

India's Water Future: Secure or Scarce?

DR. SUDHIRENDAR SHARMA

The Ecological Foundation
New Delhi, India
sudhirendar@vsnl.net

Prediction is very difficult, especially if it's about the future
– Niels Bohr

Bohr's insight doesn't seem to ring true with the assessment of India's water future. With little depression in population growth and with mismanagement of water, our per capita water availability is bound to dip below the critical level of 1000 cubic metres. This does not, however, take into account the extraneous factors – over which there is little human control – like global warming and climate change that have already begun to melt glaciers and disrupt the monsoon cycle.

At present, the country's water planning remains loyal to engineering solutions that not only burden the economy, but also exacerbate the unfulfilled promise of improving access and delivery to a growing number of water have-nots. Despite the focus on drinking water in successive five-year plans, over 20 percent of India's population does not have access to safe drinking water. In absolute terms, this number is a staggering 200 million.

Statistical puzzle

India's water sector resembles a jigsaw puzzle due to the inconsistency of water source and supply data. The Department of Drinking Water Supply (DDWS) claims that 94 percent of all rural villages have been covered with water supply by early 2004. With only six percent of the population left to be covered, the department may soon

need to be closed down or its priorities shifted to other pressing demands of the rural sector.

Due to its submission, DDWS exposes the hollowness of its lofty claim. If only a miniscule population of six percent remains to be covered, why has DDWS sought Rs. 404 billion for rural drinking water coverage in the Tenth Plan (2002-07) opposed to an expenditure of Rs. 167 billion in the previous Plan period? It seems apparent from this budget request that the claimed drinking water coverage is inaccurate.

Similar variations for coverage and projected demand can be seen for the urban water sector as well. While the urban population is projected to increase, the financial allocation for urban water supply for the Tenth Five Year Plan has been pegged around Rs. 282 billion. Though it is also claimed that 95 percent of urban population too has been covered, coverage realities are, again, inaccurate.

Despite the critical shortfall in coverage and a rising demand, the government finds it difficult to fund, monitor and manage both rural and urban water infrastructure owing to a decline of public finance stability. Under such conditions, the issue of quality and equity in distribution remains grossly unattended, both in rural as well as urban areas.

Population dynamics

If current demographic trends continue, the cross-country drinking water sector is in for a serious crisis. Though projections vary, the country's population by 2050 will fall between 1345 million and 1581 million. This prediction provides clues for the planning and implementation of water policies and interventions that will provide sufficient water for India's citizenry in the decades to come. But the planners seem oblivious to these trends.

Population Growth Scenario

Source	2000	2010	2020	2050
Natarajan (1993)	1020.50	1183.10	1301.00	
United Nations (1995)				
[a] Low Variant	1013.50	1156.60	1249.70	1345.90
[b] Middle Variant	1022.00	1189.00	1327.10	1640.00
[c] High Variant	1030.50	1221.70	1406.10	1980.00

Visaria and Visaria (1996)	995.00	1146.00		1581.00
United Nations (2002)				
[a] Low Variant	1016.94	1145.90	1236.09	1241.56
[b] Middle Variant	1016.94	1173.81	1312.21	1531.44
[c] High Variant	1016.94	1201.71	1388.48	1870.06

Adapted from Table 3.12, NCIWRD Report; <http://esa.un.org/unpp/>

The fact that the majority of the population growth will be accounted for by urban areas may add to the existing water crisis in the cities. By the year 2050, India's urban population is projected to oscillate between 48 to 61 percent. Even if the middle variant of 55 percent is taken into consideration, 800 million out of the projected total population of 1450 million will reside in urban dwellings—adding an unprecedented 500 million to the present urban population of 309 million.

Though the noted demographer Professor Amitabh Kundu argues that the urban growth rate will slow down in the years ahead as infrastructure improves in rural areas, trends predict the contrary. Urban centers are fast becoming islands of economic prosperity and employment opportunity; therefore, there has been an exodus of Indian's from rural to urban areas. Unless there is dramatic shift in the government's pro-poor policies, urban growth will create dramatic congestion and demands upon the cities' service industries.

