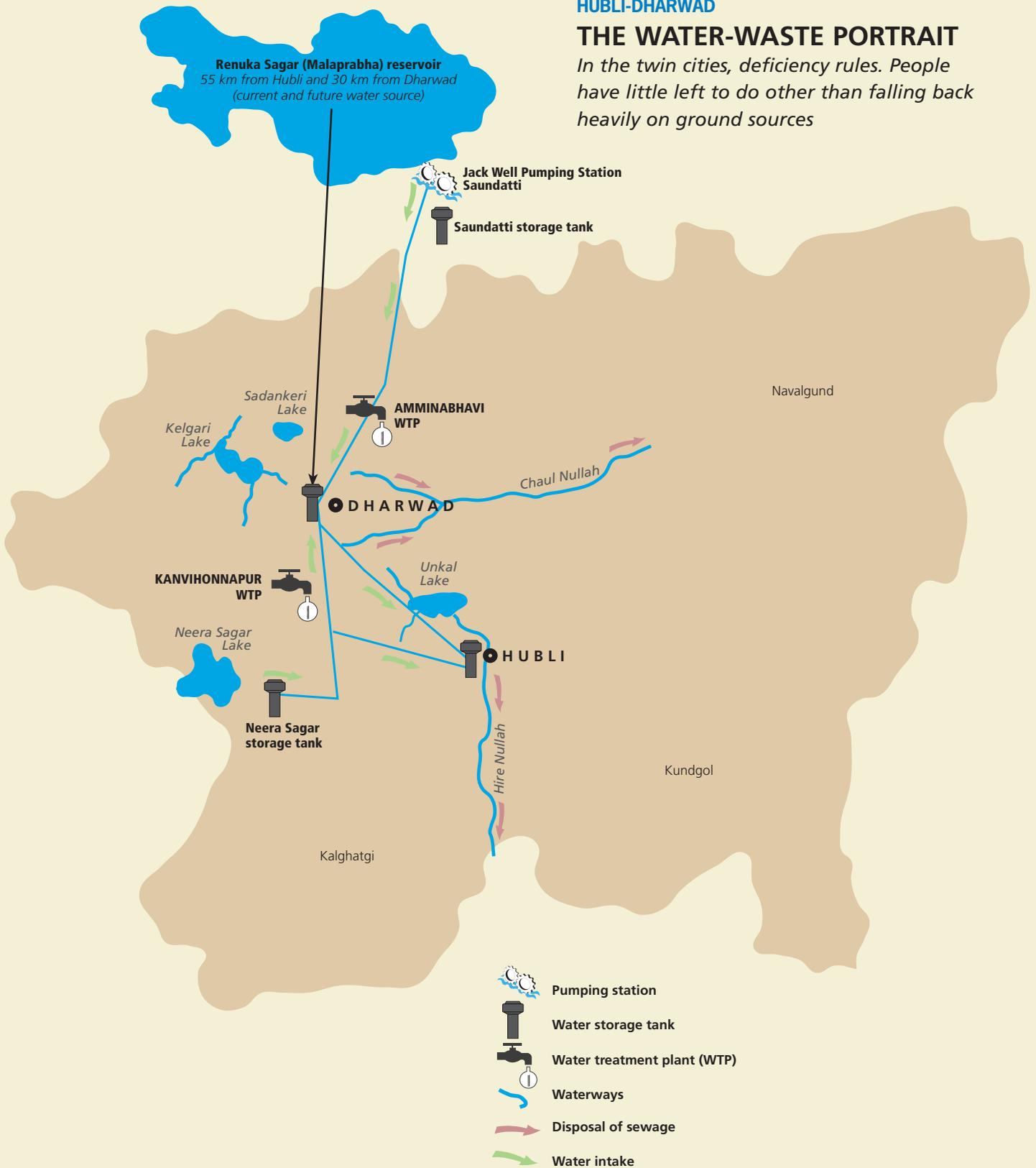


HUBLI-DHARWAD

THE WATER-WASTE PORTRAIT

In the twin cities, deficiency rules. People have little left to do other than falling back heavily on ground sources



