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A Study on India's Water Economy and how it Matters

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Abstract

Water is a necessary component of life on Earth. Water access may be considered a fundamental human right. In general, water is seen to be a free community. Water, on the other hand, is today regarded as a socio-economic resource rather than a natural resource all over the globe. Through its usage in productive activities, it offers a variety of economic advantages to people and businesses. India is now experiencing a severe water shortage. India now has 16 percent of the world's population but just 4 percent of the world's total water resources. The growing physical scarcity of water resources in India is due to increased demand and consistent supply of water resources. From an economic standpoint, the current study examines the value of water resources and developing problems linked to water shortage in India.

Keywords: *Water Economy, Economic Development, Groundwater Depletion*

INTRODUCTION

Water is vital for every country's economic development and prosperity. Water efficiency may help to reduce poverty, promote human growth, and ensure environmental sustainability. In India's instance, the water economy offers enormous potential for addressing the issue of water scarcity via water governance and investment. Humans and other animals benefit from a broad variety of products and services provided by water resources. Irrigation, hydropower, navigation, and other uses of water need water conservation and optimum use.

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It may also offer opportunities for rural residents to find work and contribute to rural development. However, the shortage of fresh water is now the greatest impediment to India's socioeconomic growth.

The economic value of water

Water was once only required for fundamental activities like transportation, drinking, cooking, and fishing. Its importance in agriculture, industry, and other household activities grew with the passage of time. The price of a product or service determines its economic worth. People do not inclined to show their readiness to pay for water in the actual world since it is considered as a free and renewable natural resource. Water has certain distinct physical, social, and economic features, making its control by market or government very difficult. It offers four different types of financial advantages. Commodity advantages, waste assimilation benefits, aesthetic benefits, and recreational benefits are the four categories. The advantages derived from the use of water for cooking, sanitation, and productive activities by people and businesses are referred to as commodity benefits. This kind of advantage denotes the exclusive use of water, which is both competitive in consumption and natural. Furthermore, aquatic bodies have a considerable but restricted potential for assimilation. They have the ability to process, dilute, and transport trash. Recreational and aesthetic advantages are considered as luxury products because, as people's wealth rises, water-based leisure becomes more popular, attracting tourist trade.

When there is a surplus of water resources compared to the demand for water, enforcing water regulations or laws is easy. The water sector, on the other hand, transitions from a “expansionary phase” to a “mature phase” as an economy develops. According to this theory, at some point during the expansionary phase, the financial and environmental costs of creating new sources for expanding water sources for expanding water resource supply likely to outweigh the economic advantage of increased usage of current stock. Finding the true location of such resources is the most cost-effective approach for maximising economic gain in such a scenario. In the case of India, existing ground and surface water supplies are being over-exploited. It will almost certainly increase the cost of discovering new and current water supplies. The ‘mature phase,' on the other hand, results in a rise in the marginal cost of supplying

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water as well as dependency among consumers. In India, current consumers are degrading water supplies both quantitatively and qualitatively, and if no other solution can be found, future generations will undoubtedly pay a higher price. In India, too, there is a lot of user disagreement. Water shortage in India has caused a number of regional and international wars in the past. Inter-state water disputes include the Krishna-Godavari water dispute between Maharashtra, Karnataka, Andhra Pradesh (AP), Madhya Pradesh (MP), and Orissa; the Cauvery dispute between Karnataka and Tamil Nadu; and the Ravi-Beas dispute between Punjab and Haryana. International water conflict is also evident in the conflict between India and Pakistan over the Indus River and the disagreement between India and China over the Brahmaputra River. This king of conflicts cannot be resolved without appropriate management methods.

A market system based on private property rights and profit motivation, on the other hand, cannot be used to determine the real economic worth of water. Market failures are an issue that market economies face in the real world. Individual or agricultural economic activity becomes inefficient as a consequence of market failures, and the resultant outcome of markets is unable to satisfy society. Externality and public benefit qualities, as well as natural monopoly traits, characterise the water resource. All of these factors contribute to market failure. Externalities are present in water sector economic operations, thus even "seemingly efficient" markets cannot satisfy the equity requirements from a societal perspective.

