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WATER SCARCITY AND SECURITY IN INDIA

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Water Scarcity and Security in India

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Abstract – Land, water and energy are basic need of human life. Out of these, water is not only an essential element for our survival but is also an important vehicle for economic development of the nation. Although water is a renewable resource, its reserve in nature is imitated. The availability and access to water will be the pre- eminent issue affecting global economic development and the live hoods of poor, given fact the fact that they often suffer the most when resource are scare. India is not isolated from these drivers and hence will need to address these issues as it emerges from a developing to a developed nation. India accounts for 2.45 % of land area and 4% of the water resources of the world but represent 16 % of the world population. With the present population growth rate (1.9 per cent per year), the population is expected to cross the 1.5 billion marked by 2050. The ever – expanding water demand of the India’s growing population and economy, combined with the impacts of climate change are already making water security is major threat in many parts of the country and with it we are witnessing severe damage to livelihoods, human health and ecosystems. UNDP report “Beyond scarcity: Power, Poverty and the Global water crisis” identified water availability per person (supply) was decreasing, while at the same time the amount of water that each person was demand was increasing. Therefore, we have to plan for its sustain development and efficient management so that growing demand of rising population, expanding industries and rapid urbanization are adequately met.

Key Word: Water Security, Sustain Development, Supply, Consumption and Gross Demand, Management

INTRODUCTION

Water is essential element for the survival of all forms of life on the earth. History tells that all civilizations originated and flourished around the sources of water. It is still the same in modern cities and countryside. Through technological advancement made in civil engineering and water resource management, we are now with better ways and means of conserving and distribution of water resource.

However, it is fact that while science is giving us more advance more ways of managing the water resource, it is also opening up new avenues for water consumption. This increasing demand for water for one reason or the other is pushing all of us crisis. Many thinkers hold the view that water could be main reason for the next world war. Conflicts over sharing of river water are going on both within and between countries. The revised draft national water policies of India, 2012 also underline the fact that “availability of utilizable water become conflicts among different user groups” (Sachinder Singh, 2012).

The importance of water has scaled such a height that some scholars have started terming it as “oil of 21st century” (Shiva, 2005). Similarly, another author wrote

that the well toward which humanity is evidently rushing is a shortage not of minerals and energy, but food and water. Water is will be more central to resources for future world development.

In context of India, it is not a water poor country, due to growing human population, severe neglect and over-exploitation of this resource, water is becoming a scarce commodity. India is more vulnerable because of the growing population and in-disciplined lifestyle. This calls for immediate attention by the stakeholders to make sustainable use of the available water resources.

WATER SECURITY STATUS:

At 2518 billion m³, the total water resource base for India, including surface and groundwater, is substantial but highly variable as during the monsoon season 50 per cent of annual precipitation falls in less than one month and 90 percent river flows occur in only 4 months of the year. The ability of the current infrastructure to safeguard that variability is low, making it difficult for accessible, reliable supply to meet projected demand and thus putting water security of India at stake. With only 200 m³ of water storage capacity per person, compared to 2200 m³

per person in China and some 6000 m³ per person in United States, India's accessible, reliable supply of water amount to 744 billion m³, or 29 per cent of its total water resource.

According to the report "Charting our Water Future" by the 2030 International Water Resource Group released in 2009 in India the low agricultural water productivity and efficiency, combined with aging supply infrastructure, would make server supply- demand gaps likely in many basin with currently planned crop choice. India 's aggregate water demand is expected to double from current level of about 700 billion cubic meters to 1498 billion cubic meters by 2030. With an estimated supply of about, 744 billion cubic meters by then, the water gap 50 per cent. This gap would be driven by a rapid increase in demand for water for agriculture, coupled with a limited water supply and shortage infrastructure.

WATER CONSUMPTION IN INDIAN AGRICULTURE:

India is one of the world's leading crop producers. Over the years, there has been an increase in water consumption in agricultural sector. The volume of water used for irrigation in India is expected to increase by 68.5 Trillion liters between 2000 and 2025. A number of demographic and economic factors are driving the use of water agricultural production.

The rise in demand in domestic and export market for food grain is one important factor. India's demand for food grain will grow from 178 MM mt in 2000 to 241MM mt by 2050. Change in the consumption pattern of agricultural products is also deriving increase in water usage. Demand for agricultural products with high water footprint is projected to rise with increased disposable income and urbanization. Contribution of non-food grain (Sugarcane, fruits, and vegetables etc.) and animal products in daily food intake for individual is expected to grow from 35 per cent in 2000 to 50 percent Rice; Wheat and Sugarcane together constituted nearly 90 per cent of India's crop production and are the most water consuming crops.

