

# Research on Urban Domestic Sewage Treatment Technology and Development Trends under the Background of Rural Tourism Development

Zhang Xiao  
Hetao College, Bayinnaoer  
Inner Mongolia, 015000, China

---

**Abstract:** The diversified lifestyle of people not only increases the amount of domestic sewage discharged, but also tends to complicate the nature and composition of sewage, making the environmental water bodies that are already under great pressure continue to deteriorate. This article analyzes the current situation and development trend of urban domestic sewage treatment technology and explores feasible solutions. However, the resulting sewage can be discharged arbitrarily without proper treatment, which can easily cause secondary water pollution and serious environmental pollution, seriously damaging the urban environment and people's health. This article mainly analyzes the current situation and main problems of urban domestic sewage treatment technology, and studies the development trend of urban domestic sewage treatment.

**Keywords:** Urban Domestic Sewage ; Sewage Treatment; Development Trend; Rural Tourism Development

---

## 1. INTRODUCTION

With the improvement of people's living standards, the amount of urban sewage discharge continues to increase. Currently, the main channels of urban sewage are domestic sewage and wastewater generated by industrial production. Domestic sewage is generated in people's daily life, such as sewage from laundry and cooking, and sewage discharged from public places with organic substances such as oil, protein, and ammonia nitrogen. The composition of this type of water quality is very complex, with many pathogenic microorganisms and parasitic eggs. If not treated properly, it will cause secondary pollution and worsen the environment. In urban sewage treatment, whether the design of sewage pipe network is reasonable or not is related to the effectiveness of sewage treatment.

From the perspective of the constructed urban sewage pipe network, the common problems are mainly reflected in three aspects: First, there are many municipal water supply and drainage systems in cities, and when designing sewage pipe networks, their pipes are not separated from rainwater pipes, resulting in mixing of rainwater and sewage, increasing the amount of sewage and workload, which to some extent affect the quality of sewage. In the development of urbanization economy, different industries have developed rapidly, the content of the products produced is also constantly enriched, and the domestic sewage used and produced by people in actual life also contains a variety of different impurities, pollutants, or chemicals.

By analyzing the source of urban domestic sewage, changes in the use of household products have led to changes in the types of impurities and pollution loads in domestic sewage. The treatment of urban domestic sewage mainly involves filtering and removing impurities or particles and using chemical and physical treatment methods to remove some of the pollutants. Many domestic sewage treatment processes are summarized based on many experiments, but the current specific operation process is greatly affected by the external environment. Moreover, the level of regional socio-economic development

and human factors will also have a certain impact on wastewater treatment processes. In addition to the continuous changes in the natural environment, it is difficult for sewage treatment technology to achieve its due effect. The drainage system in sewage treatment is relatively simple, with certain limitations in terms of treatment.

In cities, control and utilization of water resources and runoff sources are seriously neglected. Direct drainage and diversion of rainwater can be fully utilized to discharge water outside the city. If rainwater is not treated in a timely manner, it can directly cause pollution of water resources in the city. There is also a lack of scientific and technical means for treating sewage, and the drainage system is too simple. In this case, there is a significant lack of effective methods for sorting out sewage. Biological treatment technology is the main technology for treating urban domestic sewage, and it is also the most widely used technology form at present. Overall, the sewage treatment effect is good, which is conducive to protecting the environment. Through biological reaction, the sewage is effectively treated. During treatment, the organic matter and bacteria in the sewage are combined to produce colloids to ensure solid separation, and then comprehensive filtration and sedimentation are conducted for the relevant sewage. The remaining bacteria that do not form decomposition are effectively degraded using oxidation technology, to reduce the sewage and achieve the fundamental goal of reuse.

## 2. THE PROPOSED METHODOLOGY

### 2.1 Analysis of Urban Domestic Sewage Treatment Technology

The main reason why biological treatment technology can be widely used is that it is relatively simple to treat. Its principle is to conduct microbial metabolism treatment of organic pollutants in sewage, and through metabolism, conduct material transformation. The use of chemical treatment technology for domestic sewage means that a certain number of chemical substances are put into the sewage, dissolved, and

then a chemical reaction occurs. At the same time, corresponding mass transfer actions can occur to remove pollutants. Chemical treatment technology is used to fully utilize new flocculants when treating oils and fats. New flocculants mainly include two types, namely organic flocculants, and inorganic flocculants. Nowadays, inorganic flocculants are used in the treatment of sewage in relatively large oil and fat processing plants.

