



## Current state and solution proposal for plateau wastewater treatment plants: a review

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### ABSTRACT

Rapid urbanization and increasing population growth rates have led to increased amounts of sewage discharge in plateau regions. The implementation of plateau wastewater treatment plants (WWTPs) is a key solution to alleviate the pressure to fragile plateau ecosystem. However, many WWTPs have difficulties achieving the required effluent quality and the encountered difficulties can be attributed to the extreme climate conditions, e.g., low temperature, low oxygen level and low pressure, as well as the quantity and the quality of the wastewater in plateau regions. The unique operational conditions result in differences in the microbial community and the structure of bacteria, archaeal, and fungi between plains and plateau WWTPs, which in turn affect the removal efficiencies of organics, nutrients and micropollutants. Measures should be used to resolve the operational problems, such as enriching oxygen contents, modifying the operational processes, and introducing bioaugmentation technology. The review specifically demonstrated the practices used in the Tibetan Plateau in China and suggested that full-scale WWTPs using activated sludge processes can be successfully implemented to treat wastewater in plateau regions. Valuable information and experience with WWTPs in the Tibetan Plateau are of significance to guide the future design of plateau WWTPs in other areas and countries.

*Keywords:* Plateau wastewater treatment plant; Microbial community; Engineering strategies

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