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World Bank
Water and
Sanitation
Program

South Asia Region

In describing the water vending practices in Karachi this Field Note highlights the complexity, nature and scale of the practice. It also identifies areas where more information and understanding is needed to enable better management of the water market leading to improved efficiency, greater equality and lower prices for poor consumers.

Why lower service levels cost more?

The poor pay more because they have to buy water in small quantities due to their limited purchasing power and lack of facilities for storage. Buying water from a donkey cart vendor may be 4 times more expensive than buying from a commercial tanker vendor. Moreover, where households have no or limited storage capacity, they may have to purchase from a middleman who stores water and sells it by the bucket/pipes to his/her neighbor. The cost of water purchased in this way may be as much as 40 times higher than the cost of securing water from a KWSB tanker.

A Glance at Water Vending Practices in Karachi

Are people paying more for relatively lower service levels?

Overview

In Karachi, a city with a population of over 10 million, poor people sometimes pay 40 times more than the middle and upper income groups for an unreliable and indeterminate supply of water. What determines the eventual price that an end user, in particular one of the 3.3 million people living in slums, pays for water?

Karachi's bulk water supply is sufficient to service about half of its population. The present estimated demand for water is 782 mgd which is based on the following assumptions:

Low income communities:

- 63 litre/capita/day

Middle income communities:

- 132 litre/capita/day

High-income communities:

- 335.5 litre/capita/day

The demand for water in the year 2000 is estimated to be 820 mgd.

At present the bulk water supply is 605 mgd (a deficit of 177 mgd). Leakage (physical loss) in the transmission and distribution system is estimated at 40 percent, which increases the deficit for consumers to 419 mgd.

Reduction of transmission and distribution losses will lead to an immediate improvement in the quantity of water supplied to deficit areas. Furthermore, the Karachi Water and Sewerage Board (KWSB) plans to replenish bulk water supply by 100 mgd. This will narrow the bulk water deficit (at current levels of demand) to 77 mgd.

KWSB, a semi-autonomous consumer oriented organization, is responsible for bulk and retail water supply and sanitation for the Karachi Metropolitan Areaⁱⁱ. The physical infrastructure for the distribution system covers all planned and regularized areas.



