

Water Management in India: Issues and Challenges

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ABSTRACT

Water is not only basic need of human life it is also important for survival for life. So, qualitative and adequate supply of water is the biggest problem in front of our policy makers. In this study we found that the water demand would we exceed the usable water in India by 2050. Thus, we should ensure the large scale people participation in water management

Introduction

Water is the basic need for life. It is a gift of nature, which is essential for survival of man, animal and vegetation but its sources are now being irrationally exploited by men for their vested interests (C.P. Singh 2002). So, sustainable development and efficient management of water is an increasingly complex challenge in India. Increasing population, growing urbanization, and industrialization, combined with the need for raising agriculture production generates competing for water (11th FYP). India with 2.4 percent of the world's total area has 16 percent of the world's population, but only 4 percent available fresh water (Yogi, A.K. 2008). This is clearly indicates the need for water resources development, conservation and optimum use. Fortunately,

at a micro level India is not short of water. The problems that seem to loom large over the sector are manageable and the challenges facing it are not insurmountable.

Constitutional Provisions of Water in India:

In the constitution of India, water and power development is a State activity subject to Central control. Water supplies, irrigation and canals, drainage and embankments, water storage and water power belong to the State vide Entry 17 in State List (List II) in the Seventh Schedule of the Constitution of India. But these are subject to the provisions of the Entry 56 in Union List (List I) in the same Schedule which deals with the regulation and development of inter-state rivers and river valleys. Since electricity belongs to Concurrent List (List III) [Entry 38], the Centre's Concurrent jurisdiction on water power is automatic.

Water Feature in India: Water Resource and Water Demand

Water Resource in India:

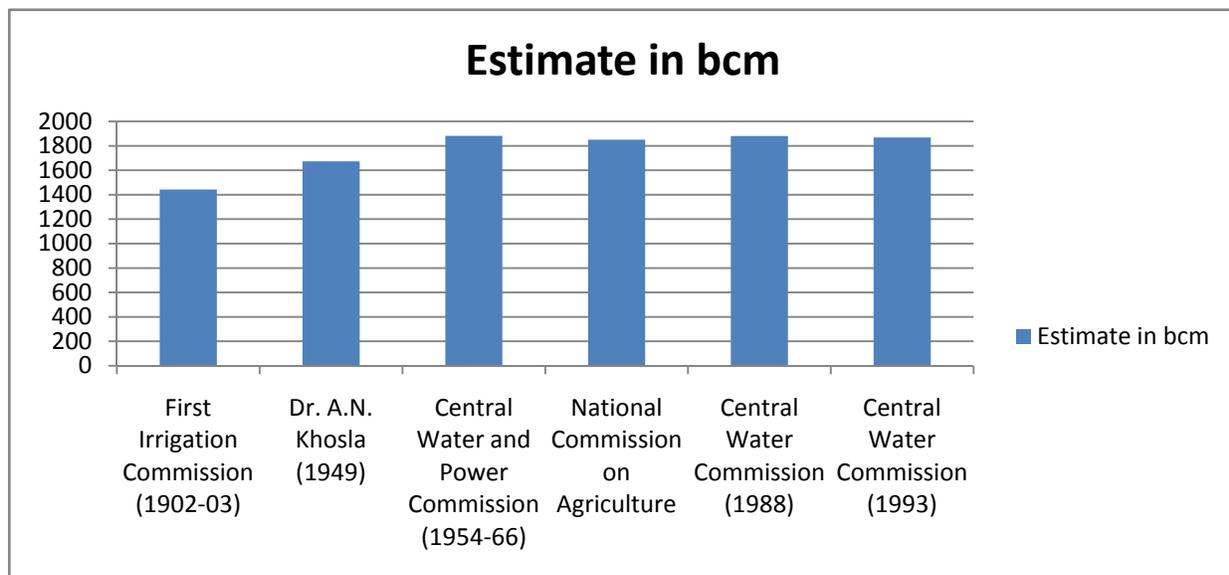
The water resource potential of the country has been assessed from time to time by different agencies. The different estimates are shown in table-1. It may be seen that since 1954, the estimates have stabilized and are within the proximity of the currently accepted estimates of 1869 billion cubic metres which includes replenishable ground water which gets charged on annual basis.

