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The Water Resource and Interlinking of Indian Rivers: An Analysis

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ABSTRACT

The paper focuses on four major sources of surface water à these are rivers, lakes, ponds, and tanks. India accounts for about 2.45% of world's surface area and 4% of the world's water resources · Rainfall is main source of fresh water in India. Water is one of the most precious natural resources and a key element in the socio-economic development of a country The paper highlights the freshwater include surface water, under river flow, groundwater, and frozen water. It is focused on conserving resources, and ensuring fair distribution. Paper explores the situation where the available potable, safe water in a region is less than its demand.

Key words: water, river, irrigation, supply, resources, agriculture conservation, maintenance and inter-linking

INTRODUCTION

Water is the most important and valuable natural resource on Earth. It sustains all life had life itself originated in water. Before the discovery of traces of water on Mars, Earth was the only planet in the solar system to contain water. Water resources are under rising damage due to a combination of factors, rapid growth of population, Industrial growth, urbanization and climate change. About 71% of Earth's surface is covered with water, but freshwater is available only 3 percentages. It is about two-thirds of the freshwater lies frozen in the form of glaciers and ice caps. The rest of the small portion is available in the form of groundwater and surface water.

Water is used in the agriculture for irrigation of crops. In industries, water is used as a coolant, solvent and in manufacturing processes. Hydroelectricity is electricity generated with the help of water. Water is also used for navigation and transport of goods. "Water security can be achieved along with energy security as it is going to consume electricity to link the surplus water areas with the water deficit areas by lift canals, pipelines, etc" (Brown, Lester R. 2013)

India covers 2.45% of the world area and possesses 4% of world's water resources. Precipitation contributes about 4000 cu km of water to the country. India has a large number of surface water resources, in the form of rivers, lakes, ponds, tanks and other small bodies. The three main rivers of North India are Indus, Ganga and Brahmaputra, which carry 60% of the total surface water in India. The flow of India's rivers constitutes 6% of discharge of all the rivers of the world.

Being an agriculture-centric country, India has developed a number of irrigation schemes. Irrigation projects of Bhakra-Nangal, Hirakud, Damodar Valley, Nagarjuna Sagar and Indira Gandhi Canal have featured prominently in Five Year Plan. "Out of India's 3,119 towns and cities, just 209 have partial treatment facilities, and only 8 have full wastewater treatment facilities. 114 cities dump untreated sewage and partially cremated bodies directly into the Ganges River" (National Geographic Society 1995)

The land area between Punjab and Brahmaputra Valley has abundant groundwater resources. The technology for identification of more aquifers can be developed further, as has been done in Punjab, Haryana, Western Uttar Pradesh, Rajasthan, Gujarat and Tamil Nadu. India also has more than 600 km long coastline. Lagoons exist in the states of Kerala, Odissa and West Bengal, where the coastline is indented. This water, known as brackish water, is used for the cultivation of paddy, coconut etc, and for fishing. "When sufficient salt export is not taking place from a river basin to the sea in an attempt to harness the river water fully, it leads to the river basin closer and the available water in the downstream area of

the river basin becomes saline and/ or alkaline water. Land irrigated with saline or alkaline water becomes gradually into saline or alkali soils" (Keller, Jack 1998)

Unmindful use of groundwater has led to the lowering of the water table. Excessive quantity of water used in irrigation increases soil salinity, affecting the crops. Disputes also have arisen where water bodies are shared between two states and distribution of water is in question. For example, in the absence of Cauvery Agreement, Karnataka developed some irrigation schemes, which affected Tamil Nadu's rice delta. "The supply of cities that depend on surface water is threatened by pollution, increasing water scarcity and conflicts among users. For example, Bangalore depends to a large extent on water pumped since 1974 from the Kaveri river, whose waters are disputed between the states of Karnataka and Tamil Nadu. As in other Indian cities, the response to water scarcity is to transfer more water over large distances at high costs. In the case of Bangalore 500,000 cubic meter of water is pumped per day over a distance of 100 km, thus increasing the city's supply by two-thirds" (Rao, Lalitha 2009)

The main emphasis of National Water Policy 2012 is to treat water as economic good which the ministry claims to promote its conservation and efficient use. This provision intended for the privatization of water-delivery services is being criticized from various quarters. "The policy also does away with the priorities for water allocation mentioned in 1987 and 2002 versions of the policy. The policy was adopted with disapproval from many states" (Parsai, Gargi 2012)

Hydroelectricity can solve a part of India's energy crisis, triggered by hike in oil prices. It is generated by the use of gravitational force of falling or flowing water. It is the most widely used form of renewable energy, with production in 150 countries; India has one of the greatest hydroelectric power potentials in the world. Bhakra Bees Management Board (BBMB) has installed a hydel power grid in North India. Hydroelectricity is cost-effective. Once a hydroelectric complex is constructed, no waste is produced and carbon-dioxide emission is also less as compared to fossil fuel powered plants.
Water of the rivers and other natural sources is getting polluted due to industrial chemicals, pesticides, oil slicks and household wastes. Around 75% of surface water in India is polluted. Rajasthan and Maharashtra have high fluoride content in water; while arsenic has been found in water of West Bengal and Bihar. There are 14 river basins found to be most affected by dumping of sewage. For example, leather factories in Kanpur pump around 5.8 litre of waste water into Conga every day. Yamuna is also known as 'Open Drain'.

