

# Solid Waste in Sewerage Systems: Characteristics and Strategies for Recovering Resources

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## Introduction

Urban water systems, such as rainwater drainage pipes, pumping stations, grease traps, grit chambers, and septic tanks, accumulate a lot of solid waste related to sewerage systems. In addition to putting the environment in danger, traditional management strategies like composting, incineration, and sanitary landfilling consume a significant amount of land. A variety of waste was collected from various facilities in sewerage systems and a terminal to address this issue, and the characteristics of solid waste were tested and analyzed. In-depth proposals were made for the appropriate approaches to resource recovery strategies. Recycling is difficult because the solid waste at the wastewater treatment plant (WWTP) contains a certain amount of heavy metals and little organic matter. The pre-sorting, treating, and recycling of solid waste is a good strategy to use before it enters the WWTP. Based on its nature, the waste was divided into three categories, and strategies for utilizing the appropriate resources were suggested. Solid waste that isn't suitable for pre-recycling can be discharged normally and treated at the WWTP. The green resource utilization of solid waste in the field of sewerage systems in developing nations is supported scientifically in this paper.

## Description

Every day a large amount of solid waste has built up in urban water service pipeline networks and facilities over the past few years. Pumping stations, grit chambers, grease traps, rainwater drainage pipes, and solid waste from septic tanks are all examples. It has a significant impact on the normal operation of sewerage system facilities. The need for daily emptying operations eventually results in the formation of a significant amount of solid waste. Solid waste in sewerage systems is essentially not utilized as a resource in developing nations. Transporting solid waste to landfills is the standard method for disposing of it from facilities in developing nations. Due to its complex composition and certain quantities of pollutants, such solid waste may pose a risk to the environment during transportation and disposal. Recycling techniques that are suitable for solid waste in developing nations need to be studied because traditional treatment and disposal methods are no longer viable due to the steady increase in environmental protection requirements [1,2].

These studies and strategies can serve as references because the solid waste produced by sewerage systems and construction waste share many of the same characteristics. There is a certain amount of organic matter in the solid waste from sewerage systems, which has the potential to be transformed into useful products like biogas or other compounds with a lot of energy. After screening and separating, some inorganic components in solid waste, such as clay, gravel, and fine sand, can be utilized as building materials. Organic matter, nitrogen, phosphorus, potassium, and other essential nutrients for plant growth

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are all found in significant quantities in solid waste. As a result, it can be utilized as a medium-grade fertilizer and soil conditioner when treated appropriately. The treatment objectives and approaches for comparable solid waste are outlined. Reduction, resource utilization, and harmless treatment are the three main categories into which solid waste treatment goals fall. Disposal techniques can vary based on the nature of solid waste and engineering requirements. Anaerobic digestion or thermochemical treatment, for instance, can be used to turn solid waste with high organic matter content into natural gas and fertilizer. The solid waste can be altered by adding lime, cement, fly ash, and other materials that can be used as road construction materials if it has good initial mechanical properties. Solidification, stabilization, thermal treatment, separation, and extraction are typically used to remove or stabilize any harmful components that are present in the solid waste [3].

It is essential to investigate the physical and chemical properties of solid waste and suggest potential methods for resource recovery for solid waste in developing nations in order to achieve efficient resource utilization. In developing nations, the level of resource utilization of solid waste produced by sewage systems is extremely low. Expanding the methods for resource recovery is necessary in accordance with the concept of sustainable development. The characteristics of solid waste were tested and analyzed using a variety of waste collected from various facilities in sewerage systems and a terminal in this study. Resource recovery strategies that corresponded to these findings were suggested. The main findings are as follows: Waste that is separated at various WWTP stages can be utilized creatively following secondary treatment. Solid waste in developing nations has a low organic matter content and a certain amount of heavy metals, both of which make recycling more difficult and costly. As a result, recycling is not advised until the management level of sewerage systems has been improved. The waste collected from various facilities in sewerage systems has not been uniform and has exhibited a wide range of characteristics. The strategy of pre-sorting, treating, and recycling these solid wastes is worthwhile to recommend before they enter the WWTP. A small amount of solid waste that cannot be recycled can be disposed of normally and treated at the WWTP. In various sewage treatment plants, solid waste can be divided into three categories [4,5].

## Conclusion

The first group has a lot of sand, very little organic matter, and a lot of heavy metals. After dewatering, these materials can be used right away as building materials. The second category has a lot of sand in it, but it also has a lot of pollutants that need to be cleaned before it can be used as a building material. The third category has a lot of polluting substances and little sand, but it also has a lot of organic matter and can be dewatered to make RDF rods or treated with thermo chemicals or anaerobic digestion to make useful products. The pre-sorting, treatment, and recycling of solid waste from sewage treatment facilities could lead to sustainable development. However, for the early classification and treatment of solid waste, corresponding treatment facilities must be constructed, which increases the cost. In order to clarify when these strategies should be utilized, further research into this subject from a life-cycle evaluation perspective is required in the future.

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