

# WATER

## TARIFFS & SUBSIDIES IN SOUTH ASIA

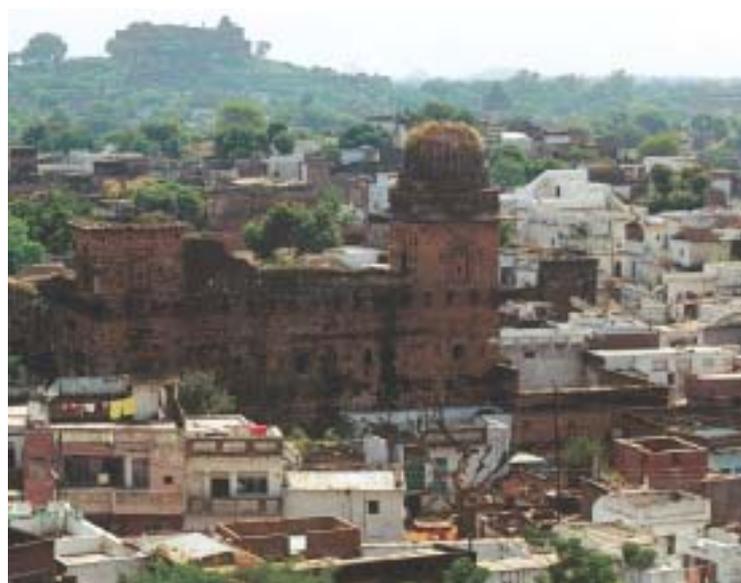
# A Scorecard for India

*REFORM OF THE WATER AND SANITATION SECTOR is occurring in many countries, and offers the potential to improve services to all. Of particular concern, however, is the situation of the poor, and reform must be designed so that they receive increased access to affordable services. A key issue in this regard is water pricing, which is one of the main variables affecting the distribution of benefits between different stakeholders. However, experience shows that water pricing, and the subsidies which are often delivered through water tariffs, can be a source of major inefficiencies in the sector.*

*While affordability has been one of the prime concerns of those setting tariffs and designing subsidies, there may be significant flaws in many common pricing strategies and subsidy delivery mechanisms. Rather than providing affordable water to the poor, these may in fact be leading to financial unsustainability of utilities, lack of access to services, and inequity. The reform process provides the opportunity to rationalize and reconsider the design of tariff and subsidy structures, and seek new ones which may provide better results.*

*This series of papers is designed to examine these issues in South Asia. It is designed to present the basics of tariff and subsidy issues, to disseminate recent research findings, and to stimulate debate on the subject.*

*The preparation of these papers was funded by the Public-Private Infrastructure Advisory Facility (PPIAF). Additional financing was provided by the World Bank, the World Bank Institute and the Water and Sanitation Program.*



Picture by Kathleen Graham-Harrison

The aim of this paper is to provide a scorecard for current urban water tariffs and subsidies in India, assessing how well they perform and identifying changes that may be needed in the context of the wider sector reform process. The paper concludes that Indian water tariffs and subsidies do not score very highly – in fact they meet only one out of four important policy objectives: they are extremely affordable. However, this comes at the expense of cost recovery, economic efficiency and fairness. Current subsidy levels are significantly higher than they need to be, given that even the poorest households could afford to meet their subsistence needs with tariffs several times higher than current levels. On the other hand, full cost recovery tariffs would probably create affordability problems for at least part of the population. However, the absence of targeting mechanisms means that subsidy resources are currently wasted on many households that could afford to pay. Restructuring tariffs to meet cost recovery levels, and introducing better targeting for subsidies, would allow the state to significantly reduce its current subsidy budget, and strengthen the financial position of water utilities allowing them to provide better service for all.



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## A SCORECARD FOR INDIA

**H**ow well do Indian water tariffs and subsidies serve the citizens of urban India? The aim of this paper is to provide a scorecard for current urban water tariffs and subsidies in India, assessing how well they perform, and identifying changes that may be needed in the context of the wider sector reform process.

The scorecard follows evaluation criteria developed in an earlier paper in this series<sup>1</sup>. Thus, tariffs are assessed in terms of the extent to which they contribute to cost recovery, economic efficiency, fairness and affordability, while subsidies are assessed in terms of whether they respond to a genuine need, achieve accurate targeting of benefits towards the poor, maintain low administrative costs, and avoid generating perverse incentives.

**There is a very wide variety of water charging practices across India. However, behind this diversity, there are a number of common underlying characteristics.**

The evaluation is based on data from a survey of water charging practices in Indian cities. The survey sample includes all 23 metropolitan cities (defined as those with population over a million), plus a representative sample of 277 Class I and Class II cities (defined as those with a population between 50,000 and 1,000,000). Overall, the cities represented in the sample have an aggregate population of 140 million people, of whom about half reside in the metropolitan cities and half in cities of relatively smaller size. All of the Indian States are represented.



