the concessionaires got their "guaranteed rate of return."

Post-private performance: the case of the Manila Water Company

Overview

The Manila Water Company (MWC) took over operation of MWSS in August 1997. The company faced enormous problems and challenges. These included the following:

- higher operating costs and concession fee obligations as a result of the depreciation of the peso;
- unreliable network with very high NRW, estimated at 63% for the East Zone;
- lower water supply, due to El Niño weather phenomenon and poor water quality;
- significant regulatory risks; and
- reluctance of banks to provide financing due to the Asian financial crisis and significant regulatory risks.

Provisions of water supply

During 1997 to 2000, MWC improved performance as follows :

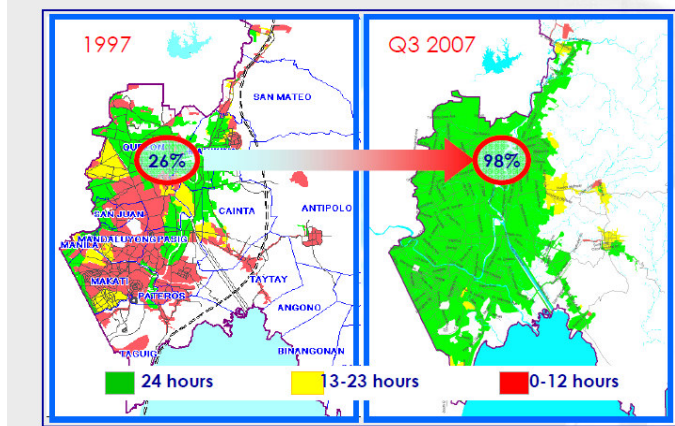
- Increased billed volume from 440 MLD to over 700 MLD (+70%)
- Service area receiving 24-hour water supply expanded from 15–20% to over 60%
- Served customers went up from 65% to 88% of the population

The company achieved this performance through:

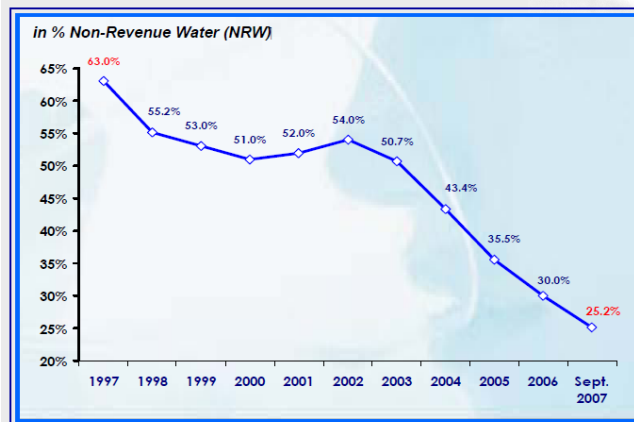
- Enhancement of customer focus by redeploying manpower and dividing the East Zone into manageable business areas and territories or blocks
- Fiscal discipline and cost-effectiveness

- Reorientation of employees on the value of quality service, business focus, and accountability for performance
- Reduction of NRW from 63% to 25%