Hubli-Dharwad

Once existing as two separate towns, Hubli and Dharwad were woven in as a single urban area within twin municipalities in 1962. The towns are situated in the Karnataka plateau, with the Western Ghats walling them up on the east. Strategically, they are on the main Mumbai-Bengaluru railway and the NH-4 highway, and form a major nodal point for central Karnataka. The highway also marks the watershed between rivers flowing to the east and west.¹

Hubli has slowly evolved from being a historic town to an important industrial and commercial nucleus of Dharwad district, with cotton and peanut growing areas and silk factories, railway workshops, and more than 1,000 allied, small and medium industries.² Dharwad is surrounded by hills, and is a major centre for educational services. Neither town has any large surface water source within their boundaries. Both attract a large floating population.

WATER

DEMAND, SUPPLY AND DISTRIBUTION

The region in and around the twin towns has always been water-starved. Till 2003, the responsibility of supplying water had rested with the Hubli-Dharwad Municipal Corporation (HDMC), but it was later transferred to the Karnataka Urban Water Supply and Sewerage Board (KWSSB). The board's estimation of water demand of the towns was about 6 per cent higher than the demand estimated against the norm for class I sewered cities (as set by the Central Public Health and Environmental Engineering Organisation, or CPHEEO). The gap between official demand and supply was about 18 per cent. With the demand increasing by 35 per cent in 2011, the gap was expected to widen to 64 per cent.³

At the time of the CSE survey in 2005-06, a 765-km pipe network was distributing water to individual households. The supply was metered: about 20 per cent in the case of Hubli and 40 per cent for Dharwad. The distribution system also provided for 55,000 community taps and 584 handpumps. However, heavy leakage losses meant that on an average, just about 72 million litre a day (MLD) was available – a far cry from the requirement. Nearly 10-12,000 cubic metre (cu m) was lost daily from the Renuka Sagar reservoir (Malaprabha river) alone owing to leakages and power failure.⁴ The Malaprabha river had an additional strain: check-dams and canals built along it for irrigation diverted a substantial amount of water, leaving little for the twin towns.

Since 2005, supply to the towns had shrunk to just three days in a week, on a rotational basis, with very precise and restrictive timings. As a result, households had to resort to large water

THE CITY

Municipal area (HDMC)	202 sq km
Population (2005)	0.9 million
Population (2011), as projected in 2005-06	1.2 million

THE WATER

Demand	
Total water demand as per city agency (KWSSB)	135 MLD
Per capita water demand as per KWSSB	159 LPCD
Total water demand as per CPHEEO @ 150 LPCD	128 MLD
Sources and supply	
Water sources	Neerasagar, Malaprabha; borewells
Water sourced from surface sources	98%
Water sourced from groundwater	2%
Total water supplied	111 MLD
Per capita supply	131 LPCD
Leakage loss	35%
Actual supply (after deducting leakage losses)	72 MLD
Per capita supply (after leakage losses)	85 LPCD
Population served by water supply system	NA
Per capita supply in the served area	NA
Demand-supply gap (after leakage losses)	63 MLD
Treatment	
Number of WTPs	2
Total treatment capacity	114 MLD
Actual treatment	111 MLD
Future demand and supply	
Demand (2011), as projected in 2005-06	183 MLD
Augmentation needed to meet the demand	72 MLD
Required increase in supply	65%

THE SEWAGE

Generation	
Sewage generated as per CPCB	107 MLD
Sewage generated as per city agency	60 MLD
Collection	
Length of sewerage network	412 km
Population covered by sewerage network	NA
Area covered by sewerage network	30%
Treatment	
Nil	
Disposal	
Hire and Biratikal nullahs	

