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TRANSFORMING MINING AND TUNNELLING THROUGH PRECISION, PREDICTABILITY AND LOCALISATION

India's mining and tunnelling industries anticipate using cutting-edge machinery to expedite the project. Technology experts and procurement specialists emphasise localisation and cost competitiveness when discussing the need for advanced equipment.

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Re-engineer processes by implementing water-optimising technologies

This article discusses a wide array of intelligent technologies, automation, artificial intelligence, etc., that will help to redesign water management to obtain more efficiency.



More than 1.4 billion people in India are affected by water crises in some way, with over 600 million severely impacted by the extreme water crisis. Given that India has only 4 per cent of the world's freshwater making drinking water for nearly 18 per cent of the world's population is daunting. The scarcity of freshwater is exacerbated by the fact that almost 80 per cent of India's surface water reserves and more than 60 per cent of its groundwater reserves are contaminated.

Over a billion people worldwide rely on self-supply water sources, with consumers increasing by more than 9 million per year. In India, a large proportion of the rural population depends on self-supply for drinking water, whereas the figure in urban India is substantial. As water reserves become dirtier and smaller, India faces challenges in protecting public health, ensuring farm productivity, growing the economy, and ensuring social stability. As a result, the water is shifting from providing life to taking it.

Efficient Practices

The world has begun to treat water as a limited resource, and India is adopting practices in the right direction. Industries are implementing zero water discharge with complete treatment of produced wastewater. Beverage giants are focused on returning water to the communities where they have plants. Food processing players engage with farmers to minimise water usage across the supply chain. And textile companies are evangelising the concept of sustainable fashion. Companies have realised the business risks emanating from the possibility of a water-scarce future. This has triggered companies to re-engineer processes, implement water-optimising technologies,

establish water audit standards, and use a collaborative approach to wade through the water crisis.

Technology as a Saviour

Water-efficient technologies will continue to be developed, but more importantly, the renewed understanding of water as a shared commodity will help these technologies find acceptance with industries, agriculture, and individuals. Smart technologies, automation, artificial intelligence, etc., will help redesign water management more efficiently. New habits will be created over the coming decades for efficient water usage, and technological intervention will become natural for large-scale use in India.

Water Treatment

Various technologies and processes are used to treat and decontaminate water for consumption by people and industries. Technologies for treating water have advanced significantly in the last few decades as researchers have increasingly focused on water and wastewater treatment suitable for the requirements in line with emerging challenges. Apart from the traditional treatment methods, innovation in the field has transformed with new-age technologies.

Nanotechnology

Water purification using composite nanoparticles that emit silver ions helps to destroy contaminants and remove microbes, bacteria, and other particulates. Water nanotechnology is used in three areas in water treatment: actual purification of water, detection of water contaminants, and prevention of pollution. It uses high pressure to separate impurities from the water and removes up to 99 per cent of all solutes in water, including calcium and magnesium ions.

Membrane Filtration Technology

Membranes, through which water passes to be filtered and purified, are integral to modern water treatment systems. The pores of membranes used in ultrafiltration can be 3,000 times finer than human hair. It is widely used for water treatment as a membrane that provides a physical barrier that effectively removes solids, viruses, bacteria, and other unwanted molecules. Different membranes are used for softening, disinfection, organic removal, and water desalination.

Reverse Osmosis (RO)

This process removes contaminants from water by using pressure



to force water molecules through a semipermeable membrane. Reverse osmosis can remove up to 99 per cent of pollutants, including lead, fluoride, chlorine, dissolved salts, and more. An adequately maintained reverse osmosis water system can last many years while ensuring high-quality and effective water output.

Way Forward

It is time to think about how our water resources are managed with the growing challenges of declining availability and increasing pollution. Adopting and implementing innovative treatment technology with sustainable practices will help reduce pollution while preserving natural resources. Sahara Industry has been manufacturing innovative products and promoting sustainable solutions for water treatment, helping utilities and industries to produce pure water and address the complex task as water continues to deplete and pollution rises. In a rich legacy spanning two decades, it has executed water treatment plants with innovative treatment technologies in hundreds of establishments for domestic, industrial, and institutional clients. ■



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