The shift in population, from rural to urban, brings yet another dimension to the crisis. While the rural water demand is assessed on an allocation of 40 lpcd, the corresponding urban demand is against a norm of 135 lpcd. So, a population shift means an additional demand on rapidly decreasing urban water resources. Interestingly, however, a city dweller presently receives an average of 200 litres of water a day, despite significant inter and intra-city inequities in water access and distribution.

Even if the accepted level of allocation (135 lpcd) were sustained in the year 2050, each of the metros will have to search for fresh sources of water to meet the growing demand. Already, cities like Delhi, Bangalore and Chennai ferry water from as far as 200 km away. Should this trend continue, rural areas would be robbed of their water, creating a deep rural-urban divide.

For example, the ongoing conflict between Uttar Pradesh and Delhi on sharing Ganga waters and the recent struggle over sharing the waters of the Bisalpur dam between villages and the city of Jaipur, are both indicative of an unstable water future. Far from

resolving such conflicts, governments have been evading the issues by politicizing them. Can legal measures and policy frameworks rationalize consumptive use? Can governments protect water rights by ensuring equity in access and distribution?

Lacking long-term strategies as well as public finances, state governments are responding to such conflicts by exercising greater control over surface resources and groundwater reserves to serve the interests of particular sections of the society. Additionally, the fact that water sector planning is restricted to the five year plan periods further complicates the issue.

Dwindling reserves

Groundwater has been the backbone of Indian economy and consequently a critical factor in country's water future. If groundwater depression in several parts of the country is indicative of future extraction patterns, the country should be close to exhausting its groundwater reserves. While the government estimates that total groundwater use will be around 230 billion cubic meter (BCM) in 2010, some current estimates of groundwater use already exceed 250 BCM.

Statistics at times can be deceptive. The fact that groundwater reserves are shrinking faster than they are replenished is a difficult reality to dispel. Additionally, there are the recent instances of ground water appropriation by soft drink and packaged water companies. The long-standing conflict between Coca-Cola and the Placchimada village exposes the vulnerability of the poor as groundwater extraction assumes corporate proportions.

The situation is further accentuated by the fact that 82 percent of all villages surveyed by the National Sample Survey Organisation use ground water to self-supply for domestic needs. Any measure to control groundwater extraction may need to take users' rights into account. Conversely, recent groundwater legislations in Rajasthan, Maharashtra, Orissa and Himachal Pradesh have been designed to restrict villagers' access to groundwater.

Has legislation been issued to counter the panchayat's growing control over groundwater? Are state governments planning greater control over water sources to increase revenue by selling water rights to commercial users? Needless to say, a unilateral decision to seize control over natural resources leaves undesired water usage to chance, especially when the States' are resource-crunched.

A recent study by International Water Management Institute issued in Indore, Nagpur, Bagalore, Jaipur, Ahmedabad & Chennai, notes that in the latter three cities the contribution of groundwater to domestic and municipal water requirements ranges between 72 and 99 percent. Most of these cities also have a thriving tanker water economy, supplying anywhere between 14-55 million liters per day.

Annual revenue from tanker water economy in these six cities alone is reported to be worth over Rs 100 crores. If we extend this figure to cover other cities across the country, this may well be the biggest informal industry, thriving solely because of municipal water supply shortages. This informal water economy depends entirely on groundwater extraction from peri-urban areas; and, in the absence of any regulation, their use led to the emergence of well fields all over the cities' periphery.

Will the tanker economy thrive for long? It may, so long as the water sources remain within economic reach and the water cost remains attractive to the urban consumer. Even if emerging groundwater legislations were to restrict the growth of this informal industry, groundwater extraction will shift base to the municipal system that, even today, sustains much of the urban supplies through groundwater. This results in a Catch-22 situation.

