



## A STUDY OF DRINKING WATER IN RURAL HARYANA

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### INTRODUCTION

Life on earth depends on water. It is possible to live a month without food, but living without drinking water even for a few days is certainly life threatening. Hence water is one of the basic needs of life. Gleick (1993) revealed that 70 per cent of the human body is water and one becomes very thirsty with the loss of about one per cent of one's body fluids. Death is inevitable if the loss exceeds 10 per cent of the total fluid. It is well known that occurrence of a high proportion of diseases and deaths across the world are associated with unsafe drinking water. Therefore, availability of potable or safe drinking water is an important element in the improvement of health and nutritional status.

At the international level the coverage of rural population by piped water supply was 33 per cent whereas it was 16 per cent only in India (WHO & UNICEF, 2015). In nut shell, 97 million people in India do not have improved drinking water facility (WHO & UNICEF, 2013). Availability of fresh water in India is perpetually decreasing.

According to National Institute of Hydrology (NIH, 2010) per capita water availability in India has reached as minimal as 1170 cubic metres per capita per year. A region where fresh water availability is between 1000 to 1700 cubic metres per capita per year is called water stress region, and one where it falls below 1000 cubic metres per capita per year experiences chronic water scarcity (Kumar et al., 2008). The problem of providing safe drinking water is acute particularly in rural India. According to the Census of India 2011,

only 35 per cent of rural households in India have an access to drinking water sources within the premises.

### **Study Area**

The state of Haryana came into existence on November 1, 1966. It was carved out from the composite territories of Punjab. Haryana is located in the northwestern part of the India. The state extends from 27°39' to 35°55' North latitude and 74°28' to 77°36' East longitude . It is bordered by Punjab and Himachal Pradesh to the north and Rajasthan to the west and south. The river Yamuna defines its eastern border with Uttar Pradesh. In area, Haryana is the 21st largest state of India, with a area of 44212 km<sup>2</sup> Haryana covers 1.34 per cent of the country. The state covered 253 million persons as per 2011 census and had 2.09 per cent of the India's total population. In size of population Haryana had 18th rank. Out of total population 165 million and 88 million persons live in rural and urban sectors respectively. The 65.21 per cent of Haryana's population lives in rural areas. The density of population of Haryana is 573 persons per km<sup>2</sup> more than national average of 382 persons per km<sup>2</sup>.

Geographically, the state of Haryana can be divided into four physical divisions:

- (a) Ambala Plain or Sub Mountain Belt
- (b) Western Haryana
- (c) Eastern Haryana
- (d) Southern Haryana.

### **Research Methodology**

Secondary data on availability, and accessibility of drinking water sources was collected from Census of India, 1981, 1991, 2001, 2011, from H series tables on Houses, Households Amenities and Assets. The data related to various state and central programmes, various institutions related to drinking water, and financial aspects was collected from Public Health and Engineering Department, Haryana; and Ministry of Drinking Water and Sanitation, Government of India (GoI), Planning Department, Government of Haryana and Planning Commission, GoI. The data related to coverage of villages by piped water supply was collected from Department of Economic Statistical Analysis, Haryana; the data related to development of groundwater was collected from Central Ground Water Board, Ministry of Water Resources, GoI. In addition to this, data was also collected from other published and unpublished sources of drinking water such as various reports and Ph D thesis submitted in various departments. The analysis of the data was done for all the census decades (1981,

1991, 2001 and 2011) at district level. Further the block level data for 2011 was generated by compiling the village level data. The spatial unit for monitoring and regulating drinking water in the state range from circle, division, sub-division, section and village. The first ever attempt to prepare a circle and division state level map was done in this thesis. The primary was conducted with the help of (i) household schedule and (ii) village schedule. The sample size for the survey was one per cent of the total 6642 inhabited villages of Haryana. Further one per cent of the total villages in each district were selected using simple random technique. From the selected villages the sample villages the sample size of the total households was defined as one per cent. The one per cent households from each village was identified by using purposive sampling while ensuring proportionate representation of scheduled caste households.

