INDIA

Working Out Ways to find Commercially Viable Measures to develop Water Resources in the Face of Climate Change and Recurring Droughts in India

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Drought is a slowly developing phenomenon which amplifies into an extreme climatic event in due course of time as it tightens the grip gradually turning into a hazard. Approximately 85% of the natural disasters are related to extreme meteorological events (Obasi, 1994) and drought has direct implication on precipitation of any area. With the onset of drought, the rainfall becomes erratic with increased temperature and decrease in humidity which progressively aggravates its severity thus creating a stress on the water resources of any region. With the increase in global population, the problem of water scarcity is increasing exponentially. Thus, with rise in the frequency, intensity and duration of droughts, climate changes have profound impact on three life sustaining sectors viz., water, food and energy.

The water vows in a developing country like India are enormous. The hydro poverty of the country is largely due to three main factors viz., (1) the swelling of population (2) the fast growing economy i.e., through industrialization and in turn urbanization and (3) the spatial incongruity of population and water resources. Studies project India to surpass China by 2022 with the current growing rate (World Bank, 2010). By 2050, the country may have to feed an extra population of 500 million. The National Commission for Integrated Water Resources Development of India states that there is a decrease in 30% of per capita water availability as the per capita water available in 1951 was 5177 cubic meters and currently it is about 1545 cubic meters. With the advent of climate change, recurring droughts the stress on the supply of basic commodities like water and food may flare up and hence it's time for planning

cost effective long term strategies to combat climate change. Industrialization in India has no doubt strengthened the economy of the country but is gradually inducing the climate change effects. As a country progresses, the urbanization also becomes rampant and currently around 50% of the people live in cities in India laying extra stress water resources. Thus over population, urbanization and demand for more water for irrigation, cause dwindling of water resources creating spatial incongruity and will also lead to overexploitation of groundwater resources. Central Ground water board (CGWB) has assessed the net groundwater availability of India by dividing the country into 6607 units (blocks or mandals or talukas) and out of this, 1071 units falling in 16 states and 2 union territories are over-exploited, 217 units are in critical stage while 697 are in the semi-critical stage with the net annual groundwater availability to be 58%.

Karnataka being the 2nd least rainfall receiving State in India, is divided into three meteorological zones, namely, North Interior Karnataka, South Interior Karnataka and Coastal Karnataka. Coastal Karnataka receives the maximum with an average annual rainfall of about 3500mm. South Interior Karnataka receives only 1286 mm average rainfall while North Interior Karnataka receives the least rainfall with 731 mm. The State has about 17 lakh million cubic meters of surface water resources accounting to 6% of the total water resources of the country. Seven rivers flow in the State with a water capacity of about 3,475TMCs owing their origin to the Western Ghat hill ranges. The west flowing rivers have a short flow length of less than 150km and satisfy around 60% of the total water needs of the State. Since Karnataka is a hard rock terrain with majority of the area consisting of metamorphic rocks, the groundwater availability is restricted to the secondary fissures, fractures and to the weathered zones. The total groundwater resource is estimated to be around 485 TMCs. The recent report from CGWB states that 43 taluks are over exploited, 72 taluks are in critical condition and the rest 61 being in semi-critical to safe categories. Thus, Karnataka with uneven spatial distribution of rainfall, erratic precipitation patterns and ever increasing population growth, has reached a stressful situation on water resources with recurring droughts.

Of the 190 lakh hectares of the total geographical area of Karnataka, about 152 lakh hectares (about 80%) is drought prone. The Karnataka State Natural Disaster Monitoring Center observes that of the last 15 years (2002 – 2006),

13 years have experienced drought condition. This indicates the impact of climate change and urges for the strategic management.

India with unpredictable climatic variations and recurring droughts has to draw elaborate plans and implementation strategies to meet the drinking water shortage to the ever swelling population. There has been a long debate on sharing of water through inter-linking rivers, diverting away the rivers from joining sea and developing integrated water producing technologies by interstate joint ventures for meeting the goals of equity, efficiency and environmental integrity of water resources utilization. The ambitious projects like diversion of rivers viz.Yettinahole, Mahadayi, Nethravathi andAghanashini are still to take off, largely due to lack of political will and interstate disputes.

Desalinating sea-water can lend a great helping hand for the parched areas of Karnataka. Proven technologies, availability of resources and geographic conditions should help India to draft elaborate plans to ensure at least safe drinking water in the extreme events like droughts. With 3/4th of India bordering with sea, enjoys abundant sunshine in most part of the year, which can be harnessed by establishing solar panels in feasible areas to tap solar energy to use it for desalination. Though laying pipes to transport desalinated sea water to drought prone areas is a challenging task, it will serve as a permanent solution and be greatly rewarded when the thirst of people is quenched with good drinking water.

What is required is prioritizing the National/State action plans and budgets to achieve such challenging tasks. Reducing the hardship to drought hit rural areas, perhaps would be the singularly most important benefit from such innovative efforts. Harvesting sea water through desalination would further open vistas for revolution in water conservation, adopting drip irrigation, water recycling etc.