

## Prospects and Challenges, Water Supply in Urban Jharkhand: A Review

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### ABSTRACT

Increasing population and climatic variation driven by climate change has led to water scarcity across India. As cited in United Nations Environmental programme 2002, by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity about two-third of the population, mainly in India will face moderately to high water stress and half of the population will face problem due to water scarcity. Ongoing mismanagement of resources and wasteful behaviour in India has led to the overexploitation of water resources, particularly groundwater. A large part of India fall under the category of physical water scarcity where availability of natural water resources is not enough to ensure the future water needs hence they need to increase their efficiency of water use and wisely maintain their available water resources. The concentration of water related problems will be more in urban settlements where quantity of available water reducing day by day. The potable water as a commodity is highly delicate and vulnerable to pollution and contamination. As such it has to be handled with a high degree of care. This paper focuses on issues and challenges associated with urban water requirements and suggest pragmatic solutions and policy measures to ensure clean, continual and convenient access to drinking water supply to all the residents of urban settlements.

**Keywords:** Potable water, Water stress, urban Settlement, pragmatic solution

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### INTRODUCTION

Most of the urban town is facing the problem of fresh water scarcity mainly due to increasing population and climatic variation in rainfall is driven by climate change. In Jharkhand, fresh water for personal and domestic uses is not mentioned explicitly in Indian constitution but clean and affordable water is essential to life and one of the fundamental human rights protected under international human rights law. Freshwater is a finite resource and is also a basic requirement for human body. Water is used mainly for domestic, agricultural and industrial purposes and also food production are essentially a function of water level at farm and industrial levels (FAO 2008). The greatest demand of fresh water resources is in

agriculture for food production as about 70% of the developed water supplies used in irrigation (Seckler *et al.*, 1998; Christine L. Moe *et al.*, 2006). Pipe water connection in households, water use demand rises from 60 to 100 liters which can vary with climatic variation and food requirements (Gleick, 1996). When pipe connections are not available, quantity of water used per capita is affected by the distance travelled and time taken for the collection of water particularly in the case of hygiene. Where People walk farther than 1 km to take water, then there is drop in the quantity of water use by 5-10 liters per day (Howard *et al.*, 2003). WHO recommended a minimum of 7.5 liters/capita/day of water to meet the potable requirements of most people under moist conditions.

Provision of potable water supply is important for socio-economic development of a country and also one of the main indicators of the development (WWAP, 2009)

### **ISSUES RELATED TO WATER SUPPLY IN URBAN JHARKHAND**

Social and economic developments are the factors which increase pressure on water resources. Water availability, management and waste water disposal are three major issues related to water supply in the urban settlements.

#### **WATER AVAILABILITY**

In Jharkhand cities depends upon underground water to meet their urban water demand. All the cities with pumping locations around the city face steep decline in water table. The fall in ground water table has been recorded for the pumping location on seasonal and perennial rivers e.g. water table, is also going down speedily due to intensive use in agriculture and supply for urban areas in Jharkhand. There are many such examples in across Jharkhand. Cities, the concrete jungle, are characterized by impervious surfaces or surfaces with very high runoff coefficient. So, water which should percolate in earth in form of rain also get drained off very fast which increases the depletion of available water resources. Due to climatic variation, there is change in rainfall pattern and also rainfall availability is reducing.

#### **WATER SUPPLY INFRASTRUCTURE**

It is expected that majority of urban growth in Jharkhand will take place in small and medium sized towns. Such towns do not have enough revenue to maintain the speed of infrastructure development with increasing demand and least capacity to manage such services. Unplanned Peri-urban areas are most prone to it having low pace of infrastructure development

#### **WASTE WATER DISPOSAL**

Industrial and domestic waste water is discharged in rivers, ponds and in wells resulting in pollution of

natural water resources. There are few examples of waste water reclamation and water reuse in Jharkhand cities but people still hesitate to use reclaimed water for potable uses hence need to make some effort to aware people about the benefits of water reuse. Water reuse also helps in underground water recharge, restore water cycle and protect natural ecological environment

#### **WATER QUALITY**

Water quality also has been a matter of political agenda across the India and Jharkhand. In the absence of strong regulation, industrial and domestic waste water is discharged in rivers, canals and underground water sources. About 70% of underground and surface water resources in India have been contaminated. High levels of pollution of the groundwater has been caused by the mining and industrialization in coal field area like Dhanbad, Jamshedpur, Bokaro

#### **INFRASTRUCTURE FOR WATER SUPPLY**

The urban water supply system is one of the biggest challenges in Jharkhand urban water supply system. Most of the urban local bodies/municipalities have to depend on the state government to get investment in water supply system. They do not have enough sources for revenue generation to maintain water supply, water supply is responsibility of both state government and urban local bodies. Unequal distribution system is also a big challenge where poor people do not have access to potable water system so effort should be done for equitable distribution of water. Political will is also a big hindrance in equitable water distribution system because there is always nexus between politicians and bureaucrats. Large fraction of state grants does not reach to its end and become the black money of these politicians.

#### **NO REGULATORY OF FRAMEWORK:**

There are no clear-cut distribution of responsibilities to different urban agencies in different urban areas and most of time they overlaps causing in the delay of

almost all water projects. No accountability and regulatory framework for core and peri-urban areas is not proper so each responsible agency can't do their duty properly. No initiative taken for public participation in decision making to improve water supply system is also a major hindrance for its improvement.