Picture by Gray Stubbs/WSP-SA

In India, it is the State Government that is responsible for choosing tariff structures for urban water supply. The State Governments generally prescribe minimum tariffs for municipal bodies of various categories, and individual cities have the option to set the tariff above this minimum level in order to recover costs, subject to State Government approval. As a result, there is a very wide variety of water charging practices across India. However, behind this diversity, there are a number of common underlying characteristics.

Virtually all Indian cities operate a mixture of measured and unmeasured tariffs, due to the relatively low coverage of metering (*see Table 1 for details*). Uniform volumetric charges are by far the most common tariff structure for measured charging; although increasing block tariffs (IBTs) are also common, particularly in metropolitan cities, flat-rate tariffs are by far the most common tariff structure for unmeasured charging. Ferrule-based tariffs (flat charges differentiated according to the diameter of

<sup>1</sup>Whittington, Dale, Boland, John and Foster, Vivien, *Water Tariffs and Subsidies in South Asia: Understanding the Basics*, World Bank 2002, (Paper #1 in this series).

**Table 1: Overview of charging structures in India**

	Metropolitan cities		Smaller cities and towns	
	#	%	#	%
<b>Metered</b>				
• Uniform volumetric tariffs	11	58	89	77
• Increasing block tariffs	8	42	26	23
Total	19	100	115	100
<b>Unmetered</b>				
• Flat-rate charge	10	56	135	72
• Ferrule-based charge	7	39	37	20
• ARV-based charge	1	5	10	5
• Tap-based charge	0	0	6	3
Total	18	100	188	100

Source: Adapted from NIUA, 2002

Note: Of the 22 metropolitan cities, three do not have any metered connections and four do not have any unmetered connections.

the connection) are also quite widespread, particularly in metropolitan cities. However, since all houses tend to use half inch connections, the use of ferrule-based charges only really affects the tariff differential between houses and apartment buildings. A handful of cities also apply charges based on the assessed value of the dwelling or, in some cases, the number of taps.

### How Well do Indian Water Tariffs Perform?

In an earlier paper, it was noted that water tariffs can be designed to meet a number of different policy objectives. These include cost recovery, economic efficiency, fairness and affordability. Although it can be difficult to meet all of these objectives at once, a well-designed water tariff should make an important contribution to one or more of them. In this section, we evaluate how well water tariffs in urban India perform against each of these criteria.

### Cost recovery

The most basic requirement of any water tariff is to raise enough revenue to cover the cost of service provision. How close do Indian water tariffs come to meeting this goal?

Although there is relatively little evidence on the level of tariffs that would allow full recovery of operating, maintenance and capital costs in India, there have been a few recent consultant studies of operating and maintenance cost for specific metropolitan cities. These have produced results of Rs.13 (US\$ 0.26)\* per cubic meter for Chennai, Rs.16 (US\$ 0.32) per cubic meter for Bangalore and Rs.17 (US\$ 0.34) per cubic meter for Hyderabad. This suggests that Rs. 15 (US\$ 0.30) would be a reasonable benchmark for current operating and maintenance costs. However, it is well-known that utilities currently operate at very low levels of efficiency, suggesting that an efficient company might have

\* Rate of conversion: 1 US\$ = Rs 50 as on February 2003

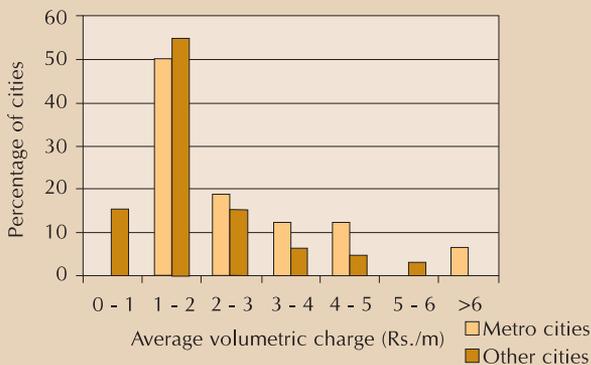
operating and maintenance costs significantly below this level.

Estimation of capital costs is much more difficult, due to limited asset inventories and methodological accounting issues, and no reliable public information is available at this time. However, capital costs are evidently very significant in the water sector and their incorporation in water tariffs would substantially raise the benchmark outlined above.

