kotak® Institutional Equities

GAME CHANGER

Deluge of Opportunity

In this issue

- Analyzing the US$30 bn annual opportunity
- Understanding pricing and regulation in the water sector
- Identifying social and corporate risks

Gamechangers

- Cost-plus pricing for water, energy
- Significant investment in water infrastructure
- Water conservation

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About Gamechanger

Gamechanger offers perspectives on ideas and developments that can potentially alter the course of the markets.

The series will explore and analyze ideas, challenge conventional wisdom, play advocate or devil's advocate depending on research conclusions. The factors that we identify as market gamechangers could come from anywhere – from policy or politics, from people or ideas, from rain or from regulation. They could change the game for the better or for worse.

Gamechanger research has implications on macro socio-economics and on long-term market behavior. Read it and stay ahead of the India story.

April 2010

An analysis of India's readiness for its forthcoming demographic dividend

Foreword

We borrow from Adam Smith who aptly used the term 'paradox of value' to describe the fact that water though life-giving is free while diamonds command a high price. More than 200 years later, the irony persists, save in small pockets of the globe where water is finally getting its due.

The debate between 'inalienable rights to natural resources' rages alongside free-market valuations of the commodity. Between these poles, we explore the space where appropriate pricing can make the 'right to water' a viable proposition.

Population growth has compelled the spread of 'organized utilities' model across the world. In India, urban areas have access to some measure of such utilities. More pertinently, millions of Indians have no access to potable water, with millions more having no access to any water within miles of their dwellings. Not surprisingly, the ad-hoc tapping of groundwater is depleting India's water table.

The cost of infrastructure needed to provide water for drinking, agriculture and industry is high. In some economies, a part of this cost is passed on by town authorities to end-users. But it is an emotive and politically sensitive subject that has found few takers among India's policy makers. We explore demand drivers and supply-side solutions that exist and that are needed.

But the heat is on. There is no escaping the fact that in India, water needs to be distributed effectively and consumed carefully if it is to keep scarcity at bay. This simple objective is hugely complex to execute. And this is where we see the opportunity for those with ideas, products and services that work to this end. Some have already seen success. We identify such gamechangers at the end of this report.

Contents

Water

DELUGE OF OPPORTUNITY

- US$30 bn per year up for grabs
- Private sector investment in water makes a start
- Industry and residential sectors drive growth

CHAPTER 1

Water: Deluge of Opportunity

We estimate the annual business potential of the water sector in India at US$30 bn. Investment opportunities will likely open up as the private sector becomes more involved in what was till now a 'public good'. Water supply to and disposal from residential and commercial segments are expected to grow significantly, even as massive government spending on irrigation continues. We highlight risks that corporate and social sectors face and identify gamechangers.

Demand and supply–both create opportunities

Water has, almost always in human history, been treated as an inalienable right. Its necessity for human survival and its abundance relative to demand has meant that, though always valued, water was never priced. The recycling nature of water led to an absence of individual ownership rights over water. With a growing population, which is urbanizing at a brisk pace, the mechanisms to store, clean and deliver water are increasingly becoming important and presenting business opportunities. We estimate that the total potential business in the water sector can amount to US$30 bn annually (see Exhibit 1).

The traditional world view of the water business, also actively promoted by aid agencies and multi-lateral funding agencies, revolves around storage and supply, which also helps policy-makers show tangible asset creation. However, this is capital intensive and over longer periods of time, needs either deficit-financing or user-charges.

Potential business in the water sector can amount to US$30 bn annually

Solutions for the water industry also lie on the demand side of the equation. We classify any water sub-segment where the final user of water pays as being on the demand side. Bottled water and purifiers now garner more revenue than water utilities across the country, beleaguered as they are by high leakages and low tariffs. India has taken halting steps towards 'privatizing water', but these attempts have not been very successful.

Exhibit 1 Significant business opportunities in water

Revenue opportunities in water (US$ mn), FY2012E

Segment	Sub-segment	US$ mn	Comments
Supply side			
Agriculture	Irrigation	17,486	Complete government control, planning commission estimates
Residential/Industrial	Water supply, sanitation	8,927	Complete government control, planning commission estimates
Residential	Desalination	299	Based on 2.5 bn l/d desalination capacity, 10 year completion
Residential/Industrial	Waste water disposal	403	Estimate assuming Rs2.8 mn per mld, 4 year completion
Sub-total		**27,114**	
Demand side			
Agriculture	Pumps	761	Private, fragmented industry
Agriculture	Irrigation equipments	370	Private, fragmented industry
Residential	Bottled water	696	Private, fragmented industry, MNCs, large Indian companies present
Residential	Purifiers	668	Private, fragmented industry
Residential/Industrial	City water distribution	646	Jamshedpur private; Nagpur, Khandwa, Latur, etc. have started pilots
Sub-total		**3,142**	
Total		**30,256**	

Source: Kotak Institutional Equities estimates

Global market context

The global water industry is estimated at US$463 bn in CY2007 (see Exhibit 2). We note that the spending by water utilities is the largest component of business amounting to US$325 bn and is expected to increase to US$500 bn by CY2016E. In India the agriculture sector and government spending on the same dominates currently. We expect the municipal market to emerge as a significantly larger market in the future.

Exhibit 2 Global water market dominated by utilities business

Water industry size, CY2007 (US$ bn)

Municipal water market	**325**
Municipal wastewater capex	100
Drinking water capex	90
Municipal wastewater opex	70
Municipal water opex	65
Industrial water market	**25**
Industrial chemicals and services	13
Industrial equipment	12
Packaged water	**91**
Household water appliances	**14**
Irrigation equipment	**8**
Total	**463**

Source: Global Water Markets 2008

We expect the municipal market to emerge as a significantly larger market in the future

Understanding the Indian situation

Globally, agriculture consumes the most amount of water (69%). Industry and residential segments split the rest of water consumption at 18% and 13%, respectively (see Exhibit 3). Industry's consumption of water is expected to grow disproportionately (3.2% p.a.) to overall demand growth (2.2% p.a.). See Appendix 1 for more information on water resources and their usage patterns.

Exhibit 3 Industry water consumption expected to grow the fastest across the world

Table showing current and projected water demand (billion cubic meters)

				Breakdown (%)	
Demand	**2010**	**2030E**	**CAGR (%)**	**2005**	**2030E**
Agriculture	3,100	4,500	1.9	69	65
Industry	800	1,500	3.2	18	22
Municipality	600	900	2.0	13	13
Total	**4,500**	**6,900**	**2.2**	**100**	**100**

Source: Water Resources Group

India's skew towards agriculture is more pronounced (see Exhibit 4) on account of low yield per drop of water and also free or (low) fixed cost electricity offered to farmers, promoting unchecked usage. With urbanization, demand from energy and industry will significantly outgrow agricultural and residential demand.

Exhibit 4 Agriculture will remain the biggest water consumer in India

Table showing current and projected water demand (billion cubic meters)

				Breakdown (%)	
	2010	**2025E**	**CAGR (%)**	**2010**	**2025E**
Agriculture	688	910	1.9	85	83
Industry	64	95	2.7	8	9
Energy	5	15	7.6	1	1
Residential	56	73	1.8	7	7
Total	**813**	**1,093**	**2.0**	**100**	**100**

Source: MOSPI, Kotak Institutional Equities estimates

There are conflicting reports on the current and projected water usage in India. Water Resources Group, a body formed by multinational companies (Coca Cola, Nestle and McKinsey, among others) has much higher consumption numbers for India–both at present and in the future (see Exhibit 5).

Exhibit 5 India can consume 1,500 bcm of water by 2030

Current and projected water demand (billion cubic meters)

				Breakdown (%)	
Demand	**2010**	**2030E**	**CAGR (%)**	**2010**	**2030E**
Agriculture	860	1,198	1.7	83	80
Industry	106	195	3.1	10	13
Municipality	65	105	2.4	6	7
Total	**1,031**	**1,498**	**1.9**	**100**	**100**

Source: Water Resources Group

In either case (whether one takes into account the government estimates or the private estimates), India has enough supply-side and demand management options to meet its water needs. India's water supply is plentiful (see Exhibits 6 and 7). The monsoons supply 4,000 bcm of rain to India every year. We note that it is sometimes fashionable to show declining water availability per capita in India since the population is growing while the average usable water has not and cannot change materially. We note that India's per capita availability works out to 1,600 cubic meters per person, which is just at the threshold of water scarcity. However, it is more pertinent to note that this average hides large inter-regional imbalances.

Exhibit 6 Brahmaputra and Ganga provide 60% of India's annual water availability

Water availability in India by river basin (annual flow, bcm)

Brahmaputra, Barak and others	586
Ganga	525
West flowing rivers from Tadri to Kanyakumari	114
Godavari	111
West flowing rivers from Tapi to Tadri	87
Krishna	78
Indus (up to the border)	73
Mahanadi	67
Narmada	46
Others	183
Total	**1,869**

Source: Ministry of Water Resources

Exhibit 7 Supply is plentiful

Sources of water (annual flow, bcm)

Annual precipitation (including snowfall)		4,000
Average annual availability		1,869
Estimated utilizable water resources, of which		1,123
- Surface water resources	690	
- Ground water resources	433	

Source: Ministry of Water Resources

EVERYONE LOVES BIG PROJECTS

- New inventory, delivery infrastructure and supply
- Inescapable costs: Users or government must pay
- Sanitation, recycling: New opportunities

CHAPTER 2

Supply: Everyone Loves Big Projects

Big ticket solutions on the supply side include the creation of more inventory and delivery infrastructure (dams, canals, etc.) and supply sources (desalination plants). We expect the government to continue its focus on supply. Such utilities face high capex and marginal costs of supply and can be feasible only with sensible user-paying policies, or with the government footing the bill. Segments like sanitation and waste-water treatment will open new opportunities.

Creating inventory infrastructure has been considered a win-win solution from the vantage point of policy makers

Storing for a non-rainy day

Given the increasing demand for water, the accepted solution has historically has been on the supply side. Creating inventory infrastructure has been considered a win-win solution from the point of policy makers. A large dam creates a reservoir for dry months, prevents flooding and possibly generates electricity as well. (Large-format solutions have been opposed on the basis of the human displacements that they cause). Despite the large investments in inventory infrastructure, India lags behind other countries in water storage capacity. High-cost solutions like desalination are increasingly finding a foothold in India.

We reiterate here that the supply-side opportunity amounts to US$27 bn annually (see Exhibit 8).

Exhibit 8 Government spending on irrigation is the biggest segment on supply side

Revenue opportunities in water (US$ mn, FY2012E)

Segment	Sub-segment	US$ mn	Companies
Supply side			
Agriculture	Irrigation	17,486	IVRCL, Patel Engineering, Nagarjuna
Residential/Industrial	Water supply, sanitation	8,927	Local companies with State government linkages
Residential	Desalination	299	IVRCL
Residential/Industrial	Waste water disposal	403	Thermax
Sub-total		**27,114**	
Demand side			
Sub-total		**3,142**	
Total		**30,256**	

Source: Kotak Institutional Equities estimates

The government's spending on irrigation in India is expected to be US$17.5 bn in FY2012E (see Exhibit 9). India has planned a major thrust in irrigation in its XIth Plan. Surface water i.e. water received from dams and canals is typically priced at a fixed rate per hectare. The flow of this water depends on timelines set by the water authorities. However, the timing or quantum of release may or may not be suitable for all crops and hence farmers end up tapping groundwater also in addition. We also note that dams are naturally decaying objects due to siltation.

