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THE INDIAN SOLUTION: WATER DEFICIENCY, POLICY AND IMPLEMENTATION IN DEVELOPING NATIONS

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ABSTRACT

India has the highest number of people in the world without access to safe water. The lack of availability to this basic resource causes thousands of deaths every year, mostly amongst the underprivileged sections of the rural and urban populace. This paper analyses the causation and effect of the deficiency in water supply in India. It further looks into government policies and their implementation over the years and explains where those policies fall short. Efficient methods of improving quality and availability of water used by other developing nations are explained with respect to their feasibility and viability in India. Lastly, this paper provides policy recommendations aimed at improving the access to clean water for all Indian citizens, irrespective of their social and economic standing.

BACKGROUND

Water scarcity is the greatest risk facing humanity in the twenty first century. One in every ten people worldwide do not have access to clean water, and natural water sources are diminishing due to climate change and pollution (Chandran, Rina, 2018).Water pollution has a wide variety of implications ranging from public health and protection of biodiversity to environmental degradation. More than 844 million people are struggling to access life's most essential requirement (Chandran, Rina, 2018). Technological innovation has failed to trickle down to the most vulnerable sections of the society across the globe.

Communities lacking economic, social and political capital across the world are deprived of clean water - something that is a bare necessity for living a healthy life. Water Aid's 2018 report stated that it's the poorest and least powerful who are most often without clean water across the world (The water gap The State of the World's Water 2018). Lack of access to clean water directly causes the outbreak of several diseases such as Typhoid, Cholera and Dysentery. It also concluded that around 289,000 children under five die each year of diarrhoeal illness directly

ISSN: 2455-8834

Volume: 04, Issue:03 "March 2019"

linked to dirty water, inadequate toilets and poor hygiene (The water gap The State of the World's Water 2018). These ill effects are felt the most in developing nations in Africa and South Asia due to factors such as conflict and overpopulation magnifying the extent of the issue.

More than 163 million Indians do not have access to clean water (Benchmarking and Data Book of Water Utilities in India). However, there have been significant developments since independence. According to a report by the Joint Monitoring Programme for Water Supply and Sanitation (United Nations World Health Organization) the share of Indians with access to improved sources of water has increased significantly from 72% in 1990 to 88% in 2008 (JMP, 2017). Despite this, India's performance indicators do not come close with average international standards according to the World Bank (Introducing 24/7 water supply, 2018).Despite the presence of adequate infrastructure, the 35 Indian cities with more than one million residents only supply water for a few hours in a day. A 2007 study by the Asian Development Bank showed that in 20 cities which were the subject of the study the average duration of supply was only 4.3 hours per day (Benchmarking and Data Book of Water Utilities in India). Urban hubs such as Rajkot are only supplied with clean water for 18 minutes a day.

There is a multiplicity of causes leading to a dearth of clean water across the world especially in India. First, is the lack of political priority. Religious and social polarization occupies much of the political discourse, with policies related to provision of basic needs such as clean water being deprioritized and given less attention to by the central, state and local governments. This causes a reduction in resources allocated to providing clean water to people, without much active political resistance against such deprioritization. This is also reflected in the efficiency and effectiveness of Government authorities. In September 2018, officials of the Delhi Jal board were arrested on charges of bribery by the Anti-Corruption Bureau (Indian Express). Incidents such as this are considered to be a trend in India. Secondly, social discrimination is another barrier for provision of clean water. There is a high correlation between nations with a history of social discrimination and nations with highest populations without access to clean water be it India or the Democratic Republic of Congo (The water gap: The State of the World's Water 2018). Finally, disaster and displacement prevent people from accessing resources despite their availability. This is the common linking factor between many African nations such as Chad, Somalia and Uganda which have been plagued by civil war and terrorism in the past few decades.

CURRENT STATE

In India. severe lack of regulation, over-privatization, general neglect and rampant government corruption have led to multiple generations thirsting for a bare minimum of safe water. The National Rural Drinking Water Programme (NRDWP) is a scheme by the Central Government

ISSN: 2455-8834

Volume: 04, Issue:03 "March 2019"

