

An Analysis of Disparities in Access to Drinking Water in the Rural Areas of Rohtak District, Haryana (India)

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Abstract

Access to safe drinking water has been a major challenge in India especially in rural areas where lack of usable water has given birth to decades old sanitation and health problems. In India, the water supply primarily depends upon two sources- Rivers and ground water. Unfortunately, both the sources are declining quantitatively and qualitatively owing to increasing population, industrialization and pollution. As per the report of Central Ground Water Board, ground water of most of the districts in Haryana is unfit for consumption due to high presence of salinity, nitrate, fluoride etc. As per Houselisting and Housing Census, 2011, in Rohtak district, 63.3 percent of rural household used taps, 8 percent used wells, 17.6 percent hand pumps and 8.1 percent used tube wells as sources of drinking water. In the present paper, Composite Index Method has been applied to find out the disparities in the availability of drinking water among the villages. Out of total 143 villages, village Kistranti has the highest number of households (99.2 percent) while four villages- Sanga Hera, Taimurpur, Sahar Majra and Kabni 7 1/2 Biswa have no households under tap water from treated source of drinking. Based upon the secondary data, the research work aims to analyze the access of safe drinking water through holistic comparison among the villages.

Keywords: Drinking water, Disparities, Tap, Handpump, Tubewell, Access

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Introduction

Water is essential not only for survival of humans but for all other life forms on earth. Access to safe and clean drinking water is a human right and one of the most important basic needs of human life. The World Health Organization (WHO) defines safe drinking water as water that does not represent any significant risk to health over lifetime of consumption, including different sensitivities that may occur between life stages. A safely managed drinking water service is one located on premises, available when needed and free from contamination (WHO and UNICEF, 2017). As per WHO report (2017), 5.2 billion people comprising 71 per cent of world population used safely managed drinking water service by 2015. The high increase in population, urbanization, industrialization and intensive agricultural practices

There are wide regional variations in the availability of adequate drinking water at each level-global, national, state and district level and so on. Regional differences arise due to variations in geographical conditions and differences in the level and pattern of socio-economic development. In India, access to clean drinking water is a fundamental right as enunciated in the right to life under article 21 of the Constitution of India. Moreover, the provision of clean or safe drinking water has been given priority in our constitution under article 47 of the Directive Principle of State Policy. As per 73rd and 74th Constitutional Amendment Acts, drinking water and sanitation are included in the list of subjects to be developed by Panchayats and municipal bodies respectively. The coverage of the rural population by piped water supply is a major aim of the government (Government of India, 2016). Though drinking

water is listed as state subject in the Constitution of India, the Central and State Government introduced many programmes and schemes to provide safe and adequate drinking water to the rural households (Singh, 2017). In 1972, Government of India introduced The Accelerated Rural Water Supply Programme (ARWSP), the first major initiative in the drinking water sector.

As per Census of India 2011, out of total rural households, 30.8 percent used tap, 43.6 percent hand pump, 13 percent wells (both covered and uncovered) and 8.3 percent tube well/borehole as source of drinking water in India. As per analysis of data 35 per cent of Indian rural households have drinking water source within the premises while 36 per cent of households have to fetch water from a source located within 500 m in rural areas. Moreover 18 per cent of the total households in India still fetch drinking water from a source located more than 500 m away in rural areas. According to House listing and Housing Census, 2011, 63.6 per cent rural households of Haryana used tap, 14.2 per cent hand pumps, 4.5 per cent wells, 14.2 per cent tube wells/ boreholes and 3.5 percent used other sources of drinking water. Thus, tap (both treated and untreated) emerges out to be the most dominant source of drinking water in state of Haryana.

Objectives

The analysis of the availability of drinking water holds a great significance owing to their importance in our life. In Rohtak district, data analysis exhibits the wide regional disparities in access to drinking water and so its equal distribution is highly attentive field of study. The research work aims to meet the following objectives-

- i. The present research aims to assess the existing situation with respect to the availability of drinking water sources in the rural areas of Rohtak district.
- ii. The purpose of the study is to analyze the spatial disparities among villages in access to different water sources-Tap water, wells, hand pump, tube well/bore well and others.
- iii. The intention is to identify the deficit, surplus or normal water supply villages through holistic comparison for better planning of water resources in the district.