Economic, social, and environmental consequences are all associated with water shortage. Food insecurity, poverty, migration, and other expenses are among them. As a result, poor water resource usage frequently comes at a cost to society and the economy. Water storage and flood control projects, on the other hand, are instances of public goods. This kind of product cannot be provided by the market since the costs of supplying such commodities are very expensive, and it is almost difficult to exclude non-beneficiaries or compel fee riders to pay. In this manner, if a farm's cost of production decreases throughout the manufacturing process, the farm is able to grab the whole market and establish a natural monopoly. It's a frequent occurrence in the water industry. Natural monopolies have the ability to offer products at a very cheap cost while

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simultaneously charging a high price. Monopolies exist in urban water supplies, hydropower plants, and other areas. If there are rising returns, however, public regulation may mitigate the negative consequences of a profit-driven Monopoly. However, in the event of market failures, nonmarket solutions may not lead to the best solution in terms of allocative efficiency and distributional fairness in the case of water resources. Because in a developing nation like India, corruption and lengthy bureaucratic procedures often result in socially undesirable results.

Price of products, consumer income, taste and preferences affect consumption or spending patterns in any free market economy, and prices are high in the case of highly desired items. While the private market has the ability to generate demand-driven private goods in a mixed economy like India, public sector activities may offer a broad variety of social goods. Improving water resources requires a grasp of the economic worth of water as well as an understanding of the relationship between the water sector and the economy. According to Saleth (2007), all water markets in India are regional, fragmented, and vary in maturity. In India's market institutions, there is a significant efficiency and welfare impact, but prices do not reflect regional scarcity or productivity. As a result, India's water markets have limited allocative capacity. The author also highlighted that India's water markets are inefficient for legal and institutional reasons, not organisational or economic ones. In Indian culture, water resources have cultural, religious, and social significance. As a result, since it is more than just an economic benefit, the socioeconomic opportunity cost of utilising this resource should be considered.

The origins and effects of India's water problem

Water is not a sold item, but rather a vital resource for human survival. However, water availability and quality varies by state in India, and water quality is decreasing day by day as a result of both human and natural activity. Precipitation is the main supply of water, although it only lasts 3-4 months.

In India, the issue of water, known as the "drought-flood-drought syndrome," is important since one-third of the country is drought-prone and one-eighth is flood-prone. There are many causes for the current water shortage. Activities such as residence and building in flood plains as a result of population growth, deforestation, and other causes are exacerbating the flood

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issue. According to a Niti ayog study, 21 Indian towns reached "day zero" by 2020. It is a scenario in which a city or location will be completely devoid of water. Chennai, a large Indian metropolis, is now experiencing a severe water deficit. According to the study, 40% of India's population would lack access to clean drinking water by 2030. Water pollution and shortages in India are exacerbated by a lack of appropriate government planning, growing corporate privatisation, corruption, industrial and human waste, and other factors. Again, since India is an agricultural nation, excessive water use for food production depletes total water supplies.

In 1990, total water extraction was projected to be 500 km^3, with irrigation accounting for 92 percent. However, as time has passed, the standards have become more stringent. Figure 1 shows that total water extraction in 2010 was projected to be 761 km^3, with irrigation accounting for 91 percent, or 688 km^3. In 2010, about 56 km^3 were used for municipal purposes and 17 km^3 were used for industrial purposes. Even today, water conservation in India is hampered by the usage of water for agricultural reasons.