Source: Anon 2011, *71-City Water-Excreta Survey, 2005-06*, Centre for Science and Environment, New Delhi

Notes: HDMC: Hubli-Dharwad Municipal Corporation; KWSSB: Karnataka Urban Water Supply and Sewerage Board

storage tanks on the roofs. Most of these tanks sourced water from motorised borewells (this being referred to as minor water supplies). In 2005-06, Hubli had 1,200 borewells, and Dharwad another 486.⁵

The crisis of water in the twin towns was expected to boom in future: in 2011, the towns would need 183 MLD of water, which would necessitate a 65 per cent increase in supply. To meet this, the authorities were planning a third stage water supply scheme from the Renuka Sagar reservoir at an estimated cost of Rs 176 crore. Once implemented, the scheme was expected to supply 100 litre per capita daily (LPCD) of water to about two million people.⁶

THE SOURCES

In the past, Hubli and Dharwad drew their water mainly from dugwells and water harvesting tanks, which collected surface run-off during monsoons.⁷ The towns had nine lakes, only two of which exist today – the Kelgari and the Sadankeri.⁸

The 175-sq km Renuka Sagar reservoir was built in 1955 at Saundatti in Belgaum district. Before the reservoir came up, the primary source of drinking water for the people of Hubli was the Unkal Lake inside the city, and the Neerasagar Lake. Dharwad depended on the Kelgari tank. Modern piped water supply systems were introduced in 1956.⁹

At the time of the CSE survey, the towns were receiving water from the Neerasagar Lake at Dhumawada, in Bedthi valley, and the Renuka Sagar reservoir (see Table: *Lifelines*). Neerasagar lies 20 km from Hubli, while Renuka Sagar is about 55 km from Hubli and 30 km from Dharwad. Any decrease in the water level of these

Source	Bulk supply (in MLD)		
	Hubli	Dharwad	Total
Neerasagar	32	6	38
Renuka Sagar	43	32	75
Total	75	38	111

Source: Hubli-Dharwad Municipal Corporation, 2005-06

reservoirs can trigger a major crisis, especially as 50 per cent of Hubli's population is dependant on Neerasagar. This reservoir's capacity at the time of survey was 38 MLD, but over the years, its capacity has dwindled.¹⁰ The Malaprabha too is facing problems: lack of sufficient rainfall in its basin has left the reservoir dry.

The towns also benefit from water stocked in a few tanks. Hubli has 21 tanks – the city's lower elevation allows for natural inflow of water through gravity; Dharwad has five.¹¹

The Hire *Nullah* in Hubli and the Chaul and Biratikal *nullahs* in Dharwad constitute the primary drainage for the twin towns. Surface water from these minor *nullahs* is not used.

TREATMENT

There are two water treatment plants (WTPs) in Hubli-Dharwad – the 74-MLD Amminabhavi plant and the 40-MLD plant at Kanvihonnapur. Surface water is treated, but the water coming

FREE FOR ALL

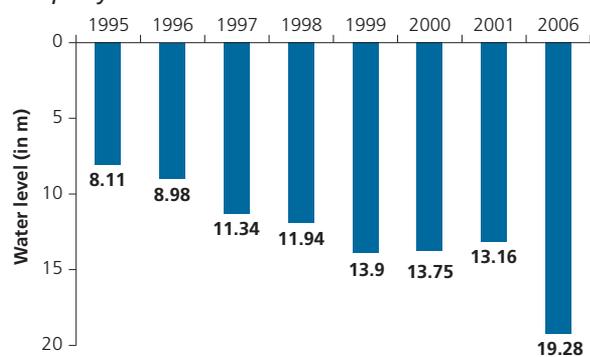
The twin towns are ravaging their groundwater

Growing water shortages as well as population pressures have not boded well: uncontrolled extraction of groundwater has been the result. In the absence of a licensing plan, borewells – for domestic as well as agricultural use – are being drilled at a frantic pace in both the towns (see Graph: *Groundwater check*). Two borewells are being drilled every week by one well-drilling company alone, one for irrigation and the other for domestic use.¹ People get either free water from government tankers, or pay up to Rs 125 for a private tanker. There are no figures for the amount of water extracted from private borewells within the Hubli-Dharwad Municipal Corporation (HDMC) area.

