

Wastewater and sludge reuse: selected case studies across the globe

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ABSTRACT

The recovery and reuse of resources are key points towards a sustainable development. Due to an ever-growing water demand, wastewater is gaining momentum as a reliable alternative water source. In the same context, sewage sludge is now recognized as a valuable resource, and not as a waste, and its valorization for nutrients and/or recovery of energy is making progress. This review focuses on the descriptive analysis of the status of wastewater and sewage sludge reuse in selected countries worldwide (Greece, Israel, Perú, Philippines and Spain), representing four continents. Generated wastewater and sludge, treatment strategies, wastewater reuse standards applied in each of the studied countries, economic aspects, public acceptance and constraints issues are presented, along with a case study of nanotechnology application for water improvement and wastewater reuse in Israel. A potential for further increase of the reuse of both sewage and sludge has been identified for all countries. Similarly, sludge reuse must be significantly enhanced for energy production and agricultural applications. In the Philippines, reuse is successfully practiced especially with domestic and food producing and distillery-based wastewater. In Spain, there is still great potential to increase the reuse areas for reclaimed wastewater application, while an important part of the sludge is already used in agriculture. In Israel, nanotechnology treatment approaches have been proved important in arid regions with minimal amounts of precipitation. The main goal of this review manuscript is to provide updated information regarding wastewater and sludge reuse for the worldwide benefits.

Keywords: Wastewater; Sludge; Reuse; Irrigation; Agriculture; Ultrafiltration; Reverse osmosis; Nanotechnology

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