Database and Methodology

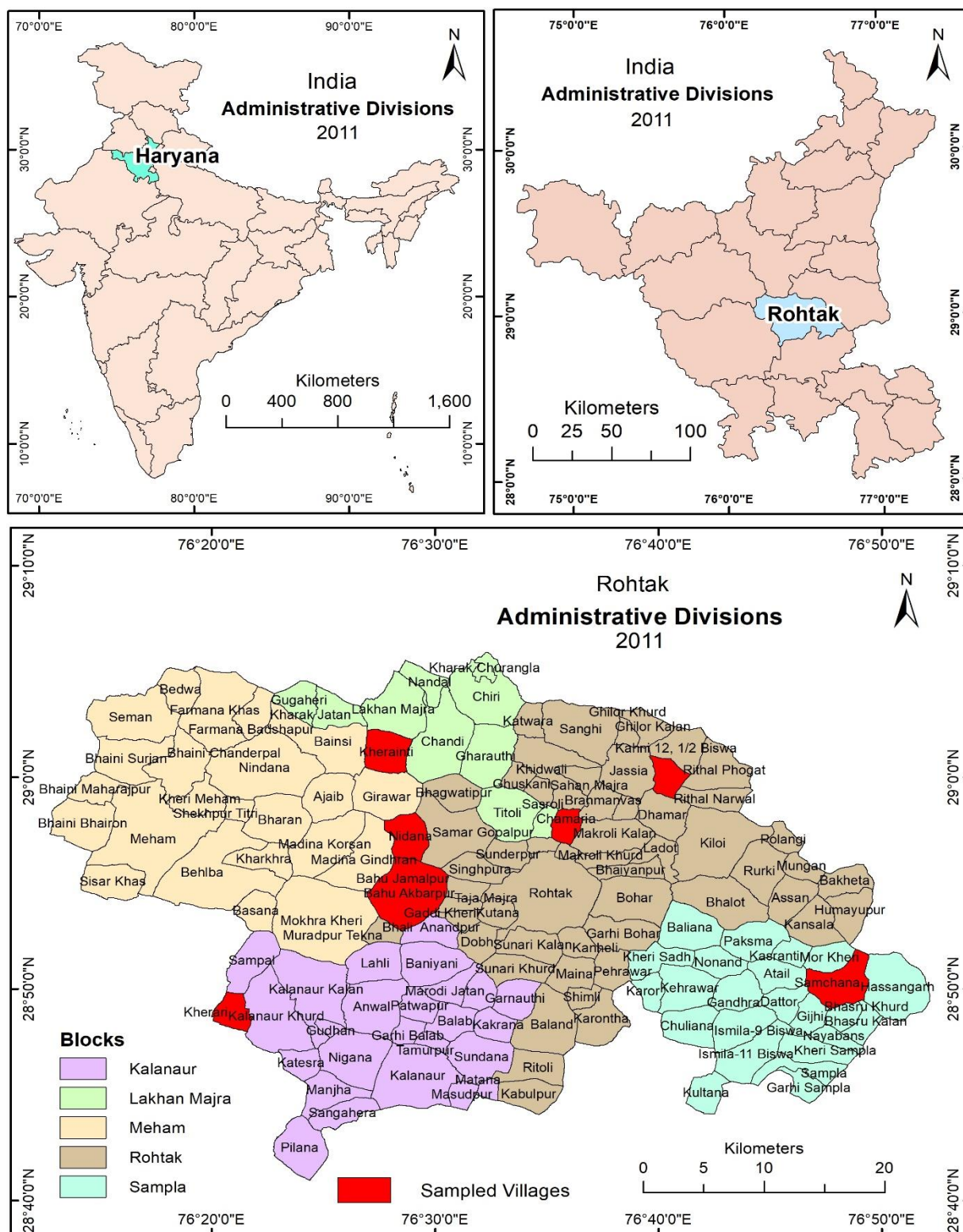
The approach adopted for the study is descriptive and analytical based on secondary sources of data that it seeks to analyze the disparities in the availability of water for drinking in rural areas of Rohtak district and identify the major problems and challenges. The Secondary data sources include-