In stark contrast, the typical price charged to residential consumers in India is around Rs.1.5 per cubic meter (US\$ 0.03), only about a 10<sup>th</sup> of operating and maintenance costs (Figure 1). Moreover, even in cities with rising block tariff structures, only in Chennai and

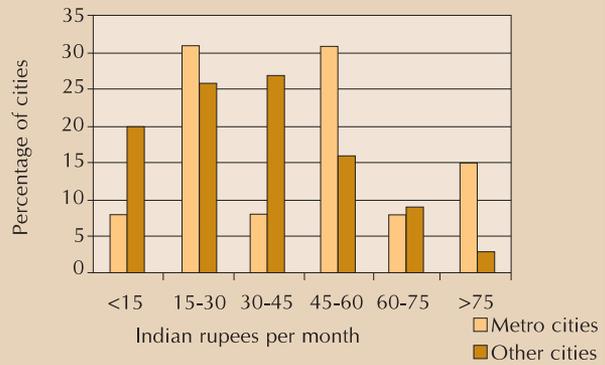
**The charges levied on residential users are less than a tenth of the likely full economic cost.**

**Figure 1: Volumetric tariffs for water in Indian cities**



Note: For cities with IBTs the graph reports the average volumetric tariff for 20 m<sup>3</sup> of consumption.  
Source: Adapted from NIUA, 2002

**Figure 2: Fixed charges for water in India**

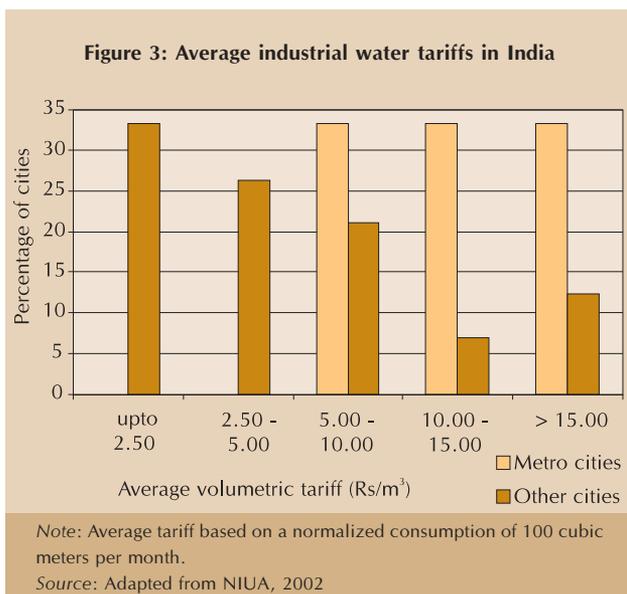


Source: Adapted from NIUA, 2002

Bangalore do the tariff rates charged for the highest blocks of consumption ever come close to recovering costs even for operation and maintenance. In Chennai, customers pay Rs.15 per cubic meter for consumption beyond 20 cubic meters per month. Although, to put this in perspective, only a small fraction of Chennai's water consumers are metered. In Bangalore, tariffs only climb into the cost recovery range for the tiny minority of users consuming more than 50 cubic meters per month.

Neither do unmetered customers come anywhere near to cost recovery. With average fixed charges of around Rs. 45 per month (see Figure 2), these customers only contribute enough to pay for the operating and maintenance cost of providing three cubic meters per month, when in reality most unmetered households are probably consuming closer to 20 cubic meters per month.

Although industrial customers face substantially higher tariffs than domestic users, many of them continue to pay less than the full economic cost of the service. Typical industrial tariffs lie around Rs.12 (US\$ 0.24) per cubic meter in metropolitan cities, and Rs.5 (US\$ 0.10) per cubic meter in smaller cities.



Indeed, industrial tariffs lie below the benchmark level of Rs.15 (US\$ 0.30) per cubic meter for operating and maintenance costs in two-thirds of metropolitan cities and 80% of smaller cities (see Figure 3).

Not only do water use charges fail to recover the costs of system operation and maintenance, but official connection charges also lie well below the typical costs of expanding the network to serve new communities. Connection charges in Indian cities are typically around Rs.1,000 (US\$ 20), compared to typical expansion costs of ten times that value: around Rs.7,500 (US\$ 150) per connection. Although low relative to economic costs, these connection charges may still represent a barrier to access by the poor. Only about 10% of utilities levy connection charges higher than Rs.5,000 (US\$ 100) (see Figure 4)<sup>2</sup>.