Exhibit 9 Significant investments planned in water development

Projected investment in irrigation during XI plan, March fiscal year ends, 2008-2012E, (US$ mn 2006-07 prices)

Segments	2008	2009	2010	2011E	2012E	Total
Major and medium irrigation	3,712	5,077	6,947	9,509	12,573	37,817
Minor irrigation	856	1,083	1,372	1,737	2,203	7,251
Command area development	323	382	453	539	642	2,340
Flood control	273	310	351	398	454	1,786
Watershed development	814	956	1,135	1,352	1,614	5,872
Total	**5,978**	**7,808**	**10,258**	**13,536**	**17,486**	**55,066**
Funded by						
Centre	732	871	1,040	1,245	1,495	5,383
States	5,246	6,937	9,219	12,291	15,990	49,683
Total	**5,978**	**7,808**	**10,258**	**13,536**	**17,485**	**55,066**

Note: We note that irrigation projects with a Culturable Command Area (CCA) between 2,000 and 10,000 hectares are classified as medium projects and those with CCA of more than 10,000 hectares as major projects.

Source: Planning Commission

Despite such massive investment, India's per capita storage capacity is significantly lower than that of other countries (see Exhibit 10). Another way to look at this is to consider the quantum of water that can be stored as a proportion of average river runoff. In the Colorado River Basin and in Australia's Murray-Darling Basin, this figure is 900 days; in South Africa's Orange River Basin it is 350 days; but overall, India can store just 50 days of average runoff, with wide variations—from 220 days in the Krishna to just two days in the Brahmaputra/Barak Basin (as per the World Bank's report: 'India's water economy: Bracing for a turbulent future').

India's per capita storage capacity is significantly lower than that of other countries

Exhibit 10 India's storage capacity is relatively small

Water storage per capita in different countries (m3 per capita)

USA	6,000
Australia	5,000
China	2,500
Spain	1,500
Morocco	500
India	200
Pakistan	100

Source: India's Water Economy - Bracing for a Turbulent Future, World Bank

India's storage capacity of 218 bcm is concentrated in six States (see Exhibit 11, to put India's capacity in perspective, Aswan Dam in Egypt has a storage capacity of 111 bcm). Not surprisingly, the States which have the maximum capacities are the upstream States and are involved in bitter disputes with the downstream States about water-sharing.

Exhibit 11 Top six States account for two-thirds of India's storage capacity

State-wise number of large dams completed and live storage capacity in India, 2009

	Completed dams	(bcm)	(%)
Karnataka	229	34	15
Andhra Pradesh	283	27	12
Madhya Pradesh	899	27	12
Maharashtra	1,676	26	12
Orissa	157	17	8
Gujarat	598	16	7
Uttar Pradesh	115	15	7
Himachal Pradesh	13	14	6
Rajasthan	180	8	4
Others	561	35	16
Total	**4,711**	**219**	**100**

Source: Lok Sabha Starred Question No. 398, dated on 16.12.2009

Most of the contracts are awarded to regional players that have close associations with local governments

The same States are expected to dominate further investments (see Exhibit 12). Since most of the EPC contracts are given out by the States (given that they contribute 90% of the total investment), most of the contracts are awarded to regional players that have close associations with local governments. However, a few large national firms are emerging to capture the opportunity.

Exhibit 12 Same states will dominate further investment

Projected investment in irrigation during XI plan by States (US$ mn at 2006-07 prices)

Andhra Pradesh	7,457
Gujarat	6,348
Maharashtra	5,826
Karnataka	5,652
Uttar Pradesh	3,543
Madhya Pradesh	3,239
Others	17,618
Total	**49,683**

Source: Planning commission

A small beginning: Private sector enters the pool

US$31 bn is being invested in the XIth plan for water supply and sanitation. Similar to the investments in water development, a large proportion (in this case, two-thirds) will be invested by the States (see Exhibit 13). We note that the government has recognized the role of private investment in this segment–a meaningful instance of this being water supply and sanitation for Tirupur town, which is managed by a local body started by an association of local industries.

Exhibit 13 Significant investments planned in water supply and sanitation

Projected investment in water supply during XI plan, March fiscal year ends, 2008-2012E (US$ mn 2006-07 prices)

	2008	2009	2010	2011E	2012E	Total
Water supply						
Center	784	976	1,216	1,518	1,898	6,392
States	2,054	2,367	2,786	3,347	4,100	14,655
Private	112	141	178	225	286	943
Total	**2,951**	**3,484**	**4,180**	**5,090**	**6,284**	**21,990**
Sanitation						
Center	336	418	521	651	813	2,739
States	880	1,015	1,194	1,434	1,757	6,281
Private	28	35	45	56	72	236
Total	**1,245**	**1,468**	**1,760**	**2,141**	**2,642**	**9,256**

Source: Planning Commission

The government has several schemes with ambitious targets of ensuring water supply and sanitation for more people

The government has several schemes, including the Accelerated Rural Water Supply Programme (ARWSP) and Accelerated Urban Water Supply Programme, both of which have ambitious targets of ensuring water supply and sanitation for an increasing number of people. However, the deadlines for achieving its objectives are constantly being pushed forward. We note that the ARWSP has been in operation since FY1973.

Deep sea solutions

Similar to the development of large projects on the irrigation side, policy makers are focused on grand projects on the drinking water supply also. National Geographic reports that there are 14,450 desalination plants in operation all over the world, processing 60 bn liters of water daily. In India, Chennai is leading the way in building desalination capacity: the city is investing Rs5.5 bn for setting up a desalination plant with a capacity of providing the city with 100 mn liters of water every day.

We expect that over the next 10 years, India will reach desalination capacity of 2.5 bn liters per day. Assuming a similar per unit capex cost as in Chennai, we expect the annual market for desalination plants in India will be approximately US$300 mn per year.

Waste water management

India does not treat its waste water. According to estimates by India's Central Pollution Control Board, as much as 69% of India's water goes untreated (see Exhibit 14). The same report also states that 39% of the actual operating capacity does not meet the government's standards for the safe disposal of water.

39% of the actual operating capacity does not meet the government's standards for the safe disposal of water

Exhibit 14 70% of waste water in India is not treated

Amount of waste water treated/left untreated in India (mn liters per day, 2007)

	Population	Sewage	Treated	Untreated	% treated
Metro	> 1 million	15,644	8,040	7,604	**51**
Class I cities	100,000 to 1 million	19,914	3,513	16,401	**18**
Class II towns	50,000 to 100,000	2,696	234	2,462	**9**
Total		**38,254**	**11,787**	**26,467**	**31**

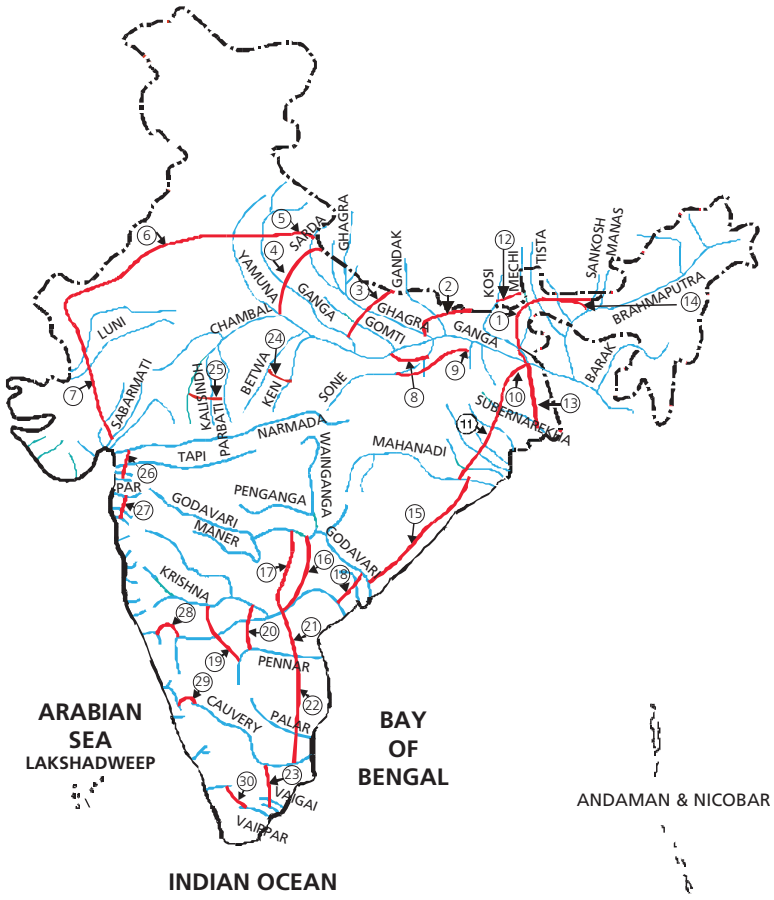
Source: Status Of Water Supply, Wastewater Generation And Treatment in Class-I Cities & Class-II Towns of India, Central Pollution Control Board, December 2009.

According to industry estimates, the capital cost required for setting up a sewage disposal plant is Rs2.8 mn for treating a flow of sewage of 1 mn liters per day. With more than 26 bn liters of water going untreated daily, the opportunity of creating the assets required to cleanse India's sewage could amount to US$1.6 bn; assuming a 4-year completion cycle, the annual opportunity could be in the range of US$400 mn.

Proposal to link rivers still fluid

This mega-project envisages 29 canals and links that would join all the major river basins in India

Figure 1: Proposed Inter Water Transfer Link



Himalayan Component

1. Brahmaputra–Ganga (MSTG)
2. Kosi-Ghagra
3. Gandak–Ganga
4. Ghagra–Yamuna
5. Sarda–Yamuna
6. Yamuna–Rajasthan
7. Rajasthan–Sabarmati
8. Chunar–Sone Barrage
9. Sone Dam–Southern Tributaries of Ganga
10. Ganga–Damodar–Subernarekha
11. Subernarekha–mahanadi
12. Kosi–Mechi
13. Farakka–Sunderbans
14. Brahmaputra (ALT)–Ganga(JTF)

Peninsular Component

16. Mahanadi (Mani Bhadra) Godavari (Dowlaiswram)
17. Godavari (Inchampalli Low Dam)–Krishna (Nagarjunsagar Tail Pond)
18. Godavari (Inchampalli)–Krishna (Nagarjunsagar)
19. Godavari (Polavaram)–Krishna (Vijaywada)
20. Krishna (Almatti)–Pennar
21. Krishna (Srisailam)–Pennar
22. Krishna (nagarjunasagar)–Pennar (somasila)
23. Pennar (Somasila)–Cauvery (Grand Anicut)
24. Cauvery (Kattalai)– Vaigaigundar
25. Ken–Betwa
26. Parbati–Kalisindh–Chambal
27. ParTapiNarmada
28. DamangangaPinjal
29. BedtiVarda

Source: National Water Development Agency

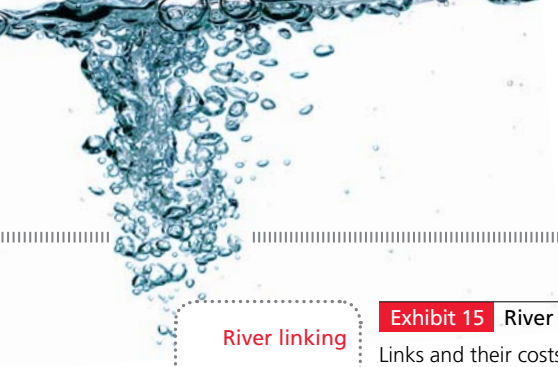
One mega proposal which has been floated over the last many decades but has seen limited on-ground traction is the National River Linking Project. This mega-project envisages 29 canals and links that would join all the major river basins in India – both Himalayan and Peninsular. The idea of this system of canals is to move water where it is needed the most as also to avoid the peculiar Indian problem of flooding in some parts of the country while drought overcomes other parts. However, this requires immense co-ordination across States and complex discussions on land acquisition from the affected parties. The proposal has also been vociferously opposed by environmental groups.

