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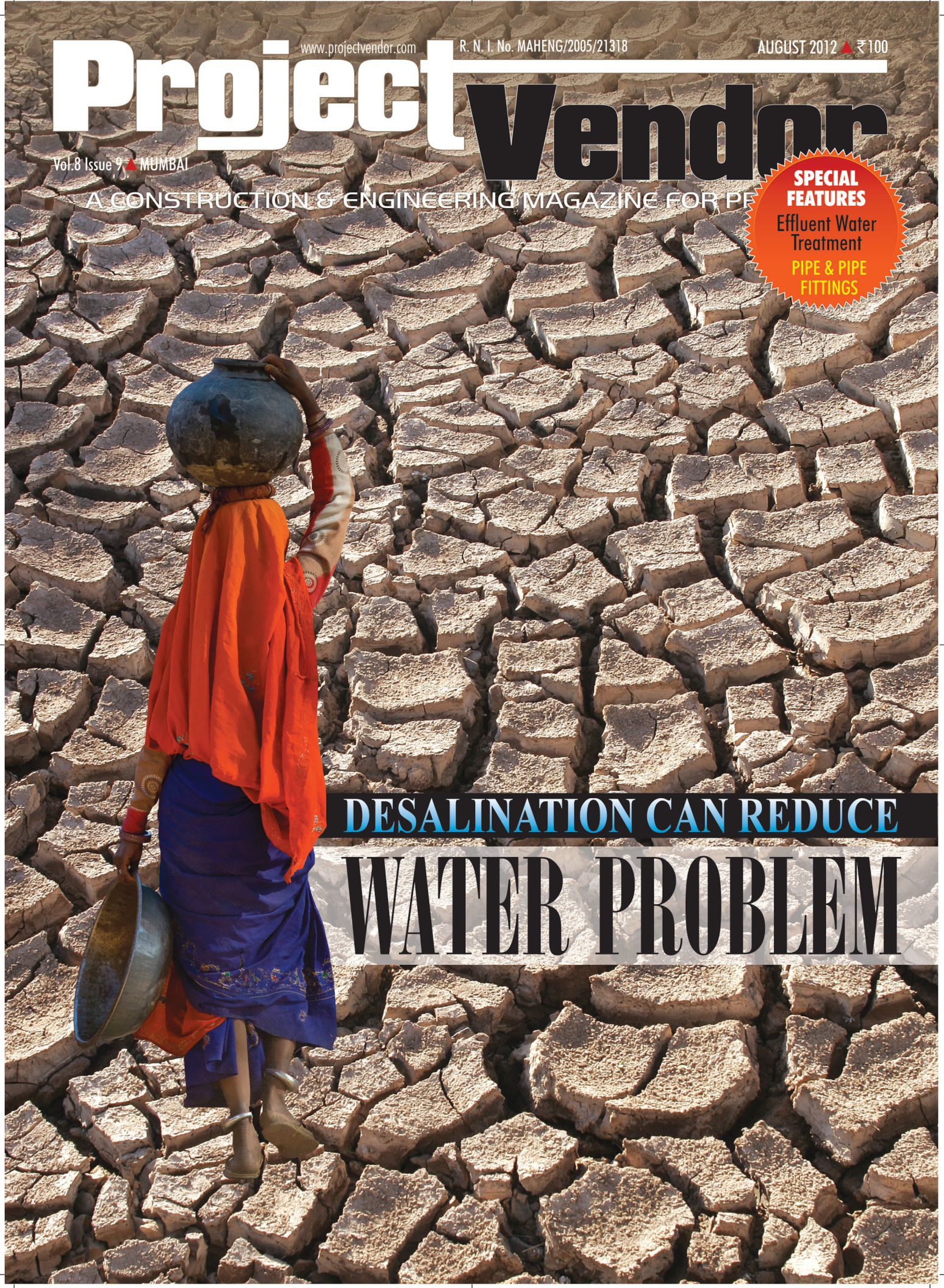
SPECIAL FEATURES

Effluent Water Treatment

PIPE & PIPE FITTINGS



DESALINATION CAN REDUCE

WATER PROBLEM

EFFLUENT TREATMENT:
Current scenario and way forward

Rishabh Sethi
writes about the need for government to encourage large industries to set-up their own wastewater treatment plants and utilise the treated water for industrial purposes.

Fresh water is available only 2.7 per cent though the surface of earth is geographically covered more than 70 per cent with water. Traditionally, agriculture has been the major source of livelihood of the Indian population. However, after Independence our founding leaders envisioned the nation progressing with a decent industrial base. This triggered the formulation of programs and strategies to construct a proper infrastructure for speedy industrialization.

