

## Risk assessment of sewage treatment Public Private Partnership projects in China

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### ABSTRACT

With the deepening of ecological civilization construction, the water pollution caused by the discharge of industrial wastewater and domestic sewage has attracted people's extensive attention. Sewage treatment project is becoming more and more important as an important work of water pollution control. In order to reduce the financial pressure of the government and improve the efficiency of the industry, more and more sewage treatment projects adopt the Public Private Partnership (PPP) financing mode. However, the PPP financing mode of the project has the characteristics of long construction cycle, long investment recovery period, many participants and so on, the project implementation process is faced with more and complex risks, how to effectively carry out the risk management of sewage treatment PPP project is the key to the success of the project. In this paper, the Principal Component Analysis (PCA) is firstly used to reduce the dimension of the risk factor set, and then the risk assessment index system is obtained after further generalization and sorting. On this basis, considering the correlation between the indicators. Use Criteria Importance Though Intercriteria Correlation (CRITIC) objective weighting method to give weight to the indicators. Secondly, the risk assessment model of sewage treatment PPP project is established by using Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) multi-objective decision-making method. Finally apply the model to the Shanghai city Bailonggang sewage treatment project risk evaluation, the results show that the operation process of sewage disposal PPP projects need to focus on professional talents loss of monitoring and control, construction safety, the effects of government credit risks, and the sensitivity analysis to verify the feasibility and effectiveness of the proposed selection model. It is hoped that the above research can provide useful reference for the construction risk assessment of sewage treatment PPP projects.

*Keywords:* Public Private Partnership; Sewage treatment; Critic method; TOSIS method; Risk assessment; China

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