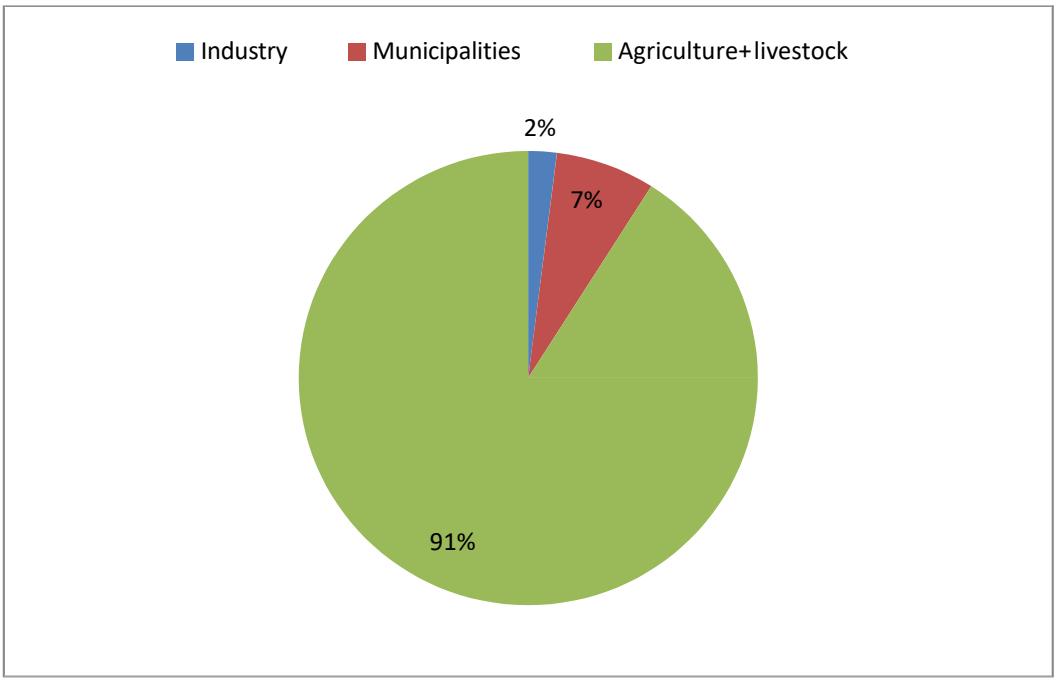
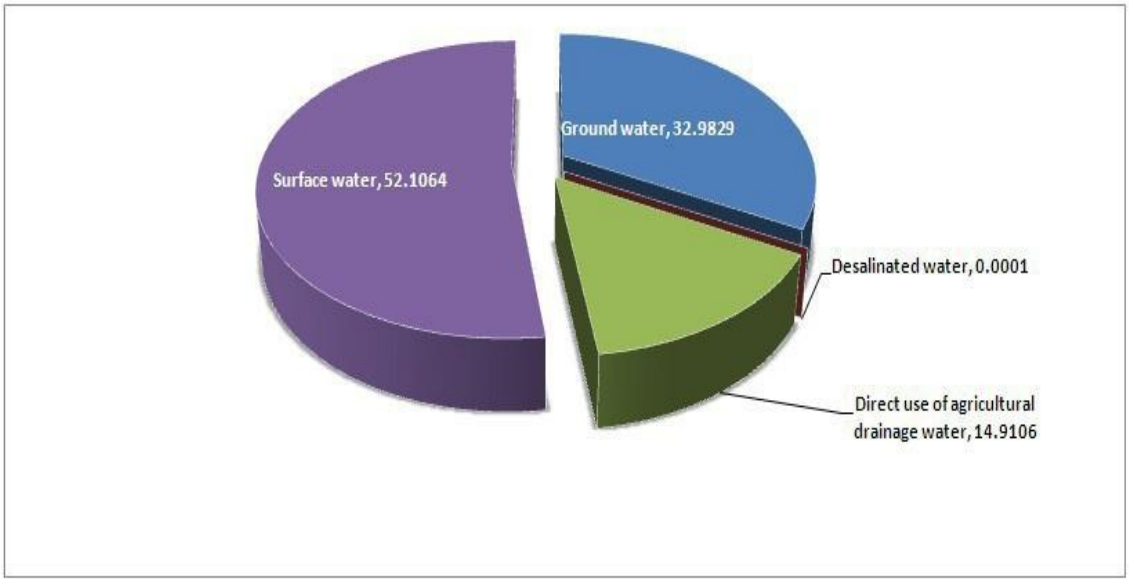


Figure-1: Water withdrawal sector in India in 2010

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Source-www.fao.org

Figure-2: Water withdrawal by source in India in 20

In 2010, groundwater withdrawals accounted for approximately 33% of total water withdrawals in India, while surface withdrawals accounted for around 51%. Similarly, while 14 percent of drainage water is used for agricultural purposes, the utilisation of desalinated saltwater to generate water for drinking or irrigation is minimal. (fig-2) Traditional irrigation methods induce water loss owing to excessive use of groundwater in the traditional agricultural sector, resulting in mismanagement of water resources.

