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Availability of Drinking Water and Sanitation Facilities in Haryana (2011): A Spatial Analysis

Miss. Sonika*

Research Scholar, Department of Geography, M.D. University, Rohtak, Haryana

Abstract – Drinking water and sanitation is the basic necessity of a community. It plays a vital role in improving health and quality of life. Adequate water is basic need of our life. Sanitation is the hygienic mean of promoting health through prevention of human contact with the hazard of wastes. Hazards can be physical, microbiological and chemical agents of diseases. Hygienic means of prevention can be by using engineering solution, simple technologies or even by personal hygiene practices. Without proper hygiene and contaminated water cause diarrhoea, cholera and other human killer diseases. According to the Census of India 2011, 833 million people (69.84%) are still living in the villages and data also shows that still around 70% of India's rural or slum population are exposed to water-borne and vector -borne diseases due to lack of basic sanitation facility, unsafe water and unhygienic condition. The condition of drinking water and sanitation facilities in Haryana is good comparatively other states. . For study of better condition we take only good household amenities like drinking water within premises, bathroom with roof, closed drainage and flush latrine availability. The analysis further reveals that there are two districts which are more deprived. These are like Mewat(-9.55) and Mahendragarh(-4.84). It does not mean that their drinking water and sanitation facilities have been decreased but they have slow pace of development as compared to the other districts. Gurgram(6.72) district enjoyed the first rank as followed by Panchkula(4.50) and Faridabad(4.24) stand respectively second and third.

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INTRODUCTION

Drinking water and sanitation is the basic necessity of a community. It plays a vital role in improving health and quality of life. Adequate water is basic need of our life. Sanitation is the hygienic mean of promoting health through prevention of human contact with the hazard of wastes. Hazards can be physical, microbiological and chemical agents of diseases. Hygienic means of prevention can be by using engineering solution, simple technologies or even by personal hygiene practices. Without proper hygiene and contaminated water cause diarrhoea, cholera and other human killer diseases. According to the Census of India 2011, 833 million people (69.84%) are still living in the villages and data also shows that still around 70% of India's rural or slum population are exposed to water-borne and vector -borne diseases due to lack of basic sanitation facility, unsafe water and unhygienic condition. In June 2012 Minister of Rural Development Jairam Naresh stated India is the world larges 'open air toilet'. He also remarked that Pakistan, Bangladesh and Afghanistan have better sanitation records.

Water supply and sanitation were added to the national agenda in the first five year planning period 1951-56. . Rural sanitation came into focus in the government of India in 1980's. The central sanitation programme was started in1986 to provide sanitation facility in rural areas. The provision of clean drinking water has been given priority in the constitution of India; with article 47 conferring the duty of providing clean drinking water and improving public health standards to the state.

Improved sanitation also means of dignity and safety especially for women. In many cultures, the only time available for women and girl to defecate, if they did not have a latrine within the dwelling, is after sunset and long waits can also cause serious illness among the women.

The availability of drinking water and sanitation facilities in Haryana is good comparatively other states. Availability of these facilities reflect the quality of life of the people. So the present study will focus on the district wise analysis of these facilities. The present study reveals status of such amenities such as main drinking water source, type of drainage, bathroom facility and latrine facilities in Haryana State in 2011. For study of better condition we take only good household amenities like drinking water within premises, bathroom with roof, closed drainage and flush latrine availability.

OBJECTIVES

- To study the spatial variation in availability to drinking water in Haryana.
- To study the spatial variation in availability to sanitation in Haryana.