By all assessments, the role of groundwater in the country's water economy seems bleak. As groundwater shrinks away from extractable limits, owing to erratic rainfall pattern and reduced recharge, the water sector will go through dramatic changes in coming years. More importantly, agriculture will be significantly affected as growing urban and industrial demands deplete farming resources.

Cropping squeeze

Drinking water accounts for just 10 percent of available water, and squeezing water out of irrigation allocations is an undeniable possibility. The irrigation sector in the country is grossly inefficient, and, administering a 10 percent efficiency norm on the existing utilisation pattern (reflected in regulation and pricing) is enough to ease water woes. But how this process will it be implemented remains unresolved.

Steady decline in exploitable groundwater reserves shifts the onus of meeting India's water demand to surface water. Estimates indicate this resource will have to contribute no less than 63-65 percent of the total water requirement in the decades ahead. This

shift is critical as groundwater has thus far been informally – in a democratic decentralized manner – at hand for anyone who could afford a diesel pump.

This is likely to change. Projections indicate that the proportion of surface water required to meet domestic and municipal demands will be between 55 & 60 percent; for industrial use, the proportion may range between 69 & 72 percent; for power, it will be between 80 & 82 percent; and, all other uses will be met from surface water only. However, such demands are pitted against shrinking ponds and tanks, dried marginal rivers on account of catchments, and heavily polluted major rivers.

Meeting food requirements for a large population in the year 2050 is another challenge, as the numbers of those producing food at the farm will be reduced. The only recluse being that urban per capita consumption of cereals is much less than the rural per capita consumption and hence the food output may have to rise by 50 per cent from the present levels. Does this indicate diversification of cropping pattern from the traditional rice-wheat system?

It indeed does but for the fact that present investment policy continues to focus on rice-wheat cropping pattern and is targeting additional 35 million hectares under irrigation at a whopping investment of over Rs. 5,60,000 crore over the next three decades. Such policy concerns are in direct contravention to the emerging trends and encourage farmers to grow crops that are economically remunerative in the open markets, even if these were high water consuming.

Isn't it a paradox to talk about water-use efficiency when major irrigation projects are on the anvil at the same time? It is tossing up a 'surplus' scenario amidst a largely 'scarce' resource. Unless farmers are given incentives and market back-up to grow water-efficient crops for changing food habits, the rural-urban conflict on sharing surface waters (from irrigation dams and canals) will snowball into major conflicts in the years ahead.

Imperfect Future

Water has been a subject of great controversy in India; so much, in fact, that five central ministries and as many institutions pull at the issue in different directions. For example, while the agriculture ministry demands more for irrigation, the urban ministry does likewise for growing cities; while the industry ministry demands liberalization for

industrial applications, the pollution boards demands stringent regulations and penalty for wasteful utilisation.

Unless water is viewed holistically (without losing sight of the hydrological cycle) and is brought under an apex that balances competing demands through an effective institutional mechanism, sound regulation based on equity, and a system that values conservation to consumption, the water future of the country will remain in jeopardy. This situation calls for a clinical dissection of the entire sector to bypass the 'business as usual' components.

Before such an 'ideal' transformation takes place, we need to emphasize technologies and institutions that are ready to take up the short-term challenges of recycling wastewater, developing cost-effective technologies, converting saline water for potable use, and enhancing water productivity across diverse uses. It is imperative that the country's large water sector, in terms of both manpower and infrastructure, disengage from its present mindset of engineering interventions and instead design solutions which require accountability from consumers.

India will be better served if those overseeing the water sector are posed the challenge of revitalising water bodies and reviving decaying marginal rivers. If economic growth includes water availability to each citizen, there is a dire need to the increase stored water per capita (The US has 5000 cubic metres of per capita stored water; China has 2500; and India has just 130). This can only be achieved, however, by creating location-specific storage facilities that conform to the constitutional mandate of decentralized governance, not by building large dams.