- i. Census of India, research journals, newspapers, reports etc
- ii. The Tables on Houses, Household Amenities and Assets (Census of India, 2011) has been used to analyse the various sources of drinking water.
- iii. The available data has been tabulated, computed, evaluated and interpreted through map at village level.
- iv. Statistical techniques such as Mean, Standard Deviation, and Composite Index have been applied to calculate the Z score for finding spatial disparities.
- v. Based upon the Composite Index Score of the availability of different water sources the villages have been divided into three categories –Low, Medium and High.

Study Area

Rohtak is one of the oldest and strategically located districts of Haryana. It is located in the south-eastern part of Haryana state. The district lies between 28°40'46" N to 29°06'08" N latitudes and 76°12' 40" E to 76°52'00" E longitude. It spreads over geographical area of 1,745 square kilometers. Out of which about 94 percent area constitutes the rural part and just 6 per cent is urban. The district is oval shaped and compact (District Census Handbook (DCH), Census of Haryana, 2011). The district is divided into three sub-districts-Rohtak, Maham and Sampla. For the administrative convenience, the sub-districts have been further divided into five community development blocks-Rohtak, Maham, Lakhna Majra, Sampla and Kalanaur As per Census of India, 2011, there were 137 inhabited villages in Rohtak district (Fig.1).

Fig.1 Location of Study Area (Census of India, 2011).



The district lacks any perennial river and the artificial drain number 8 draining north to south. The main canals of the district are Jawaharlal Nehru feeder and Bhalaut sub branch. Rohtak, Kalanaur and Sampla blocks are supplied irrigation by sub-branch of Bhalaut, While Maham, Lakhan Majra and Kalanaur blocks by Bhiwani sub branch and

Kahnaur distributary. The topography of the district is saucer shaped which sometimes cause problem of flood in monsoon season. The quality of groundwater is generally alkaline and varies from fresh to saline in different areas.

Rohtak District-Status and Situation

While in earlier census of 1981, 1991 and 2001, there have been fewer categories of sources of water supply. The methodology of data collection and tabulation of various sources of drinking water has been varied in different censuses. Census 2011 onwards, data on drinking water is published under ten categories in Census of India, 2011 (Table 1) to make study convenient, some categories have been grouped and studied collectively. For example, tap from treated source and tap from untreated source have been clubbed and studied collectively. Similarly, well from covered sources and well from uncovered sources have been studied together. Hand-pump/ tube-well or borehole forms a separate category of drinking water source. As the remaining source of drinking water have very less usage and are therefore included under single category of “Other Sources”.

In India as a whole, hand pump/tube well was the major and dominant sources of drinking water in rural households while it was tap in Haryana (Census of India, 2011). Haryana is one of the foremost states providing piped water facility to all of its villages by 1992 (Statistical Abstract, Government of Haryana, 2010-11). The use of tap as a source of drinking water in rural households was 37.8 per cent in 2001 and increased to 63.6 percent in 2011. The data from last two censuses reveals that tap as a source of drinking water is growing at the cost of hand pump and well.

Table 1: Drinking Water Sources used in different Censuses (1981-2011)

Years	Sources of Drinking Water							
1981-1991	Tap	Well	Hand-pump/ Tube-well	River/ Canal	Tank		Others	
2001	Tap	Well	Hand-pump	Tube-well/ Borehole	River/ Canal	Tank/Pond/ Lake		Others
2011	Tap from treated source	Tap from untreated Source	Covered Well	Uncovered Well	Hand- pump	Tube well/ Bore hole	Tank/ Pond/ Lake	Others

Source: Census of India, 1981, 1991, 2001 & 2011

Table 2- Share of rural households of India, Haryana and Rohtak in different sources of drinking water

