

SUN EMPOWERING WATER

Mohammed Naser Azeez, Managing Director, Aquality Intelligent Solutions Pvt. Ltd.

Across the world, between two and three billion people currently face water shortages, a number that is expected to rise in the future, particularly in urban areas. These shortages will further worsen in the coming decades, if international cooperation is not boosted in addressing this issue, warns the UN World Water Development Report.

In many parts of the world, access to clean drinking water remains a major challenge. There are a staggering 3.6 billion people, nearly half the world's population, do not have access to safely managed sanitation. Contaminated water sources can spread diseases and lead to serious health issues, especially for vulnerable populations. While traditional water treatment methods are effective, they often rely on electricity or fossil fuels, which can be costly and environmentally damaging. However, an innovative solution is gaining traction – solar powered water treatment systems.

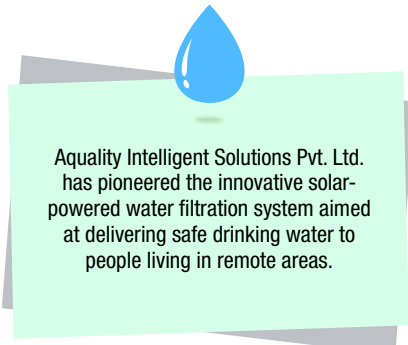
Access to clean drinking water is a fundamental necessity for all, but securing it remains a big challenge in India. The country's massive 1439 million population now the world's largest, faces a severe water crisis with almost half of the population facing the challenge.

For India's armed forces deployed in remote wilderness areas, clean water access is crucial yet extremely difficult. Natural sources like rivers and wells are often contaminated, posing health risks without proper purification. Security personnel stationed in remote, densely forested, and uninhabited regions grapple with daunting task to obtain safe drinking water.

Another vulnerable segment is the tribal population residing in forested and hilly regions with dwindling water sources. They are largely dependent on contaminated water from wells or borewells, lacking proper water infrastructure or other alternatives.

The water scarcity crisis in India is rapidly

intensifying. Nearly 80% of surface water is polluted, and 70% of wastewater is discharged untreated into water bodies. Per capita water availability could reduce by 36% in 2025 and a staggering 60% by 2050 if current practices continue, warns the Jal Shakti Ministry.



Aquality Intelligent Solutions Pvt. Ltd. has pioneered the innovative solar-powered water filtration system aimed at delivering safe drinking water to people living in remote areas.

Total water demand is projected to surge over 70% by 2025, widening the demand-supply gap. Rapid urbanization, economic growth, and lifestyle changes are aggravating clean water needs while generating more sewage. Industrial sectors like power, steel, textiles, and refineries will see their water-intensive requirements multiply.

An alarming 600 million people across Indian districts already face severe water stress, with numbers rising. Ignoring this crisis endangers public health as well as India's economic development goals and also results in crisis situation.

Sustainable solutions are desperately needed to increase access to safe water and sanitation for India's vast population, including its armed forces and tribal communities. Investing in solar-powered water treatment offers a renewable, decentralized approach to tackle this monumental challenge more holistically.

LEVERAGING SOLAR ENERGY FOR WATER TREATMENT

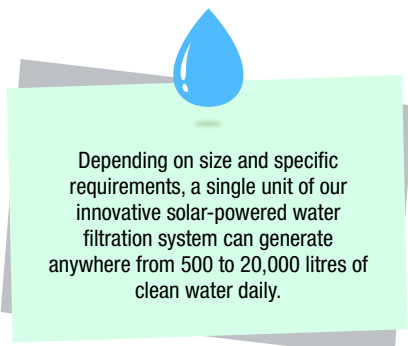
Utilizing the abundant energy of the sun, solar-powered water treatment systems employ



photovoltaic (PV) panels to generate electricity, powering the purification process. This process typically encompasses various stages, starting with pre-filtration to eliminate larger particles, followed by advanced techniques like ultraviolet (UV) disinfection, reverse osmosis, or nanofiltration to eradicate harmful microorganisms, chemicals, and dissolved solids.