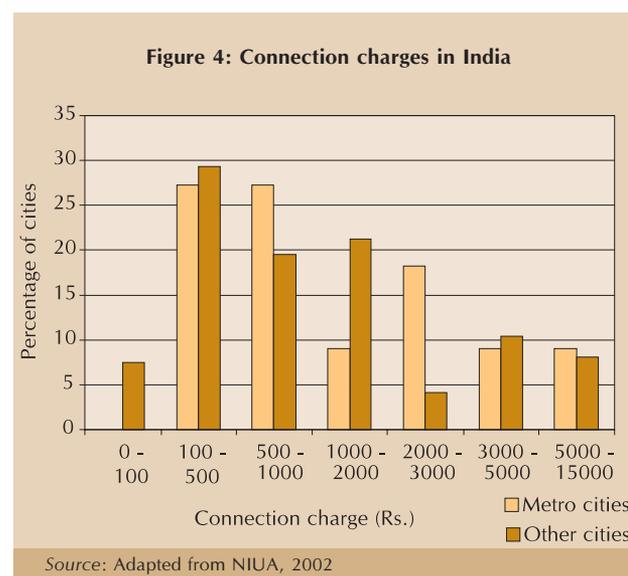
*In summary, only a minority of industrial customers in India are paying anything close to cost recovery*

*tariffs. The charges levied on residential users—both for connection and consumption, with or without meters, and irrespective of the tariff structure chosen—are less than a 10<sup>th</sup> of the likely full economic cost. Hence, Indian water tariffs essentially fail to make any significant contribution to recovering the costs of service provision.*

### Economic efficiency

An important function of water prices is to avoid wastage of water by ensuring that consumers are aware of the true cost of the water they use. Do Indian water tariffs contribute to promoting the economical use of water? In order for prices to promote economic efficiency consumers must be metered and measured tariffs must reflect the incremental cost of developing new water sources.

*It was already seen that tariffs do not even come close to reflecting the average cost of water supply, let*



<sup>2</sup>The reality is, however, that many people, particularly the poor, pay much more than the official connection charge as they have to pay the costs of laying the missing tertiary network, often duplicating pipes that their neighbors have already laid. Utilities frequently also levy additional charges and require substantial deposits. This issue, and the burden it puts on the poor, is discussed in Paper #3 of this series.

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alone the incremental cost of new sources which tend to be more expensive than water currently supplied. Furthermore, only a handful of metropolitan cities in India—notably Bangalore, Kochi, Mumbai and Pune—have come close to achieving universal meter coverage. In other metropolitan cities, only 62% of households are metered, while in smaller cities the coverage rate falls to 50%. Moreover, the official meter coverage figures potentially overstate the true extent of metering. Anecdotal evidence suggests that meters are often non-functional either due to the low quality of the equipment and intermittent nature of supply, or are deliberately tampered with by the household. For both reasons, many metered customers often end up paying fixed charges (sometimes based on their last recorded meter reading), although the exact extent of this phenomenon is unknown.

The other side of the story is that, in practice, water supply is so limited in many cities that there is little scope for wasting water. It is not uncommon for water to be available for barely an hour a day, and—owing to inadequate pressure on the distribution network—people struggle to collect water even when it is available. As a result, customers are rationed physically in their use of water, rather than controlled via price.

*In summary, with low tariffs and low effective meter coverage there are no real economic incentives for Indian consumers to economize on water use. On the other hand, the opportunities to waste water may be limited in many cities, where owing to inadequate and intermittent supply consumers effectively face physical rationing.*

### **Fairness**

The principle of fairness states that consumers should not be charged different amounts for what is essentially the same service. How well do Indian water tariffs stand up to this test? Two key areas to examine are whether

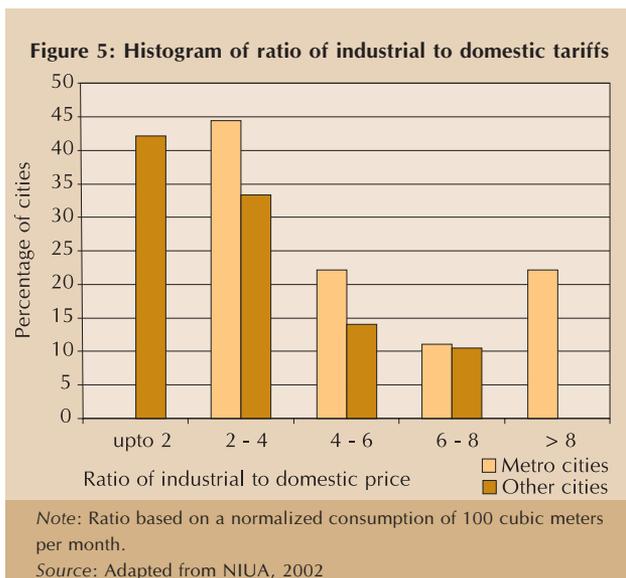


Picture by Indo-US AID FIRE-D Project

unmetered customers get a fair deal relative to metered customers, and whether industrial customers are fairly treated relative to domestic customers. The answer in both cases is negative.

Of course, use of unmeasured charges is intrinsically unfair insofar as all customers are charged the same amount irrespective of how much they consume, which means that large consumers inevitably gain at the expense of the small. However, fixed charges can at least be fair *on average* if the level of the fixed charge is about the same as the cost of buying an average level of water consumption under the volumetric tariff structure that applies in the same city.

