AN EVALUATION OF THE EFFORTS MADE BY THE CORPORATE SECTOR TOWARD SOLVING DRINKING WATER CRISES IN INDIA -WITH SPECIAL REFERENCE TO ION EXCHANGE

Dr. Dolly Misra[1], Dr. Sanjeev Gupta[2]

Article History: **Received:** 18.02.2023 **Revised:** 07.04.2023 **Accepted:** 23.05.2023

Abstract

Air, Water, Mountains, Forests, rivers, etc are all-natural resources gifted by nature. Air and water are the most important for humanity among all other natural resources. But the human being is blindly following the wrong path, which resulted in the diminishing of natural resources like drinking water. United Nations has recognized this problem as a threat to humanity and involved this issue in the famous 17 Sustainable development goals. The paper focuses on Indian water problems and efforts taken by Government and Corporate Sector companies in India. This paper uses secondary data to prove its objectives. Magazine data, Government websites, Newspapers, magazine articles, Existing Research Articles, and related company websites and their annual reports and other documents are studied to collect the relevant data. The paper also explains the work and methods/solutions taken by the ION Exchange water waste management company for an explanation.

Keywords: Water Scarcity, UN SDG 6, Sustainable Development, ION Exchange "Water is our common future and we need to act together to share it equitably and manage it sustainably. As the world convenes for the first major United Nations conference on water in the last half-century, we are responsible for plotting a collective course ensuring water and sanitation for all." Audrey Azoulay
UNESCO Director-General

[1]Assistant Professor, Department of Management, Aarupadai Veedu Institute of Technology, Vinayaka Mission's Research Foundation (DU)
[2]Senior Faculty,Department of Commerce, Dr. Shakuntala Misra National Rehabilitation University, Lucknow

DOI: 10.31838/ecb/2023.12.s2.318

1. Introduction

Air, Water, Mountains, Forests, rivers, etc are all-natural resources gifted by nature. Air and water are the most important for humanity among all other natural resources. But the human being is blindly following the wrong path, resulting in the depletion of natural resources like drinking water. Many countries are entering the stage of severe water scarcity. International Water Management Institute (IWMI) 's Report indicates that one-third of developing countries' population lives in a water scarcity stage. The coming future will see a drastic increase in the number of countries with water deficits and this problem will not only occur in West Asia and North Africa but also in major cities of India like Punjab and the central plain of the chain will also experience this problem.(Seckler et al., 1998). David Seckler, David Molden, and R. Sakthivadivel in their research paper recommend that one of the solutions to the water scarcity problem is by increasing the efficiency of water use (Seckler et al., 2003). Andrew Keller, R. Sakthivadivel, and David Seckler give emphasize water storage methods in their research paper' Water Scarcity and the Role of Storage in Development'[1](Keller et al., 2000). If we talk about groundwater availability in India, it is estimated that 60% country's irrigation needs, 50% of urban areas' water demand, and 85% of rural areas drinking water needs are being fulfilled by groundwater. But over exploitation of groundwater is making it scarce in many parts of the country. Even though it is estimated that groundwater in India is also depleting and contaminated (Balaram et al., 2022). Central Groundwater Authority (CGWA) has already warned some States and UTs about the development and regulation of groundwater which includes states like Delhi, Haryana, Punjab, Andhra Pradesh, Rajasthan, MP, Gujarat, West Bengal, UP, Karnataka, Tamil Nadu, UT of Puducherry and UT of Diu (Kumar, 2018).

United Nations has recognized this problem as a threat to humanity and involved this issue in the famous 17 Sustainable development goals. To give this issue prime importance, World Water Day is being observed on the 22 of March. Now all the signatory nations of the UN are trying to complete its all-set 17 Sustainable Development Goals. This year also, the celebration started on March 22 to create awareness about the availability of drinking water and sustainable water management practices. In India, first-time initiatives have been taken by the Ministry of Jal Shakti to conduct a census of water bodies. The report is showing the fact that at the time of the independence year, 1947 6,042 cubic meters was the per capita availability of water which declined by 75%, and in 2021 it remains at 1486 cubic meters. The main concern shown in the report is not only limited to groundwater and surface water pollution but the major concern was depletion and encroachment of water bodies. The report also states how the allocation of fresh water for agricultural purposes leads to scarcity of water in many other Indian states. To overcome this issue, public and private both sectors are working in this direction to create innovative and technology-based solutions for water treatment, wastewater management, protection from the ground and surface-based water, etc.