Study Area

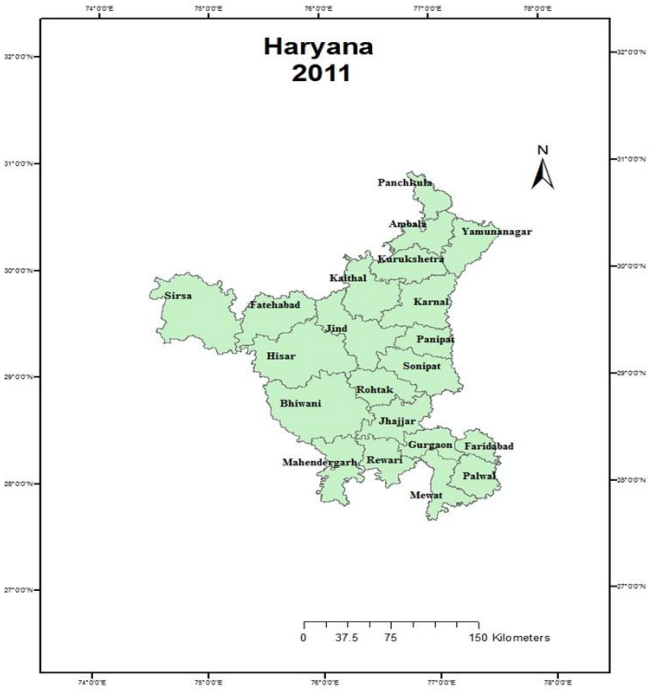


Figure: 1. Map of Study Area

Haryana is a state in northern India surrounded by Punjab, Uttar Pradesh, Himachal Pradesh, Delhi and Rajasthan. It lies between 27'37 to 30'35N latitudes and between 74`28 to 77'36 E longitudes. The state covers a geographical area of 44212 sq. kms. with population of 25,353,081 persons as per 2011 Census of India. Literacy rate of Haryana is 75.55 percent and sex ratio is 940. Despite the significant industrial development during the recent past, the economy of Haryana primarily based on agriculture. There are 21 districts in Haryana in 2011 as against 11 in 1975-76 .Haryana is primarily an alluvial plain. Soils constitute its major natural resource and agriculture is its main-stay. Besides, it shares the Shivalik foothills in the north and Aravalli hills in the south. Chandigarh is the administrative capital of Haryana.

DATABASE AND METHODOLOGY

The study is based data obtained from Households-Series Tables, Census of India 2011. In the study, Choropleth are used to show the availability in district wise facilities of drinking water, bathroom, drainage and toilets. Z-scores calculated by = x-x/sd. A composite score across based on 'z- score' has also been used. Composite index = sum of the z-scores of all selected indicators districts wise. For the analysis, Choropleth maps have been prepared with the help of Arc GIS9.3.

Selected indicators

- Drinking Water facility = Within premises.
- Bathroom facility = Bathroom with roof.
- Drainage facility = Closed drainage.
- Toilet facility = flush toilet.

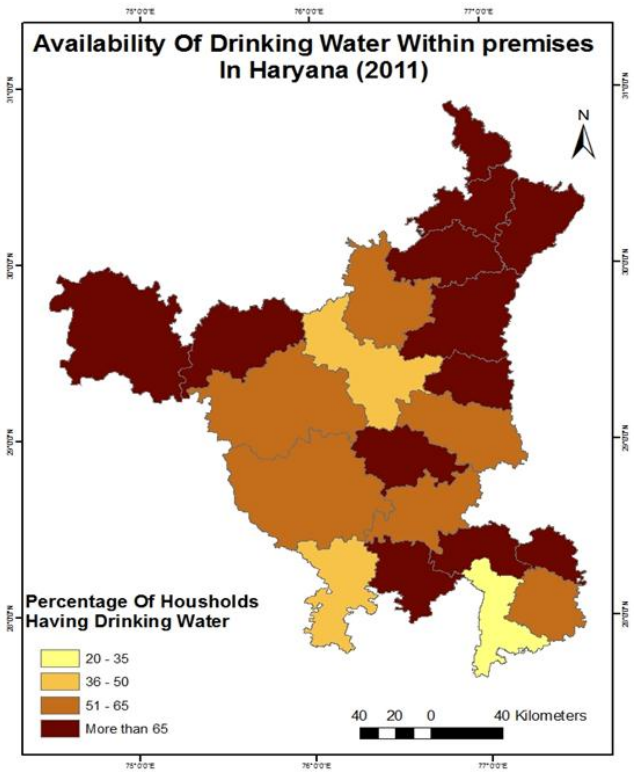
Table 1.Availability of Drinking Water and Sanitation Facilities in Haryana (2011)

