

The challenge of economic regulation of water and sanitation in urban India

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Abstract

India has a high population, low-income economy with increasingly dynamic economic growth in urban areas. However, there is a growing realisation that ‘state-of-the-art’ call centres and software development companies should not co-exist with poorly serviced slums at their entrances.

Urban services such as power and telecommunications are in various stages of institutional reform through private sector involvement and the development of economic regulation. The water and sewerage sector seems to be most reluctant to join the reform process as numerous attempts at privatisation have failed and economic regulation has yet to be introduced. Through comparisons with the electricity sector, this study considers how economic regulation might challenge the public providers of water in Jaipur, Rajasthan and possible effects on the needs for water and sanitation of the poorest.

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Introduction

Incentive-based economic regulation of monopoly water and sanitation providers is a powerful tool for improving services. Regulators, with sufficient independence from the political process, determine a maximum price (‘price cap’) to finance a desired level of outputs whilst requiring, and providing incentives for, ever-increasing efficiency. Prices in high-income countries have tended to increase faster than inflation as society demands higher standards in customer services and water quality as well as in environmental sustainability. Prices in lower-income countries may well have to increase even faster to begin the process of catching up with costs if there are ever to be sufficient resources to deliver an acceptable level of services to all.

Such regulatory models have been adapted around the world with varying degrees of success; usually in the context of a Public Private Partnership, but until recently have tended to be reactive rather than proactive regarding early service to the poor. With the demise of PPPs in lower-income countries (Nickson & Franceys,

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2003) there is now a need for adequate economic regulation of public providers, to deliver similar mechanisms for financeability and efficiency and as a prerequisite for developing effective pro-poor urban services. The fieldwork reported here forms part of a UK DFID funded research project examining how economic regulation can be used to enable and require direct providers to ensure service to the poorest, even in informal, unplanned and illegal areas.

The urban water supply and sanitation sector in India is suffering from inadequate levels of service, an increasing demand-supply gap, poor sanitary conditions and deteriorating financial and technical performance. According to the Central Public Health Engineering Organization 88% of the urban population has access to a potable water supply. However, this supply is highly erratic and unreliable as transmission and distribution networks are old and poorly maintained. Consequently physical losses are typically high, often over 50%. Low pressures and intermittent supplies allow back-siphoning, which results in contamination of water in the distribution network. Water is typically available for only 2–8 h a day in most Indian cities. The situation is even worse in summer when water may be available for only a few minutes, only on every second or third day, and sometimes not at all.

Central Government in India (although water is a State responsibility) has investigated a number of ways in which urban water supply might be reformed. As in much of the rest of the world, the central Ministry of Urban Development and Poverty Alleviation now recognizes that providing finance for new works is not enough to improve services in the long-term. The Ministry, having been forced by responses from many local stakeholders to back away from the political challenge of private sector involvement, has decided that economic regulation will be a major component of reform (*Urban Renewal Mission, 2005a*).

Lawrence Summers (2004) has observed that the great distinction between developing countries which have progressed over the last 30 years and those that have stagnated is not the ability to formulate perfect policies, but the ability to translate reasonable policies into actions on the ground. Recognising these comments, the authors consider the present state of water supply in Jaipur, Rajasthan particularly the extent to which the poor are served and, in readiness for the proposed water regulator, the authors contrast the management of water with the state of the newly reorganised and economically regulated electricity sector.

Urban water management in Rajasthan

Jaipur, capital of the state of Rajasthan, the largest in India by area as well as being one of the driest states, is home to 2.3 million people with about 15% of urban inhabitants living in slum areas (*GoI, 2001*). The Government of Rajasthan has adopted a State Water Policy, which outlines a framework for sustainable development and efficient management of the water resources of the state (*GoI, 2002*). With respect to drinking water, it requires the gradual increase of water rates, an increase in the budget allocation for upgrading domestic water supply, steps to ensure water quality and encouragement to private sector participation. Continuing state ownership of all water resources, the introduction of abstraction licensing and the introduction of necessary legislation to cater for the economically weaker sections of the population are also included. However, even though the state water policy articulates the need for reforms and states the policy objectives, a major concern is that there are no mechanisms to translate them into action.

According to the 74th Constitutional Amendment (Municipal Act) responsibility for urban water supply and sewerage should have already been transferred to urban local bodies. However, in Rajasthan the Public Health and Engineering Department (PHED), a department of the State government, continues to undertake the entire responsibility for providing water supply and sewage treatment.