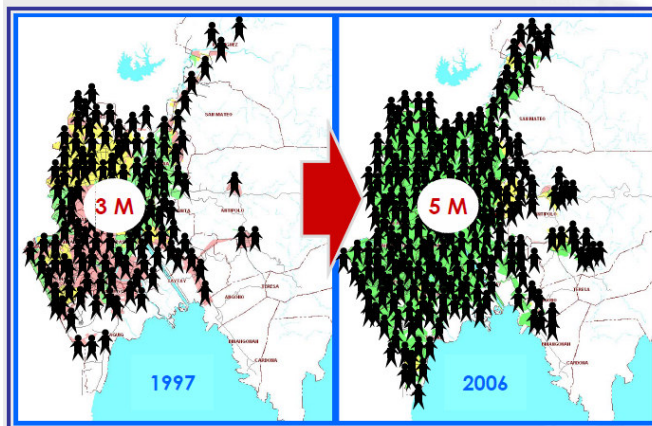
Improvement in water availability



Reduction of water losses



Increase in coverage and customer base

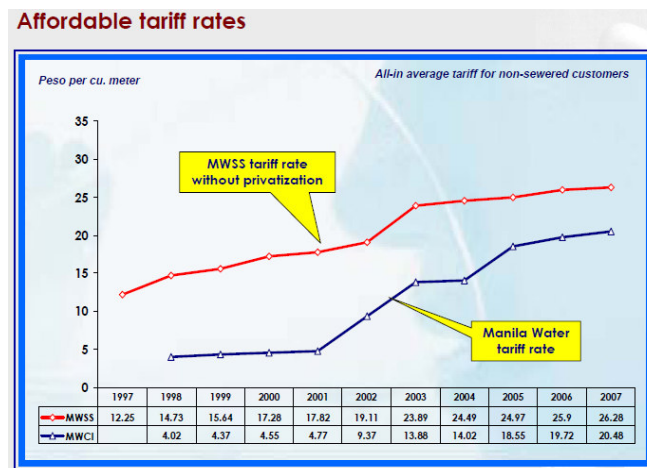


Provision of sewerage and sanitation services

MWC laid the foundation for significant improvements in sewerage and sanitation services for the East Zone. The company also installed low-cost package sewage treatment plants in several communities.

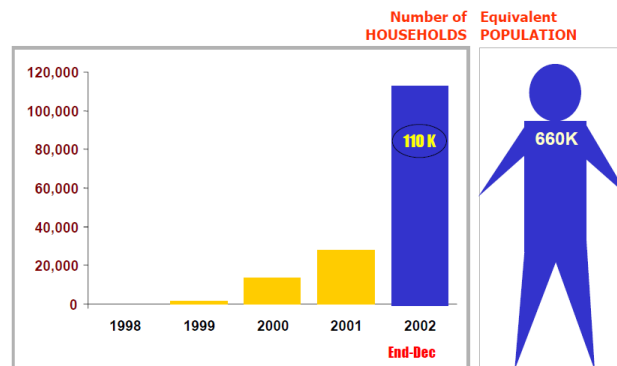
Customer service

- Immediately after implementation, a call center was established
- Branch office network was strengthened to systematize customer service
- Relationships and interaction with communities were forged at the Barangay level, the smallest political unit in the country, through projects for the urban poor
- A significant portion of Metro Manila residents still depend on vended water, priced 15–20 times higher than Manila Water's rates.



"Tubig para sa Barangay" (water for the urban poor) was MWC's program for poor communities to avail of legitimate water services at affordable rates. Since 1997, many households in the East Zone benefited from this initiative. Through the program, the company minimized illegal connections and leaks and improved the quality of life for most people and fostered excellent community partnerships.

"Tubig Para Sa Barangay"



- A territory management program was adopted to improve operating efficiency
- Under this, the service area was divided into smaller units and district metering zones
- Territory Managers were to offer better service in each Metering Zone

- Customer service and operations were synchronized for better customer focus and accountability

Productivity of workforce

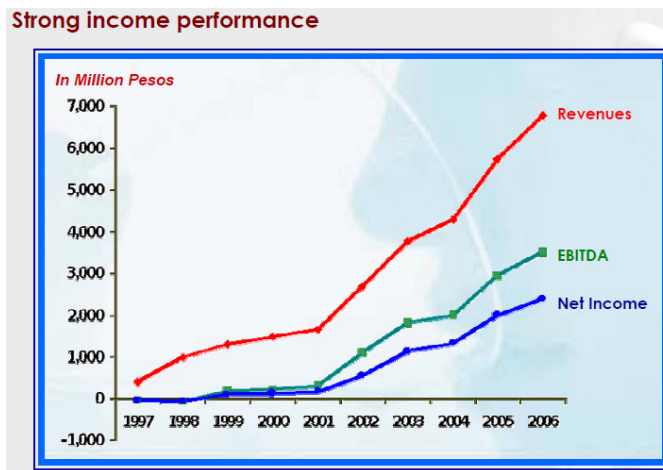
MWC absorbed 2,165 employees from MWSS in August 1997. The total headcount by 31 December 1997 was 1,641, which went down further to 1,577 by 31 December 1998. This reduction was achieved through a voluntary retirement program. The company has 1,540 employees today, or a manpower productivity ratio of 3.7 employees per 1,000 connections. This key indicator used to be more than 19 Rate of return base. 8.5, prior to privatization. The company relied on former MWSS employees, who still account for 95% of the company's workforce, to attain positive business results.