Due to groundwater depletion, Indian agriculture consumes 90% of total water. Another significant contributor to India's declining water levels is the practise of giving agricultural electricity subsidies. In comparison to China or the United States, India needs almost twice as much water to produce crops of comparable size, making it less effective in terms of water usage in agriculture. The cost of groundwater extraction is largely determined by the availability of cheap and subsidised electricity, and the availability of cheap and subsidised power encourages the extraction of more groundwater resources.

The necessity of the hour is to strike a balance between farmer needs and long-term groundwater usage. There's a chance that this water issue may lead to higher prices and slower development and productivity in the agricultural sector. In terms of ground water depletion, the government has categorised approximately 30% of India's development blocks as semi-critical, critical, or overexploited.

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Pollution of water resources is also caused by the discharge of chemical fertilisers and pesticides into bodies of water, as well as the discharge of industrial effluents into bodies of water. With poor planning and a growing population, rapid urbanisation and industrialisation leads to a drop in groundwater levels.

In this regard, agriculture and industry must increase storage capacity in drought-prone regions, as well as ensure effective water distribution among urban users. Water waste is encouraged by industrial policies, putting people's lives and livelihoods at jeopardy in both rural and urban areas.

Private ownership of groundwater has become common in rural and urban areas due to a lack of regulation for over extraction of water from traditional sources or ground for divorce and the situation. Although national water policy 2012 recommended that over extraction of groundwater be minimised by regulating use of electricity for its extraction.

Figure 3 shows that India's per capita water availability is progressively decreasing. The availability of freshwater remains more or less steady, despite the growing demand for water resources to satisfy the needs of an expanding population, agricultural, and industrial development.

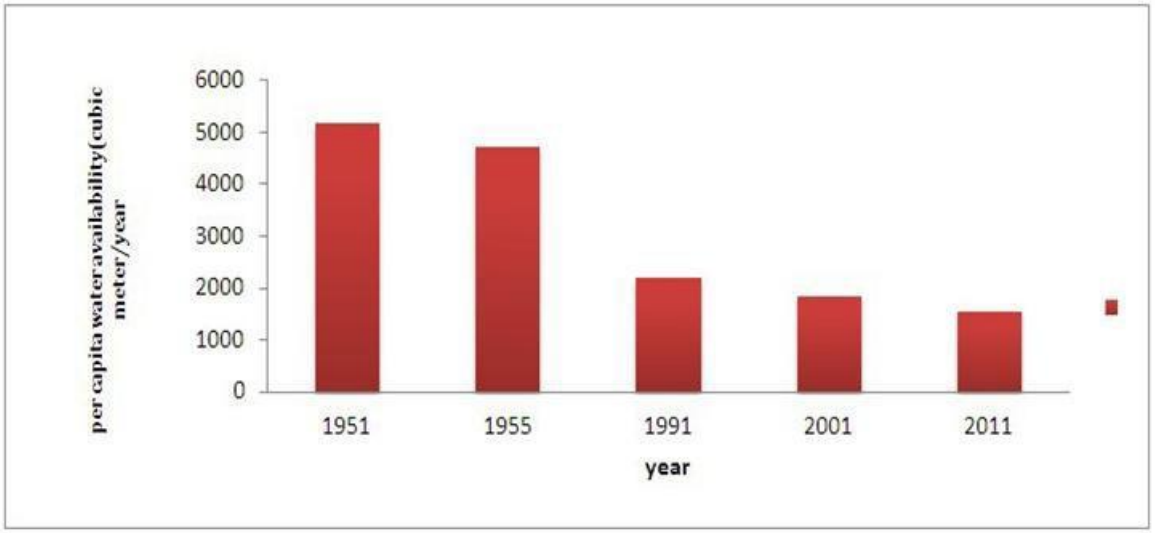


Figure-3: Per capita water availability in India

Source-EnviStats India 2018

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In India, the issue of water shortage poses a danger to the country's long-term social, economic, and environmental growth. According to the World Bank, 21 percent of communicable illnesses in India are caused by poor hygiene and contaminated water. At the same time, more than 500 children under the age of five die every day in the nation from diarrhoea. According to an NITI Ayog study, 75% of households do not have access to drinking water on their premises. People should be aware of the economic worth of water so that the nation may make the best use of its water resources while also considering long-term development issues.