which aims to provide every person in rural India with adequate safe water for drinking, cooking and other domestic basic needs on a sustainable basis (PRS Legislative Research). It was launched in 2009 by the Ministry of Drinking Water and sanitation. Despite spending 90% of Rs 89,956 crore budget over five years from 2012 to 2017, it has "failed" its targets according to an August 2018 report by the Comptroller and Auditor General of India (PRS Legislative Research). It aimed to provide all rural habitations and government schools access to safe drinking water. Of this, only 44% of rural households and 85% of government schools were provided access. It also aimed to provide 50% of rural population potable drinking water (55 litres per capita per day) by piped water supply. Of this, only 18% of rural population was provided potable drinking water. It also sought to give household connections to 35% of rural households. Of this, only 17% of rural households were given household connections (CAG Audit Report Summary National Rural Drinking Water Programme). The Comptroller and Auditor General noted deviations from the programme guidelines in the planning and implementation framework established at the centre and states. About two-thirds of states had not framed water security plans. Moreover, deficiencies were found in the preparation and scrutiny of plans such as lack of participation on part of the communities affected by this policy and underperformance on part of the National Drinking Water and Sanitation Council and state level bodies such as the State Water and Sanitation Mission, State Technical Agency etc. This has led to incomplete and inefficient works, unproductive expenditure on equipment, creation of unsustainable structures, and most importantly gaps in contractual management, with a total financial implication of Rs 2,212 crores (The Water Crisis In India: Everything You Need To Know, 2018).

The water crisis in India has led to conflicts both within and outside Indian borders. Karnataka and Tamil Nadu, two economically affluent South Indian states are entwined in a bitter legal dispute over the water of river Kaveri. There is a similar case in court relating to the river Periyar between Tamil Nadu and Kerala, another south Indian state. These court battles have also taken the shape of civil unrest between the communities belonging to these states. In the international sphere, conflicts over waters of Indus and Brahmaputra can translate into global conflicts with Pakistan and China respectively (Hawthorne, John, 2018).

There are some contextual factors that make the availability of clean water all the more difficult in India. More than half of the rivers are highly polluted with numerous others at levels considered unsafe by modern standards. The waters of the Yamuna, Ganga and Sabarmati flow are the most polluted as they a deadly mix of hazardous and organic pollutants. This is because of the normalized practice of dumping industrial, agricultural and municipal waste into rivers. The water crisis is made worse by irregular and unpredictable rainfalls the absence of which causes an acute scarcity of water. (The Water Crisis In India: Everything You Need To Know,

ISSN: 2455-8834

Volume: 04, Issue:03 "March 2019"

2018). Thus in the context of India, it is important to pay attention to not just the quantity but also quality of water. Government statistics fail to reveal the dire consequences of providing unclean water to citizens. There are 69,258 "water-quality-affected habitations" which amounts to nearly 46 million people with access to contaminated water according to studies by the WATSAN Programme (Shridhari, Paliath The Scroll, 2018).

GLOBAL PERSPECTIVE

The SODIS Method was discovered in the 1980s by Lebanese scientists It is an inexpensive way to bring clean water to poor countries. Also called Solar Water Disinfection it works by sitting a PET bottle filled with clear water in the sunlight for hours. The process reduces viruses, bacteria and diarrheal diseases in the water. Famous research establishments, such as the Royal College of Surgeons, Ireland, and the University of Uppsala, Sweden have studied the SODIS method (A method for water disinfection with solar pasteurisation for rural areas of Bangladesh, 2014). Their studies confirmed that the method does kill germs and has a positive effect on people's health. This is a cost efficient and convenient method of providing clean water at the localised level to communities. Lifestraw is a portable device that purifies water as one consumes it. Introduced in 1994, this unique technology uses a cloth filter to block contaminating diseases, making water secure to drink. The Lifestraw technology can be adopted in India to purify water in slums and rural parts where the problem is the quality of water and not the availability. It has been an efficient as an immediate solution for purifying water in African countries such as Kenya. the Recycling is a cost effective technique that makes water re-usable after treatment and purification. Israel has always been a leader in water conservation technology because of its desert location and today that necessity has grown into an economic incentive. The country recycles 85 percent of wastewater. It is estimated that by 2020, half of its agricultural needs will be met with recycled water. 300 water technology companies specializing in desalination add $2 billion annually in exports by exporting its water to other countries (Schwab, Jennifer, 2017 Huffington Post).

Desalination is way of turning saltwater into usable fresh water. This technology is extremely expensive, because the procedure requires immense levels of energy. Saudi Arabia is the largest producer of desalinated water in the world which it powers by renewable, solar energy – a resource that's abandoned in the middle eastern desert nation. It's home to the world's largest solar photovoltaic (PV) desalination plant in the city of Al Khafji. By 2019, Saudi Arabia aims to run desalination plants exclusively through solar energy. Greece uses Geothermal energy to do the same by heating water under the Earth's surface (Grapewine, 2014).