The Central Pollution Control Board (CPCB) along with the State Boards monitor water quality at 507 stations. Some of the legislation: passed by government include water (Prevention and Control of Pollution) Act, 1974, Water Cess Act, 1977, Environment Protection Act, 1986 and National Water Policy, 2002. Gangs Manthan dialogue was initiated recently, to discuss measures to check pollution of Ganga water. Placing portable toilets and small scale water treatment plants along the river can go a long way in halting pollution. Other than these, efforts of NGOs and citizens have also counted in the cleaning of lakes such as Puttenahalli lake, Dal lake, Agara lake, Rankala lake etc.

Maintenance of water quality and water conservation is the needs of the hour. Villages can collaborate to form watersheds, so that wells and other water reservoirs can be recharged with water. Ralegan Siddhi is a village in Maharashtra which successfully implemented this approach. Rainwater harvesting has been made mandatory in Tamil Nadu.

River-linking has become an urgent necessity in India. Vidarbha in Maharashtra and Rayalseema region of Andhra Pradesh face regular droughts adequate water supply would ease at least the problems of water scarcity in Rajasthan districts which remain dry for most parts of the year. It would also help in the replenishment of depleting water table. Power crisis would be soothed to a certain extent. "India accounts for 18% of the world's population and about 4% of the world's water resources. One of the proposed solutions to solve the country's water woes is the Indian rivers interlinking project" (National Water Policy 2014)

River connectivity is seen as a possible way to equally distribute of water across a geographical region. Conceptually, inter-linking water ways is appreciated by policy practitioners to resolve water problems but the practical ecological concerns usually delay the implementation. Along these lines, India's National River Linking Project that aims to connect the rivers in the Ganges basin to rivers in western and southern India has been an issue of debate. The displacement of people due to land acquisition is also a cause for concern.

The interlinking project, even to start with, will have to face many potential inter-state conflicts. If the so called 'surplus' basin areas use ecohydrological arguments, and not be guided by arithmetical hydrology, in calculating their maximum water demands, then there will be quite a disagreement on what is the 'surplus' that can be transferred. The second point of discontent will be on the sharing of the all-important flows in the pre-monsoon period, when 'surplus' states cease to be so and need the water in the river as much as the 'deficit' basins. If the past is any indicator of the trends in future, and if the

perception of the water resource engineers remains unchanged, the interlinking project may lead to so many water related conflicts, as a result of 29 which, the Supreme Court may soon get fully overburdened with them.

For example, the proposed dam on river Ken would provide 60 MW of power to adjoining villages and towns in Madhya Pradesh. The linking canals would provide a faster means of transporting goods. This would cut down the pressure on roads and railways, saving oil. Frequency of occurrence of floods and families would be reduced. Massive job opportunities would be created due to the project.

The river-linking, though seemingly promising, may open 'Pandora's box' of many unseen problems. First, is the unequal distribution of water? For example, in the Polavaram project that is coming up, the seasonal water shortage in the target area of reservoir would be alleviated; however, it would shift the water shortage down the Godavari delta during rabi and summer. The transfer of enormous quantities of water will flood forests and land for reservoirs, if not properly channelized. The weight of billions of litres of water may have seismic side effects in the Himalayan region. Water quality may also be affected by salinisation, pollution etc. Most importantly, a large number of people get displace due to such projects.
The national river-linking project is bound to face many challenges. Firstly the initial estimation of the cost was about Rs. 5.6 lakh crores. But the actual expenditure would be higher. Secondly, India needs to be mindful of the border issues with neighboring countries. India and China are already clashing over sharing of river Brahmaputra. Thirdly, the project is touted to affect the natural habitat of wild animals. A case in sight is the Ken-Betwa project which will submerge Panna tiger reserve and threaten aquatic life in Ken River. Nevertheless, the project has received approval from many stakeholders, be it the ministers of state or the citizens. It is a approval from many stakeholders, be it the ministers of state or the citizens. It is a ray of hope to millions of rural households. India's water issues could finally get an answer and focus could be shifted to other issues of national importance.

The interlinking project, as projected now, looks like a set of linkages, developed primarily for irrigation, but looking for diverse other justifications, of drought proofing, drinking water supply, flood control, etc. Its claim on providing domestic water supply to large urban areas in dry regions is very valid. Other claims are not that convincing. The Himalayan component is not based on any open and professionally assessed knowledge base. This is a source of serious concern.

CONCLUSION

Water conservation and crisis for several reasons for droughts, floods, cleaning of river Ganga, interlinking of rivers issue, interstate water disputes. In the interest of the people of India, justifications put forward for such a gigantic project should be assessed in an open and professional manner. There is a clear need for examining the presuppositions on which the whole interlinking project has been put. The need to study the feasibility of the independent links will arise only after the premises are found agreeable. If the old practice of getting feasibility studies on water related projects conducted away from the public view is continued, it will be against the expectations of the changing times of openness and transparency. Conservation of water resources are , recycling and reusing of water, watershed management, agriculture, rainwater harvesting, other measures.

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