

# Treated wastewater reuse for agricultural irrigation purposes: A case study from Turkey

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## **Abstract**

The shortage of water resources of good quality has become an important issue in the arid and semi-arid regions. As taken of the fact that this long process has been completed, several countries today regularly face imbalances of water demand and water supply, especially in the summer period, due to simultaneous occurrence of low precipitation, high evaporation and increased demands for irrigation and tourism. Not surprisingly, the decrease in resources in natural waters brought about by drought and population growth is inciting authorities to establish and to encourage the reuse of wastewater. For example, in many parts of the world, such as United States, Australia, South Africa, Japan, Italy, Spain, and Tunisia, treated wastewater has been successfully used for irrigation and many researchers have recognized its benefits. In particular in Mediterranean countries, the reuse of wastewater is undergoing fast expansion in areas with water scarcity and its application in agriculture is becoming an important addition to water supplies. Application of treated wastewater for irrigation of plants and crops is gradually becoming a common practice worldwide. Wastewater reclamation and reuse is of great interest and a viable option for many industrial sectors and countries which suffer from water scarcity problems. Although the amount of reusable domestic and industrial wastewater is much lower than the wastewater generated, many countries show an increasing interest in wastewater reclamation and reuse.

The annual total water potential in Turkey is 187 billion m<sup>3</sup>, and 30-35 billion m<sup>3</sup> of this potential is directly used for irrigational purposes. According to the General Agricultural Census results of 2001, only 13.24% of the 37472 agricultural units in Turkey have sufficient irrigational opportunities. Although Turkey is known to have a significant water potential, treatment and reuse matters of wastewaters should be considered in order to avoid local water shortages and crises, because the water potential is not homogenous in terms of geographical location and time.

In the context of this work, research was carried out to increase the quality of the wastewaters from an organized industrial district (OID) in Turkey to use for agricultural irrigation purposes. Chemical precipitation and ion exchange methods were applied.