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Infrastructure TODAY

November 2012 • Vol. 10 No. 4 ₹ 100

India's Premier Magazine for Nation Builders

VOX POP

Government should take holistic approach

In order to secure future water needs, the government will have to play a major role, both functionally and financially.

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What are the new technologies available to provide better wastewater management?

DWIVEDI

Technologies focus on the techno-economic mix for fulfilment of viability requirements and also technical requirements for specified re-use specified for industrial and domestic sector. Uniform standards are adopted for water quality parameters for the specified re-use to enable the client/contractor to choose the optimum technology at a rational cost. Cost comparison should be for the lifecycle cost inclusive of operation and maintenance (O&M) costs and not just initial installation.

There are various advanced equipment available in the market today. Similarly, with respect to process, many advancements have happened in the biological treatment both in the attached and suspended growth process such as SAFF, improved Moving Bed Biofilm Reactor (MBBR) processes in the former and Sequencing Bio Reactor (SBR) in the latter category.

Fixed Bed Bio-film Activated Sludge (FBAS) claims to combine the advantages of attached and suspended growth systems. These technologies can be evaluated in terms of foot-print, power consumption, other O&M costs and also primarily fulfilment of the desired treated sewage parameters for specified end-use to arrive at the most techno-economically feasible option.

NAGARAJAN

New technologies add value not only in efficacy of pollutant removal but also make operation and maintenance efficient. Being modular, these technologies also allow the investment to be made in a phased manner to meet future capacities as well as further stringent environmental regulations.

Enhanced nutrient reduction, bio-solids and residuals management, water reuse, improved plant safety, operational cost reduction, lower foot print, lower total cost of ownership, and centralised measurement of discharge quantity/quality are the focus areas which are well addressed by new technologies. A Membrane Bio Reactor (MBR) system for wastewater treatment can be used to recycle wastewater and adhere to strict environmental regulations. Technologies like SBR and MBR optimise footprint, render low effluent turbidity while reducing waste sludge generation.

MARRI

Innovations may be described by the difference they make to the infrastructure needs. Wastewater treatment innovations satisfy a number of different criteria:

- Integrate planning with other local services such as solid waste, organics composting programs, energy and public services so that a community benefits from wastewater treatment in a variety of ways
- Reducing the costs of wastewater treatment through waste recovery and reuse
- Minimising environmental pollution
- Embracing the flexibility so that new innovations and technologies can be employed as they become available.

CHANDANE

Water is a renewable natural resource. While much of our water supply is renewable, there are "non-renewable" water sources as well, where our use of water depletes or degrades the source. The use of semiconductors is rising globally, fed by the ever-growing number of electronic devices for the treatment of wastewater. The rapidly expanding middle classes in developing countries are compelling advanced water and wastewater treatment technologies that cater to this demand while reducing the impact on the environment and operating budgets. As such, refining current wastewater treatment technologies through innovation, instrumentation and analytical automation to enable cost reduction and increase competitive advantages is the fastest way forward.

SUBAWALLA

Conventional sources of water such as surface and groundwater are under heavy stress in many areas around the world and the demand for freshwater continues to outstrip current available supply. Due to the deteriorating quality of fresh water, wastewater is consequently becoming more challenging to treat.

A combination of technologies like MBR, Reverse Osmosis (RO) or Electrodialysis Reversal (EDR) with appropriate pre-treatment can help in achieving the toughest wastewater reuse objectives. Zero Liquid Discharge (ZLD) technologies can then further minimise the impact on the environment by converting the last and toughest stream of recoverable wastewater into reusable water and solids. Judicious use of treatment chemicals in the process can improve both quantity and quality of reclaimed water.

SANDEEP

Our new technologies ensure that they are environment-friendly (less chemicals and power to operate), occupy less space and provide quality output at lower lifecycle costs.

CHIDANAMARRI

Water and wastewater management in India has gained due importance in the recent years. With fast depleting water resources, there is a lot of emphasis on adopting the 3R of environment – Reduce, Reuse and Recycle. With the availability of the latest technologies such as MBR, ZLD, etc, the wastewater can be recycled and reused for applications such as agriculture and landscape irrigation, industrial process water, toilet flushing, ground water recharge, etc.

GANESAN

Newer technologies like gas generation (primary clarifier) from the sludge plays a major role in methane gas emission, reduces the green house effect; similarly, effective sludge management system and usage of treated water.

