Potential of Treated Wastewater Usage for Adaptation to Climate Change: Jordan as a Success Story

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Abstract

Jordan sustainable development is obstructed by severe water scarcity that induces imbalances and shortages of water supply for various uses especially under high population growth rate, sudden immigrations, and climate change. Reserving water for drinking by treating wastewater treatment plants (WWTPs) effluent and reusing it for non-drinking could be a solution. This paper investigated the capability and contribution of the existing WWTPs' effluent for reuse in agriculture sector as a climate change adaptive measure. The paper provided clear understanding for the current and future climate changes impacts, developed climate change and water policies, current water resources and demands for agriculture sector, and suggested adaptive measures. Further, it emphasized on characterizing the WWTPs and quantification of effluent taking into account the satisfaction to Jordanian standards and guidelines. Major WWTP's effluents are within Jordanian standards; however some WWTP's have concerns to microbial quality that restricts their reuse. Samra WWTP effluent can be used for highly restricted class of cooked vegetables, parks, and playgrounds. The results demonstrated that wastewater reuse can be a crucial part of Jordanian water budget, can solve environmental problems, and can be a feasible adaptive option when managed properly. Further recommendations for WWTP operations, managements, reuse, and monitoring are included.