WATER VENDING

Transportation/ Mode of Supply	Filling/Source	Customers	Range of selling price (average price tag for ~ 500 liters)	Range of costs, income and profit	Remarks
 Commercial Water Tanker	<ul style="list-style-type: none"> • KWSB hydrants • Leakage points • Wells • River beds • Informal hydrants/tanks (Rs. 80-120 per tanker) 	<ul style="list-style-type: none"> • Vendors • Residents • Squatter areas/main storage tanks • Private storage tanks/water shops • Hotels/restaurants 	<ul style="list-style-type: none"> • Rs. 200-250 (for 1200 gallon capacity tanker) • Rs. 300-450 (for 2,400 gallon capacity tanker) 	<p>Capital Cost: Bedford tanker (second hand): Rs. 300,000 - 500,000 Hino - Isuzu (new and second hand): Rs. 600,000 - 1,500,000</p> <p>Daily operational cost: Rs. 700 - 1,000 (including maintenance, wages, informal payments)</p> <p>Daily Income: Rs. 1,500 - 2,000</p> <p>Daily Profit: Rs. 800 - 1,000</p>	<ul style="list-style-type: none"> • Operates on more than 100 percent operational profit • Owned and operated by influential people
~Rs. 20					
 KWSB Water Tanker	<ul style="list-style-type: none"> • KWSB hydrants (free of cost) 	<ul style="list-style-type: none"> • Areas where water is deficient (community tanks wherever available) 	<ul style="list-style-type: none"> • Rs. 50 - 100 	<p>Costs borne by KWSB</p> <p>Informal Income: Rs. 50 - 100 per trip</p> <p>Profit: Rs. 50 - 100 per trip</p>	<ul style="list-style-type: none"> • Very few tankers reach low income areas and after much delay • Number of tanker trips are inadequate compared to the areas having scarcity of water
~ Rs. 07					
 Donkey Cart	<ul style="list-style-type: none"> • Spill points • Leakage points • River beds • Informal hydrants/tanks/valve positions (Rs. 5 - 20 per trips) 	<ul style="list-style-type: none"> • Locality kiosks/vendors • Residents • Hotels and restaurants 	<ul style="list-style-type: none"> • Rs. 50 - 70 (for a 60 - 80 gallon tank) • Rs. 3 - 5 per small container • Rs. 10 per 16 gallon container 	<p>Capital Cost: Donkey: Rs. 8,000 - 10,000 Cart Rs. 1,500 - 2,000</p> <p>Daily operational cost: Rs. 50 - 60 (including tyre puncture + fodder)</p> <p>Daily income: Rs. 350 - 500</p> <p>Profit: Rs. 300 - 440</p>	<ul style="list-style-type: none"> • Usually possess regular/permanent clients • Self owned • Directly accessible to users due to small size/volume • Poor quality of water (often contaminated water is also supplied)
~ Rs. 80					
 Push Cart	<ul style="list-style-type: none"> • Spill points • Leakage points • Community stand posts • Nearby planned areas • Informal hydrants/tanks (Rs. 5 - 10 per trip) 	<ul style="list-style-type: none"> • Water shops/vendors • Residents • Hotels and restaurants 	<ul style="list-style-type: none"> • Rs. 3 - 5 per container (10 containers per cart trip) 	<p>Capital cost: Rs. 1,500 - 3,000 (cart + containers)</p> <p>Operational Cost: Rs. 20 - 40</p> <p>Daily Income: Rs. 200 - 300 (for 6 trips)</p> <p>Daily profit: Rs. 180 - 260</p>	<ul style="list-style-type: none"> • Self owned • Regular clients • Poor quality of water (when filled from stagnant sources) • Limited scale of supply
~ Rs. 30					
 Bhishtee (Manual water carrier)	<ul style="list-style-type: none"> • Community stand posts • Mosques • Leakage points 	<ul style="list-style-type: none"> • Residents • Restaurants and hotels 	<ul style="list-style-type: none"> • Rs. 5 - 10 (for two containers) 	<p>Capital cost: Rs. 50 - 100</p> <p>Daily Income: Rs. 50 - 70 per day</p> <p>Daily Profit: Rs. 50 - 70</p>	<ul style="list-style-type: none"> • Self owned • Regular clients • Relatively better quality of water
~ Rs. 50					
 Underground tank owners in locality	<ul style="list-style-type: none"> • From commercial water tankers (Rs. 250 - 300 for 1,200 gallons) 	<ul style="list-style-type: none"> • Residents • Restaurants of the locality 	<ul style="list-style-type: none"> • Rs. 2 - 3 per minute's flow (1 gallon per minute) 	<p>Capital costs: Construction of tank + motor + pipes) Rs. 200,000 - 300,000</p> <p>Operational cost: Rs. 1,500 - 2,500</p> <p>Daily Income: Rs. 2,000 - 3,200</p> <p>Daily profit: Rs. 500 - 700</p>	
~ Rs. 275					

Market Response ⁱⁱⁱ

In response to this situation of water shortage, and given the lack of formal piped supply to many users, a range of water vending practices have developed to provide water to unserved consumers^{iv}. Essentially a parallel informal water market has evolved which is linked a number of ways to the formal city system.

One of the strongest links, as highlighted in the table above, is through the supply of bulk water to vendors - officially and unofficially - from the formal system.

Unofficial sources provide easy and unrestricted access, usually from broken mains, community stand posts, public buildings (such as mosques), or ponds etc. From this source water is sold through the private informal sector, donkey carts, push carts or *bhishtees* (water carriers)^v. This is the most common mode of water supply to squatter settlements and inner city areas.

Officially water can be obtained from a KWSB hydrant. This water gets distributed to communities/households through two mechanisms:

1. KWSB's 28 tankers deliver to communities/households free of charge. Nearly 2000 tanker trips are sanctioned daily. However, according to estimates nearly 50 percent of these tanker-trips do not reach their planned destination^{vi}.
2. Commercial tankers deliver to communities/households for a fee. There are approximately 5000 commercial tankers that obtain water from the 6 KWSB hydrants in the city. Each tanker completes 6-8 trips daily. Commercial tankers are available in 2 sizes; 1200 and 2400 gallons. The 1200 gallons is compatible to the needs of the low-income settlements where houses have a limited capacity for storage.