India's socioeconomic vulnerability is due to a scarcity of water resources. The term "social vulnerability" refers to a scenario in which individuals or organisations are unable to deal with the negative effects of different variables originating from social interactions or institutional limitations. Economic vulnerability, on the other hand, occurs when individuals lack the ability to recover from economic shocks. Trade or exchange-related shocks, natural disasters, and other factors may cause these shocks. These kinds of shocks create a vicious cycle of poverty and inequality, in which the poor become poorer and the rich get richer. Overexploitation of water resources is one element that contributes to people's socioeconomic vulnerability, particularly in rural regions. It is difficult to safeguard rural communities' interests, and it may have a negative effect on rural development. Water shortage is linked to a number of issues, including surface and groundwater exploitation, and it has an impact on women's position in society. Women are disproportionately affected by poverty and vulnerability in both rural and urban settings, since they need water for a variety of functions inside the home. Women suffer time poverty when water is limited because they spend more time obtaining water supplies from distant regions.

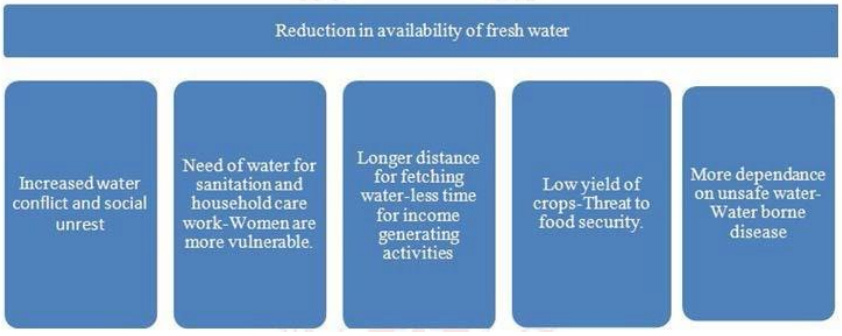


Figure-4: Impact of water scarcity and water pollution on wellbeing of people.

Source-Authors own

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Access to water in rural regions is now one of the most pressing issues of equality and empowerment. In rural regions where casteism or social exclusion is an issue, equality and empowerment are important considerations. Again, it is often said that major dam building has environmental, social, and economic risks. Large dams pose a danger to the existence of local people and wildlife, whose identity and livelihood are based on local economic systems. Displacement causes families to suffer, from the loss of traditional means of subsistence to the loss of ownership over local resources such as land, forest, and rivers.

Another thing to consider is that people in other areas of India are at danger of drought. There is damage of animal habitat as well as human habitat in such a scenario. These problems may jeopardise India's water future as well as its socioeconomic growth. From these data, it is apparent that water shortage may jeopardise India's long-term development objectives.

Is there a way to solve this issue?

Interlinking river systems in India are helpful for the country's untapped potential and effective use of water resources. India's water resources also offer a lot of promise for luring visitors. Rainwater harvesting and water recycling for non-drinking purposes should be implemented to avoid misuse of water and pollution. Rainwater harvesting may be used to replenish the groundwater supply, increasing groundwater availability. Using wastewater to clean farm lenses is also a good way to preserve the environment. To some degree, clear government laws on groundwater extraction management and adoption of water-saving irrigation methods, as well as crop planning for reduced water use, may address this issue.

Participatory groundwater management is a programme that has the potential to significantly reduce India's water shortage. It is a technique for identifying, quantifying, and managing water resources in such a manner that overexploitation of these resources is avoided. It is a practise that is carried out at the grassroots level. It allows the community and stakeholders to keep an eye on shared resources. Members who are not engaged in the implementation process do the social audit in this procedure. Rural people are also trained to be actors, facilitators, trainers, and data managers at the village level.