1.1 ABOUT JAL SHAKTI MINISTRY[2]

The Indian Government may 2019 created the 'Jal Shakti Ministry', soon after its inception all the ongoing water-related projects, programs such as the Atal Mission for Rejuvenation and Urban

[1]) Actually, Andrew Keller first presented this paper titled as 'Water Scarcity and the Role of Dams in Development' in 1998 at World Bank Water Week Conference, 15 December 1998, Annapolis, Maryland, USA, in a session on dams.

[2] https://jalshakti-dowr.gov.in/

Transformation, National Mission for Clean Ganga, Jal Jeevan Mission, and Community Drinking Water Schemes, and water-related agencies came under Jal Shakti Ministry'. The primary goal of this ministry is to provide drinking water to each and every one. After its inception, the ministry launched the 'Jal Jeevan Mission'. Jal Jeevan Mission targets 700,000 villages where to provide piped drinking water to 146 million households by 2024. The mission targets to increase household water connection coverage from 18.33% in 2019 to 100% by 2024. This mission gives encouragement to wastewater management technology-enabled systems, suppliers of water management equipment and meters, companies working in the field of construction, water quality monitoring systems, etc. Jal Shakti Abhiyan was also launched in 2019 aiming to as a movement for water conservation, recharge, and rainwater harvesting in 256 water-stressed districts. Jal Sanchay, one of the very successful water conservation projects in 2017 selected for a national award for excellence under the Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP). This project started in Nalanda, a district of Bihar. Under this project construction of dams, renovation, and desilting of the irrigation ways and already existing traditional water bodies. This project also creates awareness about the protection and maintenance of traditional water bodies, restoring rainwater and using it in irrigation and traditional water conservation techniques.

1. Research Objectives

1) To evaluate the Indian Government's efforts toward the Water crises in India

2) To analyze the Indian corporate sector's contribution with special reference to ION Exchange toward solving drinking water crises in India

2. Research Methodology

This research paper is trying to explore the Indian corporate sector's efforts to create awareness about the rightful use of water and introduce sustainable water practices. For fulfilling this purpose, this paper uses Secondary data. Government websites, Newspapers, Magazines articles, existing research articles, and related company websites and their annual reports and other documents are studied to collect the relevant data. This paper uses a descriptive research design.

3. Indian Corporate Efforts Toward Curbing The Drinking Water Crises

Protecting water bodies, curbing ground and underwater pollution, Indian companies are innovating new ways to keep water sustainability in India. In this regard, not only Indian Government but also Indian corporate's efforts are also very commendable. India as a country is fully committed to achieve all 17 SDGs.[3] SDG 6 i.e., 'Clean Water and Sanitation' is one of the areas which is helping to keep a balance with other sustainable goals. We can define wastewater as" water used for domestic and industrial use, and rainwater store in sewers is called out as wastewater." Because at last this water contains a wide range of pollutants which turned it wastewater or non-usable water. When such water is being released to other water bodies it makes their water polluted. Solution of this problem is 'water treatment, management and sustainability'.

4.1 Evaluation of Indian Wastewater Industry

[3] See it on https://www.undp.org/sustainable-development-goals?gclid=Cj0KCQjwxMmhBhDJARIsANFGOSsITOd4cxJh-hVCHmaV0uiH7_EZ0yHsc16VOJP6GLEdfUpR-ky_cC4aAuUMEALw_wcB

In 2019, Chennai made international headline when it declared 'Day Zero' because it did not have enough water at that moment and all reservoirs ran out of water. It was an alarm to many other Indian big cities. A report from Niti Ayog support this fact, it says 'if the measures towards water conservation would have not been implemented, 20 more Indian cities would face the water crises very soon including Delhi, Bengaluru and Hyderabad. Water and waste water management is coming out as a very promising subsector of environment technologies in India.

A Frost & Sullivan 2022 report placed India at the sixth place based on having largest market for the environmental technologies in the whole world, it also gives second rank water/water waste management as its subsector. According to the report, the Indian water and water waste treatment market will grow $2.08 billion by 2025 from $1.31 billion in 2020.It gives high opportunities to Indian and other countries companies to implement their projects in Indian water management market Engineering and construction services[4].

4.2 Indian Water Treatment Company - Ion Exchange

4.1) Ion Exchange

Chairperson and Managing Director, ION Exchange (India) Limited Mr. Rakesh Sharma quote companies' dedication towards sustainability goals, "Effective management of water should start from its source and it should go on throughout water 's life. ION exchange is dedicated towards sustainability development goals and believes that sustainability will come when we start using multiple ways of water conservation."

Ion Exchange is one of the pioneer Indian companies dealing in water and environment management. It has started as a subsidiary of the Permutit Company of UK in 1964 and became wholly Indian company in 1985. Ion Exchange is running its business for last five decades, now it is also making its presence at global level. Now Ion Exchange is one the unique company which is providing all range of solutions for water, water management practices, solid waste management, waste water treatment etc. The company also manufactures and distributes a variety of water treatment equipment and products. The company's products and services include water treatment chemicals, exchange resins, ultra filtration and nano-filtration membranes. Ion also supplies total water management services etc.

