

# Population, Water Crisis and Management in India- Special Reference To Rajasthan

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## Abstract

More than two billion people world wide live in regions facing water scarcity and in India this a particularly acute crisis. Million of Indians currently lack access to clean drinking water and the situation is getting worse. India the second largest populated country putting increase strain on water resources and demand for water is growing at an alarming rate.

Population growth, increasing urbanization, pollution, climate changes and mismanagement of water resources, over pumping, are likely to combine to produce drastic decline in water supply in coming decades.

There is a severe water crisis in Rajasthan. A decadal average decline in ground water by 62.70% in the Rajasthan with only 37.20% increase (From 2008 to 2018, Source; CGWB).

This paper throws light on the present status of water with respect of increasing population and methods to manage it in India.

**Keywords:** Population, Mismanagement of water resources, Declining Groundwater & Policy Recommendation.

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## Introduction

As per statement of K. Matsuura, Director General UNESCO. "Of all the social and natural crises we humans face, the water crisis is the one that lies at heart-of our survival and that of our planet earth."

More than two billion people world wide live in regions facing water scarcity and in India this a particularly acute crisis . Million of Indians currently lack access to clean drinking water and the situation is getting worse. India the second largest populated country putting increase strain on water resources and demand for water is growing at an alarming rate.

Population growth, increasing urbanization, pollution climate changes and mismanagement of water resources, over pumping, are likely to combine to produce drastic decline in water supply in coming decades. A rapidly growing economy and a large agricultural sector also stretch India's supply of water even thinner. Rajasthan state is a very poor state regarding availability of water resources due to its geo-natural conditions and increasing population. Unless the rational steps are taken to solve the problem, the global water crisis will unprecedentedly heighten in years ahead.

This paper throws light on the present status of water with respect of increasing population and methods to manage it in India.

## Objective of the Study

Following are the main objectives to study :

1. To explore the current situation of demand for and supply of water in India.
2. To evaluate the impact of growing population on water resources specially groundwater in water.
3. To study the water management in India.
4. To evolve policy frame work for up keeping the present status of water resources.

## Method & Material

This study is based on secondary data. The secondary data base was employed to explore problem of water resources due to mis-management and increasing population.

## Results and Discussion

Following are the main objectives to study :

1. Demand & Supply of water
2. Demand and usage
3. Supply of water

**Demand and usage****Domestic**

The demand for drinking water is divided between the urban and rural population and comprises about 4-6 percent of total water demand. Due to the amenities of typical urban life, people living in cities tend to lead more water intensive lives. Urbanization is going to accelerate the water crises in India. The rivers are too polluted to drink and the authorities are unable to consistently deliver freshwater to the cities. Many urban dwellers are turning to groundwater, which is greatly contributing to the depletion of underground aquifers. Rural citizens face a similar crisis. Currently 30 percent of the rural population lack access to drinking water. Most people who live in rural areas demand less water for day-to-day living than people living in cities and the majority of their water demand comes from agriculture needs.

**Agricultural**

India's agricultural sector currently uses about 90 percent of total water resources. Irrigated agriculture has been fundamental to economic development, but unfortunately caused groundwater depletion. Due to water pollution in rivers, India draws 80 percent of its irrigation water from groundwater. As water scarcity becomes a bigger and bigger problem, rural and farming areas will most likely be hit the hardest. Food security has been one the highest priority and the farming lobby has grown accustomed to cheap electricity, which may allows fast pumping of groundwater, which is something they are unwilling to give up for the sake of water conservation. If India wants to maintain its level of food security, farmers will have to switch to less water intensive crops, otherwise India will end up being a net importer of food which would massive ramifications for the global price of grain.

**Industrial**

Water is both an important input for many different manufacturing and industrial sectors and used as a coolant for machines such as textile machines etc. Cheap water that can be rapidly pumped from underground aquifers has been a major factor in the success of India's economic growth. According to the Ministry of Water Resources industrial water use in India stands at about 50 billion cubic meters or nearly 6 percent of total freshwater abstraction. This demand is expected to increase dramatically in the next decade, given the enormous forecasts of 9 percent economic growth for 2007-2008 alone.