To solve the issue of urban waste water, a bottom-up or decentralised approach

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should be used to offer government subsidies for wastewater treatment and technical support to families and businesses. The "polluter pay concept" has gotten a lot of attention in recent years all around the globe. It is a component of the so-called "Caose Theorem." When there is a dispute over property rights, the theorem states that regardless of which side is granted property rights, under the assumption of no transaction costs, the starting between parties leads to an efficient conclusion. According to the "polluter pays concept," industrial farms must face the entire cost of production. The external or societal costs of contaminating water are included in this total cost.

The OECD's risk-based strategy demonstrates how to identify, target, and manage water shortages and pollution concerns. It is possible to formulate policies that take into account both the socioeconomic and environmental elements of these hazards in order to maximise the use and protection of water resources. (See Figure 5).

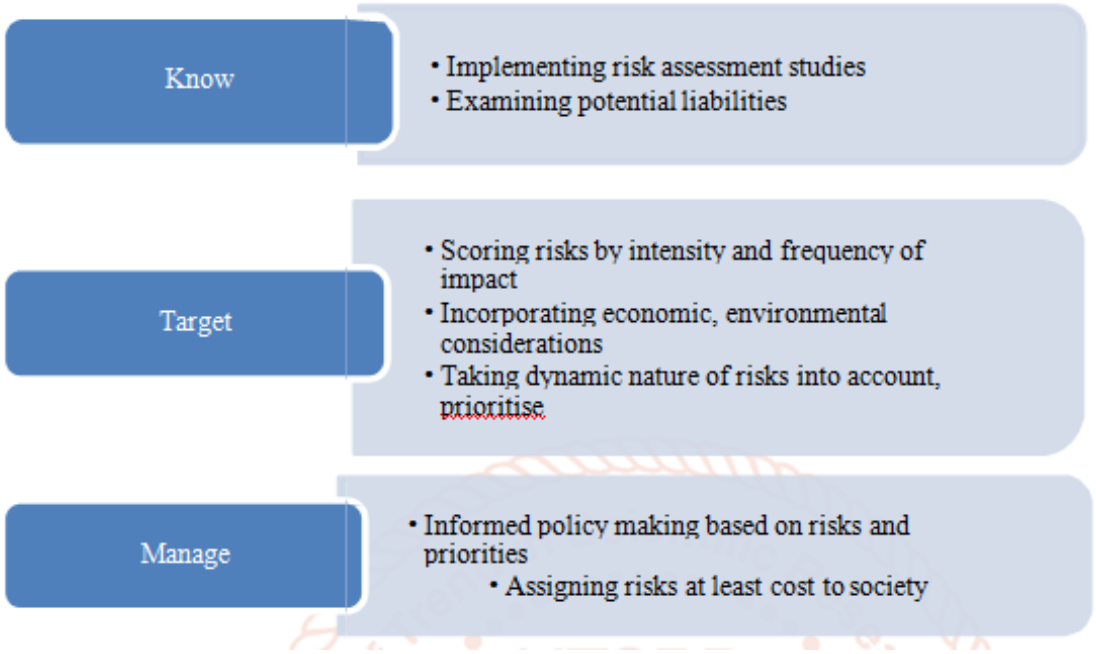


Figure-5: OECD risk based approach for managing waterrisks.

Source- OECD (2016) Water, growth and finance, Policy Perspectives

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As a result, various government policies and legal frameworks are required for water administration in India. Water policies that are gender responsive should involve a public debate that includes women in order to better understand the dynamics and needs of water resources. Water resource management is not only the responsibility of the government or the private sector. However, development plans should influence the general population so that water may be utilised in a manner that is both environmentally and economically beneficial.

CONCLUSION

In recent years, the gap between water demand and availability has widened in India. The agricultural and industrial sectors of a country, as well as human life, rely on surface and groundwater resources. Water shortages and growing demand for water for different reasons, on the other hand, have contributed to India's rising cost of economic development. Water should be used as efficiently as possible for residential, commercial, and agricultural purposes. Social institutions like as castism, poor women's position, social marginalisation, and so on have an impact on conventional societal systems. In such a scenario, it is critical to bring together the people impacted by the water crisis, the government, and the business sector when developing efficient water policy.

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