This can be evaluated by calculating how much water unmetered customers would be able to buy if they spent their fixed charge on metered water. In about three quarters of cities this 'equivalent consumption' is less than 20 cubic meters per month, which is a typical level of household water consumption. The implication is that unmetered customers are getting a relatively good deal, since they are probably consuming more water than they could have bought at the same cost under the metered tariff. This is unfortunate—not only for reasons of fairness—but because it creates resistance towards



metering and provides incentives for measured customers to try and tamper with the meters.

As regards the balance between domestic and industrial customers, the latter tend to pay at least twice as much as the former for the same service. This is doubly unfair when one considers that industrial customers are often cheaper to serve given that they take their supplies from the larger trunk mains, and hence do not necessitate any of the costs associated with the tertiary distribution



Picture by Indo-USAN FIRE-D Project

network. The mark-ups for industrial customers tend to be largest in metropolitan cities, where industrial customers pay more than eight times as much as domestic customers in 20% of cases (see Figure 5).

*In summary, Indian water tariffs tend to be unfair to industrial customers, as well as measured residential users, and small consumers without meters. Unmeasured domestic customers with high water use are those that tend to do best out of the tariff system.*

#### **Affordability**

According to the principle of affordability, water tariffs should ensure that low income households are

**With low tariffs and low effective meter coverage, there are no real economic incentives for Indian consumers to economize on water use.**

comfortably able to pay for a subsistence level of water consumption. The World Health Organization has developed a reference point of 5% for the proportion of the family budget that can 'reasonably' be spent on meeting subsistence water needs. The definition of 'subsistence consumption' varies considerably around the world, with values ranging from 5 to 20 cubic meters per month.

According to the Planning Commission of India, in 1999-2000, 23.6% of the population in urban India lived under the official poverty line of Rs. 454 (US\$ 9) per capita per month. To assess affordability, we express the cost of subsistence consumption in the 5 to 20 cubic meters per month range as a percentage of the monthly

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**Table 2: Scorecard for water tariffs in India**

Criterion	Evaluation	Comments
Cost recovery	Poor	Average prices are about an order of magnitude below likely economic costs of service provision.
Economic efficiency	Poor	Nearly half of all customers lack meters, while those with meters face prices substantially below the incremental cost of water supply. Nonetheless, wastage of water is circumscribed by physical rationing in many cities.
Fairness	Poor	Tariff structures are generally unfair towards industrial customers and metered customers.
Affordability	Good	Given that a subsistence consumption of 10 cubic meters per month absorbs only between 1.1% and 2.2% of the budget of a family living on the poverty line.

budget of a family of five living on the poverty line. This comes to between 0.3-1.2% of the budget for a family with metered service, and 2% of the budget for a family with unmetered service. These percentages lie well below the World Health Organization affordability threshold of 5%.

Connection charges at their current levels of around Rs.1,000 (US\$ 20) may represent an economic barrier to the poorest of households, unless the possibility of paying in installments is provided. This becomes even more critical in the 10% of cities which levy connection charges close to cost recovery levels of around Rs.7,500 (US\$ 150).

*In summary, Indian water tariffs are extremely affordable, even for families living in extreme poverty. Indeed, this is the only one of the original four policy objectives that they unquestionably meet in full. Connection charges may however present an affordability problem, particularly in some cities.*

Table 2 provides the final scorecard for water tariffs in urban India, and illustrates that affordability has been the overriding concern in the design of water tariff structures in India. However, unfortunately, the achievement of affordability has come at major expense in terms of sacrificing cost recovery, economic efficiency and fairness. This in turn has put Indian water utilities in a precarious financial position jeopardizing their ability to sustain service levels.

### What About the Effectiveness of Indian Subsidies?

The strong emphasis on affordability in Indian water tariff design, as well as the very poor performance in terms of cost recovery, indicate that subsidies lie at the heart of the Indian water sector. Indeed, state transfers to the water sector in India have been estimated at Rs. 5,470.8 crore (US\$ 1.1 billion) per year<sup>3</sup>, accounting for 4% of all government subsidies in India and

<sup>3</sup>Srivastava, D.K. and Sen, T.K. (1997), Government Subsidies in India, National Institute of Public Finance and Policy, New Delhi.

equivalent to 0.5% of GDP. About 98% of this subsidy comes from State rather than Central budgets; while charges contribute to a mere 3% of the overall costs of service provision in both urban and rural areas. Clearly, subsidies to the water sector represent a substantial drain on the public purse.

It is therefore particularly important to understand to what extent the Indian system of water subsidies is effective. Following the framework developed in an earlier paper, a number of important questions can be posed. Do subsidies respond to a genuine need? Are they accurately targeted towards the poor? Are they costly to administer? Do they create perverse incentives?