We note in Exhibit 15 on page 20 that the project could cost nearer to US$94 bn (at FY2004 prices). Such massive investment will itself create employment potential in the short run. We don't count this as an opportunity in our industry analysis since there is limited clarity on when and whether this project will kick off.

Direct gainers of the ILR programme will be agriculture dependent households, macro beneficiary will be the entire economy

ILR project to stimulate services, infrastructure and agriculture

The government's rationale for the river linkage project appears to be echoed in an NCAER report, "Link canals have both short and long-term impact on the economy. The short-term impact of the link canal is in the form of increased employment opportunities and the growth of the services sector. Sectors supplying crucial inputs to the construction sector, such as cement and iron and steel, also grow. In the medium to long term, the major impact of link canals is through increased and assured irrigation. Although the major and direct gainers of the ILR programme will be agriculture and agriculture dependent households, the entire economy will benefit because of increased agriculture production."



River linking can move water where it is needed most and avoid the peculiar Indian problem of flooding in some parts and drought in others

Exhibit 15 River linking project a ~US$100 bn project

Links and their costs (Rs bn at FY2004 prices)

S No.	Name of the link	Rs bn
1	Mahanadi-Godavari	142
2	Par-Tapi-Narmada	71
3	Parbati-Kalisindh-Chambal	37
4	Ken-Betwa	37
5	Damanganga-Pinjal	11
6	Godavari (Polavaram)-Krishna (Vijyawada)	91
7	Godavari (Inchampalli)-Krishna (Nagargunasagar)	234
8	Godavari (Inchampalli Low Dam)-Krishna (Nagargunasagar)	101
9	Krishna (Nagarjunasagar)-Pennar (Somasila)	83
10	Krishna (Srisailam)-Pennar	1
11	Krishna (Almatti)-Pennar	74
12	Pennar (Somasila)-Palar-Cauvery (Grand Anicut)	62
13	Cauvery (Kattalai)-Vaigai-Gundar	45
14	Pamba-Achankovil-Vaippar	30
15	Bedti-Varada	5
16	Netravati-Hemavati	3
	Cost of Peninsular Link	**1,028**
1	Jogighopa-Tista-Farakka	468
2	Ganga - Damodar - Subernarekha	198
3	Subernarekha - Mahanadi	704
4	Kosi - Mechi	163
5	Kosi-Ghagara	170
6	Chunar - Sone Barrage	47
7	Sone Dam - Southern Tributaries	76
8	Farakka – Sunderbans	6
9	Sarda – Yamuna	227
10	Yamuna – Rajasthan	111
11	Rajasthan – Sabarmati	112
12	Ghagra – Yamuna	765
13	Gandak – Ganga	270
	Cost of Himalayan Link	**3,318**
	Total cost of the river linking project	4,347
	Total cost of the river linking project (US$ bn)	**94**

Source: NCAER, "Economic Impact of Interlinking of Rivers Programme", 2008

Demand

AGRICULTURE, INDUSTRY AND HOME CONSUMPTION

- Agriculture: Growth potential for irrigation industry
- Personal use: Home use to drive demand
- Utilities: City-water distribution, waste water treatment

CHAPTER 3

Demand: Agriculture, Industry and Home Consumption

Agriculture, which uses the bulk of water in India (85%), will continue to provide growth opportunities to the irrigation industry, pump companies and irrigation equipment industry. Home-delivery of water (tanker services), bottled water and purifiers are expected to see increased demand. We expect tentative steps towards the creation of water utilities in areas of city-water distribution and especially waste water treatment.

Small, growing and privatized

The demand side of the equation, while smaller than the supply side, has more private companies (see Exhibit 16).

Exhibit 16 Private companies active on the demand side of the equation

Revenue opportunities in water (US$ mn, FY2012E)

Segment	Sub-segment	US$ mn	Companies
Supply side			
Sub-total		**27,114**	
Demand side			
Agriculture	Pumps	761	Shakti Pumps
Agriculture	Irrigation equipments	370	Jain Irrigation
Residential	Bottled water	696	Nestle, Tata Tea
Residential	Purifiers	668	Hindustan Unilever, Tata Chemicals, Ion Exchange
Residential/Industrial	City water distribution	646	Public water utilities
Sub-total		**3,142**	
Total		**30,256**	

Source: Kotak Institutional Equities estimates

With free (or low-fixed price) electricity connections and low cost pumps, India has been increasingly moving towards groundwater-based irrigation

A: Irrigation-led demand

Groundwater to the rescue. India's agriculture provides significant opportunity to the water business given that it is the largest user of its resources: Of the total 'demand-side' opportunity of US$3.1 bn, the agriculture sector alone accounts for US$1.1 bn (refer Exhibit 16). This opportunity is shared between pumps and irrigation equipment industry, which is expected to account for US$760 mn and US$370 mn of sales in FY2012E, respectively.

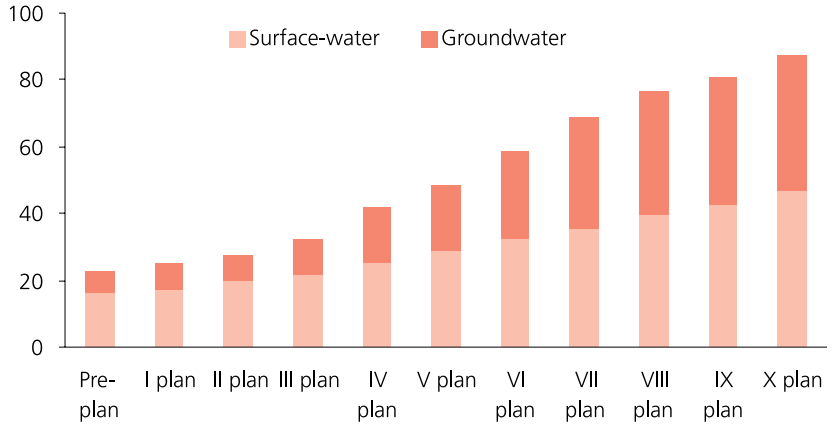
The requirement of water by the agriculture sector is met either by surface water (rivers, canals, dams, etc.) or by tapping into the ground water (wells, aquifers, etc) using pumps, with the emphasis shifting to the latter. With free (or low-fixed price) electricity connections and low cost pumps, India has been increasingly moving towards groundwater-based irrigation (see Exhibit 17).

Groundwater-based irrigation is theoretically more water efficient as the farmer can control its flow and timing. However, given uncertain timings for load-shedding by State electricity boards, a farmer ends up using diesel electricity generation sets (more polluting) or pumping out as much water as possible when the electricity does come on.

India now has an installed pump base of more than 25 mn units (see Exhibit 18), which, according to the World Bank in its report "Deep Wells and Prudence", pump out up to 230 bcm of ground water every year. The ground water does tend to get recharged due to the natural water cycle (except in case of closed aquifers–from which the water is effectively 'mined'), however, India's intensive use of ground water has been depleting its water table. The World Bank states that "of a total of 5,723 ground water blocks in the country, 1,615 are classified as semi-critical, critical or overexploited".

Exhibit 17 Ground water use has been rising faster than surface water

Plan-wise irrigation potential utilized through surface/ground water in India (mn ha)



Source: Census of India, Kotak Institutional Equities analysis

India now has an installed pump base of more than 25 mn units

India's pump industry is expected to be a US$761 mn industry in FY2012E. It is a fragmented industry with many small and large players in both the electrical and diesel segments. According to industry estimates, unit growth is pegged at 5-6% p.a., of which replacement demand for pumps is ~10%.

Exhibit 18 India has been increasingly pumping out more ground water

Number of wells in operation in India, March fiscal year-ends ('000)

	1983	1987	1994	2001
Dug well	5,385	6,707	7,355	9,617
Shallow bore well	460	1,945	3,945	8,356
Deep tube well	31	99	22	7,530
Total	**5,876**	**8,751**	**11,322**	**25,503**

Source: Central Groundwater Board

Drip irrigation used minimally. India uses far more water for agricultural purposes than its international counterparts for similar uses (see Exhibit 19). More efficient irrigation techniques are critical. Only 3.5 mn hectares of the 87.2 mn hectares irrigated area use micro and sprinkler irrigation techniques.

Exhibit 19 India uses more water across almost all major food items

Intensity of water usage across different food items ('000 litres/mt)

	India (liters/kg)	Global (liters/kg)	Difference (%)
Wheat	1,654	1,078	(35)
Rice	2,850	2,291	(20)
Sugarcane	159	175	10
Cotton	18,694	8,242	(56)
Milk	1,369	861	(37)
Eggs	7,531	3,340	(56)
Chicken	7,736	4,703	(39)

Source: Grail research

About 85% of micro and sprinkler irrigation is concentrated in the hard-rock States of Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh. Although the technical and economic viability of this irrigation method is established in as many as 80 crops, more than four-fifths of the current application is restricted to vegetable and horticultural crops, including mango and citrus. Notably, coconut, banana and grape together account for approximately half the area under drip irrigation. It is not surprising that most of the coverage is for large crops, but pertinently, the government and private bodies are researching drip irrigation opportunities for smaller and densely planted crops like rice and wheat.

Given the low coverage area and its geographical concentration, opportunities in micro and sprinkler irrigation abound. However, so long as the cost of water is low for farmers (either from surface or ground irrigation), the need to invest capital to save water will be limited. Based on industry estimates, we expect the irrigation equipment market to be US$370 mn in FY2012E.

B: Drinking water demand

Water for drinking is the Indian government's allocation priority; agri and other needs follow

Water comes home. The most basic need for water is for domestic consumption. India's National Water Policy 2002 prioritizes drinking water over other uses of water (see Exhibit 20). However, as with all policies Indian, there is a sub-clause which allows for a re-prioritization, if so required.

Exhibit 20 India prioritizes drinking water over every other use

Clause 5 of the India's National Water Policy, 2002

In the planning and operation of systems, water allocation priorities should be broadly as follows:
· Drinking water
· Irrigation
· Hydro-power
· Ecology
· Agro-industries and non-agricultural industries
· Navigation and other uses.
However, the priorities could be modified or added if warranted by the area/region specific considerations.