Over-extraction has led to lowering of the groundwater table, and has turned groundwater brackish in many places.² Drop in groundwater levels and increasing salinity is mostly noticed as one moves away towards the peri-urban areas, where abstraction of groundwater for irrigation by borewells is the maximum. Sweet freshwater is confined to a small pocket towards the west; with rising demand and increasing dependency on ground sources, conservation and recharge of this aquifer is becoming an imperative.

According to a 2007 study conducted by K V Raju of the Institute for Social and Economic Change, Bengaluru, the water shortage has

GRAPH: GROUNDWATER CHECK
Between 1995 and 2006, the water level in Hubli-Dharwad has declined by 10 metre (m) at the rate of 1 m per year



Source: National Data Centre, Central Ground Water Board, Faridabad

provided a good business to those who supply water through tankers. More than 50 tankers operate throughout the day in the twin towns.

The quantity of water supplied by them during summers is over 4 MLD in Dharwad and 7 MLD in Hubli. Fifteen companies are involved in the bottled drinking water trade in these towns. Water sales by them is to the tune of Rs 1 crore in Dharwad and over Rs 2 crore in Hubli.³

through borewells is not. Both the plants use a process combining aeration, chemical dosing, coagulation and flocculation, rapid sand filtration and chlorination.¹²

At the time of the survey, officials claimed that the towns' drinking water sources were free from pollution. However, during heavy rains, the turbidity of the water increases significantly, necessitating addition of a higher dosage of chemicals and alum for the coagulation and flocculation processes in the treatment plants.

Hubli-Dharwad has also been facing the problem of contaminated drinking water due to a faulty sewerage system. Sewerage pipes were unimaginatively laid down next to drinking water pipes. In due course, when the waterline developed cracks, it got mixed with sewerage water that was already leaking from the pipes at several points. In 2007, areas like Chennpet in Old Hubli faced an acute problem with contaminated drinking water, and residents took to the streets to protest against the alleged indifferent attitude of the municipal corporation and water board officials.¹³

THE ECONOMICS

The municipal corporation and the KWSSB jointly share the expenses and revenues. As per estimates in 2005-06, the total annual expenditure incurred over water supply was approximately Rs 27 crore. The twin towns had a little over five employees per 1,000 connections.

The water charges were flat tariff-based, the rates being fixed by the HDMC (see Table: *Water tariffs in Hubli-Dharwad*). Given that only 30 per cent of the connections were metered, the costs incurred were not recovered. As an annual average, Hubli had an actual collection of Rs 0.3 crore while Dharwad collected Rs 0.26 crore. Total annual revenues from the two towns, thus, amounted to Rs 0.56 crore. Seen against the annual expenditure, this indicates a recovery of only about 2 per cent.¹⁴

This made the selling cost of water drop as low as Re 1 per kilolitre (kl), against a production cost running as high as Rs 7 per kl in 2005. Thus, the municipal agency incurred, on an average, a 98 per cent loss per year (see Graph: *Water revenues – steeped in loss*).¹⁵

In 2005, the municipal corporation had doubled the twin towns' water tariff on the basis of a proposal submitted by the KWSSB. The board had contended that the increase was essential to pay back a loan of Rs 176 crore for the Malaprabha Drinking Water Project. The following year, the corporation decided to