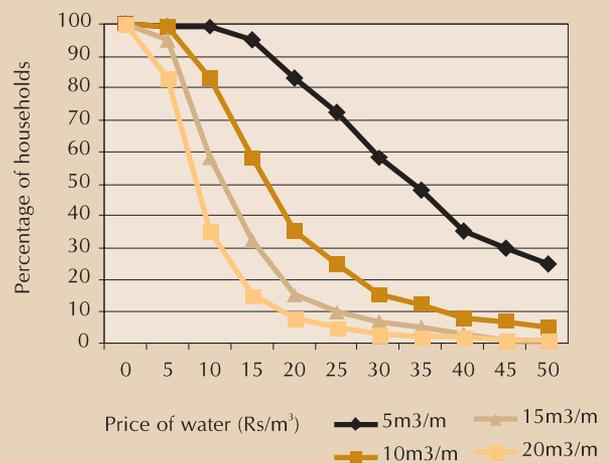
### Genuine need

Subsidies are genuinely needed when families would have to spend an unreasonable proportion of their income to meet their basic needs for water. Although it is difficult to say objectively what an 'unreasonable' amount of money to spend on water is, as noted above, the World Health Organization has for many years used 5% of family income as a benchmark level for affordability.



Picture by Indo-US AID FIRE-D Project

Figure 6: Affordability of higher water tariffs



Source: Adapted from National Sample Survey Organization (2000), Household Consumer Expenditure in India 1999-2000: Key Results from the NSS 55<sup>th</sup> Round, Ministry of Statistics and Programme Implementation, Government of India, New Delhi

Applying this principle to India suggests that even a typical five-member family living *under* the poverty line with a per capita monthly budget of Rs. 350 (US\$ 7) could afford to pay up to Rs. 6 (US\$ 0.12) per cubic meter for a subsistence block of 10 cubic meters per month, which is approximately four times the current typical volumetric charge of Rs. 1-2 (US\$ 0.02-0.04) per cubic meter. Although such a tariff represents a substantial increase over current levels, it still falls short of the levels that appear to be required to recover current operating and maintenance costs (around Rs. 15 or US\$ 0.30 per cubic meter). However, as noted above, these costs incorporate substantial inefficiencies and could potentially be significantly reduced under better management.

In order to provide a sense of how rapidly tariff increases towards full economic costs become unaffordable, *Figure 6* plots the proportion of the population who could afford to pay for a subsistence



Picture by Indo-US AID FIRE-D Project

level of consumption at different levels of the water tariff, and using different assumptions about the subsistence threshold for water consumption, the WHO affordability criterion of 5% of income is used. The graph shows that tariffs up to Rs.10 (US\$ 0.20) per cubic meter range are affordable for the vast majority of households, when the subsistence threshold is set at 10 cubic meters per month.

*In summary, while tariffs could probably be raised to four times their current levels without seriously damaging affordability for the poorest, raising them much beyond Rs.10 per cubic meter would be difficult from a social perspective. Hence, although subsidies could be significantly reduced relative to current levels, there appears to be a genuine ongoing need to subsidize the costs of water service provision.*

Assessing the affordability of connection charges is more difficult given that they are one-time payments that may often be paid out of accumulated savings. Nonetheless, the poorest households typically lack both significant financial reserves and access to affordable credit. In this sense, even current connection charges of around Rs.1,000 (US\$ 20), would be unaffordable to poor households since, as a one-time payment they would represent around three quarters of monthly income. Hence,

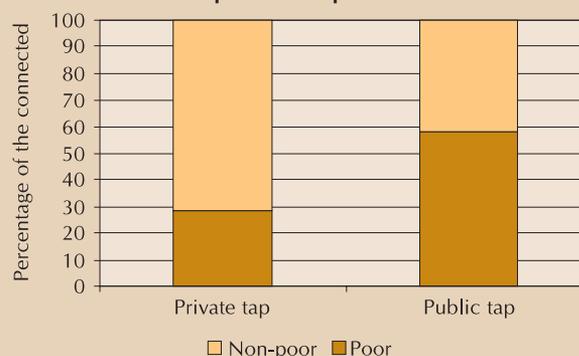
even at current low levels, connection charges would only be affordable if poor families were given the option of paying them by installments over a period of at least a year. If connection charges were to be raised to cost recovery levels of closer to Rs. 1,000 (US\$ 20) much longer term credit lines would be needed.

### Accurate targeting

With current water tariff levels in India, just about all customers pay much less than the full economic cost of the service; irrespective of how much they consume, whether they are residential or industrial, or whether they have private connections or use public standposts. *In this broad sense, water subsidies in India are not targeted at all.*

However, the tariff structures used by Indian utilities do aim to provide higher subsidies to some customers than to others, and to that limited extent some degree of targeting does take place. Users of public standposts receive the service free of charge, while residential customers with private connections pay a small price for the service, and industrial customers a higher price. Moreover, in some cities, IBTs are used to provide higher subsidy rates to low-volume consumers who are assumed to be the poor.