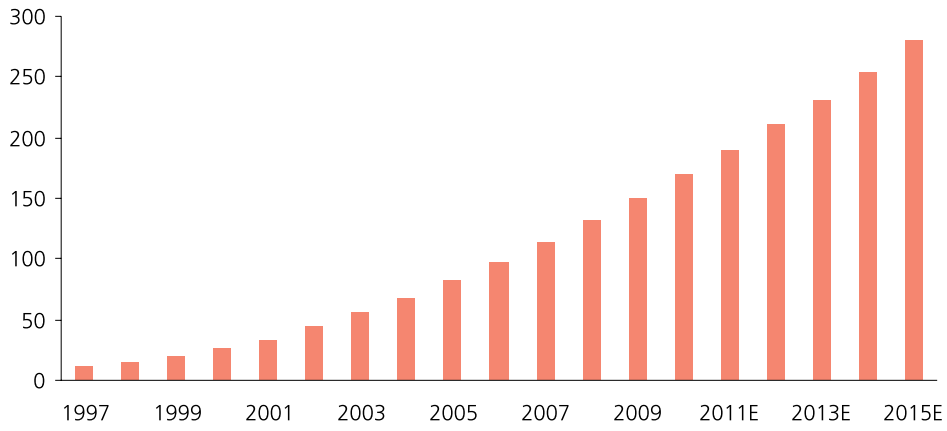
Source: National Water Policy 2002 document

The drinking water segment has been stealthily privatized. We look at three sources of drinking water: bottled water segment, the home water purifier segment and the urban water-supply utilities. Smaller industries like instrumentation (water metering), residential water recycling and purification would also possibly benefit from increasing urbanization.

Packaged water: Paying for purity. The packaged water industry has seen exponential growth in India (see Exhibit 21), with industry size expected to be Rs32 bn (US$696 mn) in FY2012E. The industry consists of private players who saw an opportunity in the frequent water cuts and the supposed contamination in the water delivered by water utilities. Water primarily sells in small pouches in India - 85% of the water being packaged in pouches or 1,000 ml bottles.

Exhibit 21 India has taken a liking to packaged water

Amount of water sold as packaged water, March fiscal year-ends, 1997-2015E (mn cases)



Source: Indiastat, Kotak Institutional Equities estimates

Water primarily sells in small pouches in India – 85% of the water being packaged in pouches or 1,000 ml bottles

An aspect of bottled water is the bulk water delivered to some residential societies by water tankers—typically bearing a load of up to 10 cubic meters of water. The tankers source their water from ground water or from municipal supplies and provide them to localities which are not connected to the urban water supply grid, or which get less than they need from allocated supplies. They charge upwards of Rs800 in Mumbai for 10 cubic meters, as against municipality charges of Rs50 for a similar volume.

C: Creating utilities

Urban water utilities. India prices its water low – but still fails to collect charges from its users. As we note in Exhibit 22, the all-India average (average of 20 cities in India) price of water is less than Rs5/ cu meter. However, 31.8% of it is unaccounted for water (UFW), i.e. it is not billed for. The water availability is limited to an all-India average of only 4.3 hours in a day.

Larger cities like Chennai, Mumbai and Bangalore are more 'profitable' than others, their operating ratio (the ratio of their costs to their revenues) being less than one. Jamshedpur, the only city whose water utility is in private hands, is also able to recover costs. Across India, however, water utilities are plagued by water theft and high operating ratios.

Some water utilities like Delhi have recently (December 2009) raised water charges by up to 50%, imposed fixed monthly service charges and added a 60% sewerage maintenance charge. Mumbai, which tried raising water charges in 2009, backed down, especially after it imposed water cuts in the city.
We believe that the all India municipal water market can at least be 1.5X the size of the 20 cities (see Exhibit 22), if all the cities are taken into account, implying a total billing possibility of US$646 mn.
Tentative steps to create water utilities get discussed in cities like Delhi and Mumbai, but so far there has been no tangible movement. If the creation of water utilities takes off, just like the creation of distribution companies in the case of electricity sector, it can open up investment opportunities.

Exhibit 22 Water utilities in India work at below operating costs – providing poor service

Various parameters for understanding the function of urban water utilities, FY2007

	Average tariff (Rs/m^3)	Unaccounted for Water (%)	Revenue (Rs mn)	O&M (Rs mn)	Operating ratio (X)	Availability (hours/day)
Ahmedabad	1.4	NA	223	318	1.4	2.0
Amritsar	9.3	57.0	172	234	1.4	11.0
Bangalore	20.6	45.0	4,255	3,414	0.8	4.5
Bhopal	0.6	NA	100	282	2.8	1.5
Chandigarh	5.0	39.0	404	548	1.4	12.0
Chennai	10.9	17.0	3,127	1,388	0.4	5.0
Coimbatore	3.7	41.0	135	111	0.8	3.0
Indore	2.8	NA	165	881	5.3	0.8
Jabalpur	1.5	14.0	62	104	1.7	4.0
Jamshedpur	4.5	13.0	532	328	0.6	6.0
Kolkata	1.1	35.0	260	1,228	4.7	8.3
Mathura	0.6	NA	9	28	3.1	2.0
Mumbai	4.6	13.0	8,789	4,284	0.5	4.0
Nagpur	6.6	52.0	561	424	0.8	5.0
Nashik	4.3	60.0	182	214	1.2	3.5
Rajkot	5.1	23.0	92	148	1.6	0.3
Surat	1.7	NA	NA	NA	NA	2.5
Varanasi	3.2	30.0	140	182	1.3	7.0
Vijayawada	2.2	24.0	91	104	1.1	3.0
Vizag	8.6	14.0	525	411	0.8	1.0
All India avg	**4.9**	**31.8**	**19,823**	**14,629**	**1.6**	**4.3**
US$ mn			**431**	**318**		

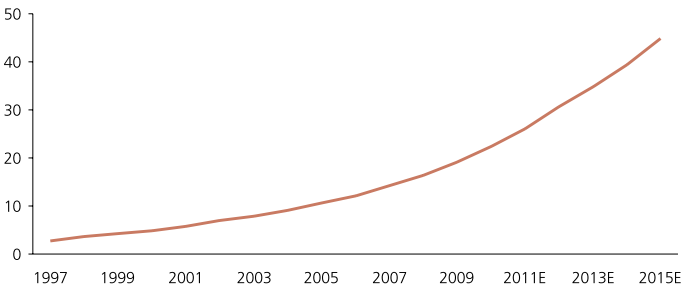
Source: Asian Development Bank

Depending on consumption, a 'capital' investment in a purifier can pay-off in less than a year as opposed to buying bottled water

Purification at a low price. Cleaning water received at home through public utilities has become big business. Industry estimates show that the segment will grow to Rs31 bn (US$668 mn) in FY2012E from Rs5 bn in FY2000 (see Exhibit 23). Purifiers come in various types, from reverse osmosis purifiers to filters. This segment is seeing increased competition and the entry of large companies launching purifiers at low prices. From the point of view of economics, depending on consumption a 'capital' investment in a purifier can pay-off in less than a year as opposed to buying bottled water.

Exhibit 23 Purifiers have grown consistently over the last decade at huge growth rates

Industry estimate of the size of the purifier market, March fiscal year-ends, 1997-2015E (Rs bn)



Source: Industry estimates

WHAT IS FREE IS NOT VALUED

- Paying for water has made a small beginning
- Privatization brings better services for a price
- Stable and enforced pricing mechanisms rationalize the use of water

CHAPTER 4

Pricing: What is Free is Not Valued

Water in India gets 'priced' according to political expediency or demand exploitation. Indians pay a small fraction of the price charged globally by water utilities. Privatizing water utilities, a contentious process globally and still a new idea in India, would possibly increase prices for customers. Stable and enforced pricing mechanisms help water users make rational and economically beneficial choices of their water use entitlement.

Price of water in India is low

The price of water varies widely in India according to use and user. The propensity to pay is higher for industry and residential areas, and agriculture is politically emotive enough to warrant subsidized water—not surprisingly, 'prices' in India tend to reflect this reality. We note in Exhibit 24 that there is no 'one' or 'correct' price of water—it depends on the ability of the customer to pay and of the supplier to extract value.

Exhibit 24 Value of water depends on where you source it from

Price of water according to its source

Water source	Rs/m^3	US$/$m^3$	Comments
Ground water	-	-	No running costs as electricity is free / low fixed rate
Municipal	5	0.1	Based on all India average of 20 cities
Tanker	80	1.7	Mumbai tanker rates (Rs 800 for a typical load of 10 m^3)
Bottled water	>12,000	>261.0	Bottle of 1 ltr costs minimum Rs 12

Source: Kotak Institutional Equities estimates

About 60% of Indians are engaged in agriculture, making any proposals involving end-user costs extremely sensitive. Given the large constituency that this represents, politicians find it difficult to support any measures that imply raising the prices of inputs to the agricultural process, whether water, electricity or fertilizer.

Water charges tend to stay unchanged for long periods of time

Exhibit 25 Flat rate of water charges for surface water provides no incentive to conserve

Rates for irrigation across States

		Rates for irrigation			
	Working expenses Rs/ha FY2000	Flow irrigation Rs/ha	Applicable since	Lift irrigation Rs/ha	Applicable since
Andhra Pradesh	1,556	148–1235	1996		
Bihar	375	74–370	2001		
Gujarat	4,768	70–2750	2001	23-1375	2001
Haryana	683	86–198	2000	43-99	2000
Jammu and Kashmir	319	19–49	2000	49-716	2000
Karnataka	2014	37–988	2000		
Kerala	442	37–99	1974	17-149	1974
Madhya Pradesh	516	123–741	1999	123-741	1999
Maharashtra	3,050	180–4763	2001	30-495	2001
Orissa	256	28–930	2002	129-4990	1997
Rajasthan	888	29–607	1999	74-1215	1999
Tamil Nadu	846	2–61	1962		
Uttar Pradesh	484	30–474	1995	15-237	1995
West Bengal	470	37–123	1977		

Source: Water Pricing as a Demand Management Option: Potentials, Problems and Prospects, Centre for Economic and Social Studies, Hyderabad

In many areas where electricity connections are either not present or are unreliable, or where supply is erratic or not relevant to user requirements (many States supply electricity to villages only at night when factories are closed), farmer ends up using diesel generators for electricity. Note that when a farmer uses a diesel generating unit, he is actually paying a price for water. We calculate that the cost of water can range from 5% to 15% of a farmer's realization (see Exhibit 26).

Exhibit 26 Paying for diesel to pump out water forms a substantial cost for a farmer

Calculating the fuel cost for a farmer growing wheat

	Punjab	Madhya Pradesh
Revenue		
Average yield per acre (kgs)	4,507	1,612
MSP for wheat (Rs per kg)	11.5	12.0
Realization per acre (Rs)	51,831	19,344
Fuel cost		
Cost of diesel (Rs per liter)	38	38
Diesel used (liters) to water an acre once	25	25
Number of waterings	3	3
Total cost (Rs)	2,850	2,850
Fuel cost as a percentage of realization (%)	5.5	14.7

Source: Ministry of Agriculture, discussions with farm-owners

When a farmer uses a diesel generating unit, he is actually paying a price for water

We note that pumping ground water is an expensive proposition. A typical bore-well could go to a depth of about 250-300 feet (if it finds water at all), with the drilling cost amounting to Rs100 per foot. PVC pipe casing in required so that the water can be pumped up without getting lost in the soft rocks nearer the surface. The cost of the pump itself and the associated pipelines to carry water to the crop also add up. As we note in Exhibit 27, setting up a bore-well can be in the range of Rs67,000-Rs90,000. Such a pump can service an area between 5 and 15 acres.