TABLE: WATER TARIFFS IN HUBLI-DHARWAD

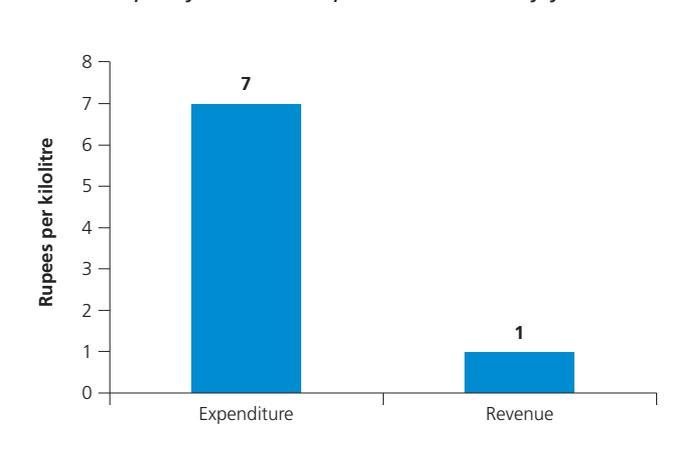
These are flat rates, fixed by the municipal corporation

Type	Per 1,000 litre	Minimum rate
Domestic	Rs 5.80	Rs 90 per month
Commercial and industrial	Rs 23.20	Rs 360 per month
Others	Rs 11.60	Rs 180 per month

Source: Hubli-Dharwad Municipal Corporation, 2005-06

GRAPH: WATER REVENUES – STEEPED IN LOSS

The municipality incurs a 98 per cent loss every year



Source: Hubli-Dharwad Municipal Corporation, 2005-06

lower the tariffs: from Rs 90 to Rs 60 for domestic users, from Rs 180 to Rs 120 for non-domestic users and from Rs 360 to Rs 240 for commercial and industrial users.¹⁶

However, this decision was vetoed in 2007 by the state government on the grounds that it would cut down the revenues of the corporation and affect the implementation of water supply schemes in the twin towns.

Tariffs changed again with plans towards a 24x7 water supply system (see Table: *Tariffs, 24x7*). The twin towns became one of the most cited examples of the Karnataka government's experiment with privatisation of water supply, a public-private partnership (PPP) initiative with the World Bank to lay out a 24x7 water supply system.

In the project area, tariffs have been revised upwards, and high-quality meters which are functional ensure the measure is accurate and based on consumption. There are four slabs, with tariffs ranging from Rs 6 per kl to Rs 20 per kl, the latter for

TABLE: TARIFF, 24X7

Upward revision beyond 2007

Belgaum/Hubli-Dharwad demonstration zones			Gulbarga demonstration zone		
Tariff slab (in kl)	Tariff (in Rs)	Monthly minimum charges per connection	Tariff slab (in kl)	Tariff (in Rs)	Monthly minimum charges per connection
0-8	6	Rs 48	0-8	6	Rs 48
8-25	8		8-15	8	
25-40	12		15-25	10	
> 40	20		> 25	12	

Source: KUWASIP 2011, 'World Bank-assisted Karnataka Urban Water Sector Improvement Project – experience on PPP for achieving 24x7 water supply and control of UFW', presentation to ministry of urban development, New Delhi, mimeo

THE COMING OF TAP CARDS

A scheme to ensure revenue recovery

For the first time in the state, the Karnataka Urban Water Supply and Sewerage Board (KWSSB), Hubli unit, is issuing 'tap cards' to consumers to ensure that water is not misused and bills are cleared on time. Approximately Rs 35 crore was due to the water board from non-payment of bills in the twin cities, of which Rs 20-25 crore is due from Hubli alone, according to *The New Indian Express*.¹

The KWSSB started issuing the cards in Hubli in March 2009. Two types of cards are being issued based on the nature of consumption. Pink tap cards are being given to non-domestic and commercial consumers, while white cards are being issued to domestic consumers. Both the kinds of cards will hold details like name and address of the consumer, date of tap connection, purpose and size of the tap connection. Besides, these cards have a bar-coding system which will help customers get details of their water bills through a computerised system from any bill collection centre of the board.²

WHERE DOES 24x7 FIT?