### **Drinking Water in the World**

In the developed countries, it is not a problem of water scarcity but there, people have to face the problem of water pollution. In 1972, the UN conference on environmental issues was held in Stockholm. It created awareness about the problems related to water scarcity. In 1976, the UN conference on the human settlement was held in Vancouver, Canada. On the basis of the laid emphasis and the recommendations made by the conference, the UN conference held at Mar del Plata Conference, Argentina in 1977 focused exclusively on drinking water and sanitation, which is dire need of the poor and the vulnerable populace (Reddy, 1999). This resulted in the designation of the period from 1981 to 1990 as the International Drinking Water Supply and Sanitation Decade (IDWSSD). International conference on drinking water and environment (Dublin, 1993) observed that water has an economic value in all its multiple uses and should be recognised as an economic good. The general assembly of United Nations (1993) has declared 22nd March as the World Water Day. Since 1997, every third year, World Water Council has been organising World Water Forum to enhance the awareness, improve access to the water supply and to draw greater media attention towards water related issues etc. (Iyer, 2005). In the year 2000, the United Nations and the international water community announced explicit goals, the Millennium Development Goals (MDGs) for human development for the period 1990-2015.

More than 3.4 million people die each year and the causes can be attributed to the shortage of drinking water, poor sanitation, and lack of general hygiene (Prüss-Üstün et al. 2008). Surveys from 45 developing countries explain that women and children bear the primary responsibility of collecting drinking water in the majority (76 per cent) of households (WHO

& UNICEF, 2010). The 443 million school days are lost each year due to water-related diseases (Human Development Report, 2006). Around 1.5 million deaths each year, nearly one in five, are caused by diarrhoea. In developing countries diarrhoea is the next to pneumonia and is the second largest reason for child mortality. It is responsible for killing more children than the combined deaths caused by malaria, AIDs and measles (UNICEF/WHO, 2009).

The United Nations set 17 Sustainable Development Goals officially known as Transforming our World: The 2030 Agenda for Sustainable Development. The sixth sustainable development goal is not only to address the issues pertaining to drinking water, sanitation and hygiene, but also to improve and maintain quality and sustainability of water resources worldwide.

### **Drinking Water in India**

In India, 52 cubic meters per capita domestic water is used per year which is less than that of Egypt, France, and the USA where 77, 106 and 215 cubic meters per capita per year is used respectively (United Nations, 2006). To protect the entitlement of the people, the central and state governments have been making commendable efforts during the past six decades in this field. In India, the chief sources of drinking water are handpumps, taps, wells and tubewells. The piped water is supposed to be the most safest, reliable and easiest source of drinking water in India (Sharma, 2008) but 80 per cent people in India use groundwater for their domestic needs (Cullet, 2014). Due to the excessive withdrawal of groundwater, the level of groundwater table is continuously decreasing. The lowering of the water table is a serious matter and cause for concern in the context of drinking water. It is also causing salinity and water quality problems that make the water non-potable. There are only 12 per cent rural families that have individual household tap connections and only 16 per cent of the total rural population gets drinking water from public taps in India (Tewari, 2010).

### **Development of Drinking Water in Rural India**

In the pre-independence period, drinking water in the rural area was primarily in the hands of communities themselves. The Bhore Committee (1944) recommended drinking water as the main requisite for healthy life. In 1972, the Government of India took first major initiative and introduced Accelerated Rural Water Supply Programme (ARWSP) to accelerate the coverage of drinking water supply in rural areas. In 1986, National Technology Mission (National Drinking Water Mission) was launched by the Government of India with stress on water quality, appropriate technology intervention, and human resource development. The

National Drinking Water Mission was renamed as Rajiv Gandhi Drinking Water Mission. In 1992, The 73rd Constitutional Amendment assigned the responsibility of providing drinking water to Panchayati Raj Institutions (PRIs). In 1999, the Government of India set up Department of Drinking Water Supply in the Ministry of Rural Development. In same the year, the Government of India also introduced Sector Reform Project with the aim of encouraging community participation in drinking water sector in 2002, it was scaled up as Swajaldhara. Up to Eleventh Five Year Plan, the Government of India invested more than 70 thousand crore Rupees on drinking water sector while the state expenditure was more than 80 thousand crore.

