

The Editor note on Wastewater reuses potential for irrigated agriculture

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This study analyzed the effects of population and urban growth on water demand for irrigation and other water users, as well as municipal wastewater quantity changes, by developing a new mathematical model. The model was developed to consider the potential for reuse of treated wastewater for agricultural irrigation, by analyzing the increasing quantity of wastewater production in an urban area. It was applied to a case study in Logan, Utah, whereby results from the model showed a total water demand of 0.7 and 1.27 m³/s in 2020 and 2050, respectively, while the model predicted that the average wastewater influent for Logan City would be more than double from 2010 to 2050. Accordingly, a model-predicted increase of 16% in the annual production of wastewater was observed from 2010 to 2025. The amount of wastewater production in 2030 was estimated to be 14.2 million m³/year, which is enough to produce food from irrigated agriculture for 11% of the future population of Logan City. This emphasizes the potential importance of reusing wastewater for irrigated agriculture.

At the beginning of the twenty-first century, water is one of the critically-situated natural resources. Limited water resources, uneven distribution of water, and continuing population growth have made the scarcity of good-quality water an important challenge throughout the world, especially in arid and semi-arid regions. On the other hand, increasing the quantity of wastewater production and dealing with the sometimes-excessive amount of wastewater in an environmentally sustainable way is an additional challenge in urban areas.

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