Scaled Up Solutions for a Future of Water Scarcity

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Introduction

Water has the same popular appeal as justice, freedom, equality, representation and power. There is also something elemental or inherently wicked about water because searching for solutions to manage and cope with water issues creates a set of different problems that are political, emotive and divisive.

Centuries of mismanagement, political and institutional incompetence, indifference at central, state and municipal levels, a steadily increasing population that will reach an estimated 1.7 billion by 2050, a rapidly mushrooming middle class demanding an increasingly protein-rich diet that requires significantly more water to produce—together, are leading the country towards a water disaster.

On top of that, there is an absence of serious and sustained attempts at the central or state levels to manage water quantity and quality, a lack of implementation of existing laws and regulations, and pervasive corruption and a poor adoption rate for new and cost-effective technologies.

Problems associated with India

India is now facing a water crisis situation that is significantly worse than any that previous generations have had to face. All Indian water bodies within and near population centres are now grossly polluted with organic and hazardous pollutants.

Groundwater extraction is growing and has become increasingly unsustainable. Consequently, in many parts of the country, groundwater levels are declining steadily. In some parts, the levels are declining by more than one metre per year.

A lack of proper **wastewater treatment** from domestic, industrial, and mining sources has meant that groundwater is being progressively contaminated by known and unknown pollutants, increasing potential health risks to humans and ecosystems.

During the last three decades, there has been an explosive growth of private tube-wells in farms because of a **lack of reliable surface irrigation. The problem is compounded by Indian law which extends exclusive rights to landowners over groundwater.** These factors, along with free electricity for pumping, have contributed to an increase in the level of groundwater use.

Despite having **four separate central bodies regulating groundwater,** there is no single database for the country. In 2016, the standing committee on water resources of the Indian parliament finally recommended having a **national groundwater database** that could be updated every two years. However, this has not seen the day of reality yet.

Also, India has seen a string of such **judicial rulings involving urban rivers** in recent years, as the country comes to grips with widespread pollution that has fouled the waterways and with runaway development that has destroyed or damaged **wetlands and floodplains**.

Forests acts as an enormous reservoir of water, which attracts humidity and creates rain clouds. With **deforestation,** this hydraulic regulation is destroyed as it reduces the forest's absorption capacity. Therefore, when rainfall continues just as much after the forests are cut, it floods the ground and streams down to nearby rivers. While streaming down, it brings an important amount of mud, which can be extremely destructive as it fills up the river with it (riverbed silting or sedimentation). The river loses its depth and expands in width causing perennial floods.

Also, the water becomes unsafe for drinking because of the accumulation of mud which reduces the amount of drinkable water available for humans and animals. Deforestation leads later on to **desertification,** which is the case for some parts of **Africa**.

The current situation has already contributed to serious **economic, social, political and environmental problems**. For example, India is facing a rising number of **interstate and trans-border river conflicts**. The **Cauvery Water dispute** between **Karnataka, Tamil Nadu, Kerala** and **Puducherry, Indus Water Dispute** between **India** and **Pakistan** etc.

Urbanisation and water crisis

Cities, even though they consume a much smaller portion of water when compared to agriculture (70 percent vs. only 8 percent), are where a lot of people live. Thus, the very same consolidation of infrastructure that makes water more reliable for urban dwellers puts more people at risk when it fails or cannot be adequately supplied. Urbanization creates its own forms of water stress via increasing per capita water consumption and rising incomes, as wealthier people use more water, energy, and water-intensive goods. Simultaneously, the

urban poor in the developing world can face inadequate access to drinking water and basic sanitation. Cities in the developing world are, in other words, sites of both acute scarcity and high consumption.

Urbanization also increases the demand for power generation, which itself requires a lot of water. This **water-energy nexus** is really a **water-energy-food nexus,** because a large portion of the energy (30 percent) and water consumption (70 percent) is required to feed a rapidly growing and urbanizing population. If the power sources for this are **carbon-intensive,** they will further sharpen the effects of **climate change**.

There are already serious **perennial and seasonal water** shortages in many cities in the developing world, which climate change is expected to exacerbate. On their current trajectories, water and energy consumption will increase competition between urban and rural populations for the same pool of resources. For example, the recent water crisis in Bangalore and Shimla caused by poor management and negligence by the government.