MBR is an advanced treatment technology that is compact. It provides treated water of high quality. MBR systems replace conventional treatment and combine clarification, aeration and filtration into a simple and cost-effective process that reduces capital and operational costs. The result is consistent, high quality effluent suitable for any discharge or reuse application.

NATRAJAN

The newer technologies would provide numerous opportunities in wastewater management in terms of: better treated effluent; minimum footprint (minimum land space for the client); and power saving – converting waste into electricity.

In earlier days, secondary treatment of sewage was the norm, that is, BOD of about 20 ppm and TSS of about 30 ppm were accepted. Now, as per the new Water Policy and standards, recycling would assume prominence which would encourage buyers to go in for the latest technology such as membrane filtration.

According to you what is the present understanding on urban water management?

DWIVEDI

At present, industries think they have to follow wastewater management only due to pollution control board norms. The industries need to have closed knit interface with the government to make them understand that this is essential not only for fulfilment of modalities but is a form of service and payback to the environment and its precious resources. This is essential for the future of the country and the globe in a larger perspective. New policies are required so that the proper implementation of wastewater management can be achieved.

NAGARAJAN

The focus needs to shift to total water management and equitable cost recovery measures for sustainability. Quality water as a resource is scarce. With multitude of water sources being tapped, surface water, deep-well water, seawater, rain water, city water, wastewater, etc with their individual environment impact, water needs to be seen holistically in all areas including irrigation, industry and municipal applications – both from supply and demand side.

This problem can be minimised by implementing efficient water management practices. Urban Local Bodies (ULBs) can adopt measures such as rainwater harvesting, billing based on water consumed and waste-

water discharged, and strict enforcement of pollution control norms. The other major loss of water is in the distribution networks and can be reduced by appropriate metering, leakage detection and on-time rectification. Regular water audits and timely maintenance will support the performance of the total water management concept. Certification of engineers by a 'Bureau of Water Efficiency' will ensure higher standards in addressing the problems of this precious resource. Programmes about water pollution at school level will build the awareness at homes and an excellent base for future citizens. The consumer/polluter needs to bear the cost of the water/wastewater treatment and delivery/collection.

MARRI

India's growing economy will translate into increased demand for water across different sectors. Various estimates and projections indicate an increasing trend in water demand for agriculture, industrial and domestic uses in the coming decades. Estimates reveal that by 2020, India's demand for water will exceed all sources of supply. In just 50 years, a water-rich nation has been reduced to a water-insecure one.

> By 2020, India's demand for water will exceed all sources of supply.

Given the enormous challenges of urbanisation and industrialisation in the Indian economy, the government will have to play a major role by empowering ULBs, both functionally and financially. Going forward, the water sector is likely to see increased and efficient governance; a sharper focus on capacity creation, be it institutional or skill development; and an increased focus on reforms aimed at providing financial autonomy to ULBs and encouraging private sector participation.

CHANDANE

The present water infrastructure is inadequate and the need to cater to industrial water need in addition to drinking water supply will further strain the water procurement cycle, and impose limits on the amount of water available to fulfil the needs of urban India. Industry is the largest users of fresh water. The High Powered Expert Committee (HPEC) Report on Indian Urban Infrastructure and Services estimates (at 2009-10 prices), the per capita investment needed for capital infrastructure in the water, sewerage and storm-water sector at Rs 13,329 and another Rs 840 annually for operation and maintenance. The total investment needed during 2012-2031 according to this estimation is Rs 754,627 crore for capital and Rs 817,671 crore for O&M respectively. Thus, the water supply, sewerage and storm water drainage investments amount to about 24 per cent of all urban sector requirements for capital and 41 per cent for O&M respectively.

There are some steps if taken in the right direction, will help in improvement of urban water supply: decentralisation of authority, improving autonomy and accountability, sustainable infrastructure development, operation and maintenance, customer service, emphasis on sanitation and waste water management, easy financing of WSS operations and infrastructure development, accountability to ULBs and customers, improving internal procedures, engaging in public-private partnerships (PPP) etc.

SUBAWALLA

With the government and industry playing more active roles, the awareness about the water and wastewater industry in India is increasing day by day. The year 2012 saw multiple moves on the policy front with the Ministry of Water Resources publishing the Draft National Water Policy and Ministry of Urban Development publishing the Draft Revised CPHEEO Manual, both of which are positives for urban water management. These policies and guidelines are expected to bring focus on the right kind of projects for water and wastewater.