Using this method in the treatment of urban domestic sewage can effectively remove grease from it. To treat urban domestic sewage, on the one hand, it is to prevent toxic substances in domestic sewage from flowing into farmland, ponds, or ditches, expanding the pollution range of water resources, and damaging environmental quality. On the other hand, it is necessary to conduct secondary treatment of urban domestic sewage to enable it to achieve the recycling and reuse of water resources after reaching the treatment standards, and improve the utilization rate of water resources. However, since urban domestic sewage treatment belongs to a high energy consumption industry, sludge anaerobic digestion is used in the application of urban domestic sewage treatment technology to achieve partial energy recovery and utilization of urban domestic sewage. However, there are significant limitations in the treatment technology, leading to the inability to reduce energy consumption in a short time. Moreover, in the research of this technology, China does not focus on nitrogen and phosphorus recovery. The reuse of reclaimed water and the utilization of wastewater biomass energy have an impact on the technical efficiency of urban domestic sewage treatment and are not obvious enough to play a role in the recycling and reuse of water resources.

In China, delayed aeration processes are mostly used in wastewater treatment, which is greatly different from international mainstream technologies, leading to restrictions on water resource reuse, mainly manifested in the fact that China's recycled water usually requires long-distance transportation to achieve its utilization value. At present, the research on wastewater treatment technology in developed countries in Europe and the United States mainly focuses on renewable water reuse, nitrogen and phosphorus recovery, and wastewater biomass energy utilization, which are issues that have not been considered in the development and utilization of wastewater treatment technology in China. To improve the level of sewage treatment, promote the reuse of reclaimed water from urban sewage treatment to meet the demand, widely use treatment technologies that are not harmful to residents in cities, introduce advanced discharge technologies into cities, and utilize efficient and low consumption in treatment technology, to achieve safe standards for sewage regeneration. Reduce the emission rate in cities, timely solve the serious problem of polluting water in cities, and thereby improve the urban environment in China.

## 2.2 Future Development Trend of Urban Domestic Sewage Treatment

Membrane treatment methods are mainly used in sewage where there are many sludge substances. Membrane treatment technology is the preferred method in the treatment of urban domestic sewage and activated sludge. In practical applications, many enterprises use this method. Sewage and microorganisms adhere to the biofilm on the surface layer of the media filter material, and through certain touch, the dissolved organic pollutants in the sewage can be rapidly degraded, which has a significant effect on sewage treatment. Sewage treatment plants are the infrastructure of a city. With

the rapid development of the city, sewage treatment plants also have better development space.

Nowadays, the upgrading speed of sewage treatment technology is accelerating, but with the increase of people's actual demand, it is not enough for sewage treatment plants to still adopt the traditional operation mode. For a better future development of sewage treatment plants, it is necessary to achieve integration of supply and discharge, and adopt a managed operation mode, thereby improving the technical level of domestic sewage treatment and optimizing the operation mode of sewage treatment plants. The use of primary treatment processes in urban domestic sewage treatment mainly includes mechanical treatment sections, such as the treatment of sewage from structures such as grids, grit tanks, and primary sedimentation tanks. The main purpose is to remove impurities of coarse particles, which can not only meet the effluent requirements, but also reduce the costs and related expenses in urban domestic sewage treatment, with high investment benefits, and can reduce the load of urban domestic sewage treatment, with the development of modern urban life, the types and quantities of impurities contained in urban domestic sewage continue to increase. The application of primary treatment processes in urban domestic sewage treatment has the advantages of stability, reliability, and simple operation.

According to the participation of oxygen in the treatment process and the growth status of microorganisms in the bioreactor, sewage biological treatment technologies can be classified into aerobic treatment processes and anaerobic treatment processes, as well as suspension growth processes represented by activated sludge and attachment growth processes represented by biofilm method. The most used treatment methods are anaerobic treatment processes and biofilm methods. If this arrangement is still used, it is still necessary to improve the efficiency of wastewater recycling and utilization. After wastewater treatment in the city, pipelines are re-laid inside the city, and a hierarchical approach is adopted to improve the transportation of reclaimed water from wastewater treatment to the daily lives of people in the city. In this way, the overall cost of constructing urban wastewater treatment plants can be maximized, and land resources can also be wasted, increase the cost of operation.