INDUSTRIALIZATION IN INDIA

But the pace was slow since independence till 1980, during this period there was restrictive growth of private sector and government's permission was required to set up any private enterprise in India. Despite this the GDP grew at a rate of 1.4 per cent per annum from 1940 - 1970. Other factors such as poverty and famine lowered India's economic growth rate. During this period, the absorption of domestic produce was higher due to limited number of producers of major industrial goods. After that period, rapid expansion of the city, population growth and increased industrialization put tremendous pressure on water supply. India went through rapid industrialization and urbanization and the amount of wastewater generated by industries have increased many fold. It is estimated that industrial water consumption is expected to multiply and will reach 18 per cent of total annual water

Activated Carbon Filter at CETP Naraina, Delhi

19.5 MLD water treatment plant at Ramganjmandi, Rajasthan

consumption by 2025, up from just 6 per cent in 2000. Experts believe that the contribution of India in the world GDP is estimated to increase from the present 6 percent to 11 per cent by the year 2025, while the contribution of US in world GDP is presumed to decline from 21 percent to 18 per cent. This indicates the emergence of India as the third biggest global economy after US and China. The evaluation is supported by the overall development in all the sectors in India, in which the key sector is the industry sector. Common effluent treatment plants (CETPs) were perceived to be a feasible solution for abatement of industrial wastewater pollution. However complexities involved with practical application and logistics proved not to be as appealing as the concept.

CURRENT SCENARIO

Presently, 6.2 billion litres of untreated industrial wastewater is generated every day that causes pollution and reduces available freshwater reserves. This necessitates that government should take initiatives and encourage large industries to set up their own treatment plants to reduce the wastewater by reusing the treated water for industrial purposes. Thermal power and steel plants are the highest generators of industrial wastewater followed by textile and food processing industry.

PROCESS OF TREATMENT

The treatment of collected wastewater should be determined by the purpose for which it is recycled. It can either be discharged in water bodies or reused for other purposes such as drinking, gardening or industrial depending on the quality produced. It should be treated up to certain minimum levels in order to free the water of harmful contaminants that pollute the receiving environment.

Wastewater generated by small and medium industries need to be transported to the Common Effluent Treatment Plant (CETP) by pumping of effluent from these industries. The effluent through pumping stations initially reaches a stilling/inlet chamber, after which it flows into the oil and grease (O&G) chamber for removing these from the wastewater, using a skimming mechanism. During this process, air and chlorine are injected into the chamber and the separated oil and grease is then disposed. Wastewater moves from the O&G chamber to be collected in the screen chamber for the removal of floating materials in the effluent. Apart from floating materials and O&G, the effluent also contains solid particles like grit and sand. This is removed in the grit chamber before undergoing biochemical treatment.

The treatment process is a multifaceted task that needs to be planned and controlled in a sequential manner in order to meet the required discharge standards. Plant is designed to meet the specific demands of wastewater to be treated. The treatment processes for various effluents originating from different industrial sources are different. Below is the general overview of the various procedural steps.

1) Primary Treatment — involves the removal of suspended solids, oils and coarse fractions, which could damage

and interfere with downstream equipment. It alters characteristics of the wastewater through chemical addition to meet the needs of the ensuing treatment processes.

2) Secondary Treatment — is the biological degradation of organic material. This process usually decontaminants water to the extent that it can be directly discharged to percolation ponds, which are less vulnerable than the natural environment.

3) Tertiary Treatment — refurbishes the product to produce water that can be safely released to water bodies. Approximately 95 per cent of the impurities are removed at this stage. The influent is first disinfected with chlorine, oxidants, or ultraviolet light irradiation. Filters such as sand, micron and active carbon are used to absorb excess chlorine, colour and organics.

SPML has been promoting sustainable water management - a task that is increasingly becoming essential and complex as the natural supplies deplete and demand rises. SPML makes an important contribution towards conserving the precious resources across the nation by reducing wastage, losses and pilferage of the drinking water and treatment of used water. SPML has designed and constructed a number of CETPs in Delhi and other cities. The Bawana CETP in Delhi is the largest effluent treatment plant in Delhi

developed for the Bawana Industrial Area with the capacity to treat 35 million litres daily. Spread over 1,922.94 acres, the industrial area has 20,000 industrial units.

WAY FORWARD

Certain practices, if implemented efficiently, can definitely make a difference. Although planning is the first step, it can facilitate the effective treatment only when there is easy access to the required resources and an ability to manage them. Some of the other factors that are equally essential for the success of treatment are:

- Availability of efficient technology that is cost effective.
- Technical ability to manufacture, install and operate treatment systems.
- Social acceptance and awareness.

In a developing country like India, pushing for greater efficiency, effective control, management and reduction of wastes can be achieved only through a comprehensive strategy. It involves precautions and changes at every stage of the production cycle, starting from the use of the right raw materials to the safe disposal of unwanted materials. CETPs are just one of the stepping-stones towards achieving pollution free production from the industries of India. ■

Rishabh Sethi is the Executive Director, SPML Infra Limited. He is spearheading business development and project management in the company's water and environment verticals. He is credited for establishing a robust IT infrastructure for the organisation, including the implementation of an Enterprise Resource Planning system through SAP. He is also leading the company towards a Strong Water & Environment Business in the areas of O&M of Municipal Water Systems, Sewage & Effluent Treatment Plants and Municipal Solid Waste Management. Prior to his current role, he was working with A.T. Kearney in New York. Sethi is a graduate in Industrial Engineering and Economics from Northwestern University, USA.