Table- 1 Water resource potential in India

S.NO	Agencies	Estimate in bcm	Deviation from 1869 bcm
1	First Irrigation Commission (1902-03)	1443	-23%
2	Dr. A.N. Khosla (1949)	1673	-10%
3	Central Water and Power Commission (1954-66)	1881	+0.6%
4	National Commission on Agriculture	1850	-1%
5	Central Water Commission (1988)	1880	+0.6%
6	Central Water Commission (1993)	1869	-----

Source: 11th Five Year Plan.

Note: bcm: Billion cubic metres.

Chart-1**Water Estimate by Different Agencies**

According to Eleventh Five Year Plan (2007-12), “Within the limitation of physiographic conditions, socio-political environment, legal and constitutional constraints and the technology available at hand, the utilizable water resources of the country have been assessed at 1123 bcm,

of which 690 bcm is form surface water and 433 bcm from ground water sources. Harnessing of 690 bcm of utilizable surface water is possible only if matching storages and built. Trans-basin transfer of water, if taken up to full extent as proposed under the National Perspective Plan, would further increase the utilizable quantity by approximately 220 bcm. The irrigation potential of the country has been estimated to be 139.9 million hectare without inter-basin sharing of water, and 175 m.ha. with inter-basin sharing.

Water Requirement for Various Sectors in India:

India has world's 16 percent of population, 2.5 percent of land resources and 25 percent of water resources. Of the total water resources in India, about 1123 km³ is the useable water for industrial, domestic and other uses but the demand of water is increase day-by-day. The water demand will estimated to rise to 813 km³ in 2010 to 1993 cm³ in 2025 and 1447 km³ in 2050. Thus, the demand of water would be exceed the usable water in India by 2050. Another estimated by National Commission on Integrated Water Resources Development (NCIWRD) in the year 2000. This requirement is based on the assumption that irrigation efficiency will increase to 60 percent from the present level of 35-40 percent. The Standing Committee of MoWR, also estimate water requirement periodically. According to National Commission on Integrated Water Resources Development (NCIWRD) and Standing Committee of MoWR water estimate shown in table-2.

**Table- 2 Water Requirement for Various Sectors in India
(2010 to 2050)**

S.NO	Sectors	Water Demand km3 (bcm)					
		Standing Committee of MoWR			NCIWRD		
		2010	2025	2050	2010	2025	2050
1	Irrigation	688	910	1072	557	611	807
2	Drinking water	56	73	102	43	62	111
3	Industry	12	23	63	37	67	81
4	Energy	5	15	130	19	33	70
5	Other	52	72	80	54	70	111
Total		813	1093	1447	710	843	1180

Source: 11th Five Year Plan.

Water Management Issues in India:

- 1. Water Use Efficiency:** a basin wise study conduct by *A. Vaidyanathan and K. Sivasubramaniam* of the Madras Institute of Developing Studies (MIDS) using potential evapotranspiration data and gross water withdrawals reports the overall irrigation efficiency in the country as 38 percent. The study reveals that the Krishna, Godavari, Cauvery, and Mahanadi system have a very low efficiency of around 27 percent while the Indus and Ganga system are doing batter with efficiency in the range of 43-47 percent.
- 2. Weak Administration:** Operation and Maintenance (O&M) activity is insufficient. So, that only 30-40 percent of the water entering the canals reaches to the plants (the normal rate is 60 percent). The gap between the potential created and actual irrigation amounts to about nine million ha. Because minor canals and field channels have not been completed. In 2006, for instance, it is very poor district 'Mayurbhanj' in Orissa was still waiting for the arrival of canals of the Subarnarekha Project which was decided in 1978 and the construction work on this site was start in 1982.

- 3. Declining Investment in Irrigation:** Deceleration in irrigation investment during the post-liberalisation period has resulted in slow growth of irrigated area in the country. The funding for irrigation sector as a proportion of the total State Plan Size from the Fifth Plan on ward has been declining. It fell from 23.25 percent of total State Plan Outlay in the Fifth Plan to only 15.9 percent in the Ninth Plan and is anticipated to fall to only 11.6 percent during the Tenth Plan.
- 4. Inefficient Water Price Policy:** although during the British period and early after independence many irrigation projects yielded a surplus, over the years the water charges from the users have been inadequate even to meet the operation and maintenance (O&M) charges. Canal water rates in most States are, however, very low. Water rates in many states have not been revised for decades. Most Northern-Eastern States (except Assam and Manipur), do not even charge any irrigation water rates. Maharashtra is the only state where the irrigation water rates are announced for a 5 percent year period at a time with a provision for 10 percent increase per annum so as to cover the full operation and maintenance (O&M) and as well as interest payable on the public deposits raised through irrigation bonds.
- 5. Safe Drinking Water:** Provision of safe drinking water in the rural areas is the responsibility of the state. No doubt India has made progress in the supply of safe water to its people, but gross disparity in coverage exists across the country. Although access to drinking water has improved, the World Bank estimates that 21 percent of communicable diseases in India are related to unsafe water. In India, diarrhea alone causes more than 1,600 deaths daily.
- 6. Declining per capita Water Availability:** the per capita availability of water has been steadily declining since 1951 due to population growth. The twin indicators of water scarcity are per capita availability and storage. A per capita availability of less than 1700 cubic meters (m³) is termed a water stressed condition while if it falls below 1000 cubic meters, it is termed as water scarcity condition. While on an average we may be near to water stressed condition, on an individual river basin-wise situation, 9 out of our 20 river basins with 200 million populations are already facing a water scarcity condition. Even after constructing 4525 large and small dams, the per capita storage in the country is 213

