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## **DOMESTIC WATER AVAILABILITY IN A RAPIDLY GROWING ROHTAK CITY OF HARYANA STATE**

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### **Abstract**

*The timely provision of sufficient and fresh water is essential to maintaining human existence. The primary source of home water supply in India is the tap water system. The Public Health Department is in charge of providing enough water and resolving any associated problems. However, the growing urban population, particularly on the periphery, is posing new problems for ensuring that all inhabitants have access to sufficient and clean water. In the current study, the drinking water supply situation in Haryana's rapidly expanding Rohtak metropolis was studied. Primary and secondary data have been gathered for the purpose. Urban growth was identified using municipal boundaries from various eras, and residential areas were identified using satellite images from 2006 and 2019. A field survey has also been done in several colonies and planned residential areas. The results demonstrate that water delivery systems have improved over time, but growing populations pose new problems for ensuring everyone has access to enough water.*

**KeyWords:** *Urbanizations, Domestic water supply and its challenges*

### **Introduction**

Water is vitally important for life, agriculture irrigation, and the foundation of all progress. It is one of the three basic requirements, along with food and shelter. The source of drinkable water left its mark on human civilization as well. The largest human civilizations of antiquity were built close to water supplies, particularly around rivers. The inhabitants at the time had very little awareness of the available natural resources, and as a result of poor management, they



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were unable to create canals to utilize the river water. In awake of the importance of the water in daily life, its sources and distribution areas played a pivotal role in the human civilization and always got the status as ‘cradle

Approximately 71 per cent of the surface of the world is covered by water, 97 per cent of which is salt water and only 3 per cent is classified as fresh water. There is an unequal distribution of the fresh water. According to NACE, USGS, 1967 and The Hydrologic Cycle "Pamphlet," USGS, 1964, glaciers, subterranean water, lakes, rivers, and swamps make up a total of 69per cent, 30 per cent, and 1 per cent of all fresh water. It has frequently been noted that some locations' drainage systems, height, relief structure, and climate all play important roles in the unequal distribution of water. As a result of these variables, certain localities have experienced floods while others are known to be drought-prone zones. It is also true that just 1per cent of the water is accessible to people for usage, with the other 80 per cent being unevenly spread throughout isolated places.

Due to the tremendous population expansion, particularly in emerging nations' metropolitan centres, water shortage is now one of the biggest threats. In addition to being influenced by population increase, rising water consumption is also linked to technical advancement and economic progress.

It is also true that it is impossible to predict with certainty whether there will be a sufficient supply of drinking water in the future because new uses for water have developed over time, such as the ability to operate an air conditioner or a two- or four-wheel vehicle, which are rising along with per capita income. With the introduction of these facilities, substantial water usage rose over time. Water contamination was also a result of the industrial revolution's overuse of water resources. Conflicts between governments over the allocation of river water also made it difficult to distribute water evenly for drinking and agriculture purposes. It is also true that it is impossible to predict with certainty whether there will be a sufficient supply of drinking water in the future because new uses for water have developed over time, such as the ability to operate an air conditioner or a two- or four-wheel vehicle, which are rising along with per capita income. With the introduction of these facilities, substantial water usage rose over time. Water contamination was also a result of the industrial revolution's overuse of water resources. Conflicts between governments over the allocation of



