

Atheneum

Urban water: Crucial challenges and drivers

[Join this Discussion](#)

In light of key trends and challenges, what is the future outlook for urban water utilities?

There have been lots of changes in urban water utilities due to industrialization and consequential urbanization. Due to the water intense industries, utilization of water has increased abnormally and excessive withdrawal of water from the ground has depleted ground water in many areas due to insufficient surface water availability. Drawing water from the ground requires more energy to be used, and in turn, a lot of water is needed for generating energy. Many Government regulations have been enforced to combat this situation, such as rain water harvesting and the recycling and reuse of water in industries and common effluent treatment plants, etc. In some coastal areas, desalination plants have been installed to treat seawater in order to make it drinkable, and although the cost of treatment is high, there is no other place to go to get fresh water. Awareness of water utilization needs to be increased and the practice of conservation of water to be cultivated in people. People need to be aware of the consequences of having no water or less water in the future and thus act accordingly for optimum utilization of water. There is a need for the water authorities to brainstorm for the solutions for future urban water utilities by bringing water experts together and taking necessary precautions now to experience a better outlook in future for urban water utilities. Funds need to be allocated accordingly to balance the water utilities in urban areas.

What opportunities do innovations in nano and biotechnology present for the water sector?

A recent buzz word in various fields is nano technology, and there has been a lot of work happening in the research of nano technology within the water sector. Nano materials are being developed to remove harmful constituents from water. Most of the research in nano technology is happening in the area of water treatment rather than water conservation. Nano materials are developed and used for the removal of pesticides, Arsenic, lead, iron, etc. There is ongoing research for further advancements in this area.

There are a lot of opportunities in the field of water for biotechnology, especially for the treatment of waste water from industries and domestic applications. This will enable people to use the treated water for industrial and other applications, helping to reduce fresh water usage.

Using nano technology and biotechnology, water intense industries can treat their effluent efficiently and reuse the treated water for process and other applications. Industries should aim for Zero Liquid Discharge concept to protect the fresh water contamination, thereby reducing the disease burden on people. More and more technologies need to be developed for water treatment for the removal of total dissolved solids for drinking water applications. Presently people are using Reverse Osmosis technology, which generates a lot of waste water during the process. There is an urgent need to develop alternative technology to Reverse Osmosis where conversion should be closer to 100%. Increasing research in biotechnology to develop new crops which do not require so much water is vital, as agriculture is the major consumer of water.

The global population is expected to reach around 9.5 billion in 2050, which amounts to an estimated 90% population growth in the cities of the developing world. What challenges does rapid urbanisation pose to water utilities, and how will they adapt to manage rising demand and depleting resources?

It is very important to think of future problems regarding water availability due to increasing population. The quantity of total water remains the same and hence there is urgent need for alternate arrangements for water conservation. Increase of population leads to more demand for water for their use. This also increases the industrialization and consequential demand for more water for making more products. Industries need to optimize their utilization of water per product produced. There should be normalization on this aspect for the total water management in industries. Some countries face problems with leakage of water during distribution, a problem which needs to be addressed with new technologies and mitigative measures. Governments of every country need to plan and allocate funds and technical people to think of the solutions for the issues presented by population increase and thus higher demand for water. Resources need to be planned in advance, there should be strict regulations for the proper utilization of water, and Zero Liquid discharge needs to be implemented by regulators and strictly followed. Incentives need to be planned for the industries for their good work in the field of water conservation.

In addition to population growth, what other social, economic and environmental factors are driving the water utilities industry?

Primarily, industrialization due to urbanization is driving the water utilities industry. Agriculture is the major consumer of water and the requirement of water needs to be optimized for this purpose. New industries are evolving day by day to meet the demand of the requirements of the increasing population. Every day, new chemicals are introduced to the environment and these are entering the water bodies and contaminating the water. Most of the water then becomes unfit for drinking due to the increased industrialization and release of contaminants to the water bodies, be it surface water or ground water. Water availability per person is decreasing day by day due to population increase.

Increase in population has a tremendous impact on the water utilities industry with regards to meeting the expectations of people on water supply. Treatment of water is becoming more costly and also has a definite impact on the water utilities industry. Availability of fresh water is depleting due to industries and changing environmental factors, and rains are decreasing over time due to increased environmental changes.

This entry was posted in [Energy & Utilities](#) on [August 31, 2015](#) by [Dr. T.N.V.V. RAO](#).

About Dr. T.N.V.V. RAO

Dr. T.N.V.V. Rao has over 25 years of experience in the area of water management. A Ph.D. in Environmental Chemistry and M.B.A in Operations, he has a string of additional qualifications in environmental management, business management, and sales & marketing. He has to his credit a large number of papers that have been published in reputed Indian & international journals, and presented at prestigious seminars and symposia. Conversant with state-of-the-art technology and instrumentation, Dr. Rao has been associated with a wide number of important analytical and research projects for reputed institutions and associations. He has conceptualised, developed & evaluated state-of-the-art water purification systems, as well as handled training in sales & service, technical guidance and customer complaints. This, along with his tenure at the leading water purification company, a leader in specialty chemicals manufacturing and a leader in Flavor & Fragrance manufacturing, has brought him invaluable first hand understanding of customer needs. His experience includes being a Management Representative for ISO 9001 certification and he is conversant with good documentation practices.