Districts	Drinking Water Within Premises	Bathroom With Roof	Closed Drainage	Flush Latrine
Punchkula	74.56	78.06	44.58	64.51
Ambala	84.28	75.37	16.76	63.07
Yamunanagar	83.27	65.57	17.18	48.92
Kurukshetra	80.36	72.63	19.64	57.64
Kaithal	57.14	63.24	12.3	33.41
Karnal	79.11	69.68	20.45	54.89
Panipat	67.55	75.41	19.28	66.97
Sonipat	63.47	72.24	21.3	58.92
Jind	48.97	63.63	13.64	39.37
Fatehabad	69.79	62.71	14.13	21.92
Sirsa	81.82	64.66	22.44	32.01
Hisar	59.88	71.75	22.04	45.07
Bhiwani	53.23	64.87	11.89	39.98
Rohtak	67.4	77.25	29.73	63.37
Jhajjar	62.2	72.7	12.5	57.78
Mahendergarh	47.69	49.7	5.87	30.47
Riwari	67.82	64.65	12.4	42.99
Gurgram	80.24	83.5	54.13	74.67
Mewat	23.41	25.92	2.29	16.46
Faridabad	71.85	79.52	37.57	70.71
Palwal	56.92	45.98	6.36	38.84
Haryana	66.12	68.64	21.48	50.42

Source: Census of India 2011.

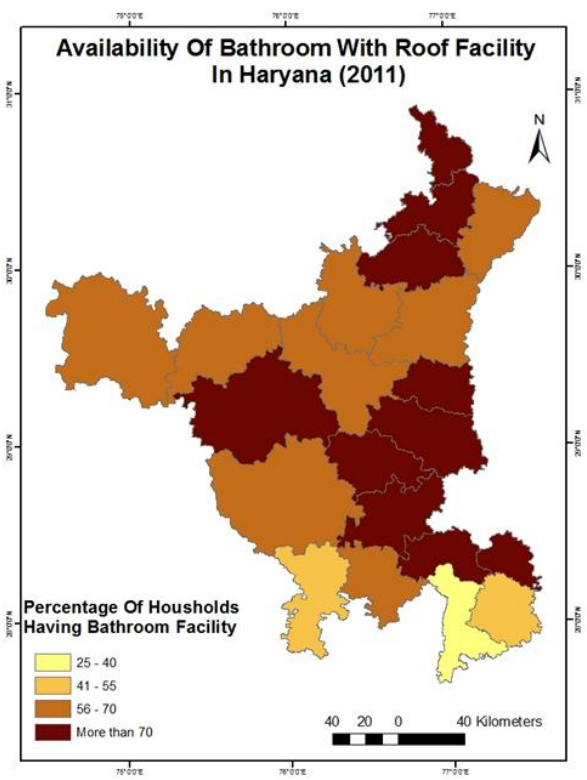
AVAILABILITY OF DRINKING WATER WITHIN PREMISES

In this map, Punchkula, Ambala, Kurukshetra, Yamunanagar, Sirsa, Karnal, Panipat, Rohtak, Rewari, Gurugram, Faridabad show very good condition with regard drinking water facility and in these districts availability of drinking water is very good in Ambala (84.23%) Yamunanagar (83%), Gurugram (80%). From the southern Haryana, Mahendergarh, Mewat are in poor condition with the regard of availability of drinking water and Mewat shows the most deprived district because only 23% households have drinking water within premises.



Source: Census of India, 2011.

Figure: 2 Drinking Water within Premises in Haryana.



Source: Census of India, 2011.

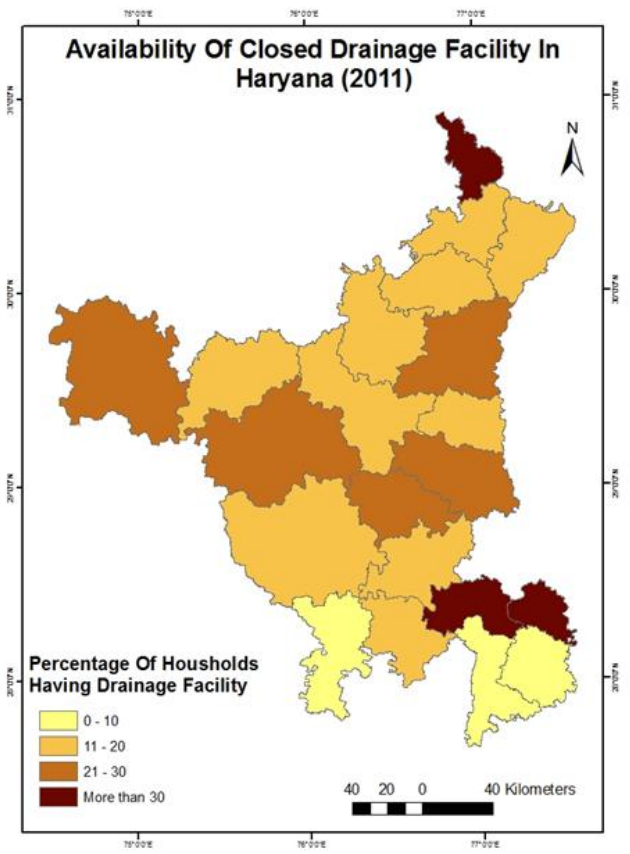
Figure: 3 Bathroom with Roof Facility in Haryana.