Profile of a Water Entrepreneur

Mr. Mohammad Hussain is a resident of Shah Rasool Colony, an old squatter settlement in Clifton, Karachi. He has constructed a large underground water tank in his house which is sufficient to store over 7000 gallons. He buys water from the tankers and supplies to the neighborhood through plastic pipes and motors. He earns Rs. 300-500 daily through the sale of 500-600 gallons of water to his neighbors. "I sell water as a gesture of good will. Therefore I charge minimum profit. However, the earning is sufficient to bear my household expense".

The present water market in Karachi is a profitable business for all stakeholders except the majority of the urban poor. As demand far exceeds supply, and the market is unregulated, consumers, who have limited participation in the supply and delivery of water, have limited influence over its price. To protect the interest of consumers, price control measures (part of a regulatory framework) would be needed; but policy makers need information to enable them to make informed decisions on pricing and regulation to ensure equality and maintain prices at affordable levels.



This information could be generated through a process of dialogue with consumers, suppliers, vendors, government and social intermediaries and some well-targeted research. Some possible issues to explore are:

1. How does the water market in Karachi really work?

Currently, the main actors adjust the prices to maximize profits, with no apparent improvement in the level of service. The following type of information could enable policy makers to set and enforce price regulators.

- the **scale and magnitude** of the market, the actors involved and their relationships.
- the **full economic cost** (including externalities) of supplying water
- factors that contribute to the **cost of water supplied** at the household level (geographical location in the city and transaction costs, inclusion/exclusion from the city's distribution system, source of water, capacity to store)
- **short term interventions** which could have a positive impact on the price of water (re-location of hydrants, reducing leakage from tankers, carts etc.)
- factors that determine **demand and willingness to pay**
- **attitude and expectation** of households towards the current mode of supply and their ideas about how this could be improved

2. What are the best institutional and financial arrangements for **different sets of consumers**? The following interventions could be considered and demonstrated.

- **a range of partnerships** between consumers, the informal sector, private sector, and the government. The role of social intermediaries could be explored (partnerships between concessionaires and the informal sector, water cooperatives etc.)

- different institutional arrangements for different levels of the supply chain (i.e. water could be distributed to households from the secondary level through a community built and maintained distribution system with or without private vending, supplied with a single official connection to the city network)
- optimum pricing arrangements to achieve efficiency and equity (e.g. a differentiated tariff scale with a corresponding menu of service)
- potential impact of metering on overall system performance
- procedures for monitoring and regulating the market



Making changes in an established market, is not easy and simple solutions are unlikely to be found. However, with a realistic appreciation of the current situation consumers and suppliers alike will be better equipped to begin to change the current situation for the better.

Endnotes:

- i. These statistics are based on the 'KWSB Basic Facts, 1997-1998'.
- ii. KWSB supplies water to domestic, commercial, industrial and other categories of consumers except the areas that are in the jurisdiction of Defence Housing Authority, Cantonment Boards and various other federal, provincial and local/autonomous bodies. The KWSB supplies bulk water to these authorities according to specific contractual arrangements.
- iii. This field note is based on interviews with key stakeholders: KWSB; Water Tankers Association; tanker operators; bhishtees; donkey cart operators; water retailers, hydrant operators and end-users. The areas covered included Orangi Town, Korangi, Lea Market, Lyari, Shah Rasool Colony, Lower Gizri, Aligarh Colony and Zia-ul-Haq Colony. Feedback was also obtained from meetings organized by the Urban Resource Center, Karachi.
- iv. It is difficult to determine how many households access water from this form of vending. Other consumers invest in self built infrastructure to access water from the mains.
- v. However, in the older areas of the city, bhishtees also deliver water to households living in apartment blocks where a distribution system was not laid. This practice has been prevalent since pre-independence.
- vi. The free tanker trips are largely negotiated by local politicians and other influential people.

Some other available sources of information are:

- Urban Resource Center; Forum Reports; Fact sheets and Transcripts; 1996-98.
- Water Engineering Development Center/Dawood College of Engineering Technology: Study of the Economic and Social impact of Privatization; in process.
- Citizens Alliance in Reforms for Efficient and Equitable Development: <http://sangat.org/creed>
- World Bank: Private Sector Participation in Urban Environmental Sanitation; 1997
- Karachi Water & Sewerage Board: Basic Facts; 1997-98

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