Figure 7: How effective is self-selection into public standposts?



Source: National Sample Survey (50<sup>th</sup> Round), 1993-94

**Table 3: Distribution of subsidy across customer classes in Hyderabad**

	Industrial connection	Residential connection	Public tankers	Public standpost
Daily water consumption (m <sup>3</sup> )	7.69	0.57	0.05	0.05
Average tariff (Rs./m <sup>3</sup> )	14.5	7.1	0.0	0.0
Average cost (Rs./m <sup>3</sup> )	16.7	16.7	12.9	42.0
Subsidy rate (%)	13	57	100	100
Annual subsidy (Rs./conn/yr)	6,283	2,028	767	235

Source: Own calculations based on data from HMWSSB.

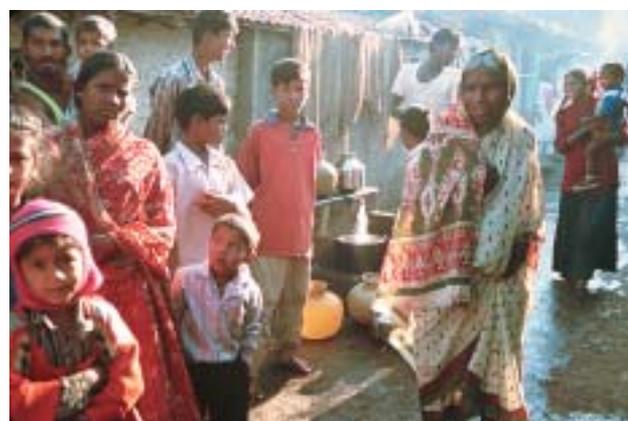
By providing a zero cost, low quality of service, public standposts offer a choice that is only likely to be attractive to lower income families. In this sense, they implicitly target subsidy resources by encouraging the poor to voluntarily select the more subsidized service. Figure 7 compares the proportion of those using private and public tap services that live below the poverty line. The results show that those using public taps (58%) are almost twice as likely to be poor as those using private taps (29%).

The implication is that self-selection works to some degree, but that even among those using public taps only three out of five are poor. This may simply reflect the lack of availability of capital for the utility to expand private connections into neighborhoods where people would be able to afford them, forcing some non-poor households to make use of public taps at least for drinking water purposes.

These statistics also show that a substantial proportion of the users of both services are non-poor so that any indiscriminate subsidy applied to either of them will end-up leaking away to unintended beneficiaries. These ‘errors of inclusion’ are 42% for public standposts and 71% for private taps. Moreover, 40% of the urban poor in India do not use either private or public taps, but rely on tubewells, handpumps and surface water sources. These people do not benefit at all from

subsidies to the water utility, and represent a serious ‘error of exclusion’.

Finally, it is paradoxical to note that even though there is an effort to apply higher subsidy rates to those services most likely to be used by the poor, in practice the absolute value of the subsidy received by each of these customer groups is inversely proportional to the subsidy rate. This point can be illustrated with data from the Hyderabad Metropolitan Water Board (see Table 3). The data show that although industrial consumers have the lowest subsidy rate on their tariffs, their consumption is so much higher than that of any of the other customer groups that they end up receiving a much higher absolute value of subsidy (Rs. 6,283 or around US\$134 per year). Conversely,



Picture by Indo-USAID FIRE-D Project

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customers relying on public standposts consume such a small amount of water that—even though it is provided free of charge—the overall value of the subsidy they receive is very modest (Rs. 235 or around US\$ 5 per year).

*In summary, there is little targeting of subsidies in Indian water tariffs given that just about all consumers pay less than full cost. This means that more than 70% of those benefiting from subsidies channeled towards private connections are not poor, while 40% of the poor who do not use any public water services are excluded altogether. Public taps do a reasonable job of channeling subsidies towards the poor, however because they deliver such small amounts of water the absolute value of these subsidies is very small compared to those enjoyed by private connections. These targeting failures suggest that the overall subsidy cost to the state*

**More than 70% of those benefiting from subsidies channeled towards private connections are not poor, while 40% of the poor who do not use any public water services are excluded altogether.**

*could be significantly reduced if subsidies were more effectively targeted towards the poor.*

### **Low administrative cost**

Since there is no major system of subsidy targeting in India, there are few if any associated administrative costs. The exception may be in a few cities that continue to use Annual Rateable Value (ARV) as a basis for unmeasured charging, since the corresponding property valuations should—at least in principle—be updated



Picture by Indo-USAID FIRE-D Project

from time to time, although this does not always happen in a timely fashion.