AVAILABILITY OF BATHROOM FACILITY WITH ROOF

In this map, Punchkula, Ambala, Kurukshetra, Hisar, Panipat, Sonipat, Rohtak, Jhajjar, Gurugram and Faridabad show the good condition of bathroom with roof facility. In these districts, Gurugram has highest percentage in availability of bathroom with roof facility. We found that with the regard of bathroom facility, Mahendergarh, Palwal and Mewat from the southern part of Haryana are most deprived and in Mewat only 25% households have bathroom with roof facility.

AVAILABILITY OF CLOSED DRAINAGE FACILITY

Closed drainage is a safest type from the hygienic point of view. In closed drainage facility, Gurugram has first rank in all districts. This map clearly shows geographical pattern of availability of closed drainage facility in districts Haryana. Punchkula, Faridabad and Gurugram show good condition whereas Sirsa, Hisar, Rohtak, Sonipat and Karnal show the average condition. But in southern districts of Haryana Mahendergarh, Mewat and Palwal, drainage condition is very pathetic.



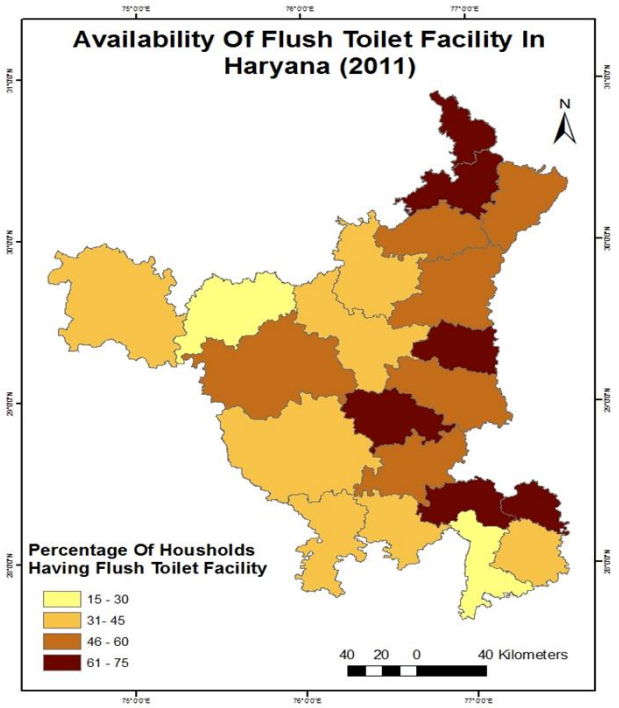
Source: Census of India, 2011.

Figure: 4 Drainage Facility in Haryana.

AVAILABILITY OF FLUSH TOILETS FACILITY

Toilet Facility is one of the very essential components of the sanitation. Sanitation is an integral component of public hygiene and health. It contributes to clean and improved environment, social development and generates significant economic benefits. The problem is not only economic but of human dignity as well. With this felt need of sanitation in general and latrine facility in particular the government of India launched a total sanitation campaign in 1999 as a demand-driven, community-led programme to make sanitation coverage universal. India's performance on this front continues to be poor and raises a serious concern for the country.

Flush toilet is good from hygienic point of view. In this map, availability of flush toilet facility is good in Punchkula, Ambala, Panipat, Rohtak, Gurgoan and Faridabad. Gurugram has first rank in flush toilet facility because 74 % households have flush toilets whereas Yamunanagar, Kurukshetra, Rohtak, Sonipat, Hisar and Jhajjar have average condition. But from the Easter Haryana, Fatehabad and from the southern part, Mewat show the very poor condition only 16% households have flush toilet facility.



Source: Census of India, 2011.

Figure: 5 Flush Toilet Facility.