Table 1. COMPANY PROFILE

Industry Type	Environmental service provider
Website	https://ionexchangeglobal.com/
Company Size (No. of Employees)	Appx. 1000 to 5000 employees
Headquarter	Mumbai (Maharashtra)
Type of Company	Public Limited
Year of Foundation	In India, 1964 (became wholly Indian company in 1985)

[4] . see it on https://www.trade.gov/market-intelligence/india-water-and-wastewater-treatment-industry#:~:text=Demand%20for%20high%2Dend%20treatment,(CAGR)%20of%209.7%20percent.

Special operation areas	Waste water Treatment, Ground & Industrial water treatment, Rural Water Treatment, water treatment, Water Management Solutions, Drinking water solution, Recycling and reusability of Sewage water, Top water solution, Municipal water & sewage Treatment, High purity water system

Table. 2 RANGE OF PRODUCT/SOLUTIONS PROVIDED BY ION EXCHANGE

Water Treatment	**Waste water Treatment**	**Solid Waste**	**Process Separation &Purification**
1.Raw Water Treatment 2.Process Treatment 3.Post Treatment 4.Drinking Water Treatment	1.Waste Water System 2.Water Recycle 3.Zero Liquid Discharge	1.Sludge Dewatering 2. Waste to energy	1.Ion Exchange Process 2. Membrane Process 3. Ion Exchange Membrane Process

Source: - https://ionexchangeglobal.com/products/engineering/

4.2 Company's Achievements

1) At the TERI Water Sustainability Awards 2022-23 supported by UNDP & IWA, the company was awarded the 'Certificate of Appreciation 'for its innovative technology in water technology for our INDION Integrated Waste Management System.

2) Mr. Rakesh Sharma, chairman & MD of 1) Ion Exchange (India) Ltd received Champions of Sustainability Solutions Award in 'ECONOMIC TIMES SDGS IMPACT SUMMIT 2019'.

3) Mr. Ajay Popat the president of Ion Exchange (India) Ltd received he TERI-IWA-UNDP Water Sustainability Award for Wastewater treatment & Safe Reuse in 2021-22.

4.3 Company's Contribution

1) The company is using its best technological solutions to handle to all sort of wastages including liquid, solid and gaseous waste produced by Industries, communities, households and manufacturing sites etc. The company is now working with Jal Sansthan (water cooperation) to replace the traditional methods of water clarification methods. Traditional water clarification methods are supplying poor quality water which varies season to season. The company has developed a sustainable water clarification process which is using food grades biodegradable organic polymers approved by NSF & ITRC approved. It resulted in providing safe and clean drinking water throughout the year ((pH 7.0 -7.2, Turbidity<1, Colour <3 Pt Co). After successful implementation of this project , now many other cities are being allocated to the company for implementing similar project(Ginting, 2020).

Source: - Sustainable Growth and Development 58th Annual Report 2021-22 (ION Exchange)

1) Uranium a radioactive element is found in drinkable water (Balaram et al., 2022). The company is providing system of removing uranium (1600ppb to 2100ppb) from the ground water of India's one of the states on the demand of DWSS (Department of Water Supply & Sanitation).

2)

Source: - Sustainable Growth and Development 58th Annual Report 2021-22 (ION Exchange)

3) The company is also taking removal of f Per and Polyfluoroalkyl Substances (PFAS) very seriously. PFAS is a chemical very harmful for human health and animals. The company is developing special ion exchange resin process to remove PFAS from the water.

4) During pandemic, the company has under taken one project to support a leading tyre company. The tyre manufacturer company wanted to setting up a multipronged '4R' (reduce, recycle, reuse and renewables) strategy to ensure environmental sustainability and protection. To fulfil this purpose the company has designed, manufactured and installed a water and wate water management plant. The technology, equipment's and machines, the company has used 'tried and tested 'technology based on Life Cycle Costs which automatically resulted in achieving Zero Liquid Discharge, conserve the use of fresh water and also comply with the pollution control norms.

Source: - 'Effluent Treatment Plant', - Sustainable Growth and Development 58th Annual Report 2021-22 (ION Exchange)

5) ION Exchange is providing water and waste water treatment to corporates like for Kia Motors, the company has provided Water 3 Treatment Plant (WTP) (2000 m /d), Zero Liquid Discharge (ZLD) for Waste Water Treatment Plant (WWTP) 3 3 (2050 m /d) and Sewage Treatment Plant (STP) (900 m /d) at Anantapur, Andhra Pradesh.