The PHED is overseen by the Rajasthan Water Supply and Sewerage Management Board (RWSSMB), which controls, supervises and guides PHED on behalf of the Government of Rajasthan in policy, financial and technical issues. It is an extended arm of the government. The PHED has the full responsibility for the water sector, for planning, implementation (design and construction), service provision and O&M of water supply projects in Rajasthan. However, the PHED does not have any reasonable level of autonomy with no legislative framework for setting water tariffs. This multiplicity and overlap of responsibilities is a major bottle-neck and partly responsible for ineffective and poor performance. Clear fulfillment of past reform initiatives as well as demarcation of present responsibilities and mandates are desperately needed, particularly if a new regulatory body is to be introduced into the system.

Operational performance

At present 84% of the population of Jaipur is reported to be supplied by the PHED, 76% through individual connections, 5% through hand pumps and 3% through public taps. There can be wide variations within the city in quantity and quality of water supplied. Breakdowns can deprive consumers of water for several days. Most importantly, the coverage figures say nothing about the equity of distribution. Poorer areas are provided with less water whereas the influential rich get a more satisfactory service. The poor households which are not connected pay high costs in terms of collection time and health related costs from drinking contaminated water. Wealthier households have better possibilities to cope with this situation. Installation of roof tanks and (additional) supply from privately owned boreholes improve their situation.

Meanwhile, the water table is decreasing every year as the present water supply in Jaipur city is 97% dependent on groundwater with very limited recharge. Clear signs of increasing water scarcity and decreasing quality make the situation worse. Contrasting with the official 1280 boreholes and 1800 wells equipped with hand pumps, it is suggested that there may actually be upwards of 20000 private wells in the city that have been drilled for private uses. Most of the tube wells in the old part of town show high levels of nitrate (230 mg/l), well above the prescribed limits. To meet the demands there is a new scheme, presently under construction with Japanese funding, to pipe surface water 100 km to the city at considerable cost and with no viable plan to recover costs through adequate tariffs.

Financial performance

The price charged for water in urban areas is constant throughout Rajasthan. The current tariff has not been revised since 1998. Generally tariffs are very low. Over a period of 30 years the tariff for minimum consumption increased in real terms by 250% (see Fig. 1), but relative to inflation it had lost three quarters of its value during the period. In an attempt to ensure revenue generation since 1990 all new connections are metered so that now 92% of the costumers now have metered supply, but around 50% of the meters do not work.

The increasing block tariff is structured into three consumption blocks (<15, 15–40, >40 m³) but with such a large initial block 31% of domestic consumption falls within the first category. Industrial tariffs are substantially higher than domestic rates, but with only a marginal share of the revenue collected from industrial consumers, it makes cross-subsidisation irrelevant. Charging industry more than the actual costs, coupled with the unreliability of the service, tends to drive them to self-provision. The system performance has to improve significantly to be able to get back the industrial costumers and to attract households which are

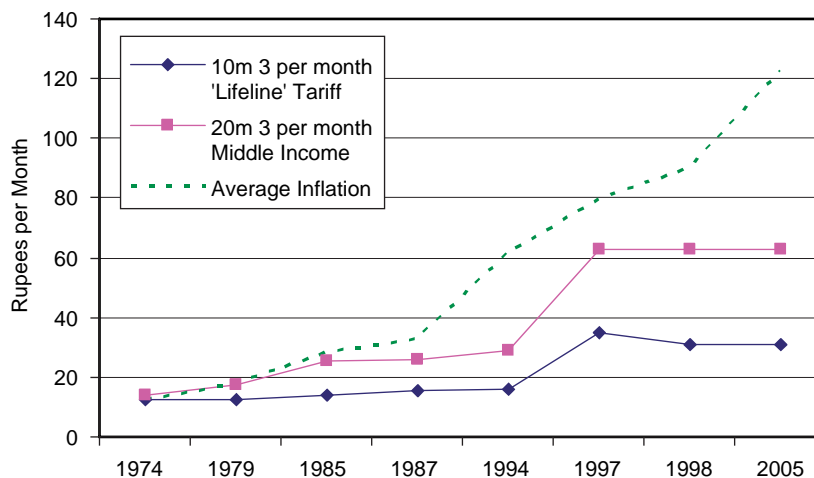


Fig. 1. Water tariff increases relative to inflation.

now privately served. Sewerage tariffs are 20% of the water tariff where a household is connected to the PHED network, well below the 100–120% required to support wastewater treatment.

