

Sustainability and Financial Viability of Urban Water Supply and Sanitation in Dryland Areas

A Case Study of Indore City

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The simultaneous attainment of financial, environmental and social sustainability of urban services is an important requirement of development. Huge investments are being made in the improvement of urban infrastructure and services in India. Within urban infrastructure the supply of water and its disposal after use has become one of the most problematic aspects of planning and management. Water has to be brought from distant sources and the wastewater needs to be treated before being discharged into natural water bodies or rivers. In dryland areas which are physically water scarce and constitute some 70 per cent of the country, the problem becomes even more acute as the costs associated with setting up and running Water Supply and Sanitation (WSS) services go up exponentially.

The situation is particularly problematical in Indore which is the largest city of Madhya Pradesh. The city is situated on the dry Malwa Plateau which is naturally water scarce similar to most parts of western, northwestern, central & peninsular India. The city has a fairly long history of urban planning from the early 20th century providing rich material for a study: <http://www.scribd.com/doc/115030982/Indore-WSS-Critique>. This study is based on a secondary review of the documents of the Indore Municipal Corp (IMC) and other sources and suggests remedial measures. The study does a detailed analysis of actual expenditure and revenue of the IMC for five years to show the extent of the unsustainability of the water supply and sewerage systems. The main conclusions and recommendations are as follows:

1. The finances of the IMC as a whole are unsustainable. Property taxes which should constitute the major source of income because they are a progressive tax that is borne proportionately more by the more affluent citizens, contribute only 11% of the own revenue of the IMC and 9% of the total revenue. The actual per capita property tax revenue in 2006-07 was a meagre Rs 131 as against the national average of Rs 486 and even in 2010-11 it was only Rs 225. The debt service ratio in 2010-11 was 7.1 per cent and it is slated to go up even further once the principal payments for the Asian Development Bank (ADB) loan begin in 2015. This will put further pressure on the finances.
2. The revenue model of the Water Supply is on an even more unsustainable footing. The solid waste removal and sewerage sector's finances are in the red. The actual recovery of costs through water taxes, charges and state government grants is only about 45%. The collection of water taxes is about 50% of what the minimum should be. The major cost item is that of the electricity bills for pumping water up from the Narmada to Indore. Despite the increase in average monthly water taxes per connection to Rs 225 in 2011 the situation has not improved. The electricity bills are slated to go up in future.
3. The status of the WSS sector is extremely poor. Non revenue water in the water supply system is very high due to leakages and theft. The actual supply is only 243.5 Million Litres per Day (MLD) against the design of 391 MLD. As a consequence the cost of water is also high. The water supply from the Narmada is the costliest at Rs 17.76 per Kilo Litre (KL) while the Yashwant Sagar and Bilawli supply is the cheapest at Rs 2.25 per KL. The actual average supply is 113 litres per capita per day (lpcd) as opposed to the norm of 135 lpcd. This too is skewed with 54 per cent of the population receiving piped water supply at 171 lpcd and the rest 46 per cent having to rely on standposts, open wells and handpumps for a supply of 46 lpcd. The poor IMC supply has resulted in a proliferation of private and commercial groundwater supply which has seriously depleted the aquifers in Indore. An affordability analysis shows that the recovery of the full costs of water supply will lead to water taxes constituting 7 per cent or more of the household expenditure of 43 per cent of households living above the poverty line but with an income that is equal to or less than the average household income in the city, assuming that water will be supplied free to the 27 per cent households living below the poverty line.
4. The waste water system is grossly inadequate and so most of the waste water is disposed of untreated into the streams running through the city which have unacceptable levels of biological oxygen demand (BoD) and are highly polluted. There is no proper storm water drainage and since the natural drainages have become blocked due to construction the city suffers from extensive flooding in the monsoons.

5. Despite the pre-project review of the water supply system done by the ADB having clearly shown that the current supply from the Narmada is financially unsustainable no other alternatives were explored for providing water to the city. Instead a third phase of the Narmada supply has been implemented at a huge cost with the ADB loan. Later analysis shows that the internal economic rate of return (IERR) and the financial internal rate of return (FIRR) calculated at the time of sanction of the loan on the basis of certain assumptions are grossly inflated. This will push the IMC into a severe resource crunch. The ADB it appears has wilfully manipulated the economic and financial data to push through the loan for the third stage of costly water supply from the Narmada to benefit big companies which supply and construct centralised water supply and sewerage systems.

6. The poverty pockets in the city which are home to 27 per cent of the population are very poorly served in terms of WSS facilities and given the high cost of these services they are not in any position to pay for them. The special projects for the provision of basic services to the urban poor under the ADB, Jawaharlal Nehru Urban Renewal Mission (JNNURM) and Department for International Development (DFID) projects are not being implemented properly.

On the basis of the above review the following recommendations are being made:

1. The Governance of the Water sector needs to become more transparent, participatory and accountable, more democratic in short. A clearly defined City water policy needs to be evolved to begin with.

2. A Geographical Information System must be used to map all the properties within the municipal limits and then grade them according to zones and building quality for determination of adequate property tax rates. The share of property taxes must increase to at least 30% of revenue receipts and the per capita tax realisation should reach Rs 700. The tax collection system must be improved drastically and penal measures taken against defaulters.

3. A Proper inventory of the WSS systems in the city has to be prepared including both surface and ground water and the storm and waste water disposal systems. Currently there are radio frequency sensor based instruments and computer softwares to accomplish this quite easily. Only then can an authentic water demand and waste water and storm water generation scenario be chalked out for planning of services. Despite clear directions from the ADB and the Central Groundwater Authority (CGWA) in this regard no progress has been made so far.

4. The Water Sustainable Urban Development (WSUD) principles, which have now been recommended by the National Mission for Sustainable Habitat, should be used to design a hybrid ground cum surface water system. These principles involve rainwater harvesting, groundwater recharge, protection of local water system, demand side management, curbing wasteful use, penal provisions for higher water use, looking for options to recycle and reuse treated wastewater, treating wastewater in a decentralised way and a road map for achieving full recycle. This hybrid system will be much more sustainable in financial, social and environmental terms than the wholly centralised system being used at present. The centralised systems should be used only where necessary to provide services to the congested poverty pockets where there might not be space available for decentralised solutions.

5. This alternative system would put the onus on the more affluent citizens, corporations, private commercial establishments and government institutions who are in possession of a considerable portion of urban land to tackle their water supply and waste water disposal needs in a decentralised manner from their own resources. This would then free the IMC resources for provision of free or subsidised WSS services to the poor and the lower middle class who are not in a position to pay for them fully. This is something that the ADB, JNNURM and DFID have wilfully ignored so as to favour big companies that set up and run centralised WSS systems.

6. Detailed surveys and design should be carried out to determine the actual benefit/cost ratio of such an alternative plan and then compare it with the surface water only alternative that has been implemented so far. This alternative plan should be implemented forthwith if found more appropriate.

7. The detailed plan for artificial recharge in the Gambhir and Shipra River Basins drawn up the CGWB should be implemented without any delay so as to improve the overall availability of water in the catchment of Indore city.

8. Solar power should be used for pumping the Narmada water supply and other power needs to the extent cost effective.

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