Exhibit 27 Setting up a tube well can cost up to Rs 90,000

Break-up of costs of setting up a tube well (Rs)

Cost items	Rs
Total drilling cost (Rs)	25,000 - 35,000
PVC pipes till the level of hard rock	7,000 - 10,000
Cost of 5 HP pump	20,000 - 25,000
Laying of pipes to carry water to the filed	15,000 - 20,000
Total	**67,000 - 90,000**

Source: Discussion with farm owners, Kotak Institutional Equities estimates

Global experience

Municipalities across the world price water significantly higher than the current price in India (see Exhibit 28). Also, the pricing of water by municipal bodies typically includes charges for cleaning the waste water that is generated after consumption, something not prevalent in India.

Exhibit 28 Indian water charges are one-hundredth of highest prices charged internationally

Charges US$per m3, FY2009

Country	Water	Waste-water	Combined	Domestic use (lpcd)
China	0.27	0.12	0.39	95
Denmark	**8.83**	**-**	**8.83**	**114**
France	3.58	0.66	4.24	232
Germany	3.12	1.75	4.87	151
India	**0.08**	**-**	**0.08**	**139**
Netherlands	1.26	-	1.26	NA
Russia	0.35	0.24	0.59	NA
South Korea	0.49	0.16	0.65	552
United Kingdom	2.03	2.20	4.23	139
United States	1.03	1.42	2.45	616

Source: Discussion with farm owners, Kotak Institutional Equities estimates

Is privatized water more expensive?

If we compare the water prices charged by municipalities with the extent of 'privatization', we note that many of the agencies where the prices are high are private (see Exhibit 29). Called water utilities, these agencies serve municipalities on the basis of annual maintenance contracts. We note that that the utilities earn reasonable EBITDA margins (see Exhibit 30).

Exhibit 29 European countries follow a wide mix of public and private delivery models

Table showing privatization of water-related services in Europe (% of population)

	Water services		Wastewater services	
	Private	Public	Private	Public
England	100	-	100	-
France	71	29	56	44
Spain	56	44	62	38
Germany	33	67	8	92
Poland	3	97	3	97
Netherlands	-	100	5	95

Source: SUEZ Environment annual report, 2009

Exhibit 30 Utilities earn a respectable EBITDA margin in Europe

Table showing revenue and profitability of large water firms (CY2009, EUR mn)

	Suez		Veolia	
	Water	Waste	Water	Waste
Revenue	3,993	5,319	12,556	9,056
EBITDA	866	798	1,837	1,194
EBITDA margin (%)	**22**	**15**	**15**	**13**

Source: Respective company's annual report, 2009

Privatizing water has been a contentious issue globally–and also in India. Attempts to privatize water in Latin American countries have ended with mass protests and a withdrawal of the private proposal. The rallying case for opponents of privatization is Cochabamba in Bolivia, where after violent protests by residents on (actual and feared) increased water-usage charges, the government had to back out of its agreement with a private company.

In India, Delhi and Mumbai have tried their hands at (partial area-based) privatization without success. Smaller cities, however, have taken a lead in experimenting with the privatization of water management and service delivery. Nagpur is running a demo-project (pilot phase) of a 24/7 water supply project with Veolia as the private party. The project is expected to be scaled up to a city level soon. Veolia is also working with the government of Karnataka in smaller cities like Gurburga and Hubli-Dharwad. Similarly, Khandwa in Madhya Pradesh has entrusted its water supply service to Vishwa Infrastructure and Services. Kolkata has awarded a consortium of JUSCO (which manages the water utility at Jamshedpur) and Voltas a water services contract for Sector V in Salt Lake (which is primarily a commercial area dominated by IT offices). As cities begin to get more comfortable with the idea of private sector handling its water needs, possibly the trend will pick up in right earnest across the country.

Smaller cities have taken the lead in experimenting with private water management

Grow rice or sell water?

World Bank's India's water economy

The city of Chennai suffers from chronic and severe water shortages. In the past it has meant that major industries (fertilizer and chemical factories) have closed for months because of water shortages. And it has meant, and means, that people in this city have learned to live with small amounts of water for a few hours a day. The standard coping strategy—sinking household tube wells—became ineffective as water tables dropped and as salt water from the sea intruded into the aquifer under the city. There were a number of different proposals for augmenting the meager supplies of water to the city (in addition to strenuous efforts to repair leaks, and more generally improve the quality of the utility—Metrowater—and its infrastructure).

In 1996, Metrowater and the World Bank did an assessment of the feasible alternatives for supplying additional bulk water to the city.

The major sources being considered by the city were the Veeranum Tank (which required the construction of a 250 kilometer pipeline) and desalination, both of which were very expensive, especially relative to the domestic tariff of Rs2/ cu m. But what was striking was that, while the city suffered from water shortages, there were large areas growing paddy just north of the city, using water from the AK aquifer. A detailed prior hydro-geological study indicated that the sustainable yield of the aquifer was very large, and back-of-the-envelope calculations showed that the water would cost the city just a small fraction of the cost of water from any other source.

'This is all well and good,' explained the Metrowater officials, but 'that water is used by farmers, who are a strong lobby and who will not permit us to take their water' (showing, incidentally that the ubiquitous Indian policy of 'priority for drinking water then agriculture' was impossible to implement in practice). 'But what if you bought the water from the farmers,' they were asked. 'No, our farmers are very wedded to growing paddy, they would not be interested in giving up their water ...' The seed of this idea was, nevertheless, planted, and in 2003, 70

Exhibit 31 Trading may be cheaper than high capex projects

Cost and quantity of raw water from different sources for Chennai

Source	Quantity (mld)	Cost (Rs/m^3)	Comments
Existing sources	91	1.5	
Recycled sewage from industry	23	55.0	To comply with anti-pollution requirements
Krishna supply	250	2.0	
Chembarambakkam tank	45	1.9	
AK aquifier	227	1.9	Farmers paid 'forbearance payments'
Palar aquifier	23	5.0	
Veeranum tank	45	13.0	Pipeline of 250 kms built for water supply
Desalination	100	50.0	Capex of Rs 5.5 bn
Total	**805**		

Source: World Bank

percent of the raw water for the city came from buying water from farmers in the AK aquifer! 'Did the farmers react unfavorably as you thought?' Metrowater was asked. 'The farmers are not happy,' was the reply. 'Why?' 'Because all the farmers want to sell their water, and we cannot buy from all of them!' was the reply.

There is both good news and bad news in this story. The good news is that the experience unequivocally showed that farmers were quite willing to accept 'forbearance payments' to desist from irrigated crops, when they got more money that way than from planting water-guzzling crops like paddy. And in this is one of the very rare cases where a ban on additional wells is actually enforced. However, there is a darker side to the story, too. Eight years ago, Metrowater had funding for a major study which would look both at the hydrogeology (how much water could the aquifer yield on a sustainable basis?) and at institutions (how to set up formal water entitlements which would add up to the sustainable yield and which could be leased or sold to the city?). As is standard for Indian water institutions, Metrowater showed little interest in the second, which has not yet been done. In fact, they did worse—they pumped far more from the wells than could be sustained over time, and did nothing to put in place arrangements to safeguard the aquifer *From: World Bank's India's water economy: Bracing for a turbulent future.*

The way forward

India needs to get its water pricing right. All developments on the demand side as well as conservation efforts will get a significant boost once the signaling mechanism of pricing is in place. Across the three segments of agriculture, industry and residential, the pricing of water will lead to the realization of the economic value of water, prompting more efficient use. We have already noted how wasteful India's agriculture is in its water usage–such wastage is replicated across the other segments too.

Enforcing the pricing and ensuring that the sums due are collected requires further political will. Indian urban water utilities suffer long delays in collecting their dues, with average accounts receivable across the country being five months: with Mumbai having a year-long receivable cycle. Pricing will differ across regions and segments; having a mechanism to determine the prices and enforcing them is critical.

Regulation

FREE MARKET WITH NO REGULATOR

- Confused and overlapping regulations across three government levels
- Private investment in water is allowed – both Indian and foreign
- Regulator who can create stable investment climate needed


TATA
indicom

CHAPTER 5

Free Market with No Regulator

In India, water is subject to the jurisdiction of the Centre, States and Local Bodies. These over-lapping purviews create uncertainties as to which agency is in charge of what. Private investment in water is not prohibited–both Indian and foreign investment is allowed. It is the lax user-cost-recovery culture that deters private sector participation. Given that States have the legislative power over the management of water, we believe more and more States will set up their own regulators, a trend that has already begun. We look forward to regulators playing a more pro-active role in water policy formulation and in creating viable investment climate.

Overlapping regulations across three government levels

According to the Indian constitution, water is the subject of legislation at three levels: the Centre, States and Local Bodies, with the primary responsibility resting with the States, while the Centre looks at inter-State water disputes only. We take a brief look at the provisions of the Constitution which provide legislative legitimacy to the three centers of power.

Powers accorded to the Centre

Water is the subject of legislation at three levels: Centre, States and Local Bodies

At the Centre, the operative provision is article 262 of the Constitution of India, which states that the Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-State river or river valley.

Also, entry 56 of List I (Union List) of Seventh Schedule provides that "regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest".

Powers accorded to the States

Entry 17 under List II (State List) of Seventh Schedule provides the States power to make laws on "water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I".

Powers accorded to Local Bodies

Under the seventy-fourth amendment to the Constitution, the States have been given the authority to devolve to the Municipalities, the powers to perform functions and the implementation of schemes of, among other things, "water supply for domestic, industrial and commercial purposes." (Entry 5 of Twelfth Schedule).

Since water bodies do not confine themselves to the political boundaries drawn up between States in India (some countries do follow such a demarcation system), given the over-lapping jurisdiction, it requires co-ordination and co-operation across States to explore and implement national level policies. Also, local water bodies may serve more than one local body and hence, rule making for the same requires significant involvement from all concerned stakeholders.

We note that unlike power, where the cost of production is high while cost of transportation is low, which makes it a national business, water, with its low cost of production and high cost of transportation, is a localized business. However, even though water is a local business, the rules and policies governing its upstream use impacts the downstream sector and hence rule-making coordination is called for.

Private investment in water is allowed – both Indian and foreign

There is no specific restriction on the entry of private players in the water sector. However, given that the user cost recovery mechanism is not operational across the country, the private sector has been hesitant in investing in the sector. For example, Latur in Maharashtra, which privatized its water supply, had to backtrack from its commitment to a private player on metering after facing public resistance—this, despite significant improvement in leakage reduction.

According to the Consolidated FDI policy announced by the Government of India, which is effective from April 2010, 100% FDI is allowed in the water sector as below:

Clause 5.22.1 states "100% FDI is allowed under the automatic route in Construction and maintenance of-roads, rail-beds, bridges, tunnels, pipelines, ropeways, runways, waterways & water reservoirs, hydroelectric projects, power plants and industrial plants".

Clause 5.22.3 states "100 % FDI is allowed under the automatic route in construction and maintenance of rural drinking water supply projects, package water treatment plants, rain and rain water harvesting structures, waste-water recycling and re-use techniques and facilities, rain-water re-charging and re-use techniques of ground water".