The very low tariffs do not send the right signal, that water is scarce and must be treated as a valuable commodity. As there is no real licensing to regulate abstraction those who can afford to abstract in a totally uncontrolled manner without any tariff. Compounding the low revenue is the inefficiency of provision. The total number of PHED Jaipur employees is around 3000, an average of 11.5 employees per 1000 connections, and an indication of the considerable scope for efficiency (SAPI, 2004).

The end result is an operating ratio (operating costs/operating revenues) averaging 2.7 over the past five years and a system which is totally dependent upon subsidies and postponement of necessary capital maintenance. Customers, who have become used to paying US\$0.70 per month for their water, albeit of limited quality, need considerable assistance to understand any requirements of a new economic regulator to increase prices by a cost reflective 500% to service the new surface water supply.

The present system for changing tariffs is for the PHED to propose and then forward the proposals to the RWSSMB who subsequently forward proposals for approval by the state cabinet, the final decision-making authority for tariff setting. The result is that tariff decisions are not based on any reasonable planning and financial data analysis but purely on politicians' tactics making popular decisions to win the next elections. Consequently tariffs and revenues from water charges are too low and the PHED is a bottomless pit for subsidies, a clear indicator of the need for more independent and transparent economic regulation.

Within the existing framework the customers of PHED Jaipur are not involved in any process. There is no mechanism for any planned consultation with consumers and no formal hearing procedures in place. General customers cannot express their needs and priorities to the decision making parties other than through political votes.

Electricity regulation, Rajasthan

The Power Sector in Rajasthan has also been facing problems, typically unexpected voltage and frequency swings, frequent service interruptions, restrictions on demand, high system losses, poor cost recovery and heavy commercial losses. Although power generation and sales grew over the years, demand always exceeded supply.

The State Government started a process including tariff reforms and rationalisation in November 1999, restructuring of Rajasthan State Electricity Board in July 2000 into five companies (for generation, transmission and three distribution companies (Discoms) and the establishment of Rajasthan Electricity Regulatory Commission (RERC) in January 2000. The broader objective of this unbundling was to improve operational efficiencies, maintain a judicious balance among interests of various stakeholders, achieve commercial viability of the sector and improve service delivery in terms of quality and quantity.

To ensure a response in 2003 Central Government issued the Electricity Act 2003 which makes it mandatory for every state to have a regulatory body for electricity. The RERC consists of three members, each having a fixed tenure, appointed by the State Government on recommendation of an independent Selection Committee. The Act contains provisions for safeguarding the interests of the consumers. It demands "uninterrupted and reliable supply of electricity for 24 h a day and good quality electricity at reasonable rates" (RERC, 2003) and it forced the RERC to take several measures for redressal of consumers' grievances. RERC set up several forums: complaint centres, district level forums, corporate level forums and finally an Ombudsman to settle disputes which could not be resolved in the earlier stages.

In Rajasthan the required separation of ownership, management and regulation has taken place. However, the government is still influencing the Discoms, and the internal structure of the Discoms has not apparently changed at all. It is a purely administrative re-organisation and the "replacement of procedures and paper work with a cost-benefit analysis" for tariff reform has not happened (Ruet, 2005).

However, there has been an attempt in electricity to enhance transparency and customer involvement with the RERC constituting a Commission Advisory Committee. The 21 members represent the interests of commerce, industry, transport, agriculture, labour, consumers, non-governmental organisations and academic and research bodies in the energy sector. The Consumer Unity & Trust Society (CUTS) was nominated to this Committee. As an independent NGO it represents the interests of domestic and agricultural consumers,

advocating consumer's concerns at policy level and trying to establish a network for consultation at grass roots level. In six selected districts CUTS is running consumer awareness and capacity building programmes and is setting up customer committees, but so far only in rural areas. With increasing numbers of the urban population there will be a need to put more focus on urban customers in order to advocate their needs and to report on Discom's compliance with standards of performance. It has taken an initiative by CUTS to ensure that a customers' Charter of Rights might be displayed in public.