### **WATER UTILIZATION AND INFRASTRUCTURE MANAGEMENT:**

Intermittent water supply is faced by almost all cities in Jharkhand. No city provides 24x7 water supplies except some public private partnership systems. Inadequate water supply is a big problem in Jharkhand as only some of households are connected and stand posts. Average duration of water supply is found between 1-6 hours. A large fraction of population does not have access to public water facilities hence they have to depend upon the private water suppliers and have to pay more charges in comparison to public water supply. Poor people are more vulnerable to this system because they have least participation in public water system management. The brunt of the burden of poor quality of water delivery is borne by the poor. Lower-income households without access to public networks typically have to rely on market sources to access water at a higher price. Water utilities in Jharkhand water quality in the piped water distribution system is more prominent and serious in urban Jharkhand, Middle income groups and weaker section, because they do not have enough resources to maintain their water supply infrastructure and disinfect residual. An international survey of water loss as a percentage of water supplied reported that in industrialized countries water loss ranged from 8% to 24%. However, in middle income or newly industrialized countries, water loss ranged from 15% to 24%, and in developing countries like India water loss was estimated at between 25% and 45% (WHO 2001). Frequent power outage too contributes to low

or negative pressure in the pipes which allows contaminated water or wastewater surrounding the pipes to be drawn in through any cracks. Equitable distribution of water supply is also major problem as only prestigious people have access to potable water supply and poor people do not receive minimum clean water requirement. Unmetered water supply cause increase in extravagantly use of water by consumers. Due to this Municipalities/responsible authorities are unable to recover costs causing lack for further investment in expansion and maintenance of water supply infrastructure (McIntosh, 2003; Water and Sanitation Program – South Asia 2003). This erodes the consumer confidence, reliability and willingness to pay for billed water. Due to low fraction of households connected to piped water supply remains low, leading to declining financial viability (Singh et al, 1993; Rogers et al, 2003). Aging of the water supply infrastructure is also a big problem facing aging of water supply infrastructure by Indian municipalities as they do not have enough revenue collection to replace them.

### **SOLUTIONS FOR EFFICIENT URBAN WATER SUPPLY**

There are many techniques to increase the availability and better management of the water resources in the urban areas like rain water harvesting for underground water recharge and for storage in tanks. Water reuse or water from waste water after appropriate treatment can be used for non potable uses like flushing, cloth washing, plant irrigation, agriculture and also for potable uses after latest treatment technologies.

### **RAIN WATER HARVESTING SYSTEM**

Water supply in urban areas, since than water harvesting is mandatory and compulsory for all building plans to get approval. Before this, about 9% of rain water percolates and mix with underground water. Many countries like China, Australia, Brazil and India Rain water harvesting is an efficient, promising

and sustainable way to increase and supplement the availability of underground and surface scarce water resources in areas where the people are facing the problem of shortage of potable water supply and existing water supply systems are inadequate and failed to meet the adequate demand of potable water supply (O. O. Aladenola, 2009 Jharkhand is located in the region of monsoon climate where rainfall variation is most prominent in different months of year also imbalanced by climate change. Most of rainfall in Jharkhand cities occurs in monsoon months. Also there are many regions in India are facing variation in rainfall, more rainfall in some specific months. Due to increase in water demand rainwater collection has become an important technique to collect water for agriculture, underground water recharge and non potable uses (Leggett and Shaffer 2002; 2005; Peters 2006)

### **REUSE OF WATER**

Many of the urban settlements in India are facing inadequate water supply and scarcity of water resources in the absence proper water management techniques and policies. To overcome this short water supply, reclaimed has become a prominent reliable alternative water source, which can be sold as new product.

### **CONSERVATION OF SUPPLIED WATER**

It is also an important strategy to improve efficiency of water supply system. In large urban settlements, a large fraction of supplies potable water is used for landscape and plant irrigation. Also the water demand increases in dry season when there is need for more irrigation like playground, golf course, parks etc. By reclaiming waste water, the demand of potable water can be reduced because recycled water can be used for landscape and plant irrigation in big urban settlements. Water metering with slab system has been identified as an effective tool for encouraging public for conservation of water.

### **IMPROVING WATER DISTRIBUTION SYSTEM AND**

### **ITS USE**

By reducing water losses in pipe distribution system, low flush, dual flush or vacuum flush toilets water can be conserved in urban areas. With the help of efficient irrigation system like drip irrigation water can also be conserved in urban settlements. Recycled water can be used in industries instead of potable water.

### **GROUND WATER RECHARGE**

By replenishing underground fresh water aquifer we can improve water supply efficiency. Bio swales creation along transportation corridor for underground recharge is being applied in many countries. Reclaimed water can be directly percolated in natural water aquifer to improve water level. Rainwater harvesting is also technique by with underground is charged and termed as artificial aquifer recharge.

### **CONCLUSIONS**

Almost all of these are technical factors but we should also consider about socio-economic aspects i.e. willingness to pay, human perception, assessment of monetary and non-monetary benefits, as well as environmental aspects. All these aspects should be studied in harmony with economic, social and environmental sustainability. Saving water using metered connection will lead to less consumption in urban settlements of India. Water reuse will increase water availability and check environmental. There is dire need of private investment for improvement in water supply efficiency, provision of new physical infrastructure, revenue collection by adequate water charging that help in capacity building of water system, reduction in leakages and theft of water, efficient monitoring system.

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