Regulators, as and when they emerge, will do so State-wise

Regulator can ensure equity of access

Currently, there is no national regulator in the water sector. The legislative power on water related issues rests primarily with the States and hence, regulators, as and when they emerge, will do so State-wise.

Maharashtra has taken the lead by passing the Maharashtra Water Resources Regulatory Authority Act 2005 and setting up a regulator. The regulator's job description primarily revolves around planning and allocation of State water resources and setting up a water tariff system.

Once the regulator model starts getting accepted across States, regulators can work towards ensuring equity of access, adherence to benchmarks of services from the public or private operators, protecting consumer rights, while creating viable tariff structures for the recovery of capital and operating and maintenance costs, and possibly yielding a profit, especially if the private sector is to be invited.

We note that State regulators can play the role of master-coordinators in their States, bringing about coordination with other States, so as to implement inter-State projects (like the river linking project) and also help resolve inter-State disputes.

Relevant excerpts from Maharashtra Water Resources Regulatory Authority Act, 2005

12. The Authority shall exercise the following powers and perform the following functions, namely:

(a) to determine the distribution of Entitlements for various Categories of Use and the equitable distribution of Entitlements of water within each Category of Use on such terms and conditions as may be prescribed;

(c) to determine the priority of equitable distribution of water available at the water resource project, sub-basin and river basin levels during periods of scarcity;

(d) to establish a water tariff system, and to fix the criteria for water charges at sub-basin, river basin and State level after ascertaining the views of the beneficiary public, based on the principle that the water charges shall reflect the full recovery of the cost of the irrigation management, administration, operation and maintenance of water resources project;

(e) to administer and manage interstate water resources apportionment on river systems, of the State;

(f) to review and clear water resources projects proposed at the sub-basin and river basin level to ensure that a proposal is in conformity with Integrated State Water Plan and also with regard o the economic, hydrologic and environmental viability and where relevant, on the State's obligations under Tribunals, Agreements, or Decrees involving interstate entitlements:

(h) to lay down the criteria for modification in Entitlements for the diversion, storage and use of the surface and subsurface waters of the State.

(i) to fix the criteria for trading of water Entitlements or Quotas on the annual or seasonal basis by a water Entitlement holder.

(m) in the event of water scarcity, the Authority, in compliance with its policy and rules for allocating such scarcity, shall adjust the quantities of water to be made available to all Entitlements and shall permit the temporary transfer of Water Entitlements between users and Categories of Users in accordance with the approval of the River Basin Agencies;

(o) to establish a system of enforcement, monitoring and measurement of the Entitlements for the use of water that will ensure that the actual use of water, both in quantity and type of use are in compliance with the Entitlements as issued by the Authority;

(q) to promote efficient use of water and to minimize the wastage of water and to fix reasonable use criteria for each Category of Use;

(r) to determine and ensure that cross-subsidies between Categories of Use, if any, being given by the Government are totally offset by stable funding from such cross-subsidies or Government payments to assure that the sustainable operation and maintenance of the water management and delivery systems within the State are not jeopardised in any way;

(s) to develop the State Water Entitlement data base that shall clearly record all Entitlements issued for the use of water within the State, any transfers of Entitlements and a record of deliveries and uses made as a result of those Entitlements;

(u) the Authority shall review and revise the water charges after every three years;

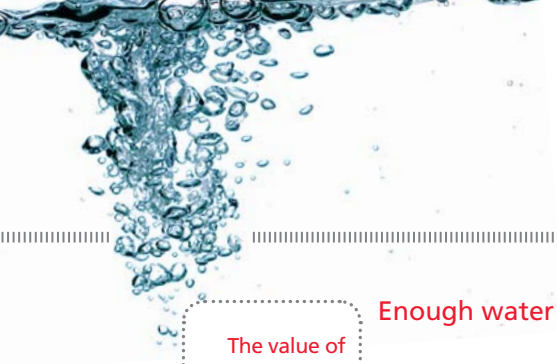
ALTERCATIONS OVER ALLOCATION

- The issue is not of physical scarcity but of space-time mismatch
- Allocation is a vexing issue – individual, State, country entitlements
- Industry risks: Disruption of operations, growth constraints

CHAPTER 6

Risk: Altercations Over Allocation

In India, the key issue is access rather than scarcity. For consumers, States and even countries, the value of water depends on location, geographically and in the socio-economic order. Geographic accidents of fate give one State an abundance of rivers and another endless arid plateau, triggering protracted battles over common resources like rivers and mountains located in neighboring States. Industry also is vulnerable to water allocation issues, facing risks of disruptions in operations and growth constraints.



The value of water depends on where one is and when

Enough water for all

Physically, there is no scarcity of water, even though, as we note in the Appendix, only 2.5% of the world's water is fresh water, which is fit for human use. Putting the numbers again in perspective, India's annual precipitation is 4,000 bcm and the consumption demand annually is less than 1,000 bcm currently. The issue is primarily the spatial and temporal skew—water is not available at a time and place where it is required. This scarcity makes water a coveted commodity that is worth paying for.

Note that the value of water depends on where one is and when. For an urban agglomeration, especially in summer, the value of water can be very high. The value of water increases exponentially as it begins to get scarce, the lower the quantity of water available the more critical the prioritizing of its use. Scarcity feeds the perception of value and increases the user's willingness to pay. Not surprising then, that while at the level of nations, the specter of water-scarcity leads to diplomatic wrangling. At the level of States and cities, it becomes the stuff of political squabbles, while at the last mile, it seems to be worth killing for!

In this section, we use press clippings to highlight the issue at various different levels:

Indore: Teen killed over water dispute

Headlines Today Bureau, Indore, March 31, 2010

A teenaged girl was stabbed to death following a dispute over fetching drinking water from a public source in Indore on Wednesday.

The incident occurred in the city's Pakshi Bagh area. According to police, the victim – 16-year -old Poonam – had a heated argument with Hukum Chand a couple of days ago.

On Wednesday, Hukum along with his friends attacked Poonam when she was standing outside her house. She was stabbed repeatedly leading to her death on the spot.

The assailants fled after the murder. Police were looking for the accused.

Sadar police station CSP S.S. Chauhan said, "There was a dispute between Hukum and Poonam over fetching water three days ago. Hukum stabbed Poonam over the issue. A case has been registered under Section 302 of IPC against him and the investigation is on."

Water crisis in Mumbai is blamed on the mafia, even as Mumbai tries to hike rates for its water supply

BMC bats for hike in water rates

Times News Network, Feb 19, 2010, 02.07am IST

In the backdrop of unprecedented water crisis and a desperate need to tap additional sources of revenue, the Brihanmumbai Municipal Corporation (BMC) is batting for an increase in water charges in an attempt to lift itself out of its current financial doldrums.

The civic body's hydraulics department has moved a proposal to increase water rates by 25-35% in the residential and slum category and by 20-38% for the industrial and commercial sectors. The last time water charges were hiked was six years ago.

If the BMC gets its way, housing societies and other residential complexes will have to pay Rs 4.50 per thousand litres of water as opposed to the current charge of Rs 3.50. Industrial establishments will see an increase of Rs 7 per 1,000 litres.

One of the main reasons for this proposal is the rising cost of water production, say civic officials. "With a staggering rise in our production cost, it is essential to revise the existing rates so as to enable us to maintain the extensive distribution system that supplies water to citizens," reads the draft letter. According to BMC estimates, cost of water production has increased by 50.58% since 2002 when the rates were last hiked.

The existing increase in the basic requirements for purification and transmission, and other factors such as labour cost, electricity power, liquid chlorine, liquid alum and other components, the cost of water production for the corporation works out to Rs 10.23 per 1,000 litres.

The revision has come after the BMC's finance department found the corporation was running short of funds. Six months ago, it issued a circular directing heads of departments to study the feasibility of raising the charges for services that have seen no increase in rates for the past few years.

This year, the BMC in its annual budget, has set aside a large chunk of money for water works project—an increase to Rs 2,721 crore from last year's 2,352 crore. "We believe that an increase in water rates will have a positive effect on the funding, planning and implementation of major projects of water supply," said an official.

The civic body's reasoning may not go down well with the general public, which has no option but to make do with limited water supply. The BMC currently supplies 2,950 million litres daily (mld), which falls short of the present demand by over 1,000 mld.

"If the rates are increased, we expect it will have a positive effect whereby people will impose restrictions on their consumption pattern," said the official.

The hydraulics department has moved a draft letter (DL) to the municipal secretary along with the revised rate chart. The DL will now be forwarded to the standing committee, and subsequently the civic house for final approval from political parties. "Political parties should keep in mind that it is no longer feasible to supply water at the existing rates, which are much lower than those of other cities," said a senior civic official.

Between States: Tamil Nadu and Karnataka have waged an epic battle over the Cauvery waters which quench the thirst for their respective States

Sub-par monsoon may reignite Cauvery water dispute

rediff.com, June 26, 2009

The biggest dispute that haunts both Karnataka and Tamil Nadu is the Cauvery Water dispute. Every year, the chief ministers of both states pray for nothing but a good Monsoon so that a dispute can be avoided and the farmer community is happy over all. However with an extremely uncertain monsoon and there appearing to be nothing more than a drizzle in Karnataka, there is expected to be heightened tension between the two states.

The water level at the Krishna Raj Sagar reservoir has hit a rock bottom and this prompted Karnataka Chief Minister, B S Yeddyurappa to issue a statement that the stipulated amount of water for the month of June will not be released to Tamil Nadu. Yeddyurappa said that the water levels in all the reservoirs have hit rock bottom and hence there is no chance of releasing water.

According to information available with the government, Karnataka has recorded 136 mm of rain till date and this is 5 per cent below the average rainfall which should have been received by the state in the monsoon season. The revenue minister, Karunakar Reddy says that the water levels in the reservoirs in Karnataka are extremely low.

In the month of June, Karnataka was supposed to release 10 TMC ft of water to Tamil Nadu according to final award of the Cauvery Waters Dispute Tribunal in New Delhi. However the water level at the KRS reservoir is 72 feet, which is only 8 feet above the dead storage level of 64 feet. In comparison to this year the water levels at the same reservoir was at 102 feet. Moreover the inflow into the reservoir has come down to just 386 cusecs this year in comparison to 4120 cusecs during last June.

Yeddyurappa says, "Forget irrigation, there is an acute shortage of drinking water in the state. The water levels are so low that water would not flow even if the crest gates are opened up. The only thing that can save us is the rains, he says. However as of now the situation is under control since Tamil Nadu has not yet approached Karnataka seeking their share of water for the month of June.

Now this is not a matter that could be decided by the two chief ministers of the respective states. Both the states are governed by the verdict of the Cauvery Waters Dispute Tribunal. Both the interim and final verdicts of the tribunals had stated that Karnataka had to release water on a monthly and at times on a weekly basis. The quota stipulated for the month of June was 10 TMC of water, which now Karnataka says is impossible to release at this point in time.

An advocate who has fought the case at the tribunal preferred to remain anonymous while giving this comment, "In case there is a distress then water will have to be shared on a pro rata basis, according to the verdict of the tribunal. As of now the Tribunal has stayed the matter since Karnataka decided to approach the Supreme Court challenging the verdict."