Financial and operational performance Jaipur Discom

RERC 2003 issued 'Distribution Licensee's Standards of Performance—Regulations'. Investigating the effects of regulation the researchers found that the utility submits its performance report to RERC, but this is not made available for consumers. In case of non-performance RERC does not take any action as the Commission is of the view that it is too early in the reform process. This means the Discoms have no incentive to perform. Furthermore the data basis is remains unreliable and RERC draws conclusions only from the reports of one of the Discoms, Jaipur. No other source of information is considered.

Jaipur Discom has been publishing Annual Report & Accounts since 2001. The researchers had great difficulties in getting hold of the reports as the personnel of Jaipur Discom was convinced that these reports are only given to government officials and the commission. Analysis of the data shows that in the period from 2000–2004 the distribution losses of Jaipur Discom remained at the very high level of 40%. This level of losses is totally unsustainable and RERC predicts financial collapse of the companies (RERC, 2004) if no substantial improvements can be achieved. The operating ratio of Jaipur Discom was stable since 2001, at approximately 1.1, very much better than water but still far from sustainable.

The expected improvements of the reform process and the introduction of regulation are yet to be seen after four years. In September 2005 there was a massive protest by the farmers in Jaipur city. Among the main demands of the farmers was a roll-back of the tariff increase, there is also resentment over the use of the new meters. Customers believe the meters to be inaccurate and give higher values than actual consumption. The domestic customers also have a feeling that the tariff will continue to increase without any improvement in the service. Government has responded to these protests by postponing further price rises. Economic regulation of sensitive utilities has yet to make a significant impact on long-term financial sustainability.

Services to the poor

For a monopoly public provider, service to the poor is a key indicator of achievement of public, societal goals. In addition to data collection in government offices the authors undertook focus groups in a representative selection of slums and shanties to determine how the poorest households obtained water and sanitation and their perceptions on future service quality and prices.

The most recent information about slums from the Rajasthan Urban Infrastructure Development Project in 2000 shows that illegal unplanned poor settlements, 'Katchi Basties', have settled on a large scale along the foot of the hills towards the North and the East, with a few in other parts of the town. Field investigations showed that there is no 'standard' slum area and that different categories concerning legal status, water, sanitation and infrastructure services can be defined. Selecting only one area was found to be insufficient to represent the whole spectrum of water services. To ensure best understanding four different slums were investigated (Table 1).

The situation in the regularised slum is in the best condition. There is good standpost water supply (abstracting from a borehole to overhead distribution tank) proper roads and functioning drainage, all improve the living conditions. However, the piped water supply is generally unreliable and insufficient; an additional source always contributing to requirement is needed. Public standpost supply is stated as minimum requirement. People are used to obtaining water for free and preferably they would like to keep it like that. For improved water services the stated willingness to pay ranges around the often quoted affordable 3% of the household incomes. The percentage of income spent for water services is generally below 1%. The reported prices from private suppliers (about 50 households, above ground network connected to a private borehole) were much higher than the existing PHED tariff. Connection procedures seem to be mostly unclear.

Table 1
Water, sanitation and electricity supply in Jaipur slums

	Balmiki Nagar	Kunda Basti	Nirmar Nagar	Lunka Puri Basti
Legal status	Regularised	Not regularised	Not regularised	Not regularised
No. of households	800	500	800	1500 in wider area
Household size	5–6	4–7	7–8	10
Age of settlement	12 years	30 years	20 years	25 years
Family income (Rs./month)	1,500–4,000	1,000–4,000	3,000–15,000	1,500–3,000
Rent (Rs./month)	None	Minority on rent, 300–400	50% on rent, 500–600	None
Employment	Solid waste collection/ sweepers	Peon	Regularly employed	Peon
Electricity	Single/shared/none	50% connected/no shared connections	1	Single/shared
Illegal connections	Not possible	None		Still exist
Bill (Rs./month)	300	200–1000	300–750	800–1200
Satisfaction			Good	
<i>Water</i>				
Bill (Rs./month)	30–50 (PHED)	None	150 (private)	30–40 PHED/100 (private)
Satisfaction	Yes	No	No	
Supply systems	6 psp + 1 tank (25% piped + psp)	3 tanks + handpumps + factory in 0.5 km distance	120 out of 800 with private piped supply + 2 handpumps + 1 tanker	psp + handpumps + 40% piped PHED (few from private well)
Duration	30 min		20 min	
Quality	Good	Good	Good	Good
Reliability	Bad, problems in summer	Bad	Bad	Bad
Time for collection	1.5–2 hrs	without tanks 3 hrs	1–2 hrs	0.5–2 hrs
Willingness to pay for improved service	Rs.50–100 per month, preferably nothing as they can cope with situation as it is	Rs.50, but only for household connection	Rs.150, but only for household connection	Rs.50
Consumption/month	6 m ³	6 m ³	12 m ³	9 m ³
Household sanitation	Pit or poor flush latrines	Open defaecation	Pit latrines	Pit latrine (provided by NGO)
Drainage system	Open drainage canals	None	None	None
Roads	Good	None	None	None
Major problem	Employment, making money for living	People want psp, because water is for free	Water	Roads, drainage
Overall remarks about services	Fear further increase in electricity costs, satisfied with water services as they are for free	Given both water and electricity at 200, they would pay for electricity as they think they can organise water somehow	Tanker supply started in 2005, once per day, after complaining to local politician, main pipe in 250 m distance, no obvious technical reason for not getting connected,	Standpost is purely side effect of borehole made to supply elevated water reservoir for better off area