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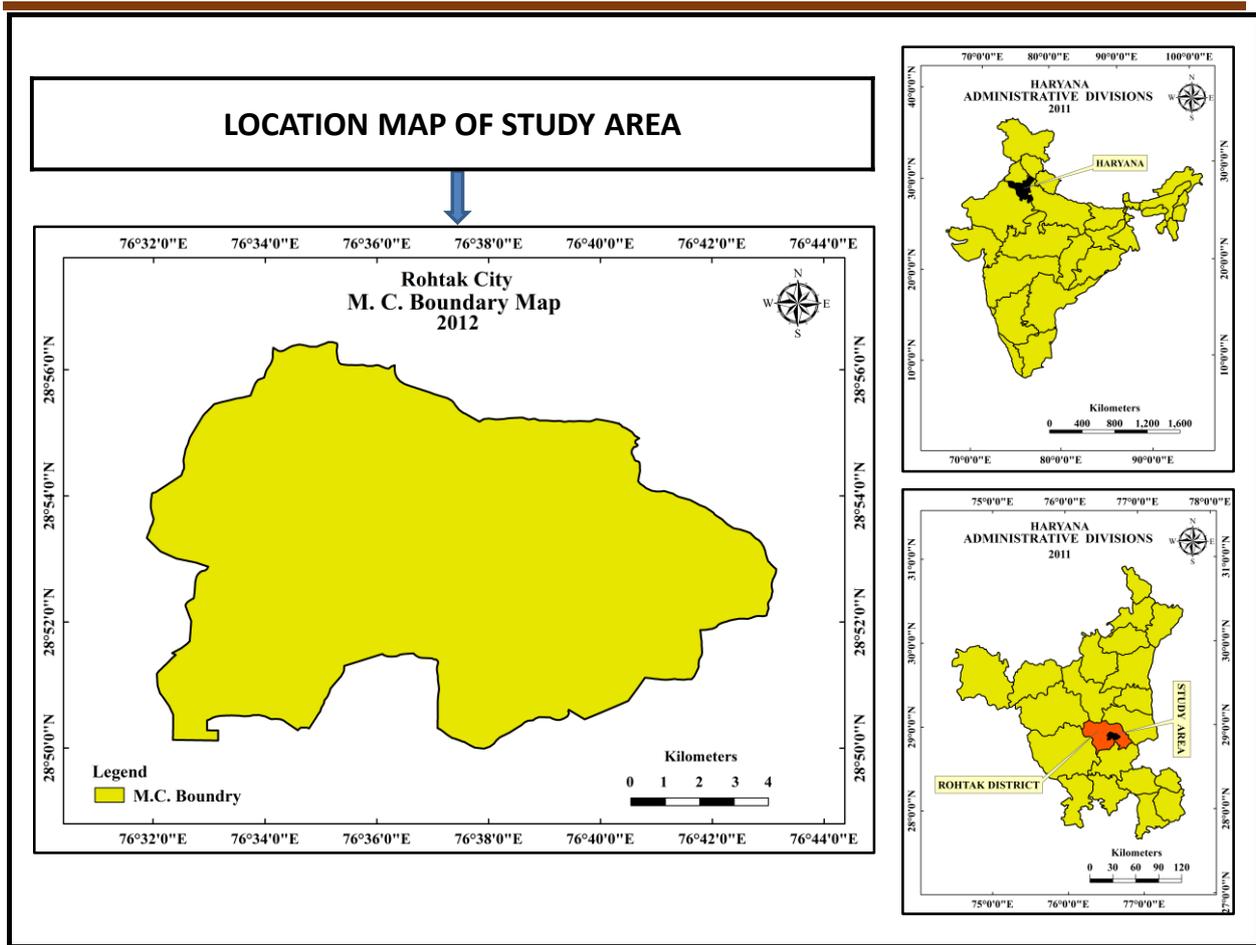
river water also made it difficult to distribute water evenly for drinking and agriculture purposes.

In addition, inadequate water policies and their faulty execution are to blame for the lack of water available for drinking and other uses, given the restricted availability of water resources. As a result, inadequate water supplies were caused by overuse, exploitation, and rising demand, which also called into question sustainable development and management practises.

### **Study Area**

The city of Rohtak is situated between the longitudes of  $76^{\circ} 31' 50''$  and  $76^{\circ} 43' 10''$  east and the latitudes of  $28^{\circ} 50' 00''$  and  $28^{\circ} 56' 25''$  north. In the most recent few decades, the city's population and municipal area both grew quickly. In 1981, the city's size was around 22 square kilometres; by 2013, it had grown to reach over 140 square kilometres. Similar to how the city's population expanded from 1,66,761 people in 1981 to 4,06,799 people in 2011, A sufficient and clean water supply is one of the many fundamental amenities that the growing population requires in order to live sustainably. Tehsil and district headquarters are located in the city.

### **Figure 1: Location Map of Study Area**



### Statement of Problem

In terms of population, Rohtak City ranks third in the state of Haryana. It has a great deal of potential to grow because it is a hub for new medical and educational institutions. In 1951, there were 71,902 people living in the city; in 1991, there were 2,16,096 people. The city's population in 2011 was 4,06,799 people. A significant portion of the rural population moved to Rohtak City because there are greater chances for jobs, transportation, health and medical care, education, and other fundamental utilities & amenities there. Water supply is one of the essential needs, but the growing population puts greater strain on the utilities and facilities already in place to meet the new, increased demand. Investigating the water supply situation in Rohtak, a city that is rapidly expanding, became important as a result.