Sources	Percentage of Households					
	2011			2001		
	India	Haryana	Rohtak	India	Haryana	Rohtak
Tap Treated	17.8	47.4	50.8	24.3	37.8	17.1
Tap Untreated	13.0	16.3	13.3			
Handpump	43.6	14.2	17.6	43.2	35.7	33.9
Well Covered	1.5	0.9	1	22.2	16.5	48.4
Well Uncovered	11.8	3.6	7			
Tube well/Borehole	8.3	14.2	8.1	5.7	7.6	*
Others	4.0	3.5	2.3	4.5	2.41	0.7

As per the Tables on Houses, Household Amenities and Assets (Census of India, 2011), Rohtak has performed better than the state as well as national average in terms of availability of water resources for rural households particularly in the category of tap water (shown in fig.3). In figure 3, graph shows the availability of various sources of drinking water in rural, urban and the whole district of Rohtak (Census of India, 2011).

Fig.2

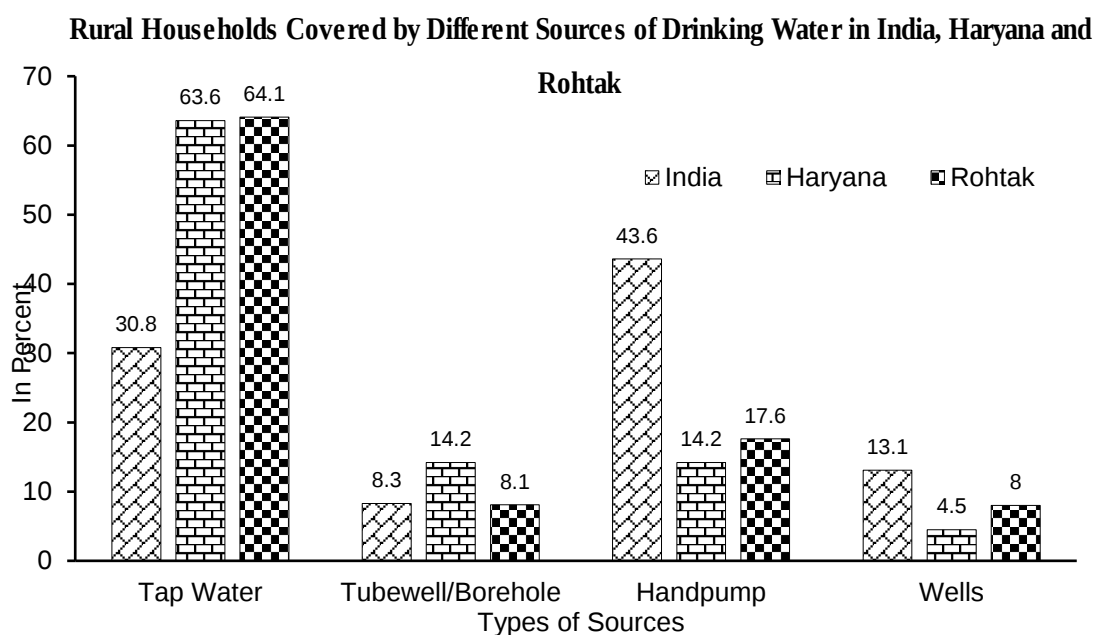
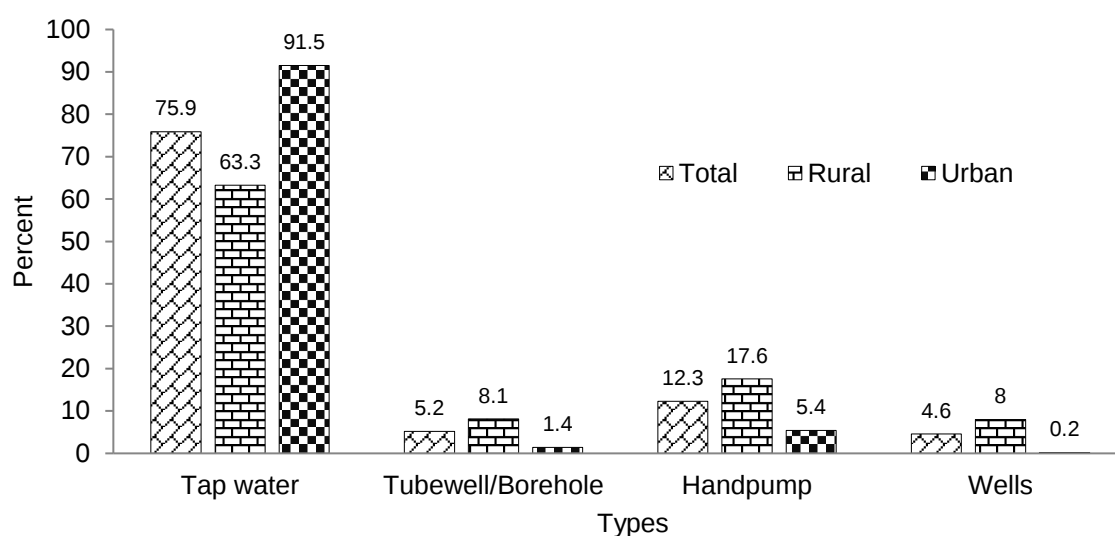


