A System Dynamics Model to Optimize Purified Water Supply from the Dam for Residences Use in Rural Communities

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Abstract:

The effective management of water supply is important to ensure sustainable health and well-being of residents in communities. This paper presents a system dynamics model to optimize the delivery of clean water from dams to communities more especially in rural areas. The developed model includes elements such as water inflow, purification processes, storage capacities, distribution channels as well as consumption patterns.

The dynamics of water supply is influenced by various factors such as seasonal fluctuations or variations, maintenance schedules, as well as population growth. The developed model employs feedback loops to simulate the interactions between these components and identify potential inefficiencies in the system.

This study aims to suggest and develop strategies to enhance the reliability and efficiency of water supply to the targeted areas. Different scenarios are analyzed to evaluate the impact of management and administrative practices, such as adjusting purification capacity, optimizing storage levels, as well as improving distribution methods. The objective of the study is to provide insights for policy makers and stakeholders to ensure sustainable and equitable water supply for rural communities.

The results of the study demonstrate that system dynamics modelling can effectively identify key areas of improvement in the water supply chain and better service delivery. This approach presents a comprehensive framework for addressing the complex challenges associated with rural water supply systems and support informed decision making in water resource management.

Keywords:

System dynamics, Water Supply, Sustainability.