Karnataka at the moment is not doing much to push for an early hearing as it believes that it will not have to follow the verdict of the tribunal since the matter is stayed. Tamil Nadu on the other hand says that the tribunal's verdict will have to be implemented until the Supreme Court takes a final decision. Karnataka however on its part is watchful and could also push for an early hearing if the rains continue to play spoil sport and Tamil Nadu steps up the heat and demands an immediate release of water as per the order.

Between countries: Rhetoric on the Indus river treaty, signed between India and Pakistan has risen of late

India to call Pak bluff on water soon

6 Apr 2010, ET Bureau

NEW DELHI: India is likely to respond soon to Islamabad's slew of charges on water-related issues, in an attempt to prevent water from emerging as a flashpoint in Indo-Pak ties.

During foreign secretary-level talks in February, Pakistan had handed over a non-paper on water, listing a series of complaints and suggestions. India is now expected to respond to it. An initial study on Pakistan's non-paper has concluded that the issues raised by Pakistan are `frivolous.' It is also felt that the technical issues — which include timely sharing of data and information — could be easily resolved within the Indus Water Commission.

The Pakistan government had started highlighting water as a major concern ahead of the foreign secretary-level engagement and this was taken up by elements like Lashkar founder Hafiz Saeed in what is seen here as an attempt to whip up sentiments against India.

But India has found little basis for Pakistan's water arguments. The assessment on the non paper concluded that Pakistan's contention that India's usage of the western rivers — the Indus, Jhelum and Chenab — would adversely impact Pakistan's rights as a lower riparian state is "untenable and malicious propaganda."

In the non-paper, Pakistan had asserted that agriculture is being adversely affected by the shortage of water. But the study highlights Pakistani prime minister Yousaf Raza Gilani's interview to the Financial Times last month in which he said that Pakistan had a bumper crop of wheat. ``There is so much surplus that we have had to have new storage constructed for our strategic reserves. We have surplus rice, a bumper crop, people are getting good price for cotton," Mr. Gilani had said.

This was followed by Pakistan foreign minister Shah Mehmood Qureshi who asserted that Pakistan's water woes were a result of its own wastage and not because of India. ``It's not being stolen in India. It's being wasted in Pakistan," Mr. Qureshi had said giving water statistics. These two statements from Pakistan are seen as contradicting Pakistan's own position in the non paper.

It has further been noted that Pakistan has `wrong notions' on provisions of the Indus Water Treaty which clearly spells out the water sharing formula between the two countries. Under the Indus Water Treaty, Pakistan has water rights over three western rivers — the Indus, Jhelum and Chenab — while India has complete access to the eastern rivers — Sutlej Beas and Ravi. Article II of the treaty gives India certain rights over the western rivers including domestic use, navigation, limited agriculture use including irrigation over 1.34347 million acres and generation of hydropower.

Corporate sector: Food companies with significant water requirement face the ire of local residents

Kerala's panel moots realisation of Rs 216 crore from Coke

Times of India, Mar 22, 2010

THIRUVANANTHAPURAM: In a setback to soft drink major Coca Cola, an experts panel set up by Kerala government on Monday suggested legal steps to realise Rs 216.26 crore as compensation from it for the "multi-sectoral" loss caused by its plant at Plachimada in Palakkad district.

The 14-member committee, headed by additional chief secretary K Jayakumar, also recommended setting up of a tribunal to take the legal process forward since it would not be possible to the affected people to individually fight the legal battle.

The panel report, handed over to state water resources minister N K Premachandran, held that besides heavy withdrawal of ground water, the Hindustan Coca Cola Beverages Ltd plant had inflicted harm to the farming and environment in the area by dumping solid waste.

It quantified the damage suffered by various sectors due to the functioning of the plant from 1999 to 2004 as agricultural loss (Rs 84. 16 crore), pollution of water resources (Rs 62 crore), cost of providing water (Rs 20 crore), health damage (Rs 30 crore), wage loss and opportunity cost (Rs 20 crore).

Receiving the report, the minister said it would be placed before the state cabinet to take appropriate steps.

The LDF government had set up the high-level panel to assess the "socio-economic damage" allegedly caused by "exploitation" of ground water by the plant. The report incidentally came on a day which is being observed as 'World Water Day'.

Gamechangers

POLICY, PRICING AND PRIVATE INVESTMENT

- Better water pricing
- Reasonable energy pricing
- Construction of water infra
- Water conservation

CHAPTER 7

Gamechangers: Policy, Pricing and Private Investment

Both demand and supply side changes are required to avert a water crisis. Better water pricing, reasonable energy pricing, construction of dams, river linking and water conservation measures can all lead to making access to water easier. Privatizing water utilities, especially in sewage disposal (politically more feasible), can possibly lead to greater private investments in the sector and make services more accountable.

Pricing models emerge

Water in India is practically free. The argument that water is fundamental to life and hence cannot be bought and sold sounds hollow when food products are marketable and priced. There is an operating cost and depreciating capital cost of delivering water which needs to be recovered from users since we believe it to be unsustainable for the government to foot the bill in perpetuity. As we have seen with other sectors (oil, fertilizers, etc.), subsidies can balloon dramatically and the artificially administered prices fail to send signals to users to change their usage patterns.

GAME CHANGER

Water pricing will become a reality—whether through active policy intervention or through natural market forces. The rapidly growing bottled water and purifier segments represent a cost that the society is willing to pay for clean delivered water. Similarly, as we note in Exhibit 26, spending on diesel for pumping out groundwater is a cost that the farmer pays for water.

We expect practicable and acceptable water pricing mechanisms will emerge over time compelled by increasing demand in the face of crumbling infrastructure. We do not expect massive jumps in pricing in the residential and agriculture sector, however, if a gradual increase can be sustained, it can begin to pay for the upkeep and maintenance of the utilities. Stringent pollution control norms would mean that industries treat and re-use water.

Rational pricing of electricity

With a great deal of electricity being free or heavily subsidized, there is no limit to which it can be used to pump out ground water. Depleting ground water reduces the fall-back option in case monsoons fail or if surface water proves insufficient. In areas where the ground water is 'mined' (i.e. pumping out water from an aquifer that is not recharged), it leads to a permanent loss of a natural resource.

It is estimated that on an all-India basis, 22% of the electricity consumed is used in the agriculture sector, with the proportion rising to greater than 30% in many States. We note that the quantum of electricity required has been increasing as a result of an increase in the number of pumps and also due to the increasing depths to which they need to be dug so as to reach the groundwater.

GAME CHANGER

Rational pricing of electricity would make supplying electricity to the farmers commercially feasible for the electric utilities. Paying more for using more would make farmers cautious about over-drawing power–and hence, and lead to more sensible use of ground water. It is however, important to note that the levels of tariff at which demand becomes elastic to pricing may currently be too high to be viable from a political and socioeconomic point of view. Hence, it is important that small steps are taken such that, incrementally, a reasonable tariff is arrived at over a period of time.

More dams – with a more humane approach

Big dams are a highly contentious issue in India. Movements like the Narmada Bachao Aandolan have created wide-spread awareness about the human rights issues like displacement that come with the territory for large projects. However, as we have noted, India lacks significant water storage capacity. A dam helps not only in creating a reservoir for surface water but also helps recharge ground water. It can also help generate hydro-electricity.

If the government can get its act together in working out a resettlement model for the displaced that is fair to all, it could possibly renew its focus on Big Dams. The creation of dams can also lead to increased investment, leading to employment creation and a multiplier effect in industries related to construction (steel, cement, power generation, etc.) On the agricultural side, it will lead to a higher irrigation area–due to wider and longer availability of surface water and recharged ground water.

Linking the rivers

The idea of linking rivers is neither new nor unique to India. China's diverts water from its water surplus south east to the deficient north east regions. Similarly, the Colorado River Canal System is seen by many as the lifeline to southwest US. Cutting through 1,450 miles of mountains and deserts, the Colorado River supplies water to over 25 mn people and helps irrigate 3.5 mn acres of farmland. More water is exported from the Colorado River's 250,000 square-mile basin than from any other river basin in the world.

Linking rivers will require deft political maneuvering as it will involve complex issues of land acquisition, resettlement, water-sharing and equity and spending allocation, among a host of other issues. However, just like the building of dams, this project can have a massive multiplier effect across the economy. Indirect spin-offs include insulation against 'unforeseen' problems like floods and drought.

Conservation and efficient usage

Creation of supply and moderation of demand via 'right pricing' can help reduce stress created by the scepter of water scarcity. A significant solution lies in lowering the water requirement of the economy, thereby reducing the burden of creating more supply and keeping the price of water low. Water conservation needs to be implemented across agriculture, industry and residential use.

GAME CHANGER

Creating a culture of water conservation can lead to moderating demand. Similarly, changing the structure of the needs in the economy can also impact demand. For example, while policy makers may not be able to influence the dietary patterns of the economy as it gets richer, they can help indicate their choice of the source of power generation or irrigation by providing suitable incentives or policy directions.

Appendix 1

UNDERSTANDING WATER

Understanding Water

Concentrated water

Three-fourths of the earth is submerged in water, but only 2.5% of this is useful for human use. Even of the 2.5% fresh water, only one-third is readily accessible–the rest being locked in as ice and snow (see Exhibit 32).

Exhibit 32 **Groundwater forms a miniscule percentage of overall water on earth**

Table showing the distribution of water

Salt water		97.5
Fresh water		2.5
of which:		
Glaciers	68.7	
Groundwater	30.1	
Permafrost	0.8	
Surface / atmospheric water	0.4	
Total	**100.0**	**100.0**

Source: UN

Fresh water, like almost all natural resources, is not necessarily concentrated in the places where it is needed most (see Exhibit 33).

Exhibit 33 **55% of water supports 85% of humanity**

Global population and fresh water distribution (%)

	Population	Fresh water
Asia	60	36
Africa	13	11
Europe	12	8
North America	8	15
South America	6	25
Australia	1	5
Total	**100**	**100**

Source: UN

Units of water

Understanding the units is critical as water is measured in different units depending on the magnitude. We work here mostly with the metric units (see Exhibit 34).

Exhibit 34 Dealing with various terminologies can be confusing

Conversion table for typical water related terms

Converting from	Converted	Units
1 cubic km	1.0	billion cubic meters
1 cubic km	1.0	trillion liters
1 cubic km	10^9	cubic meters
1 cubic meter	10^3	liters
1 million liters per day	365,000	cubic meters per year
1 gallon	3.9	liters

Source: Kotak Institutional Equities

Virtual water

It is intuitively difficult to understand the amounts of water embedded in our day-to-day usage of certain products, ranging from food to energy. We note that only a very miniscule proportion of water is consumed directly—not only is residential demand a small portion of total demand, of that, only 4% of water is used directly for drinking (see Exhibit 35).

Exhibit 35 Most of the residential demand for water is for cleaning

Usage pattern of water in a typical Indian urban household (%)

Activity	%
Bathing	28
Toilet	20
Washing clothes	19
Washing utensils	16
House cleaning	7
Drinking	4
Cooking	3
Others	3
Total	**100**

Source: Grail research based on data for Ahmedabad, Delhi, Hyderabad, Kanpur, Kolkata, Madurai, and Mumbai

Significant water demand for agriculture and industry is derived demand based on the final goods desired by the consumers–hence, it is possible to calculate at retail levels the amount of water embedded in the final good or service used by the consumer.