**Supply of Water****Supply**

Surface water and groundwater are the sources of India's water supply. Other sources such as desalination are negligible because they are not cost effective.

**Surface Water**

The main rivers, the Brahmaputra, Mahanandi, Godavari, Kaveri, Indus, Narmada and Tapti, flow into the Bay of Bengal and Arabian Sea. They can be classified into four groups: Himalaya, Coastal, peninsular and inland drainage basins. The Himalayan rivers, such as the Ganges, are formed by melting snow and glaciers and have a continuous flow throughout the year. The Himalayas contain the largest store of fresh water outside the polar ice caps and feed seven great Asian rivers. This region receives very heavy rainfall during the monsoon period, causing the rivers to swell and flood. The coastal rivers, the Brahmaputra and the Krishna, especially on the west coast, are short in length with small catchment areas. The peninsular rivers, which include the Mahanandi, Godeawari, Krishna and Kaveri, flow inland and also greatly increase in volume during the monsoon season. Finally, the rivers of the inland drainage basin, such as the Mahanandi and the Godavari, dry out as they drain towards the silt lakes. India receives an average of 4000 billion cubic meters of rainfall every year. Unfortunately only 48 percent of rainfall ends up in India's rivers. Due to lack of storage and crumbling infrastructure only 18 percent can be utilized. Rainfall is confined to the monsoon season, June to September. When India gets an average, 75 percent of its total annual precipitation, due to India's storage crunch the authorities are unable to store surplus water for the development of better capturing and storing infrastructure making water scarcity an un-necessary yet critical problem.

**Ground Water**

Groundwater is the major source of drinking water in both urban and rural India. It is also an important source of water for the agricultural and the industrial sectors. India possesses about 432 bcm of groundwater replenished yearly from rain and river drainage, but only 395 bcm are utilizable. Of that 395 bcm 82 percent goes to irrigation and agricultural purpose while only 18 percent is divided between domestic and industrial sectors. Total static groundwater available is approximately 10,812 bcm.

Groundwater is increasingly being pumped much faster than recharge through rainfall. The average groundwater recharge rate is 260m<sup>3</sup>/day. Groundwater crisis is not the result of natural factors it has been caused by human actions. During the past two decades, the water level in several parts of the country has been falling rapidly due to an increase in extraction. The number of wells drilled for irrigation of both food and cash crops have rapidly and indiscriminately increased. (WBR 2005)

**Population and Availability of water**

Although water is nature's most wonderful abundant and useful compound yet it is also the most misused one (P.C. Jain, 2003).

Water is a free and valuable gift of nature so it should be consumed by us with rationality. Due to increasing of population the availability of water per person per year is decreasing continuously in India as well as in Rajasthan. The population of state has increased more than three times but area and water are fixed assets. The state of Rajasthan has 10.4 percent of the country's Geographical area but sharing only 1.15 percent of its water resources.

**Table (A) Population and availability of water in India**

Year	Population(Crore)	Availability of water cubic meter/year/person
1947	40	5000
2000	100	2000
2025 est.	139	1500
2050 est.	160	1000

**Source:** Maru Krishi Chayanika CAZRI, Jodhpur(2004,05)

It could be seen from above table(A) that in the year 1947 the population was 40 crore in India and availability of water was 5000 cubic meter/ year/person but in year 2000 the population increased to 100 crore but availability of water in comparison of population declined and came 2000 cubic meter/ year/person in the year 2000. In the year 2050 it is estimated that population will be about 160 crore and availability of water will be decreased to 1000 cm/y/p.

Rajasthan Shows the similar trends in table (B) below:-

**Table (B) Population and availability of water in Rajasthan**

Year	Population (Crore)	Availability of water cubic meter/year/person
1951	1.6	2200
2000	5.4	941
2050 est.	8.64	439

