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# Phyto-treatment Technology for Wastewater Reuse in Agriculture

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## Résumé

Wastewater use in agriculture is a growing practice worldwide. Drivers include increasing water stress, in part due to climate change; increasing urbanization and growing wastewater flows; and more urban households engaged in agricultural activities. With freshwater either unavailable or too expensive, and wastewater treatment not keeping up with urban growth, urban farmers often have no alternative but to use untreated wastewater in low-income countries, as well as middle-income countries. This paper aims to highlight a cost effective, ecofriendly, sustainable Soil Aquifer Treatment (SAT) technology for treatment of wastewater recycling and reuse in agriculture. Primary treatment was given to raw sewage collected from the campus. Lysimeter studies were conducted to optimize the retention time, hydraulic loading rate, treatment media and vegetation. A pilot scale wetland system of dimension 4m x 1.5m x 1m made of Fiber Reinforced Plastic filled with soil, sand, marble chips and gravel, installed at CSIR-NEERI campus. The sewage was applied to the system at the rate of 1.2 m<sup>3</sup>day<sup>-1</sup> with a retention time of 2 days. The vegetation used in the system was collected from banks of sewer line. The treated wastewater was then applied to the crops grown as per the season on experimental plots (3m x 3m triplicate) to assess the effect of treated and untreated wastewater on soil physico-chemical and microbial properties of soil and crop growth. The use of CWS was found to be very efficient for the removal of pollutants like BOD (85-96%), COD (~98%), nitrogen (50-80%), phosphorus (~95%) and pathogen (~95%) from primary treated wastewater. The finding suggests that the wastewater can be safely used for irrigation after treatment.

**Mots-Clés:** Soil Aquifer Treatment, pollutant removal, wastewater, reuse, agriculture

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