The direction of technical research can be closely promoted around this goal. Currently, the most widely used technology is biotechnology. This type of technology is a technical method with better environmental protection effects. Sewage is classified according to anaerobic and aerobic impurities in sewage, and comprehensive treatment of urban sewage is conducted through microbial reactions. This is a relatively widely recognized method, which is also widely used in sewage treatment enterprises. It is necessary to continuously innovate on this basis. Currently, Photosynthetic bacteria have emerged, which are rich in different types of vitamins and proteins, and do not exist in sludge disposal. They have been widely used in Japan, the United States, and European countries.

## 3. CONCLUSION

With the rapid development of cities, only by comprehensively innovating technological forms and improving management capabilities can urban domestic sewage be effectively treated. Technical innovation should be carried out under the guidance of sustainable development and environmental protection concepts, so that urban domestic

sewage can be reasonably converted into usable renewable water, ensuring the quality of urban domestic sewage treatment, and creating a better urban ecological environment for people. From the current situation of urban domestic sewage treatment, there are still shortcomings. It is necessary to conduct in-depth analysis and actively introduce high-tech achievements to better play the role of this technology, ensure the quality of water resource recycling and meet the needs of urban development. In addition, wastewater treatment plants also need to adopt diversified treatment modes, expand their scale, constantly update wastewater treatment technologies, and promote the development of green and energy-saving sewage treatment work.

#### 4. REFERENCES

- [1] Zhang Jian Research on the current situation and development trend of urban domestic sewage treatment technology [J] Theoretical Research on Urban Construction (Electronic Version), 2015
- [2] Cheng Juntao Research on the current situation and development trend of urban domestic sewage treatment technology [J] China Equipment Engineering, 2018 (4): 2
- [3] Ran Fei Research on the current situation and development trend of urban domestic sewage treatment technology [J] Commodity and Quality, 2017, 000 (020): 292.
- [4] Li Lei Research on the current situation and development trend of urban domestic sewage treatment technology [J] Building Engineering Technology and Design, 2017, 000 (022): 4147-4147
- [5] Yang Yongming Research on the current situation and development trend of urban domestic sewage treatment technology [J] Henan Building Materials, 2016 (5): 2.
- [6] Sun Jianing, Wang Zizhou, Gao Yan, et al Key Points and Case Study of Rural Domestic Sewage Treatment under the Development of Rural Tourism Economy: A Case Study of Zhejiang Province [J] Shanxi Agricultural Economics, 2021 (11): 4
- [7] Zou Xiuqing, Xie Meihui, Xiao Zegan, Wu Ting, Yan Yin Yulin Rural development evaluation and obstacle factor diagnosis based on entropy weight TOPSIS method [J] China Agricultural Resources and Regionalization, 2021, 42 (10): 10.
- [8] Li Zhizhi, Zhao Dan A sewage treatment device for ecotourism areas: CN217025596U [P] two thousand and twenty-two
- [9] Qiu Jin Research on the Existing Problems and Development Countermeasures of Rural Community Construction in Gangang Village, Dongtai City [D] Yangzhou University, 2018
- [10] Wang Tong Research on the current situation and development trend of urban domestic sewage treatment technology [J] Theoretical Research on Urban Construction (Electronic Version), 2015 (024): 005
- [11] Wang Ze Brief Discussion on the Research Status and Development Trend of Urban Sewage Treatment Technology [J] Operator, 2019, 33 (002): 160-161
- [12] Ji Jia, Wang Xu A Study on Public Participation Models in Urban and Rural Tourism Based on the "Non formal" Phenomenon [C]//Urban and Rural Governance and Planning Reform - 2014 China Urban Planning Annual Conference 0
- [13] Lu Yang Research on the current situation and development trend of urban domestic sewage treatment technology [J] Theoretical Research on Urban Construction (Electronic Version), 2015, 000 (001): 712-712
- [14] Chen Zhiyong Research on the current situation and development trend of urban domestic sewage treatment technology [J] two thousand and fifteen
- [15] Geng Yingjie, Yuan Yajie, Xing Meilan, et al Research on the current situation and development trend of urban domestic sewage treatment technology [J] Science and Technology Information, 2014 (3): 2