The technical reasons stated by PHED for not connecting the yet to be regularised areas are not plausible. The approach for developing the supply network in such areas is haphazard.

The residential zones where there is no sewerage have on-site sanitation installations, in the poorest areas provided with the help of an NGO, Sulabh. Some slums, which are not regularised as they are in the low lying areas and so are planned to be rehabilitated, have no sanitary facilities and open-air excretion is common. Although the water and sanitation service may not be considered 'good' it may well be considered 'good enough' in the circumstances with a much higher standard than many other Indian cities. It is particularly impressive that even in the poorest slum the direct provider has provided a surface level pipe network, and had instituted a promotion campaign to enable households to connect at reduced price, in addition to providing back-up facilities for those who could not even afford a subsidised connection.

In contrast to water, the electricity services were reported to be satisfactory in all survey areas, including the slums. Connection rates are high, billing procedures clear and efficient. The reduction of illegal connections is a sign of good management, in addition to the price increases which have to be paid for better services. Facing the choice between water and electricity for the same costs (Rs. 200), people in Kunda Basti would choose electricity in the belief that they would still be able to organise water somehow without paying. There is no easy alternative coping mechanism for electricity.

Regulating through the courts

In the face of such ineffective institutional reform India, or rather some of its more active citizens are resorting to the law courts. For the protection and improvement of the environment, there are many laws and many rules with Boards and appellate authorities dedicated specially to enforcement of those laws. However, these authorities are not sufficiently independent of central or state governments to make any difference. The requests for interventions of the courts are therefore becoming a practice rather than an exception in monitoring solid waste disposal and river pollution, for example.

Numerous Public Interest Litigation' cases (PILs) have been filed by individual citizen or citizen groups seeking legal remedies for pollution. In Delhi the Supreme Court is currently managing the construction of wastewater treatment plants and in Jaipur, as well as Delhi, solid waste management, a responsibility of the municipality, is being monitored (managed?) by the courts. Having recourse to the law has become a way of protecting the urban environment when government systems have failed. Interestingly, in this process, the courts do not seek any contribution from the professional experts or specialists. The civil services are believed to be the experts of everything (and masters of nothing?). Even this attempt at regulation through legal initiatives often only has a limited impact in terms of redressing environmental wrongs. Shourie (2004) recounts the painful example of solid waste management in Delhi where, not surprisingly, the Supreme Court was unable to give sufficient time to everyday management of solid waste disposal outside their court-room and the requested regular updates on service delivery were never read.

Conclusion

In India where for poor people survival is an everyday challenge conventionally delivered water, sewerage and power services are luxuries. Slum dwellers are not really concerned about the time and energy spent in getting water, as long as they are receiving something at practically no financial cost to themselves. Government appears to be delivering this as the household survey demonstrates. Households are quite prepared to continue accessing water through emergency hand pumps, even in urban areas with high levels of on-plot sanitation, potentially a significant health risk. Expectation levels are very low. In the circumstances the water utility is delivering a reasonable service and Government knows that it cannot restrict this service. High-income groups pay for tanker supplies or a private borehole. Perhaps the group most affected by the possibility of tariff reform through economic regulation is the middle-income households. The middle income group can be used as a resource to generate funds for systemic changes as they can pay for the water supply at preset, economically viable tariff rates. However, this group believes they have been hit hard by the increase in power tariffs, particularly as there has been little noticeable improvement in service and so will have to be

convinced to switch over to the new system through effective marketing and essentially on ground improvements in service standards. (Fig. 2).