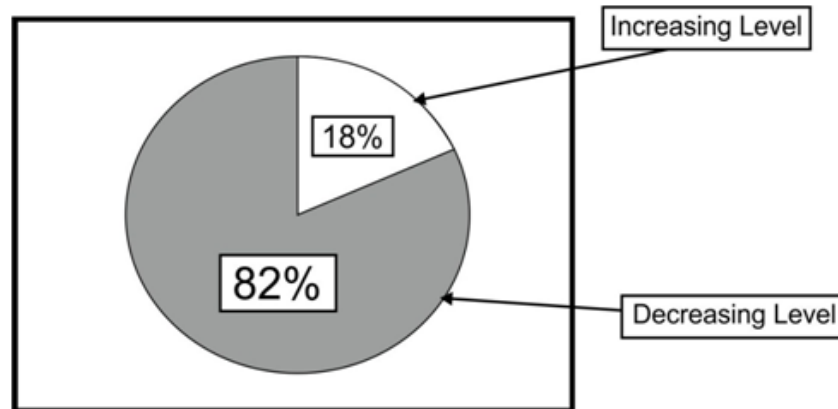
**Source:** Water resources department, Govt. of Rajasthan.

This table (B) depicts the pressure of growing population on availability of water in Rajasthan. It shows that availability of water is decreasing continuously due to increase in population.

**State of Groundwater in Rajasthan**

After 1950, in Rajasthan out of 54 years, 46 years were famine years, the consumption of groundwater increased from 69 percent(1988) to 120 percent (2004).

Insufficient rain, demand of water and increasing population, ruthless exploitation of groundwater and withdrawal of ground water greater than recharge, causing declining of ground water table in Rajasthan for last twenty years. This condition is shown in figure (1).

**The Declining status of groundwater (1984-2004)**

It is seen in Fig. 1 that during last twenty years the groundwater level increased in 18percent area where as 82percent areas show the decline status in groundwater level. The main cause of this event is vigorously increasing population and their requirements (Bohara J.B. 2006).

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**Management of Water**

After independence, India's primary aim's were economic growth and food security rather than water conservation. India, the largest populated country, facing water scarcity, has no law and legislation on groundwater utilization. Every individual can get water from any where without paying price. Increasing population, cheap electricity, rapid pumping and individual sell ownerships are main factors for depleting of ground water in India(G. Anand, 2005 & Ramaswamy, 2007). India needs to keep boosting agricultural production in order to feed its growing population with Jeopardizing its water availability. Farmer need to switch to less water intensive crops. The authorities of India also lacks the ability to store and deliver potable water to its citizens especially when it's supply shrinks (Brooks, Niha 2007)

Most of cities of India demand a particular quantity of water per day in mcm. And local bodies supply as per requirements but only 1/2 part of demand of water actually reach to consumers due to infrastructure problems, Such a leaking pipes. Lack of proper maintenance of pipes and canals, now causing major inefficiencies in water use. As a result of the Government's inability to provide adequate water, private water suppliers, which charge exorbitant prices, have spring up and people have beings to dig neighborhood wells depleting ground water even further.

**Policy and Action Plan**

Following policies will be helpful in upgrading of present situation of water and its better management:-

1. To adopt water management practices by regulating usage with effective legislation.
2. The privatization of water and water could be supplied to all the inhabitants at a minimum cost.
3. Adopt an indigenous system and technology for storing and harvesting of rain water specially in Rajasthan such as Toba, Nadi, Khandin, Kund etc.
4. To Control the growing population with the help of family planning program and better education.
5. It is required to strengthen the local bodies and their working system in sense of water supply e.g. to check pipes leakages and their proper maintenance.

6. Reviving old age traditional system for water harvesting and conservation through NGO.

**Recommendation**

To prevent the water crisis in India

1. According to twelfth five year plan (2012-17) there must be emphasised on aquifer mapping watershed development involvement of NGO and efficiency in developing irrigation capacity.
2. India should work and develop PPP based modernize urban water distribution system.
3. Local groups must be empowered in terms of knowledge, understand and real time information on the status of ground water.

**Conclusion**

India is facing a looming water crisis that has implication not only for its 1.1 billion people, but for the entire globe. India's demand for water is growing even as it stretches its supplies. Water scarcity in India is predominantly a man made problem and India needs to make water supply a national priority. India's need for a comprehensive management program is severe because of its rapidly depleting water supply and growing population.

It is also emerged from the study that the population is putting pressure on water resources. India has the power to avoid this through treat human, agriculture and industrial waste effectively and regulate ground water with respect to growing population.

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