ISSN: 2455-8834

Volume: 04, Issue:03 "March 2019"

Non-profit Organizations have gone a long way in providing clean water to the poorest of African countries. Organizations like Ride4Water and Water Aid help poor countries to produce more fresh water for consumption and sanitation. Water aid has tackled the job of bringing water to the most forgotten villages of Ethiopia. In Konso, it has installed gutters on the sloped roofs of the buildings to conduct rainwater to a covered tank. The water is treated and used in the health center. Undertaking challenges that have not been completed successfully before, WaterAid is also working in villages like Foro. Their approach combines traditional methods such as sand dams to capture and filter rainwater with new ideas like installing toilets that also generate methane gas for a new communal kitchen (Tina Rosenberg, National Geographic, April 2010) The Bill & Melinda Gates Foundation has awarded $17 million to PATH, a Seattle-based global health organization, to test new approaches to making sure that low-income people in developing countries have access to clean drinking water. It looks at ways to improve water quality in developing countries, including helping companies develop low-cost filters, gadgets, and other water-treatment products to stimulate a commercial market and keep prices low. These nonprofits coordinate their efforts with those of the Government authorities to provide clean water to the most underprivileged sections of societies in third world countries.

THE INDIAN SOLUTION

Despite India failing to provide water to households generally, a few villages have successfully implemented ideas of rainwater harvesting and reusing of water to successfully deal with problems related to shortage of water. These moves have mostly been reactionary to irregular monsoon cycles. In 1994, check dams were built along the Machhan, and watershed management programs were undertaken by the NGO Sadguru (Vijaykumar, Neeti 2018). As the dams recharged the groundwater, water became available to the 153 households in that area. Similar programs were undertaken in the villages of Gandhigram, Raj-Samadhiyala, Mandlikpur and Jhabua. Primitive methods such as these have been extremely instrumental in rural regions where use of high level technology is economically unviable. Non-Government Organizations such as WaterAid and One Drop mobilize populations at the local level across the barriers of caste and class to implement water and sanitation programs. They act as a supplement to Government programs by increasing their effectiveness. However, they can only provide real benefits if the Government Agencies perform their part, which they often fail to do.

Alongside grassroot programs by NGOs and local authorities there is a need for centralized action through policies of the Central and State Governments. The Central Government in 2018 announced the launch of six pilot projects for providing clean drinking water supply in villages under the ‘Swajal Project; one each in the Indian states of Uttarakhand, UP, Rajasthan, Maharashtra, Bihar and Madhya Pradesh (Dash, Deepak, 2018). These are amongst the 115 most

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Volume: 04, Issue:03 "March 2019"

backward regions of the country as identified by the Niti Aayog. The project will involve locals in civil work and maintenance of the system. This project aims at increasing water supply through rainwater harvesting and other water recharging initiatives (Dash, Deepak, 2018 -The Times of India).

In the cities of Hubli, Belgaum and Gulbarga in the state of Karnataka, the private operator Veolia implemented a continuous water supply program for 180,000 people (12% of the population of the 3 cities) within 2 years (2006–2008) (Introducing 24/7 water supply,2018). This was achieved by carefully selecting and ring-fencing demonstration zones (one in each city), renovating the distribution network, installing meters, introducing a well-functioning commercial system, and effective grassroots social intermediation, all without increasing the amount of bulk water supplied. The project, known by its acronym as KUWASIP (Karnataka Urban Water Sector Improvement Project), was supported by a US$39.5 million loan from the World Bank (Introducing 24/7 water supply, 2018). The project is expected to be scaled-up to cover the entire area of the three cities. This project is a milestone since it became the first major commercial hub to provide continuous access to water without increasing its supply. The Jamshedpur Utilities and Services Company (JUSCO) provides water and sanitation services in Jamshedpur, a major industrial center in East India that is home to Tata Steel. Efficiency and service quality has improved substantially in Jamshedpur over the following years under JUSCO. In 2009, one quarter of residents received continuous water supply and the average supply increased to 7 hours everyday. Private initiatives such as these must be encouraged and monitored because they target the problems of scarcity and continuous availability simultaneously.

The solution to a problem which is as acute and complex as the water crisis in India requires collective action by multiple stakeholders. Tangible change is only possible through effective implementation of state policy combined with efforts from Non-Governmental Organisations and citizens. However cities such as Jamshedpur show that sustainable models of providing a continuous supply of clean water is feasible and worth emulating.

CONCLUSION

Following a discussion on the background, policy status, implementation, issues and possible solutions surrounding water deficiency in India and various other developing nations, it is clear that innovative solutions are required which take into consideration active community engagement and allow societal feedback to inform an inclusive public policy. Through the collaboration of NGOS, citizen-led efforts and government leadership, sustainable models of supplying clean water are not merely possible but also hold potential for future up-scaling in a

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large level. Such sustainable models do not require expensive methods of implements, and cost-effective models exist; the analysis of international best practices yields practical results and case-studies which can be applied to the Indian context. Thus, this paper has provided a brief overview of the aforementioned areas of study, and hopes to educate readers regarding the same, to inform future policy-making in a marginal manner and progress efforts in reform.

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