Open communication with employees was established, including full transparency about the financial performance of the company. As required under the concession agreement, an employee stock option plan has been offered to all regular employees absorbed upon privatization. This plan ensures ownership equal to 6% of the total outstanding stock of the company and would allow opportunity for capital gains, once the shares are listed on the local stock exchange.

Financial performance

During its first 2 years Manila Water experienced net losses, which can be attributed to transition and start-up problems and reduced water supply due to El Niño. In 1999, with the water supply back to normal, the company recorded positive earnings (before interest, taxes, depreciation, and amortization) and financial viability. This was achieved through increased revenue and fiscal discipline.

The company got additional financing of \$55 million from a consortium of banks, enabling it to pursue its capital investment plans and expand service coverage.



Key messages

The key lessons that can be learned from the privatization of MWSS and the experience of Manila Water are as follows:

- To ensure successful implementation of privatization, the Government must have clear objectives, firm political will, focused execution of its action plans and programs, and unwavering support from the private sector.
- The close link and unique relationship between MWSS and the "Regulatory Office" would require experienced regulators to manage, considering the regulators do not have complete independence.
- Concessionaires need a strong balance sheet and cash flows to address "regulatory lag" and survive liquidity problems resulting from external factors (for example, currency devaluation as a result of the Asian financial crisis).
- MWSS privatization showed success initially, but establishing a credible regulatory structure requires more time and effort. Changes in policy and contract will present new challenges and opportunities to all stakeholders, particularly MWSS and its concessionaires.
- To ensure the success and sustainability of the MWSS privatization, both MWSS and its concessionaires should strengthen existing partnerships to ensure that the latter remains efficient in the delivery of service to its customers, especially the urban poor.

ANNEXURE-III: NATIONAL EXAMPLES

Over the past few years, the few of the PPP projects in Water Sector in India are summarised in below cases:

1. Case Study 1

LATUR

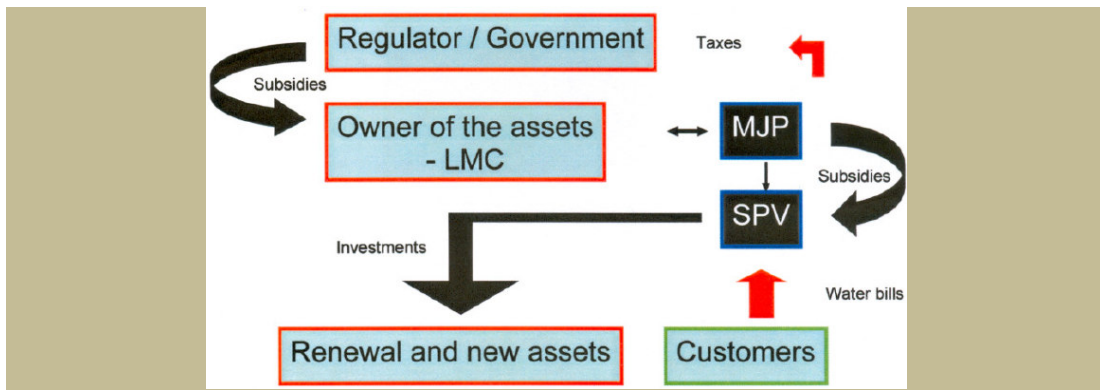
- India's 1st 'Source to Tap Integrated Management Contract'.
- Area of 32.56 sq. kms, population 4 lakhs
- Transmission network currently includes
 - 3 water sources
 - 3 Water Treatment Plants (WTP) of 109 MLD capacity (2 are inefficient, total used capacity is only 35 MLD)
 - 4 pumpstations (one for raw water)
 - 2 MBRs
 - 10 ESRs, 1 GSR
- Present house connections : 31,000
- Total number expected as per survey : 80,000
- Problem Areas :
 - Inequitable water supply
 - Poor demand coverage (Twice per week covering 80% of population)
 - Poor asset maintenance
 - Poor management of water supply account
 - Improperly-maintained records
 - Poor collection efficiency
 - Lack of meters
 - Many illegal connections
 - High NRW
 - LMC not able to meet O&M costs
 - Lack of customer services and complaint redressal system
- RFP invited from pre-qualified bidders in April 2007
- SPV (Latur Water Management Company) created
- Bidding Criteria : Premium paid by operator over 10 years for use of the assets
- MJP will act as PMC
- Contract awarded in September 2007
- The Management Contract involves :
 - Operations & maintenance of water works
 - Both bulk supply and distribution networks
 - Manage new connections including collection of applications, connection charges, etc.
 - Manage regularisation of illegal connections and impose penalties as specified by MJP
 - Implement Hydraulic Modelling and integrated MIS
 - Investments in metering, billing and collections for 10 years
 - Provide and install EEC marked water meters and recover expenditure from consumers establishing meter workshops
 - Develop Customer Information System including 24x7 Call Centre
 - Bulk water transmission over 65 km

