Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Ecological Wastewater Treatment by Tree-Root-Filter - Sustainable Sanitation-Solution for the Tropics

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Abstract

Tropical inlands reveal the minor indices for sewage treatment of the world. In the tropics, results of conventional wastewater treatment facilities are weak, because of their need for secure energy and specialists for maintenance and monitoring. Our proposal of ecological wastewater treatment (EWT) promotes the natural purification of organic effluents in order to root oxygen release of some tropical amphibian plants. They create a decomposer/mineraliser - biocoenosis around their roots (periphyton), as detected in most weeds of swampy sites. Munguba, *Pseudobombax munguba* (Mart. & Zucc.) Dugand, a native tree species from the Amazonian floodplains of Brazil, has been identified as the best potential subterranean oxygen provider. In our EWT facility, the tangle of roots of *P. munguba* constitute a real root-filter. In an anticipated anaerobic primary treatment, the crude wastewater transforms in a mineral-sediment free solution. After the effective root-filter treatment, the exposition of the effluent to solar radiation in a vertical aquarium indorses disinfection and molecular sulphur precipitation. Several treatment plants have been established in Manaus City. They show best results and functionality, especially in comparison to conventional treatment facilities. Additionally, the nutrient absorption and resulting accelerated growths of the trees may be used for commercial exploitation of cellulose, timber and fruit production. People themselves can provide easy maintenance to EWT. The study presents the elements of the EWT and discusses the treatment results. We expect to promote EWT as the best option for wastewater treatment in the tropics, as it is totally independent from electrical energy and moving parts. Actually, we run studies by transforming wastewater-treatment investment in commercial production of fine fibers, as a base for sustainable development.

Keywords: Autodepuration, biotic oxygen release, environmental service, Munguba, root zone

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