6) The company has supplied 13 m /d agitated thin film dryer system to achieve Zero Liquid Discharge to the largest automobiles manufacturer of India, Hyundai Motor India Ltd. By adopting this company will reduce its dependency on fresh water and also follow least discharge.

7) The company has built an integrated total water management facility for Polyester Filament Yarn (PFY) unit at Silvassa. After the successful implementation of waste water treatment facility in Hoshiarpur and Allahabad for Reliance Industries Limited.

8) Ion Exchange has begged one contract for making waste water treatment system HPCL-Mittal Energy Limited (HMEL), that will enable HMEL to reduce water wastage in its refinery. HPCL-Mittal Energy Limited (HMEL) is a company dealing in petroleum and petrochemicals.

9) Ion Exchange has installed its Water Treatment Plant having capacity of 70 m^3/h in Dahej, Gujarat to support a leading chemical pharmaceuticals company name Arti Industries.

10) Even the big Government Enterprises like (SAIL) India's largest steel producer in India are taking company's help in water treatment. Ion Exchange has installed an integrated water supply system consisting of 30 m^3/h ETP with Demineralization (DM) plant, 250 m^3/h side stream filter system and many more facilities in their plant.

11) The company having the philosophy of 'Making a difference where its matters' is giving solutions to various types of water problems. The condition and availability of ground water is depleting day by day many pollutants like arsenic, iron etc are polluting the available water day by day. Keeping this in view, Ion Exchange is providing hand pumps and tube well attachments. The company has provided, 12 m /d 3 and 30 m /d fluoride removal tube well attachment to Mandla public health Engineering Department in Madhya Pradesh.

Source: -IEI News A House Journal of Ion Exchange India Limited, Volume 85, Nov 2020

3. Conclusion

Water is for life. Water is important for everyone including animals, birds, trees, human beings and any other area where living being exists. Water is one of the main factors behind the industrial and societal growth. India is a country full of all the natural resources where availability of water is not less but the explode of population is putting much negative pressure on water availability in India. Over exhaustion of water is spreading water pollution every day. At International level, water scarcity is already a big concern, UN has included this issue in its 17 SDGs which is showing world nation's serious view towards this problem.

4. References

https://ionexchangeglobal.com/products/engineering/

https://timesofindia.indiatimes.com/india/un-one-in-four-people-in-the-world-do-not-have-access-to-safe-drinking-water-community-must-manage-supply-and-sanitation/articleshow/98930151.cms

https://timesofindia.indiatimes.com/india/what-india-is-doing-to-tackle-its-water-crisis/articleshow/92141578.cms#:~:text=In%20the%2075%20years%20since,1%2C486%20cubic%20meters%20in%202021.

https://timesofindia.indiatimes.com/t10-march-23-2023/4-why-water-woes-could-leave-india-high-and-dry/articleshow/98922576.cms

https://www.wabag.com/about-us/

Balaram, V., Rani, A., & Rathore, D. P. S. (2022). Uranium in groundwater in parts of India and world: A comprehensive review of sources, impact to the environment and human health, analytical techniques, and mitigation technologies. *Geosystems and Geoenvironment*, *1*(2), 100043. https://doi.org/10.1016/j.geogeo.2022.100043

Ginting, P. (2020). *Sustainable Growth and Development*. https://doi.org/10.2991/aebmr.k.200606.082

Keller, A., Sakthivadivel, R., & Seckler, D. (2000). Water scarcity and the role of storage in development. *Water Management*, *39*, 1–24. http://books.google.com/books?hl=en&lr=&id=NyW8kY86kEwC&oi=fnd&pg=PR5&dq=Water+Scarcity+and+the+Role+of+Strorage+in+Development&ots=_tquG7MAop&sig=QCBH07USieMmOc8d05cUG4BV3RA%5Cnhttp://books.google.com/books?hl=en&lr=&i

Kumar, C. P. (2018). Water Resources

Issues and Management in India Available online www.jsaer.com Journal of Scientific and Engineering Research , 2018 , 5 (9): 137-147 Water Resources Issues and Management in India. *Journal of Scientific and Engineering Research*, *5*(9).

Seckler, D., Amarasinghe, U., Molden, D., Silva, R. de, & Barker, R. (1998). World Water Demand and Supply, 1990 to 2025 : Scenarios and Issues.Research Report 19. In *International Water Management Institute* (Issue January).

Seckler, D., Molden, D., & Sakthivadivel, R. (2003). The concept of efficiency in water-resources management and policy. *Water Productivity in Agriculture: Limits and Opportunities for Improvement*, 37–51. https://doi.org/10.1079/9780851996691.0037