- Distribution network over 600 km
- Tariff increase proposed every 2 years
- Rezoning of transmission network to decommission the 2 inefficient WTPs
- Providing labour for minimum 1 km expansion in network per year
- Collecting system-related data and reporting performance to MJP
- Concessionaire paying a fixed sum per month to MJP
- Optimisation of existing network
 - Carried out through network and demand management EDAMS systems to effectively rezone and optimise the system
 - Intention was to balance pressure distribution and ensure proper flow conditions
 - A properly zoned, optimised network automatically reduces existing leakage, minimises future leaks, makes leakage control easier and prolongs the effective lifespan of the network
- Zoning analysis
 - Carried out to define static head zones (pressure zones)
 - Rezoning through remedial work was recommended
 - Zoning plan was drawn up and fieldwork commenced for commissioning of the new zones
- Network analysis
 - For network optimization was carried out using 2031 demands within the existing supply area
 - Hydraulic analysis leads up to the compilation of a network optimisation plan
 - The objective of the exercise is to improve the equitable distribution of water supply, maximizing the capacity of the existing network and meeting demands with the supply area

- The tariff structure for the project is as follows:

| Sl. no | Consumer Category | 2007-08 | 2008-09 2009-10 | 2010-11 2011-12 | 2012-13 2013-14 | 2014-15 2015-16 | 2016-17 onwards |
|--------|-------------------------|---------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1. | Domestic | 8.80 | 9.60 | 10.60 | 11.15 | 11.70 | 12.30 |
| 2. | Institutions | 17.00 | 18.70 | 20.50 | 21.50 | 22.60 | 23.75 |
| 3. | Industrial & commercial | 40.00 | 42.00 | 44.00 | 46.20 | 48.50 | 50.90 |

- Special concessions offered to slums, unmetered connections and social functions.
- Benefits :
 - 24x7 availability of quality water within 2 years (> 100 lpcd)
 - Increased coverage
 - 100% metering, regularising illegal connections
 - Financially viable business model through enhanced operational efficiency, reduced losses and imposition of optimal tariff structure
- The Contract Structure is as follows :



- The performance benchmarks for the project are :

| Performance Improvement | Year 1 | Year 2 | Year 3 | Year 4 |
|--|--------|--------|--------|--------|
| Reducing Leakage (l/day/connection) | 137.5 | 118.3 | 99.2 | 80.0 |
| Reducing under billing (% theoretical billed volume) | 40.0% | 20.0% | 10.0% | 5.0% |
| Finding unknown connections (% of total) | 40.0% | 70.0% | 90.0% | 95.0% |
| Improving Demand per connection (cum) | 10.0% | 50.0% | 100.0% | 100.0% |
| Improving domestic Debt recovery | 45.0% | 58.0% | 71.0% | 85.0% |

- Variable Costs

- Calculation based on actual costs incurred by LMC over a period divided by actual volumes of water produced and pumped

| Rates Calculation | Power | chemicals | raw water |
|-------------------------------------|------------|------------|------------|
| Current Cost (Rs in lakhs per year) | 158.9 | 16.1 | 13.8 |
| Current Volume pumped (m3/year) | 12,045,000 | 12,045,000 | 12,045,000 |
| Rs/m3 | 1.3192 | 0.1337 | 0.1146 |

- Escalation in variable costs will be borne by the client and not the operator
- Old debts of LMC towards electricity and raw water will be cleared by LMC. Supply to SPV will not be stopped