The National Rural Drinking Water Programme (NRDWP) was launched on 1st April 2009 by modifying the earlier Accelerated Rural Water Supply Programme and subsuming earlier sub Missions, Miscellaneous Schemes and mainstreaming Swajaldhara principles. The Department of Drinking Water and Sanitation was upgraded as a separate Ministry of Drinking Water and Sanitation, in 2011. The Ministry of Drinking Water and Sanitation is the nodal Ministry for the overall policy, planning, funding and coordination of programmes of drinking water and sanitation in the country.

In 70 years of the political independence, India has not been able to ensure safe drinking water for all its citizens. The major areas of concern as per rural drinking water are its adequacy and quality. In India, 92 per cent fresh water is used in agriculture, three per cent used in industry and only five per cent is available for domestic purposes like drinking water and sanitation (Khan, 2009). According to World Water Development Report (2003), Water for People, Water for Life India ranked 120th among 122 countries in drinking water quality and ranked 133rd among 180 countries from water availability point of view (Gautam, 2009). In 69th round survey, National Sample Survey Organisation (NSSO) data revealed that 54 per cent of rural households in India did not have drinking water facility within their premises (Government of India, 2013c). Only 32 per cent of rural households in India use various methods of water treatment and one-fourth of the total households did not have daily water supply.

In 2005, the Government of India launched Bharat Nirman Programme for overall development of the rural area and drinking water was one of the six components of the programme. The target of the programme was to provide drinking water to uncovered (in term of distance, quality, and quantity of drinking water) and slipped back habitation based on National Habitation Survey 2003, within five years.

## **Development of Drinking Water in Haryana**

Haryana was one of the foremost states of India to provide at least one safe source of drinking water to all the villages by 1992. After that, the focus had been shifted to augment/strengthen the drinking water supply infrastructure in the villages. The Government of Haryana has started and successfully running some schemes to augment/strengthen the drinking water infrastructure in rural areas (Government of Haryana, n.d.).

**Augmentation Water Supply Scheme:** Under this scheme, the existing drinking water facilities are to be improved/strengthened in the villages to increase the quantity of water supply to 55/70 LPCD. Before the Augmentation Water Supply Scheme, the norms of the government about the drinking water supply were 40 LPCD under minimum needs programme. But in nineties, the Government of Haryana introduced this scheme to augment the water supply in the rural areas of the state and the norms of drinking water were increased to 55 LPCD for Non-DDP and 70 LPCD for DDP areas.

**NABARD Aided Schemes:** In order to accelerate the implementation of Augmentation Water Supply Schemes, the state has been seeking assistance of NABARD (National Bank for Agriculture and Rural Development) since 2000-01 under various tranches. Under NABARD schemes the money can only be spent on the implementation of AWS schemes and the money of the scheme can't be used for purchasing land for water works etc.

**Schemes Financed by National Capital Region Planning Board (NCRPB):** In Mewat area, to provide a safe and sustainable source of drinking water to the people, the Rajiv Gandhi Augmentation Drinking Water Project was approved by National Capital Region (NCR) Planning Board in 2004.

**Indira Gandhi Drinking Water Scheme:** To provide individual water connection of drinking water free of cost to SC households, Government of Haryana launched Indira Gandhi Drinking Water Scheme on 19th November 2006, on 87th birth anniversary of late Smt. Indira Gandhi. Under this scheme, a concession of 50 per cent of the monthly water tariff had been extended to SC households. The scheme aimed at providing free water connection including a free water tank of 200 liters, construction of a three foot wide cemented platform to each of SC households in rural as well as the urban areas of the state. The total cost would be Rs. 4000 per households approximately. Now the scheme is running under the name of SCSP (Special Component Sub Plan).

**Independent Feeders:** The government also released money for the installation of independent feeders. Independent feeders were installed to solve the problem of erratic power supply to provide drinking water supply facilities as per the designed norms.