Fig.3 : Share of different Sources of Drinking Water in Rohtak District



Result and Discussion

Furthermore, in Rohtak the use of tap water has been prominent according to Census, 2011. Collectively tap water from treated and untreated sources serves 64 per cent of households. In contrast in 2001, tap water served only 17.1 per cent of households in the district. The main source of drinking water was well in 2011 in Rohtak which served 48.4 per cent of households. So, the trends have changed in the district in three ways. Firstly, the increase of tap water services in 2011 as compared to 2001 in Rohtak district. Secondly, decline in use of well between 2001 and 2011. Thirdly, the use of handpump has declined from 33.9 per cent households dependent in 2001 to only 17.6 per cent households in 2011. Basically, the changes have shown the shift towards safer source of drinking water. Handpump in the region are now found to give more saline water and drinking water through open source like well has always been a primary health concern for the residents. Tap water has now given an opportunity to have access to clean and safe drinking water which is greatly

Using the composite index method, Z score was calculated for 5 sources of water-Tap Water (treated and untreated), Hand pump, Tube well/borehole, Wells and Other sources. Using the highest (1.86) and lowest (0.86) Z Score, all the villages of district have been divided into 3 categories of drinking water availability-Low, Medium and High. Village Sanga Hera of Rohtak sub-district obtained the highest score while village Jasia from the same sub district scored the lowest in the composite index. Out of total 141 villages, 89 villages have found place in low category, 43 in medium and 9 villages in high category of drinking water availability. No village from Sampla sub-district found place in High category demanding the urgent attention from planners. Villages -Kherainti, Bhaini Bharon, Sisar Khas, Nigana, Gudhan, Simli, Bohar(Rural), Kiloi Khas etc. have low Z score .i.e. less than 0.40 indicating less water availability for rural households. While the villages- Ajaib, Sunari Khurd, Sunderpur, Nandal, Sahan Majra, Kahni 7 ½ Biswa and Sanga Hera scored the higher among villages.

Conclusion

The villages of Rohtak district show a wide disparity in the availability of drinking water sources water ranging the Z Score from 0.18 to 1.86 and the disparities is visible even among the sources of drinking water themselves. Tap water from treated source is considered as the most reliable, safest and the easiest source of drinking water. Out of total 143 villages, village Kistranti has the highest number of households (99.2 percent) while four villages- Sanga Hera, Taimurpur, Sahan majra and Kahni 7 ½ Biswa have no households under tap water from treated source of drinking. The study has also revealed that, though the villages - Ajaib, Sunari Khurd, Sunderpur, Nandal, Sahan Majra, Kahni 7 ½ Biswa and Sanga Hera scored the higher in drinking water availability but these are lagging behind in access to tap water. Finally, it can be concluded that the use of tap as a source of drinking water is increasing with time but at the same time tube well/borehole is also growing. So, the government should focus to cover the households with tap or piped water facility based on canal water. The special focus should be on villages Sanga Hera, Taimurpur, Bedwa, Jasia, Kherainti, Bhaini Bharon, Sisar Khas, Nigana, Gudhan, Simli etc.

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