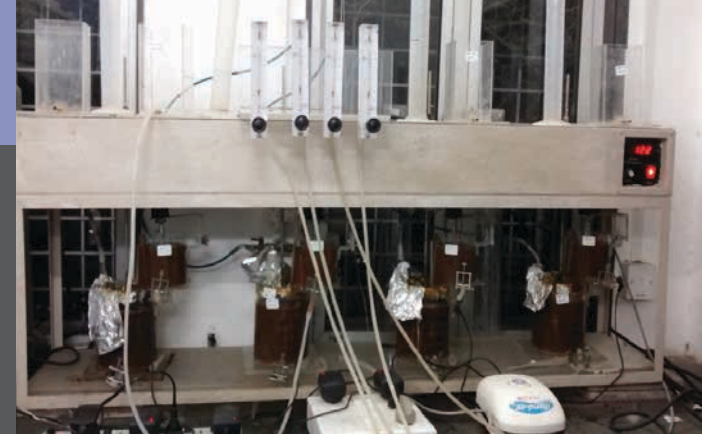# Membrane Sequential Bio-Reactor for Decolorisation of Wastewater

Problem Statement: An eco-friendly and cost-effective biological treatment system is essential for sustainable wastewater solutions in today's world. However, the treatment process that decolourises the objectionable dark brown colour and reduces a large amount of organic matter present in raw wastewater to permissible limits is challenging. As a result, conventional wastewater treatment plants are incapable of producing high-quality effluent. Membrane Sequential Bioreactor (MSBR) is one of the promising technologies which not only has the intrinsic ability to provide high-quality effluent but, most importantly, meets stringent effluent standards.

Uniqueness of the Solution: The MSBR developed in Environmental Infrastructure and Clean Technologies (EICT) Laboratory after an extensive study on decolourisation of distillery wastewater has the ability to work in a non-sterile environment. The unique feature of MSBR is that the bio-reactor does not require any dilution of the water prior to treatment. This saves the cost of procuring fresh water for the industries.

Current Status of Technology: The design and operation of MSBR for decolourisation of actual distillery wastewater is extensively tested in a lab-scale reactor with excellent results. However, a large prototype in an industrial setup is yet to be commissioned.

Societal Impact: Distilleries are one of the most water-intensive industries and generate about 8-15 L of wastewater per litre of alcohol produced. They produce ethanol and many ethanol derived products, which find applications in various industrial and pharmaceutical products. There are 300+ molasses-based distilleries in India, and this number is expected to grow further with the recent impetus given by the government to blend ethanol in petrol. A majority of these industries lack sustainable wastewater solutions which MSBR can provide. MSBR helps reuse treated wastewater, resulting in an overall reduction in freshwater requirements and safeguarding against surface and groundwater pollution.

Patent(s): Nil

Relevant Industries: Wastewater, Environment.

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