In India, which in many ways is known as a functional anarchy consisting of many disparate interests and power groups, it has been felt that only through a statutory body which draws its powers from the constitution of India can strong, bold executive decision can be taken. Examples that immediately come to mind are organisations like Central Election Commission and the Supreme Court of India which have pushed through extremely bold path-breaking decisions and these have been implemented. It is felt that since water and sanitation are such fundamental areas for growth and development a statutory body shall be created which would be able to push through the desired regulatory process swiftly. However, this also has its problems. The constitution of India would have to be amended, for which political will is essential. Hence without political will it is unlikely that any reform is possible and conversely if there is political will then there may not be any requirement for such a statutory body. The question then arises as to how the necessary political will to bridge the different interest groups' needs can be built?

The regulators for telecoms and electricity are deemed to be independent of government but only have powers to recommend. The laws creating these bodies gave them partial mandates and limited powers of enforcements. The selection of members has been heavily biased towards retiring government civil servants, on many occasions taken from the sector they are now supposed to regulate, perpetuating the mindset and attitudes developed over a working life. In spite of the above mentioned limitations, it is encouraging to note that steadily positive progress, that is, division of roles, recovery of production cost through proper tariff structure, better services to poor, reduction in number of illegal connections and theft of electricity has been made and there is hope of further progress being made in the future.

The picture drawn from Jaipur's water utility portrays inefficiencies, lack of customer involvement and representation, a haphazard pro-poor water policy and consequently a strong need for reforms. The government of India and the foreign lending institutions are exerting pressure on the State governments to bring about change.

An attempt in this regard was initiated in November 2005 by the launch of the 'National Urban Renewal Mission' which initially mentioned 'Independent Regulators' for urban services as a mandatory requirement for funds to be released by the Government of India. However, the guidelines for reforms were modified later with regulation omitted. Instead accrual-based double entry system of accounting, levy of reasonable user charges with the objective that full operation and maintenance cost is collected within the next seven years (project duration), providing basic services to poor and earmarking budgets for the same were included in mandatory reforms (GOI, 2006).

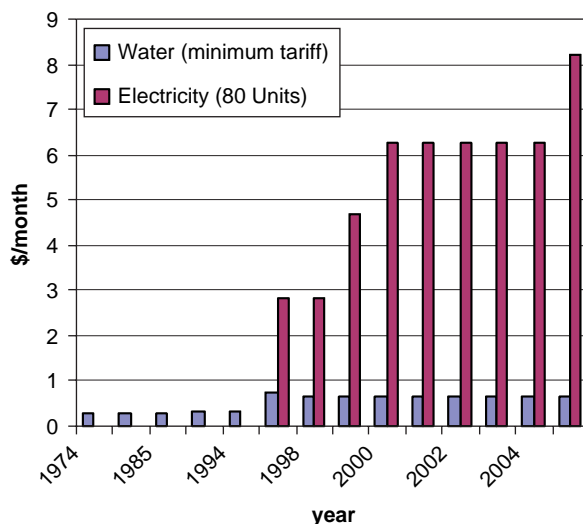


Fig. 2. Comparison of changes in water and electricity tariffs.

Given the present reluctance for private sector involvement and now regulation in water and sanitation sector, it is recommended that the public water utilities in India should identify improvements that can actually be implemented without significant institutional change for example non-revenue water reduction, leakage reduction, optimize energy use by asset management planning and bringing down the cost of production, transmission and distribution along with the above mentioned reforms. However this is easier said than done, looking at the huge population and the poor record keeping. Hence it is suggested that instead of trying to adopt a institutional reform process, a piecemeal approach be taken and simultaneously the middle income group be taken into confidence through their political representatives, balancing local service improvements with local tariff raise.

Today in India the state exerts too much control in too many areas. Being owner, policy-maker and manager of the water sector at the same time, the state is involved in too many tasks and is not able to concentrate on any of the essentials. Though an enabling state which allows others do what they can do best would be for the benefit of the whole country, society has yet to agree with this prescription. Economic regulation of corporatised water providers are not yet a strong enough driver to facilitate the desired quality of sustainable water and sanitation for all.

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