India has the highest water footprints among the top rice and wheat producing country. States with highest production of rice/ wheat are expected to face groundwater depletion of up to 75% by 2050. Agriculturally based industries such as textiles, sugarcane and fertilizer are among the top producers of wastewater. Thus in totality water conservation and management in the agriculture sector hold the key to water security in India.

Food security of India is closely linked to its water security. Studies suggest that irrigated agriculture has dominantly underlain the significant increase in food availability of India. During the last six decades, the gross irrigated area increased from 22 million hectares to 85.8 million hectares.

WATER CONSUMPTION BY OTHER SECTORS:

Apart from agricultural sector, the industry and domestic sector consumes approximately 11 per cent of the available water in India. The drivers for the growth of the water- intensive industries in India have been primarily been multifaceted. FDI equity inflow in the industries sector has grown from \$ 1.93 Bn in 2004-2008 to \$17.68 Bn in 2007-08. Between 2006 and 2010, investment in infrastructure development was approximately 7.7 per cent of India's GDP.

While the 11th plan projected that infrastructure investment has increased from \$ 408 billion to \$514 billion, it is expected to double tone of \$ 1 trillion during 12th plan. Thermal power plants (the most water-intensive industries units), constituted 64.6% of the installed power capacity in India during 2010. Annual per capita consumption of power is expected to grow from 704.2 Kwh by 2012. About 75% of the total planned power capacity expansion is projected to come from thermal power. A combination of these above facts promises to put the necessary strain on the water resource.

Industries water consumption is expected to quadruple to between 2000 and 2050; by 2050 industries, water consumption will reach 18 per cent of total annual water consumption, up from just 6 per cent in 2000. Industrial wastewater discharge causes pollution and reduces available freshwater reserves. Almost 6.2 Bn liters of untreated industrial wastewater is generated every day. Thermal power plants and steel plants are highest contributors to annual industrial wastewater discharge.

GROSS DEMAND PROJECTIONS:

Several studies have projected the annual demand for water in India (Table.1). These projections strike the alarm for a relook at the water management police of country.

Table 1: Annual Current and Expected Requirement of water in India (in BCM)

Different sectors uses of water	1990	2000	2010	2020	2020
Domestic	32	42	56	73	102
Irrigation	437	541	688	910	1072
Industry	-	8	12	23	63
Energy	-	2	5	15	130
Other	33	41	52	72	80
Total	502	634	813	1093	1447
BCM : billion cubic meters'					

Source: Compendium of Agricultural Statistics, 2012,

Table. 2 Future Water Usages

Year	Agriculture	Industry	Domestic	Total	Per Capital
	Billion Lit/Day				
India					
2000	1658	115	93	1866	88.9
2050	1745	441	227	2413	167.0
China					
2000	1024	392	105	1521	82.7
2050	1151	822	219	2192	155.4
USA					
2000	542	605	166	1313	582.7
2050	315	665	187	1167	484.6

Source: Government of India, 2009

Table. 3 Per capita water availability in India

Year	Population (Million)	Per capita water availability (m3/year)
1951	361	5177
1955	395	4732
1991	846	2209
2001	1027	1820
2025	1394	1341
2050	1640	1140

Source: Government of India, 2009

KEY POLICY INTERVENTIONS NEEDED

- Water conservation through development of watersheds and river basins, increase in storage capacity and linking of rivers;
- Effective water use through improved irrigation systems, water efficient crops and recycling of waste water;
- Prevention of water pollution by banning the discharge of untreated sewage and effluent in river, judicious use of agro-chemicals and regulation on over-exploitation of ground water;
- Water resources management and distribution through PPP, metered water supply, pricing of water for sustainability;

CONCLUSION

India is not a water deficit country, but due to severe neglect and lack of monitoring of water resources development projects, several regions in the country experience water stress from time to time. Further neglect in this sector will lead to water scarcity during the next 1-2 decades. It is therefore necessary to prevent this crisis by making best use of the available technologies and resources to conserve the existing water resources, convert them into utilizable form and make efficient use of them for agriculture, industrial

production and human consumption. Imposing regulatory measures to prevent the misuse of water and introducing rewards and punishment to encourage judicious use of water, will be helpful to conserve water. Finally, awareness and orientation of all the water users to change their lifestyle to conserve water can help the country to tide over the water crisis in the future. The challenge is manageable provided we have favorable policies and mechanisms to persuade our people to change their lifestyle.

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