### **Availability of Drinking Water**

There are various sources of drinking water used in the rural Haryana. For the convenience of the study, the sources of drinking water are categorized into tap, handpump/tubewell, well and other sources. Tap contained both treated and untreated, handpump/tubewell also contained handpump, tubewell, and borehole, well contained covered and uncovered both and other sources have contained camper and tanker etc. By survey data, it was revealed that tap was the major and dominant source of drinking water in all the surveyed households which covered by 53.5 per cent of the total surveyed households. The data on drinking water provided by census of India at household level for 1981, 1991, 2001 and 2011. The methodology on data collection and tabulation varied in different censuses. The data for 1981 and 1991 were classified into six sources of drinking water: (i) well, (ii) tap, (iii) handpump/tubewell, (iv) river/canal, (v) tank and (vi) others. In 2001, all sources of drinking water mentioned in 1981 and 1991 were retained except handpump/tubewell and tank. The handpump/tubewell data was bifurcated in two categories: i) handpump and ii) tubewell/borehole. The borehole as a source of drinking water was added with tubewell. Further spring as a source of drinking water was also added as a separate source. The data on tank included pond and lake as a source of

### **Tap**

Though 81.9 per cent of the total surveyed households have tap water facility available within their household premises, but only 53.5 per cent household use tap as source of drinking water. It ranged from a high of cent per cent households in 13 villages of Basawal (Panchkula), Badhaur (Panchkula), Nagal (Ambala), Bara (Ambala), Bazeedpur (Ambala), Rattangarh (Yamunanagar), Mand Kheri (Yamunanagar), Keherba (Karnal), Badalgarh (Fatehabad), Dariyawala (Sirsa), Bhandor Nichi (Mahendragarh), Khampura (Mahendragarh) and Rojhaka (Rewari) villages to a low of nil in ten villages of Sunarian (Kurukshetra), Nagla (Panipat), Sihakhera (Sonipat), Mangalpur (Jind), Badh Jethu (Rewari), Pawti (Rewari), Siraska (Gurgaon), Maindla (Mewat), Kherla Kalan (Mewat) and Sumahra (Mewat). In surveyed households, 81.9 per cent had tap water facility but the use of tap as a source of drinking water was just 53.3 per cent, depict a gap of 28.3 per cent households.

Tap water, have been classified into three categories:

- (a) High (Villages where 75.0 per cent or more rural households use tap water)
- (b) Moderate (Villages where between 50.0 to 75.0 per cent rural households use tap water)
- (c) Low (Villages where less than 50 per cent rural households use tap water)

### **Handpump/Tubewell**

Handpump/tubewell was the second major source of drinking water in surveyed villages. In all, 36.1 per cent of the total surveyed households used it. All surveyed households in six villages of Sunarian (Kurukshetra), Nagla (Panipat), Sihakhera (Sonipat), Pawti (Rewari), Siraska (Gurgaon) and Maindla (Mewat) were using handpump/tubewell as a source of drinking water. On the other hand, in 20 villages handpump/tubewell was not used by even single surveyed household. The use of handpump/tubewell in surveyed villages can be categorised into four categories:

- (l) High (used by more than 75 per cent households)
- (m) Moderate (used by 50.01 to 75.0 per cent households)
- (n) Low (used by 25.01 to 50.0 per cent households)
- (o) Very Low (used by 25 per cent or less households)

### **Well**

Well was the third major source of drinking water after tap and handpump/tubewell in the surveyed households. An average 5.1 per cent surveyed households used well as a source of drinking water. Out of the total 67 villages, well was used only in nine villages.

### **Other Sources**

Other sources which were used in surveyed households included tanker and camper. The total share of both sources was 5.3 per cent in all the surveyed households. In 14 of the total 67 surveyed villages, other sources were used for drinking purpose, out of total 117 households in these villages, 24 households or 20.5 per cent households used other sources of drinking water.

### **Conclusion**

Tap and handpump/tubewell used by more than half or 53.5 per cent and one-third (36.1 per cent) households respectively were the major sources of drinking water in surveyed households. At state level 36.1 per cent of the total households used handpump/tubewell as a source of drinking water. The share of Non-SC households (37.6 per cent) was more than the SC households (28.9 per cent) and the share of BPL households was also lower than the Non-BPL households. From accessibility point of view, 67.7 per cent of surveyed households had drinking water within premises. In thirty villages, all surveyed households had drinking water



facility within their premises. The irregular supply of tap water was the main problem in the areas where tap water supply was canal water based. The villages from northern and eastern Haryana faced wastage of groundwater as a main problem. The illegal tap connection, insufficient water supply, finance cluches, electricity problem and castes discrimination are other problems of drinking water faced in ten of the surveyed villages.

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