For example, electricity that is delivered to us consumes water based on how it is produced (see Exhibit 36). We note that the Chinese water scarcity is caused by significant water withdrawal by their power generation sector. Similarly, larger amounts of water are needed to produce non-vegetarian food as opposed to vegetarian food (see Exhibit 37).

Exhibit 36 Water consumption varies with source of power

Water embedded in energy (liters/kwh)

Power source	liters/kwh
Wind	-
Uranium	0.3
Natural gas	0.4
Coal	0.6
Solar	1.0
Oil	3.8
Hydropower	79.2
Biomass energy	252.0

Source: Water Footprint Network

Exhibit 37 Non vegetarian food has more embedded water

Water embedded in food (liters/kg)

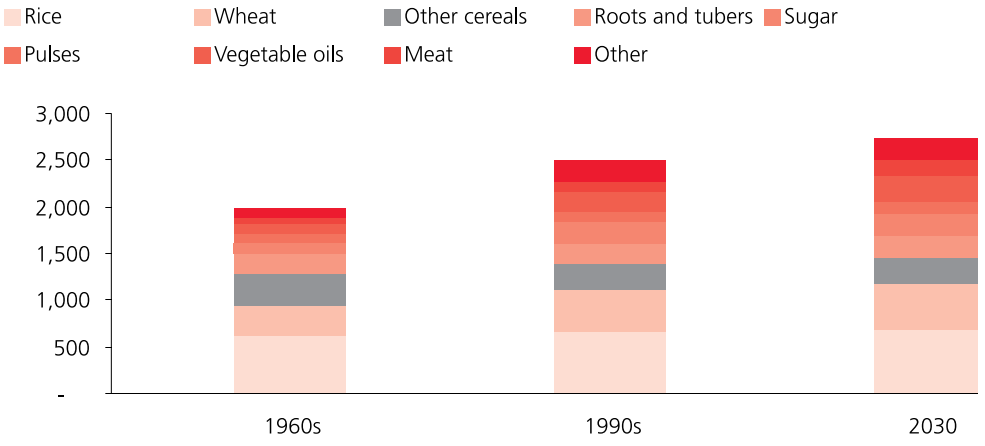
Food	liters/kg
Vegetarian	
Rice	2,291
Wheat	1,078
Potato	970
Corn	881
Milk	861
Coffee	861
Tea	125
Non-vegetarian	
Beef	14,677
Pork	4,703
Chicken	3,821
Goat	1,034

Source: Water Footprint Network

As the country grows richer, it is expected that more of the calories consumed by its people, will come from non-vegetarian food (see Exhibit 38). Given the changing profile of the consumption basket, the demand for water will rise further.

Exhibit 38 Meat and oils dominate in the increasing calories intake

Dietary energy supply of a typical developing world person (kcal/person per day)



Source: The United Nations World Water Development Report 2

As India grows and modernizes, its requirement for water will increase because of a variety of issues– including the changing dietary habits of its people and increasing power consumption.

Appendix 2

DEALS IN THE WATER SPACE

Deals in the Water Space

Private equity deals

There has been significant traction in the private equity (PE) space for unlisted water related companies. We highlight some of the major investments made by the PE funds in India.

Water Management Firm Doshion Gets $9 Million From IDFC PE

February 11, 2007, VC Circle

Ahmedabad-based water management company Doshion Ltd has announced Rs 35-crore funding from IDFC Private Equity Fund II, a fund managed by IDFC Private Equity. Doshion provides water management solutions to industries in the oil and gas, processing, electronic, pharmaceutical and power sectors.

It said the capital will be used to expand and also for acquiring niche companies in the areas of design and fabrication of water treatment plants and for bidding for upcoming BOT and BOOT projects in the water segment.

Doshion was founded by Dhirajlal Doshi (its chairman) in 1978. The company started out as a small company manufacturing ion exchange resins. Now it claims to have a pan-India presence and is also said to have executed projects in water purification, waste water and effluent treatment in India and overseas. Its Indian clients include BHEL, L&T, Hindustan Zinc, Dalmia Sugars, HPCL, BARC and Maruti. The company also has presence Thailand and Indonesia. According to Doshion's Managing Director Ashit Doshi, the company is looking at focusing on urban and rural water supply and treatment, as well as waste water treatment, which is slowly opening up for private participation.

This is the first investment in this sector by IDFC Private Equity. However, the Mumbai private equity fund has been upping its cleantech investments lately. It recently led a $100 million deal in Moser Baer Photo Voltaic in which IDFC PE's contribution was $40 million. The fund also has $22 million investment in Gujarat Petronet LNG and $60 million startup capital in Krishna Godavari Gas Network Ltd, a company building the natural gas pipeline network in Andhra Pradesh.

The others like Intel Capital and Siemens Venture Capital, among others, are looking at water treatment and water management space closely. In 2005, ICICI Venture had done a management buyout of Chennai-based water and waste water treatment company VA Tech (led by CEO Rajiv Mittal). Recently, now called VA Tech Wabag, the company acquired its erstwhile Austrian parent for $100 million.

Part-Exit Event For 4 PE Investors In VA Tech Wabag IPO

March 22 2010, VC Circle

ICICI Ventures-backed VA Tech Wabag is looking to raise Rs 125 crore in this public offer.

A host of private equity investors in ICICI Ventures-backed VA Tech Wabag are looking to make partial exit during the proposed initial public offer of the engineering services company that focuses on water and waste water treatment. One of the rare management buyouts in India, ICICI Ventures had backed the buyout of the company from its Austrian parent VA Tech WABAG GmbH in August 2006.

ICICI Ventures funds have already made partial exit from the company in the past and now join others such as GLG Emerging Markets Fund, Sattva India Opportunities Co and Passport India Investments to sell more shares of the company.

VA Tech Wabag is looking to raise Rs 125 crore through fresh issue of shares which would be separate from the offer for sale by the existing investors.

Although pricing of the issue is still under wraps, if the price paid by GLG to buy a stake in the company three years ago is any indication, it could be in the region of Rs 1,000 or even more. GLG had invested Rs 88 crore or about $20 million in February 2007 which translates into 9.55% stake currently. Adjusting for stock split and bonus shares last year, its average cost of ownership is pegged at around Rs 988 a piece.

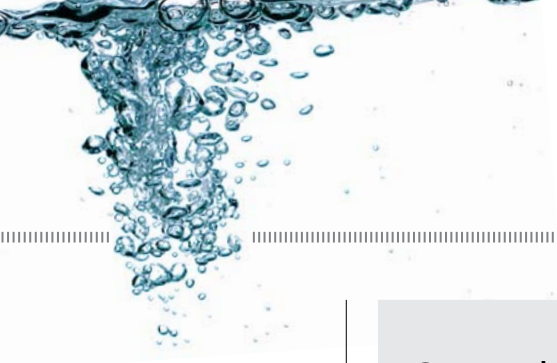
Since GLG is one of the sellers in the issue and assuming it would not like to exit at a loss, the issue price is expected to be over Rs 1,000. The company could be looking at dilution of the equity base by around 10-15%. The total issue to the public would then work out to around 35% of the post issue capital.

This would mean a multi-bagger for ICICI Venture. It is estimated the private equity firm along with the management paid out somewhere in the region of around Rs 50-60 crore to acquire majority equity holding in the company. A pricing of over Rs 1,000 a share would mean the company will be valued anywhere between Rs 1,000-1,500 crore(~$220-330 million).

The company has four promoters led by British national Rajiv Mittal who owns 21.6% pre IPO followed by Amit Sengupta (5.6%), Shiv Narayan Saraf (5.11%) and S Varadarajan (5.11%). They will also be big gainers in the IPO. The cost of acquisition of shares for these four executives is pegged between Rs 3-7/share.

VA Tech had revenues of Rs 469 crore for the six months ended September'09 with net profit of Rs 3.45 crore on a consolidated basis. For the year ended March'09 it had consolidated revenues of Rs 1,133 crore with net profit of Rs 41 crore. VA Tech has presence in drinking water, municipal wastewater, industrial water, industrial wastewater and desalination and is said to be evaluating both organic and inorganic growth opportunities.

Some of its competitors includes Veolia Water India, Degremont India, Hindustan Dorr Oliver and L&T in the municipal sector and companies like Thermax, Ion Exchange, EIL, Hindustan Construction, Nagarjuna Constructions, Gammon India and Driplex in the industrial sector.



Concord Enviro Systems To Raise $10M From Sage Capital

December 23 2009, VC Circle

The environmental engineering solutions firm operates in the area of waste water treatment systems.

Concord Enviro Systems Pvt Ltd, an environmental engineering solutions firm, has raised funding in the region of $10 million from Sage Capital Funds Management Pvt. Ltd, a source familiar with the transaction told VCCircle. This is a maiden deal by Sage NPE Fund I, managed by Sage Capital.

Concord is engaged in development, manufacturing and installation of waste water treatment and reuse systems. o3 Capital was the Sole Advisor to Concord Enviro for this transaction.

Concord is a 15-year-old company that has installed around 350 waste water treatment and recycle plants in India, Vietnam, Jordan, Philippines, Italy, Mexico, Australia, New Zealand and Sri Lanka based on its patented membrane based separation technology. Its key customers are defence forces like Army, Navy, Coast Guards and corporate clients include Biocon, Cipla, Jubilant Organosys, Lupin, ONGC, Raymonds and United Breweries.

Sage Capital, which invests $5-15 million across each deal, has been formed by former Ambit Capital partner and CEO Manish Kanchan. The firm has made some proprietary investments before in areas like logistics, infrastructure, real estate and jewellery.

Waste water management sector is catching attention of private equity players as rising urbanisation increases demand for such services. The water and wastewater treatment equipment market in India is valued at Rs 5,400 crore expected to grow at a compounded annual growth rate (CAGR) of 13% annually over the next 5 years.

Some investment in this area includes ICICI Venture's investment in VA Tech Wabag and IDFC Private Equity's investment in Ahmedabad-based water management company Doshion Ltd.

Notes

Notes

"I, Akhilesh Tilotia, hereby certify that all of the views expressed in this report accurately reflect my personal views about the subject company or companies and its or their securities. I also certify that no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report."

Ratings and Other Definitions/Identifiers

Definitions of ratings

BUY. We expect this stock to outperform the BSE Sensex by 10% over the next 12 months.
ADD. We expect this stock to outperform the BSE Sensex by 0-10% over the next 12 months.
REDUCE. We expect this stock to underperform the BSE Sensex by 0-10% over the next 12 months.
SELL. We expect this stock to underperform the BSE Sensex by more than 10% over the next 12 months.

Other definitions

Coverage view. The coverage view represents each analyst's overall fundamental outlook on the Sector. The coverage view will consist of one of the following designations: Attractive, Neutral, Cautious.

Other ratings/identifiers

NR = Not Rated. The investment rating and target price, if any, have been suspended temporarily. Such suspension is in compliance with applicable regulation(s) and/or Kotak Securities policies in circumstances when Kotak Securities or its affiliates is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances.

CS = Coverage Suspended. Kotak Securities has suspended coverage of this company.

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NA = Not Available or Not Applicable. The information is not available for display or is not applicable.

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