2. Case Study 2

| SI No | Area | Description |
|-------|---------------|--|
| 1 | Project Name | <ul style="list-style-type: none"> • World Bank assisted Karnataka Urban Water Sector Improvement Project (KUWASIP) at Belgaum, Gulbarga & Hubli-Dharwad |
| 2 | Project Scope | <ul style="list-style-type: none"> • Performance based contract with private sector firm for rehabilitation, operation and management of water service in Pilot areas |

| | | |
|---|---|---|
| 3 | Contract Details | <ul style="list-style-type: none"> • Operator Contract period: 3 ½ years • Single contract for all three ULBs • Single contract between five parties Vs Operator • Distinct obligations for all parties Vs the Operator • KUIDFC authorized to act on their behalf vis-à- vis the Operator • Prime contractual responsibility – Operator |
| 4 | Contract Price Details | <ul style="list-style-type: none"> • Performance based contract. • Total contract price Rs. 28 crore (Rs. 22.40 crore Remuneration; Rs. 5.60 crore Max. Bonus). • 60% of Rs. 22.40 crore i.e., Rs. 13.50 crore Fixed Remuneration: • 40% of Rs.22.40 crore i.e., Rs.8.90 crore Performance Remuneration. • Fixed Remuneration: 15 equal quarters • 12% of Performance Remuneration, if all targets achieved, 18 months after effective date; 28% of Performance Remuneration spread over two year Operation & Management Period, if targets achieved. • Penalties (max. 10%) for failure; termination. |
| 5 | Operator Performance Targets (End of the Contract Period) | <ul style="list-style-type: none"> • To demonstrate Continuous Pressured Water Supply to every Customer in each Demonstration Zone. • Metering of minimum of 90% property connections. • Maintenance of computerized records of readings. • Reduction of the losses to 30 litre / connection / day /metre pressure in each Demonstration Zone. • Operation on a 24 hour basis of the Customer service centers established at Demonstration Zone. |
| | Operator Performance Targets | <ul style="list-style-type: none"> • Continuous Pressured Water Supply must be provided to every connected property and stand-post. • Emergency stoppages shall not exceed twelve hours and no |

| | | |
|--|--------|---|
| | | <p>more than an average of four emergency stoppages in a period of 12 months.</p> <ul style="list-style-type: none"> • 100% of all property connections and public stand-posts must be metered. • 100% of Customer meters must be read and billed every month. • Losses must be reduced to 20 litres per connection / day / metre pressure by the end of 24 months. • System connection requests must be fulfilled within 7 days. • All Customer complaints to be responded to within 24 hours and redressed within 7 days of such complaint. • Leaks appearing at the surface must be repaired within 24 hours of notification/observance. |
| | Status | <ul style="list-style-type: none"> • 8 Priority Investment works for augmenting bulk water supply completed and commissioned. • Laying of distribution network in 5 Demo Zones – completed. • House service connections - completed. • All the five DZs operationalised and O&M phase commenced on 3rd April 2008. • Performance achievements being collected • Scaling up being planned for the rest of the city |

3. Case Study 3

NAGPUR WATER SUPPLY

- Population of 2.5 million spread across 217 sq. km, set to double in 25 years
- Total connections 2,25,000
- Total pipeline network 2,100 km in 10 Water Distribution Zones
- Raw water pumping stations : 3
- Opex at WTP : Rs 3.30/ 1000 ltrs
- Total water supply : 500 ML/day
- Total Water Losses/UFW/NRW : 291 ML/day (54%)
- Water Supply Financials
 - Annual expenditure : Rs 106 crores

- Total demand from consumers : Rs 70.7 crores
- Total recovery on water bill : Rs 50 crores
- Problems Faced :
 - Water Losses and UFW
 - Equitable distribution (Alternate day / 20 hrs/day)
 - Accountability
 - Water to Slums (inefficient system)
 - Water network coverage and inadequacy of network
 - Water supply management during summer peak demand
 - Old and inefficient assets
 - Capacity augmentation delay for future from limited water sources
 - Capital availability
 - Low water tariff and Poor billing mechanism
 - Lack of professional approach
- One water supply project under PPP already underway
 - Features
 - 15,000 Connection including slum
 - 10 slum areas
 - Population 1.5 – 1.75 lakhs
 - Contract
 - Study, Rehabilitate, Operate contract with private operator.
 - Penalty/bonus for targets in UFW, quality, customer services and continuity of supply
 - Rehabilitation Plan
 - Replacement of 100% House service connection & Meters
 - Replacement of old conservancy GI pipe
 - Rehabilitation of Tertiary network
 - Hydraulic modeling as per Master plan
 - Installation of new billing system
 - Customer Facility centre