Being expensive, it is not plausible that the system will provide water to all

Writing in the *Economic and Political Weekly*, Bengaluru-based researchers Priya Sangameswaran, Roopa Madhav and Clifton D Rozario say the 24x7 water supply project has to be assessed on four counts – need, feasibility, costs and institutional arrangements. While, they find that there is a felt need for such a system, there are clear questions about feasibility and costs.¹

In terms of equity of supply, the researchers take an in-depth view of the pro-poor strategies of the government in the project. They find that while the policy is commendable, there are a number of problems on ground. Firstly, the upper limit of 8,000 litre per month (set at 55 LPCD) for the lowest slab penalises households with larger families. Furthermore, the one-time connection charge (earlier Rs 2,000 and now charged on a pro-rata basis) is given to households with regularised and legal connections. The poor find the cost of 'regularisation' is much higher and often unaffordable.²

Since the aim of the project is to augment supply, improving efficiency of distribution and reducing leakages will make more water available; more efficiency of collection will improve sustainability of the utility. But this is where the project has problems.

First, the challenge of upscaling will be enormous. The pilot project reaches some 13,700 connections, as against the over 100,000 connections in the adjoining cities of Hubli-Dharwad.³ In other words, reaching some 10 per cent of the twin cities' existing connections has taken seven years and more. It has also been costly. How will this reach the rest of the city, and by when? More importantly, will it impact the supply and sustainability of water

consumption above 40 kl.¹⁷ The aim of a 24x7 supply system is efficiency, prevention of leakages and revenue recovery (see Box: *The coming of tap cards*).

The Dharwad demonstration zone has 5,500 connections with a population of 37,000. Veolia, the French company chosen to operate the system, has recorded that 60 per cent of the customers consume less than 15 kl per day, contributing to 23 per cent of the total water charges and 33 per cent of the water used. On the other end of the spectrum, 16 per cent of the households use more than 25 kl per day, use 37 per cent of the water and account for 50 per cent of the collections. Monthly collections in this pilot zone have increased from Rs 2.5 lakh to Rs 8 lakh, which pushes towards financial sustainability.¹⁸ Yet, it is not all good as it seems (see Box: *Where does 24x7 fit?*).

SEWAGE

There are no sewage treatment plants (STPs) in Hubli-Dharwad. The entire sewage goes untreated into the natural water courses. About 70 per cent of the wastewater is let out into sewers and *nullahs* and 30 per cent goes into cesspits.¹⁹ The only forms of

sources – will there be quantifiable reductions in the amount of water to be sourced for supply? As yet, there is no evidence to suggest this will happen. Only a promise.

Secondly, the financial sustainability of such projects becomes crucial. By the Karnataka government's own assessment, the project (across all cities), with high tariffs and efficiency of recovery, fails to balance its books. This is also because the cost of water is high – over Rs 12 per kl. Interestingly, the cost to the operator and auditor is more than the cost of bulk water – Rs 5.45 per kl.⁴ Clearly, in this scenario, the big question is the cost of delivery of water in Indian cities and what this will do to the sustainability of local bodies and the strain on the already poor infrastructure of sewerage systems. The more water the city uses, the more its sewage.

All the waste of the two cities, estimated anywhere between 60-100 million litre daily, goes untreated even after the pilot project of 24x7. It makes its way into all the tanks and drains in the city, contaminating the groundwater and destroying critical waterbodies. And, this is the groundwater people are so often dependent on for their water needs.