### Objective of the study

To find out the status of water supply facilities in Rohtak city



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## **Data Source &Methodology**

The Rohtak municipal water supply infrastructure has been identified using both primary and secondary data. The locations of waterworks and boosting stations in the city of Rohtak were determined with the use of a field study. Waterworks and boosting stations have been located using a Global Positioning System (GPS) device called the "Garmin Oregon 550t" for this project. On the other side, the Public Health Department Rohtak collects attribute data on the waterworks' establishment year and water storage capacity.

## **Key Findings of the study**

Surface water from the Bhalaut Sub Branch and Jawahar Lal Nehru Canal (JLN) is Rohtak City's main source of drinking water (BSB). Following storage in the water works, the city receives its supply of water. In the various areas of the city, there are now 16 water works and 29 boosting stations. The waterworks, boosting stations, and pipe systems must be maintained by the Public Health Department. The water works and boosting stations' specifics are as follows:

### **Water works 1**

In 1931, the city had a population of around 35,000, but there was no facility for the delivery of tap water. In 1931, the first water system for the city of Rohtak was built at the Sonapat stand and along the Sonapat road. Canal filtration is the foundation of the water system. But in 1932, the first tap water connection was made available. In present time, water is supplied either directly from this water works or with the help of five boosting stations which are located near JullahawalaChowk, Gohana Adda, Dairy Pana, Prem Nagar Chowk and PharaMohalla. The water works has the capacity to supply the 27.24 MLD (million liters per day) in present time.

### **Water works 2**

The population of the city was around 1.66 lakh in 1981. As a result, the city's waterworks 1 were unable to adequately supply all of its citizens with water due to the city's growing population. So, the state government built the second water works in 1981 along the Jhajjar road. The present installed capacity of the water works is 47.24 MLD water. 12.5 Cus and 16 Cus water is received from JLN and Bhalaut Sub Branch respectively. Six boosting stations established to supply the water of this water works which are located in Government Senior



Secondary School, Old ITI Ground, Old Sugar Mill, Old Bus Station and Hisar road IDC Colony. One boosting station is proposed in Ajeet Colony.

### **Water works 3**

The population grew to around 3 lakhs in 2001. Therefore, the third water treatment facility was erected by the government in 2009 along the Sonepat Road and JLN Canal. The water treatment facility has an 18.16 MLD water storage capacity. Seven boosting stations, situated in C.R. Stadium, Model Town, Hooda City Park (near new Bus Stand), along Hafed road, T.B. Hospital, along Jind Road, and Gaukaran Talab, are used by the water works to supply water. There are two proposed boosting stations for Rajeev Nagar and Khokhrakot.

### **Water works 4**

The government erected new waterworks at All India Jat Heroes Memorial College in 2010 to meet the water demand of Dev Colony, Revenue Colony, and Jat Education Society. 3.50 MLD of water may be stored there. In Revenue Colony, a boosting station was constructed to provide enough water.