| <i>KPI</i> | <i>Baseline KPI</i> | <i>Target KPI</i> |
|--|--|--|
| UFW level | NRW assessed at 50% | UFW below 30% for proportionate bonus |
| Increase of volume billed compared to FY 2007-08 | Average Volume billed for FY 2006-07 = 21.7 MLD This value shall be used for the cost-benefit analysis of the rehabilitation plan. Baseline KPI for assessment of bonus/penalties during O&M will be based on FY 2007-08 data. | Higher than baselines by 10% for bonus |
| Continuity of supply | 2 to 24 hours depending on area of supply | 24x7 throughout the zone, minimum 2m pressure at tap |
| Water Quality | 63% of samples tested had a residual chlorine level higher than 0.2 ppm | Residual chlorine higher than 0.2 ppm |
| Handling complaints | Not applicable | Within 3 days |

- Based on good results thus far, proposal for entire city supply under PPP
- Invited EOI for RFQ in Aug 2008, 10 bidders applied
- Estimated cost Rs. 6.5 billion
- NMC has received Rs. 615 crores JNNURM sanctions for water supply expansion

- NMC will apply for Rs. 350 crores JNNURM grant for rehabilitation of distribution network
- Performance-based contract for 25 years
- Proposal to collect full user charges for assets created under JNNURM
- JNNURM funding for better viability and reduced capital cost
- Rationalization of tariff for full cost recovery and subsidy to urban poor
- Concessionaire to finance capex to rehabilitate, repair, maintain and provide proper backup for refurbishing and replacing water supply infrastructure
- Asset ownership with NMC
- Exclusive rights of operating water supply services, including collection of water charges assigned to Concessionaire on behalf of NMC
- All operational risk with Operator
- Concessionaire will retain fee in proportion of water quantum supplied & sold
- Charge will depend on performance-related factors :
 - limiting physical & commercial losses below certain levels and
 - ensuring adequate collection efficiency
- Regulator in place to
 - Ensure consumers receive expected service level at reasonable cost
 - Protect short term and long term interests of consumers
 - Provide certainty for public and private investment
 - Enhance accountability and transparency
 - Control the financial performance
- Regulatory Office set-up
 - Regulatory Office set as an SPV created by NMC. The participation of other stakeholders in the constitution of the SPV may be envisaged
 - Initial set up and annual operating budgets approved by the Parties chargeable to the Operating Cash Flow
 - Regulator appointed for 5-year (extensible) contract
 - Regulator personally accountable for prejudice to the Parties
 - Key Staff selected on the basis of merit references
 - Public access to all resolutions and statements of the Regulator on the RO Web Site
- Mechanism of enforcement
 - Independent Regulatory Office will adjust rates, and will monitor contract performance
 - Operator will be penalized on breach of its obligations under the Contract
 - Performance bond in favor of NMC
 - Operator will get Power of Attorney to act against illegal connections and disconnect bad payers

4. Case Study 4

| | |
|-------------------------|--|
| Name of Project | Development & Management of Water & Sewerage Networks for Salt Lake Sector-V at Kolkata on 30 yr BOT basis. |
| Job Description | Construction of 3 MGD Clear water pumping station, 8 MLD STP, 2.25 ML capacity ESR, 500 mm dia. DI K9 of 3.2 KM, 150 mm to 700 mm dia. Sewerage Network of RCC Hume pipe class NP3 of 14.43 KM with IPS, Installation of bulk & consumer meter, O&M of entire utilities, Billing and collection for 30 year concession period. |
| Client | NDITA, Kolkata (KMDA as Tech. Facilitator) |
| Project Features | <ul style="list-style-type: none"> ▪ Contract for Bulk water supply to be entered between KMC & NDTA, ▪ Developer to purchase bulk water from KMC @ Rs.5/KL and bill consumers a combined 'water-cum-sewage' charge based on volumetric tariff. ▪ Any revision in bulk water supply charge by KMC, passed on to consumers. ▪ Developer to retain 'water-cum-sewage' connection charge, approved by NDTA ▪ 10% escalation on tariff every five years ▪ Metering Policy to be in place. ▪ Min. monthly charge equivalent to 50% of demand charges. ▪ Withdrawal of ground water by existing consumers is prohibited. |
| Project Value | <ul style="list-style-type: none"> • Water Supply – Rs. 260.7 million • Sewerage System – Rs. 340.7 million |
| Tariff | Rs. 25 per kL |
| Funding pattern | 65 % Private + 35 % Jnnurm |
| Partners | JUSCO – VOLTAS |
| Project Duration | 19 Months (Construction Phase), 30 years BOT concession |