### **Avoidance of perverse incentives**

The high levels of subsidy in the Indian water sector lead to a variety of behavioral distortions such as water wastage, while the imbalance of industrial and domestic tariffs may encourage some business users to disconnect from the public system and rely on private wells instead. However, perhaps the most serious distortion that has arisen in the water sector in India is the need for water consumers to develop coping mechanisms to deal with the intermittent nature of supply. The economic burden of these ‘coping costs’ proves to be quite considerable.

Owing to the precarious financial situation of many water utilities in India, service quality has suffered seriously, and in many cities service is only available for a few hours each day, or even every other day. On the one hand, households with private connections are often forced to construct storage tanks and/or private boreholes to tide them over during service interruptions. On the other hand, households relying on public standposts often have

**Table 4: Scorecard for water subsidies in India**

Criterion	Evaluation	Comments
Genuine need	Good	Tariffs beyond Rs.10 per cubic meter would be genuinely unaffordable for a substantial proportion of the Indian population; however current tariff levels could easily be increased by a factor of four without affecting the affordability of the service for the poorest households.
Accurate targeting	Poor	All water users receive subsidies. There is some success with self-selection of the poor into public standposts; however although this service is more highly subsidized the absolute value of the subsidy is small.
Low administrative cost	Good	Given that there is hardly any targeting of subsidies, the administrative costs are necessarily minimal.
Avoidance of perverse incentives	Poor	The subsidy system discourages water conservation, encourages large industrial customers to self-supply, and leads to the phenomenon of 'coping costs' through which many households end up paying much more than they do in utility charges.

to queue up for long periods to obtain water when it becomes available.

These 'coping costs' can be very considerable, both in absolute terms and relative to the charges that customers pay to their water utilities. Two recent studies for the cities of Delhi and Dehradun found that average coping costs for households with private connections work out at Rs.3.5 (US\$ 0.07) per cubic meter, compared with utility charges of around Re.1 per cubic meter in Delhi and Rs.3 per cubic meter in Dehradun<sup>4</sup>. These studies also show that the 'coping costs' per cubic meter faced by users of public standposts appear to be much higher than those faced by those with private connections. However, the former are more likely to take the form of time wasted queuing at standposts as opposed to monetary

expenditure, and are hence more difficult to value in economic terms.

*In summary, the precarious financial situation of water utilities in India has led to declining quality of service, which imposes substantial indirect 'coping costs' on consumers. These typically exceed the financial charges that consumers pay to utilities.*

Table 4 provides the final scorecard for water subsidies in India, and illustrates that although there is a genuine need for water service subsidies in India, current subsidy levels are significantly higher than they really need to be to keep services affordable for the poor. Moreover, owing to the almost complete absence of targeting, there is tremendous wastage of subsidy resources, most of which are captured by non-poor households.

<sup>4</sup>For further details see: (a) Choe, K., Varley, R.C.G., and Biljani, H.U. (1996) *Coping with Intermittent Water Supply: Problems and Prospects*, Activity Report No. 26, Environmental Health Project, U.S. Agency for International Development, Washington, D.C.; (b) Zerah, M.H. (2000) *Water: Unreliable Supply in Delhi*, Manohar, Centre de Sciences Humaines, New Delhi, India.

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## Conclusions

Indian water tariffs and subsidies, unfortunately, do not score very highly against a number of standard performance criteria. Indian water tariffs only meet one out of four important policy objectives: they are extremely affordable. However, this comes at the major expense of sacrificing cost recovery, economic efficiency and fairness.

Indian water subsidies do respond to a genuine need. Given current income levels, water tariffs much beyond Rs.10 (US\$0.20) per cubic meter would make the service unaffordable for a significant proportion of the population. However, given that under current inefficient management operating and maintenance costs stand at around Rs.15 (US\$0.30) per cubic meter, it may be possible to close the gap between affordable tariffs and cost recovery tariffs by improving utility performance. Notwithstanding, tariffs that cover full capital costs would clearly lie beyond the reach of a substantial majority of households, indicating that capital subsidies are likely to remain an important feature of the sector.

In spite of this, current subsidy levels are significantly higher than they need to be, given that even the poorest households could afford to meet their subsistence needs with tariffs four times higher than current levels. Moreover, the absence of targeting mechanisms means that subsidy resources are wasted on households that could afford to pay.

Hence, if tariffs could be raised closer to the level of operating and maintenance costs and some kind of targeting mechanism be introduced, significant performance improvements could be achieved in terms of cost recovery, economic efficiency and fairness, without seriously jeopardizing affordability. Furthermore, as a result, the state could significantly reduce its current subsidy budget, and the financial position of water utilities could be strengthened allowing them to reduce the burden of coping costs and provide better service for all.

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