



Potential and Validation of Sustainable Natural & Advance Technologies for Water & Wastewater Treatment, Monitoring and Safe Water Reuse in India (PAVITR)

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Keywords: Wastewater treatment, water reuse, water management, drinking water, scientific cooperation, Europe, India

ABSTRACT SUBMITTED TO SUWANU EUROPE CONFERENCE

Introduction and study objectives

Demand for safe drinking and agriculture waters are increasing across the world as population and needs for food grows. According to the UN World Water Development Report, three out of ten people do not have access to safe drinking water and up 70% of the world do not have access to safely managed sanitation. In developing countries like India, proper water and sanitation scenario are a matter of serious concern. A EU-India-funded project: Potential and Validation of Sustainable Natural & Advance Technologies for Water & Wastewater Treatment, Monitoring and Safe Water Reuse in India (PAVITR) aims to develop cost-effective and sustainable solutions to ensure the implementation of technologies from Europe to India. The technologies that are being installed can be scaled up for government entities and investors, to provide safe water reuse, rejuvenate water quality of rivers, and restore ecosystems. The consortium involves universities, research institutes, SMEs and NGOs from both EU and India to form a broad team of experts that can guarantee the success of the project. Fourteen prototypes were designed and installed in Pune, Dhanbad, Aligarh, Nagpur, Visakhapatnam, and Kharagpur. The technologies covered a wide spectrum to tackle water management and quality, challenges including wastewater treatment with advanced technologies & natural base solutions, drinking water treatment, rainwater harvesting, and the treatment of pollutants of emerging concern.



Methodology

The project runs from 1 February 2019 and should end on 31 January 2023. The main contributions that PAVITR is addressing includes (i) Provision of safe and long-term operating sanitation systems minimizing risks for people and the environment. PAVITR proposed the implementation of resource-oriented sanitation systems on both local and regional scales. Utilizing products produced from the sanitation chain shall increase the incentive to properly operate and maintain the systems and thus provide long-term benefits to society, health, and the environment. (ii) The promotion of resource-oriented sanitation systems enabling the use of safe products from the sanitation chain. The support and integration of entrepreneurs facilitates a sustainable agriculture and food security, protection of the environment, and economic growth, mainly on a local scale. (iii) Technology and knowledge transfer to ensure the replicability of the systems.

The systems that are being installed are designed to improve life quality to around 50.000 PE, but if properly replicated can become a tool to improve waters in rural India and a model for other developing countries. Nevertheless, the approach consists of the know-how exchange of prototype size technologies and processes, aiming a future up-scale of our technologies to achieve stronger impacts in India.

Results and conclusions

The project is deploying & developing water-wastewater technologies, to treat waters from different origins and a large array of pollutants, including emerging and traditional contaminants. Furthermore, PAVITR is developing management & planning strategies to enable better monitoring of pollution levels with innovative sensors to boost real-time measurements and open-access databases. Through our ambition, the novel technologies, and their validation, under Indian conditions, will help to address drinking water and wastewater challenges. The project has been structured with a holistic approach, to face shared challenges in Europe and India. We consider that international cooperation and research can bring us to effectively tackle the difficulties and hurdles to ensure the production of safe water, recover resources and to improve water quality for a better future, issues that are aligned with the UN sustainable development goals.