Composite Score of All of Selected Water and Sanitation Facilities in Haryana

Districts	Total Composite Score
Punchkula	**4.50**
Ambala	**2.62**
Yamunanagar	**0.93**
Kurukshetra	**2.03**
Kaithal	**-2.42**
Karnal	**1.60**
Panipat	**1.91**
Sonipat	**1.04**
Jind	**-2.47**
Fatehabad	**-2.16**
Sirsa	**0.12**
Hisar	**-0.05**

Miss. Sonika*

Bhiwani	**-2.2**
Rohtak	**2.67**
Jhajjar	**0.21**
Mahendergarh	**-4.84**
Riwari	**-0.97**
Gurugram	**6.72**
Mewat	**-9.55**
Faridabad	**4.24**
Palwal	**-3.93**

Source: Census of India 2011.

First of all absolute values of households changed into percentage after that the formula of z-score applied that is x-x/S.D. Then the selected indicators that is drinking water within premises, bathroom with roof, closed drainage and flush toilet facilities calculated with the help of z-score formula and after that composite score of all indicators calculated that is a sum of all four selected indicators.

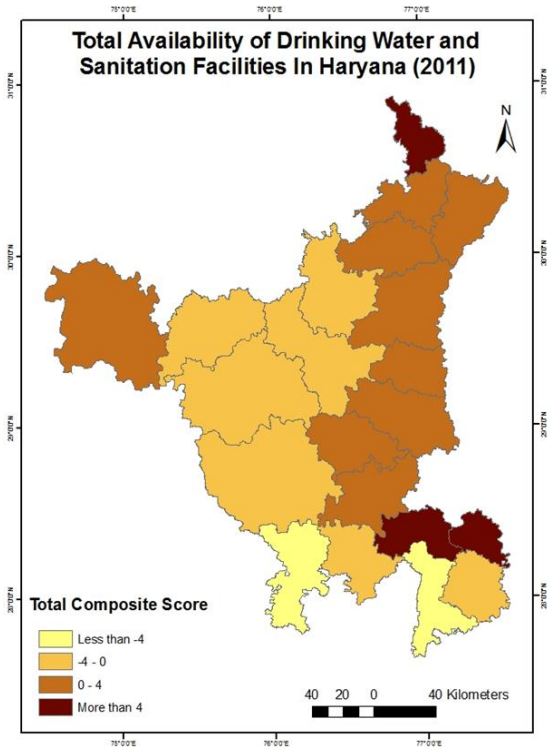


Figure: 5 Drinking Water and Sanitation Facilities Haryana.

Above map that is a total composite score based map of all four selected indicators that is drinking water within premises, bathroom with roof, closed drainage and flush toilet facility, it is categories in four categories that is less than (-4),(-4 to 0), (0 to 4) and above 4. Figure 5 exhibits that Punchkula, Gurugram and Faridabad has good condition in all four selected indicators. All these districts are lies in north and north-eastern part of the state whereas Ambala, Kurukshetra, Yamunanaga, Karnal, Panipat, Sonipat Rohtak, Jhajjar and Sirsa have average condition. There are seven districts like Jind, Fatehabad, Kaithal, Hisar, Bhiwani, Rewari and Palwal have not good condition in these facilities and from the southern part of state, there is two districts that is, Mahendergarh and Mewat shows very worst condition.

CONCLUSION

Overall availability of drinking water and sanitation facilities is good in all districts of Haryana state. The analysis further reveals that there are two districts which are more deprived. These are like Mewat(-9.55) and Mahendragarh(-4.84). It does not mean that their drinking water and sanitation facilities have been decreased but they have slow pace of development as compared to the other districts. Gurgram(6.72) district enjoyed the first rank as followed by Panchkula(4.50) and Faridabad(4.24) stand respectively second and third. Some districts like Gurugram, Panchkula, Faridabad, Ambala, Kurukshetra, Panipat, Rohtak have better drinking water and sanitation facilities it may be possible because the development of these districts are due to near of Country Capital along with eastern part and two districts locate along with State capital from northern part of the state. But the situation is still disappointing in case of Mewat and Mahendergarh districts because despite of development, these are more deprived are more deprived. It is also noted that these districts locate in southern part of the state. It may be caused by dominance of sandy soil and less development industrial development in south western and western part as compare to other districts

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Corresponding Author

Miss. Sonika*

Research Scholar, Department of Geography, M.D. University, Rohtak, Haryana

E-Mail – ddhakwal@yahoo.com