### **HSVP water works**

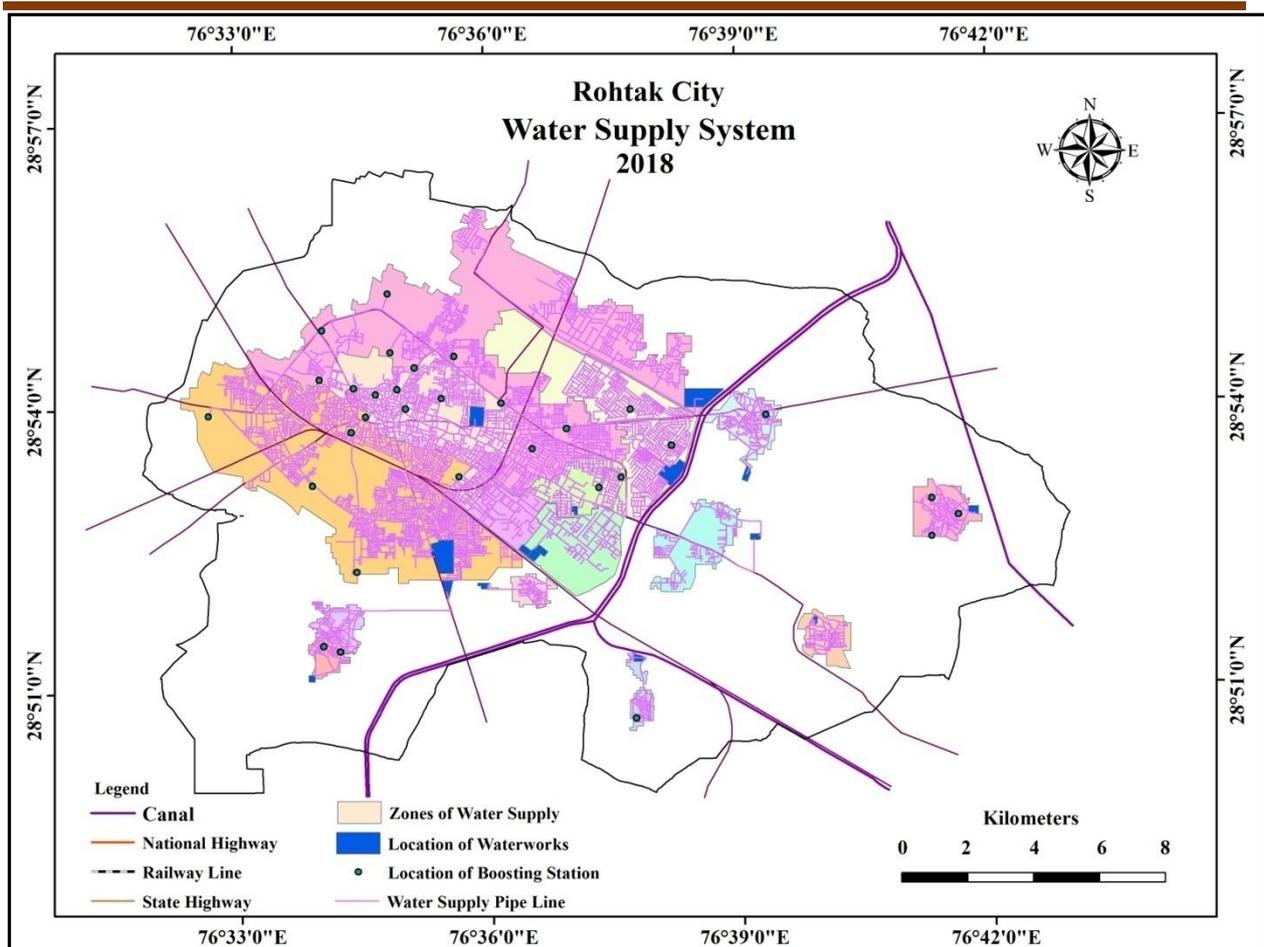
For the planned residential and commercial zones created as part of Haryana ShahariVikasPradhikaran, the State Government has developed separate waterworks (HSVP). Sectors 1, 2, 3, and 14 of the HSVP are receiving water supplies. Sector 2, Sector 3, and Sector 14 all include three boosting stations.

**Table 1: Establishment of Waterworks in recent incorporated villages under Rohtak City**

<b>Sr. No.</b>	<b>Water Works located in</b>	<b>Year of Establishment</b>
1.	Bohar (MilwanPana)	March 31, 1970
2.	Bohar (BhopanPana)	March 31, 2010
3.	Baliana	March 22, 1990
4.	GarhiBohar	Dec. 31, 2008
5.	Kherisadh	March 31, 1986
6.	Pahrawar	Aug. 31, 1995
7.	Kanheli	March 10, 2008
8.	SunariaKhurd	March 21, 2004
9.	SunariaKalan	Dec. 31, 1985

*Source: Public Health and Engineering Department, Rohtak*

### **Figure 2: Water Supply System in Rohtak City**



Source: Public Health and Engineering Department, Rohtak

### Other water works

Water is supplied to planned residential colonies and sectors by the waterworks and boosting stations already mentioned. Beyond it, there are two significant medical, educational, and health institutes, each of which have their own water systems. Maharishi Dayanand University and PanditBhagwatDayal Sharma Health & Medical University both have their own water systems in place. Within the Rohtak city municipal boundaries, the State government absorbed eight villages between 2007 and 2013: Bohar, Baliana, GarhiBohar&Majra, Kherisadh, Pahrawar, Kanheli, SunariaKalan, and Sunaria Khurd. Each of these settlements has its own distinct water system (Table 1). There are two panas in Bohar Village: Milwan and Bhopan. For MilwanPana and Bhopan Pana, respectively, there is one tub-well and one boosting station. There are two tub-wells and three boosting stations in Baliana. Both SunariaKhurd and Pahrawar have two boosting stations.



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## Conclusion

The sustained advancement of human civilization depends on water. The population of Rohtak is growing quickly, especially in the outlying districts, according to the current report. It amplifies the demand for water, which puts strain on the waterworks and boosting stations that are already in place. The first waterworks were built in Rohtak City in 1931. But from 1981 to 2018, the government built 15 waterworks and more than 30 boosting stations to meet the needs of the growing population and to supply water.

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