Besides, as the researchers say, the Hubli-Dharwad project does not focus on the need for sustainable water supply – groundwater recharge or rainwater harvesting strategies. The institutional arrangement is also lacking. The researchers say there is no information or accountability about the quality of water supplied in the demonstration zones. "There is a confidentiality clause in the contract that the operator shall keep confidential all matters relating to the services it provides," which compounds the problem.⁵

In other words, the idea of 24x7 may be laudable. But the pilot project shows that there is a huge gap between what is intended and what will be finally achieved.

sanitation facilities available in the twin towns are septic tanks and community latrines. It is very likely that the underground aquifers are contaminated with sewage: the increasing levels of chloride in surrounding peri-urban and rural areas are indicative of this. Drains like the Hire *Nullah* and the Biratikal *Nullah* have turned perennial owing to the discharge of wastewater into them.

With summer temperatures exceeding 35°C and monsoons erratic and unreliable, Hubli-Dharwad's wastewater has become a valuable resource for urban and peri-urban farmers: many extract it from the *nullahs* and underground sewer pipes to irrigate their crops. However, there is little realisation of the fact that the effluent could be an environmental hazard if it is not sufficiently decomposed. A scheme called the 'Urban Waste Utilisation Project in the Hubli-Dharwad City Region' to use wastewater for irrigation led to results less promising than hoped. While the high nutrient load of wastewater increases crop yields and reduces the need for costly fertiliser inputs, it can lead to health problems for farmers and ruin crops and soil quality in the long run.²⁰

LOOKING AHEAD

The 2007 *City Development Strategy* (CDS) draft report, commissioned by the municipal corporation of Hubli-Dharwad, recommended a Rs 2,966-crore infrastructure investment plan spread over the next six years for the twin towns. The plan covered key areas like water supply, sewerage and sanitation, stormwater drains, solid waste management, traffic and transportation, slum development and urban poverty alleviation.²¹

Of the total amount, says the CDS, Rs 678 crore was earmarked for water supply and Rs 544 crore for sewerage and sanitation. The water supply component included Rs 300 crore for the Malaprabha stage III project and Rs 150 crore for refurbishing the water supply network. The sewerage component included Rs 200 crore for laying of new sewers and Rs 100 crore for the repair of existing sewers, besides Rs 50 crore for sewage treatment plants. The allocation for stormwater drainage includes Rs 70 crore on the construction of drains along the major arterial roads, Rs 65 crore for conversion of *kuchcha* drains into *pucca* ones,

TABLE: KARNATAKA'S 24X7 ACHIEVEMENTS

Leakage losses stemmed, 26,045 houses connected, claim the authorities

Demonstration zones	Reached (no of house connections)	Real losses (litre/connection/day/metre pressure)
Belguam (south)	4,566	5.21
Belguam (north)	4,314	10.52
Hubli	7,834	5.45
Dharwad	5,945	4.84
Gulbarga	3,386	2.36
Total	26,045	

Source: KUWASIP 2011, 'World Bank-assisted Karnataka Urban Water Sector Improvement Project – experience on PPP for achieving 24x7 water supply and control of UFW', presentation to Union ministry of urban development, New Delhi, mimeo

Rs 50 crore on lining and covering of existing drains and Rs 50 crore for conserving natural water bodies.²²

Karnataka has, however, been investing in water reforms before the CDS came into the picture: in 2004, it had began a project which was extended till 2011. Four north Karnataka towns were chosen – Belgaum, Hubli-Dharwad and Gulbarga – as demonstration zones. The Rs 237-crore project, funded jointly by the World Bank and the state government, led to the establishment of the Karnataka State Urban Water Supply Council. The project aimed awarding performance-based management contracts to private companies – French water major Veolia Water won the contract – to repair the water system for 24x7 supply and to manage operations, including billing and collection, in the pilot zones.²³

By February 2011, some Rs 200 crore had been spent, 108 km of transmission mains and 238 km of distribution mains laid, and 26,045 metered houses connected. Continuous water supply was operationalised in all demonstration zones across the three cities. It was termed a success, as it claimed to have stemmed the leakage losses and did not increase water tariffs (see Table: *Karnataka's 24x7 achievements*).²⁴