SANDEEP

There is high awareness of increasing water scarcity and government regulations on effluent discharge. Industry should look at reducing their overall water footprint, which will lead to a more efficient, cleaner and competitive operation. The approach has to be a holistic one and cannot be looked at as an end of pipe solution where all effluents are collected and treated, and an effort is made to recycle at the final point. It is essential to start with a proper study of the entire water circuit and then arrive at processes that can bring down water usage; cut wastage; and recover and recycle at source. This will lead to advantages in: reduced utilisation of source water; nil or reduced discharge; and possibility of product recovery from waste streams.

CHIDANAMARRI

Even though there is awareness about water and wastewater management, the current water and wastewater management practices are not enough for creating a sustainable environment. Only 31 per cent of the wastewater generated in 23 metropolitan cities is treated and the remaining 69 per cent is open dumped in rivers and other fresh water resources. Municipalities are under severe stress to meet the growing demand of water in urban areas. Existing water infrastructure

facilities have to be revamped for efficient functioning and capacity additions need to be made. The major challenge faced by the municipal corporation is funding these projects. As water is either free or subsidised in India, municipal corporations are not able to generate sufficient revenues to develop adequate water infrastructure in India.

> "The entire water supply network must have accurate water meters with data loggers.

Municipalities should come up with proper water tariffs and charge the customers according to their water usage. The tariffs should be revised every two years to keep up with the costs. This would reduce non-revenue water, water thefts and aid in implementing water management practices.

GANESAN

Awareness about the water in urban areas must to be improved. Still, significant amount of water is getting wasted due to leak, wastage, unmetered connections, and meter errors. Water leak auditing and walk through audit for all the distribution network pipelines is a must. The entire water supply network must have accurate water meters with data loggers linked to GPRS so as to monitor regularly.

Rainwater harvesting: Rain water percolation pit for individual houses, commercial complexes shall be established. Storm water drain must be linked with the nearest lake or river. This will increase the storage quantity of water for urban areas.

Reuse of water: Promote the recycling and reuse of waste for gardening, toilet and other cleaning purposes.

NATRAJAN

We must focus on recycling in urban water management due to increased urbanisation. Secondly, desalination could be an alternative source of water in urban water management in coastal areas considering the demand-supply gap.

What would be an effective wastewater management model to implement in country like India?

DWIVEDI

A proper, strict and stringent set of pollution norms. The EPC industry and the government machinery should work in tandem with each other to materialise things in the right perspective and achieve the socio-economic objective of conserving the fresh water sources ensuring its perennial availability by adhering to the principles of *reduce* (Judicious use of fresh water by curbing wastage and prohibition for non-potable uses), *recycle* (Provide infrastructure for treatment of sewage and conveyance of useable treated sewage) and *reuse* (define non-potable uses of recycled/reclaimed water and making it mandatory).

NAGARAJAN

Municipal/ULBs: The water discharge permits similar to those for industries should be mandatory for housing complexes/residential areas as well, to encourage responsible use of water. ULBs collect and transport wastewater at great expense to remote locations for centralised treatment. Distributed wastewater treatment near the main sources can reduce the expenses of collection/transport at the same time offering treated water for reuse at the main consumers.

Industries: The industries should be mandated to stop use of ground water and instead, use tertiary treated sewage water from ULBs. This can be made possible either by policy or by differential pricing of treated sewage water. The machinery used for production should be evaluated for water consumption and wastewater generation. The current trend focuses on energy/fuel consumption only. Publishing of water footprint should be made mandatory for consumer and industrial products.

MARRI

A single wastewater treatment technology would be inappropriate for a country like India which has several different geographical and geological regions, varied climatic conditions and levels of population. It is more appropriate to address the potential of identifying appropriate solutions for different regions.

The five main wastewater treatment technologies that are commonly used are:

i) Waste stabilisation ponds;
ii) Wastewater storage and treatment reservoirs;
iii) Constructed wetlands;
iv) Chemically enhanced primary treatment; and
v) Up flow anaerobic sludge blanket reactors. These are suitable for different conditions and have advantages and disadvantages, especially in terms of requirements for land, cost, remediation efficiency and other factors.

However, from the sustainability aspect, the selection of the appropriate solution must be balanced between simple systems that do not require use of chemicals and those that have high pathogen removal. Motivating the community as a whole to work towards effective functioning of a local system is one of the critical prerequisites.

The 12th Five Year Plan period is for the water

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