m³ as against 6103 m³ in Russia, 4733 m³ in Australia, 1964 m³ in USA and 111 m³ of China. It touches 400 m³ in India only after the completion of all the ongoing and proposed dams. [11th FYP]

Water Management Challenges in India:

1. To ensure the access of safe drinking water for all peoples.
2. To ensure the adequate quality and quantity of water for agriculture, industry and urban centres.
3. To find the appropriate answers for drought-prone areas /zones.
4. Foster consciousnesses of scarcity promote conservation and minimize waste.
5. Improve and maintain water quality, control pollution and protect water sources.
6. To protect and preserve the natural environment/ecological system, preserve integrity of rivers and maintain river regime.
7. To ensure the equity- between groups, between generations and between species.
8. In particular, reduce burden on women and give them a voice in water planning and management.
9. To minimize the conflicts and hardships and provide means of resolutions/redress.
10. To help the people for cope with floods and minimize damage.

Suggestions:

The following steps would be taken for augmentation of water availability and its efficient use:

1. Public Private Partner Ship should be introducing in irrigation, drinking water supply and water development because:
 - i) Encourage innovation.
 - ii) Better access to finance.
 - iii) Latest knowledge of technologies.
 - iv) Better management efficiency and entrepreneurial spirit.
 - v) Improved operation of infrastructure services.
 - vi) Rationalized or cost based tariffs for services and
 - vii) More responsiveness to consumer needs and satisfaction.

- 2 Literacy Movement: A water literacy movement should be launching and regulating should be put in place for the sustainable use of ground water.
- 3 In water-scarce areas, the land-use system should emphasise the cultivations of crops of high value and requiring less water such as pulses and oilseeds.
- 4 Rain water harvesting and aquifer recharge should be given priority for ensuring the stability of supply. Necessary legislative measure to regulate and control the development and management of ground water would be taken up simultaneously.
- 5 Low cost green houses can be promoted in areas where evaporation exceeds precipitation in a year. Therefore, water users are required to participate in conserving and allocating water resources optimally. Hence, participation of farmers in irrigation and water management should be encouraging.

Conclusion:

Water is the basic need for life. It is a gift of nature, which is essential for survival of man, animal and vegetation but its sources are now being irrationally exploited by men for their vested interests (C.P. Singh 2002). Over the last 50 years, irrigated agriculture has been vital to meet fast-rising food demand. In the coming years the strong demographic demand for food is expected to continue, and intensified irrigated agriculture will have to provide close to 60 percent of the extra food. However, in recent years, the pace of irrigation expansion has been slowing, there has been less improvement in productivity, and water availability for irrigation is increasingly constrained. Governments have long led the expansion of large-scale irrigation, but performance has been suboptimal, and reforms that have been introduced have proved slow to improve efficiency and water service (*Water Sector Board Discussion paper No. 10, May 2007, The World Bank, Washington, DC*). So, efficiently water management is a matter of concern to the world and particular in India because, 60 percent Indian agriculture is depends on rain fail and agriculture is the mainstay of the Indian economy. According to NSS round 2001 the workforce dependent on agriculture is 54.3 percent of whom 50.3 percent depend on crop production and 4 percent on livestock production. Agriculture and allied sectors contribute nearly 22 per cent of Gross Domestic Product (GDP) of India and further 9.93 percent

contribution in total export in India (March,2006). Agriculture sector play a vital role in Indian economy i.e., livelihood and export. Agriculture is the most important sector of the Indian Economy from the perspective of poverty alleviation, and employment generation. The following steps would be taken for augmentation of water availability and its efficient use:

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