Globalization and its impact on water resources

Processes of **globalization** are having profound effects on water resources at all scales, from local to international. Globalization is frequently defined as a movement toward greater economic, political, and cultural integration across nations. Globalization processes also contribute to increased rates of urban and industrial development, which in turn leads to competition for scarce water resources between agricultural versus other uses. Like climate change, globalization has highly uneven effects among individuals, communities and social groups.

Water marketization can be defined as the process of creating the economic and policy infrastructure to **treat water as a commodity**. The process of water marketization has been driven by **neoliberal economic reforms** that have been closely associated with **economic globalization**.

Reforms such as **structural adjustments, trade liberalization, and privatization** have also led to dramatic changes in the ways that water resources are managed, which has had dramatic implications for those who do not have access to water or the resources to purchase water.

The effects of increasing marketization can be particularly detrimental to poor people in less developed countries, many of whom depend on private water vendors, or on distant and/or polluted water sources. In many cases, the poor pay significantly more for water than do higher to middle income users who are connected to municipal supplies.

What needs to be done?

- **Floodplains** of rivers can be a source of **aquifers** where any withdrawal is compensated by gravity flow from a large surrounding area. This can be used as a source of providing water to the cities. Thus, flood plain can be a level player to mitigate the crisis. For example, **The Delhi Palla flood plain project** on the **Yamuna** is providing water to almost a million people daily.
- **Forested hills** can be a great source of **uncontaminated underground aquifers** that contain mineral water comparable to several international natural mineral waters.
- In a predominantly agrarian country like India, agriculture uses great volumes of water. Therefore, to address the water crisis in the country, authorities must first tackle farmers' **unsustainable practices** of water use. To address this water crisis, Indian policymakers will have to **incentivise sustainable water management** in agriculture and encourage farmers in drought-prone areas to grow crops that require less water.
- We must preserve water resources in their entirety and whilst using them, utmost caution is to be practiced – only as much water recharged by rainfall should be withdrawn. These **'conserve and use' schemes** can benefit the cities, people, wildlife and the planet; and preserve and protect these invaluable resources from the pressures of human expansion.

Steps taken by the Government.

Understanding the need of the hour, the Government of India has taken several initiatives to provide **clean drinking water, promote water conservation and adequately treat sewage wastes**.

- **MGNREGA for water conservation:** Mahatma Gandhi National Rural Employment Guarantee Act is one of the biggest government funded employment scheme in the world. The huge workforce employed under the MGNREGA has enabled the government to introduce **water conservation** as a project under the Act. The government aims to improve **groundwater harvesting** and build **water conservation and storage mechanisms** through MGNREGA.
- **Jal Kranti Abhiyan:** The government is making active efforts to revolutionise villages and cities through **block level water conservation schemes**. For example; the **Jal Gram Scheme** under the **Jal Kranti Abhiyan** is aimed at developing **two model villages** in water starved areas to lead the other villages towards **water conservation and preservation**.
- **National Water Mission:** Government of India has launched **National Water Mission** with the objective of **conservation of water, minimizing wastage** and ensuring more **equitable distribution** both across and within states through integrated water resources development and management. One of the objectives of the Mission is to **increase the water use efficiency** by 20%.
- **National Rural Drinking Water Programme-NRDWP** is to provide every rural person with adequate safe water for drinking, cooking and other basic domestic needs on a sustainable basis.

- **NITI Aayog Composite Water Management Index —** With the objective of achieving effective utilization of water, NITI Aayog has developed the **Composite Water Management Index**. The index revolves around issues ranging from water scarcity and related morass like deaths due to lack of access to safe water, its projected increase in demand over the years and finding ways for its effective conservation.

Human security relates to the well-being of individuals, including both freedom from fear and freedom from wants. As a concept, human security refers not only to security from **physical violence,** but also to **food and water security, livelihood security and environmental security**. India suffers from water shortage for cultivation and drinking despite the fact that many big rivers, some of them perennial rivers, flow through some parts of India. Though we have much natural resources like water, minerals, abundantly growing crops and so on, we still suffer, because our knowledge of utilising these natural resources to the maximum advantage is still inadequate. Thus, a coordinated effort from all stakeholders with active cooperation from the civil society can go a long way in solving the water woes that India is facing.