5. Case Study 5

| | |
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| Name of Project | Construction of new water treatment plant on BOT basis and Operation and Maintenance of the existing Water treatment Plant 25 year lease |
|------------------------|---|

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|-------------------------|--|
| Job Description | Construction of series tube wells and complete existing network including reservoirs, pipelines and boosting pumping station up to consumer levels and O & M of new distribution network. |
| Client | Haldia Development Authority, Haldia |
| Scope | <ul style="list-style-type: none"> • O&M of existing Series tube wells 13.62 MLD, raw water pumping station 28.00 MGD. • Construction of new 50 MGD WTP in 3 phases: 25 MGD, 12.5 MGD & 12.5 MGD in addition to existing 20 MGD WTP being augmented to 25 MGD. • Four Nos. 1000 mm dia. MS suction main. • 380 |
| Project Value | Rs. 880.00 million |
| Tariff | Ind. Rs.11/kL , Comm Rs.9/ kL , Resn. Rs. 5/ kL , Mun. Rs. 3/kL |
| Funding pattern | Private |
| Partners | Ranhill Utilities Malaysia - JUSCO |
| Project Duration | 24 Months (Construction Phase), O&M for 25 Years |

6. Case Study 6

| SI No | Area | Description |
|-------|------------------------------------|---|
| 1 | Project Name | <ul style="list-style-type: none"> • 24x7 water supply project for Mysore city |
| 2 | Project Scope and Salient features | <ul style="list-style-type: none"> • Largest water supply PPP project in India based on performance based management contract • First city-wide water distribution management contract (O & M Billing & Collection, Customer Support Systems) serving million plus population • One operator for the entire city – optimized & effective solution • Funding by JNNURM (80%), Govt. of Karnataka (10%) |

| | | |
|---|---|---|
| | | and MCC (10%) |
| 3 | Contract Details | <ul style="list-style-type: none"> • 6- Year tripartite contract between Karnataka Water Supply & Drainage Board (KUWSDB), Mysore City Corporation (MCC); and JUSCO. Contract Period comprise of 3 phases • PHASE 1: PREPARATORY PHASE (12 MONTHS) • PHASE 2: REHABILITATION PHASE (36 MONTHS) • PHASE 3: MAINTENANCE PHASE (24 MONTHS) • Key contractual clauses include Bulk Water supply commitment, quality of water, discussion policy, Dispute resolution Mechanism |
| 4 | Contract Price Details | <ul style="list-style-type: none"> • Management fees: Lump sum in two parts. <ul style="list-style-type: none"> ○ Fixed fees (50%) paid in 24 equal quarterly installments. ○ Performance fees (50%), paid six monthly on achievement of targets over project period of 6 years as per performance chart • Operating Cost: Lump sum in two parts. <ul style="list-style-type: none"> ○ Fixed fees (30 %), paid in 23 equal quarterly installments ○ Performance fees (70%), paid six monthly on achievement of targets over project period of 6 years as per performance chart • Rehabilitation Cost: <ul style="list-style-type: none"> ○ BOQ driven ○ Based on Capital Investment Plan (CIP) ○ Payable against invoice for completed works not less than Rs 10 laths |
| 5 | Operator Performance Targets (End of the Contract | <ul style="list-style-type: none"> • Number of connections with 24x7 - 30% • Revenue Improvement - 30% • Revenue Water in 24x7 area - 10% • Resolution of Complaints on service in 24x7 area -10% |

| | | |
|--|---------|--|
| | Period) | <ul style="list-style-type: none"> • Resolution of Complaints in entire zone - 5% • Leakage levels in 24x7 - 5% • Quality compliance in 24x7 area - 5% • Pressure compliance in 24x7 area - 5% |
| | Status | <ul style="list-style-type: none"> • Effective Date of Contract from January 27th, 2009 • Learning's from this project can be replicated in other cities and towns. |

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