A key advantage of solar-powered water treatment systems lies in their sustainability. By tapping into renewable energy, they reduce the carbon footprint associated with water purification. These systems can be deployed in remote areas where grid electricity is not available, offering a dependable and economical solution for security establishments and communities in need.

An exemplary example of successful solar-powered



Depending on size and specific requirements, a single unit of our innovative solar-powered water filtration system can generate anywhere from 500 to 20,000 litres of clean water daily.

water treatment systems' implementation is the Nanosource project in Mexico. This initiative has installed over 200 solar-powered ultrafiltration systems in rural communities, supplying clean drinking water to thousands of people. Engineered for minimal upkeep and user-friendly operation, these systems empower local communities to manage their water security effectively.



AQUALITY LEADING THE WAY

AQUALITY Intelligent Solutions Pvt. Ltd., formerly known as AQUALITY Water Solutions, has spearheaded efforts to provide clean drinking water to security forces and various establishments, including human settlements in countries grappling with challenges. The concept of a Solar Powered Water Filtration System was born in 2015 when the company presented a prototype to the Ministry of Water & Sanitation.

This groundbreaking solar water filter features a high-speed water filtration unit capable of purifying water from virtually any source, including hand pumps, swamps, wells, floods, rivers, and even wastewater. Employing advanced purification techniques, the technology ensures water is thoroughly cleaned, leaving impurities behind and producing high-quality water fit for drinking without the need for electricity.

Compact in size, roughly equivalent to a large box, the purification device has low power requirements and lacks removable parts necessitating maintenance or replacement, such as carbon filters or reverse osmosis membranes. The system can recycle used water for toilet flushing in all Swachh Bharat Mission toilets, addressing the challenge of unused toilets due to water scarcity.

This innovation not only mitigates the logistical hurdles associated with transporting bottled water

but also diminishes the risk of waterborne diseases impeding mission success. It guarantees a continuous supply of clean water to remote areas where security forces are stationed or in villages struggling with water scarcity due to the absence of electricity.



SALIENT FEATURES

- Completely mobile, can be installed anywhere
- Rapidly deployable during emergencies/disasters
- Available in various sizes - small to commercial/community scale
- Stand-alone, user-friendly system to purify and disinfect water
- Solar energy-based alternative to current water treatment technologies
- Enables armed forces to access clean water in the field regardless of source quality
- Reduces logistical burden of transporting water tankers/bottled water convoys
- Highly scalable - single unit can produce 500 to 20,000 litres of clean water per day
- Promotes sustainability by reducing electricity and bottled water demand
- Reduces carbon footprint, electrical use, bottled water transportation/disposal
- Portable, modular unit for safe drinking water for humanitarian missions

- Can be mounted on vehicles to provide clean water at different locations daily
- Solar-powered water purification - a potential solution for safe, clean drinking water provision

Harnessing solar energy, these solar-powered water treatment systems present a sustainable and adaptable solution to the global water crisis, with the potential to positively impact lives and communities by facilitating access to clean water.

WAY FORWARD

In areas grappling with water scarcity, solar-powered water treatment systems can significantly contribute to water recycling and reuse efforts. These systems have the capability to purify wastewater or brackish water sources, yielding high-quality water suitable for diverse applications including irrigation and industrial processes, in addition to providing clean drinking water.

India's extensive population, encompassing both armed forces and tribal communities, urgently requires sustainable solutions to enhance access to safe water and sanitation. Embracing solar-powered water treatment presents a renewable, decentralized strategy to confront this significant challenge.

Aquality Intelligent Solutions Pvt. Ltd. is at the forefront of this endeavour, offering a compact system adaptable for deployment in any setting. With a steadfast dedication to quality and innovation, the company is prioritizing the expansion of the system to meet the demand for widespread implementation, thereby advancing renewable and sustainable solutions for clean and safe drinking water.

About the Author



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Mohammed Naser Azeez serves as the Managing Director of the renowned Aquality Intelligent Solutions Pvt. Ltd., an ISO 9001:2015 company, specializing in technologically advanced water treatment solutions to ensure clean and usable water. He has made significant contributions to improving people's lives by providing clean drinking water facilities, demonstrating a strong commitment to technological innovation and maintaining a standard of quality excellence.




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