

Calculation of Leakage Water and Forecast Actual Water Delivery in Town Drinking Water Supply Systems

Yunkata Sanyasi Rao Sasipati
Center for Excellence
Computer Technology
Hiroshima City, Japan

Zulfadli Bin Zaimuddin
KAMTEL Technologies Corp.
Hiroshima City, Japan

Krishnam Raja Gommamallaka
Center for Excellence in
Computer Technology
Vizhagapuram City, India

Abstract: Almost all proposals present forecast data of the variables in town and conclude the results. However, some variables such as water cost change its volume during the traversal from source to end. Each of these variables need to be studied with low parameters also. This low parameter form is leakage water. Water demand forecast can be calculated for the coming years, but leakage water also need to be calculated and then actually delivered water to the end users has to be forecast. This paper proposed a model of piping network, leakage locations. Calculated leakage water and forecast the actual delivery of water to end users. On the application side, the results of this paper help administrators take decisions on improving infrastructure of water distribution system and take precautions to save the maintenance of the infrastructure. The ideas and methods presented in this paper can be applied to other projects of similar nature. On the academic research side, this innovation helps further in-depth analysis to be carried out to calculate exact leakage water volumes. Water supply departments can also benefit from this research.

Keywords: Water Demand, Leakage Water, Forecast, Empiricism, Least Square

1. INTRODUCTION

Problems addressed in this research paper is to calculate water wastage due to leakages and forecast how much water is actually delivered to end users.

As water demand increases, water supply management requires changes. For the last few decades water requirements has been increasing both due to an increase in water usage and reduced water supply. Water leakage reduction in public water systems is a crucial part of water demand management. Especially water supply systems managed by Municipalities, Corporations and other Government organizations grow more threats due to poor management.

Usually, leakage is the largest component of distribution loss yet it is not subject to focus other than management decision by utilities. Leakage in public water supply systems results in loss of purified drinking water but also means of wasting the money and material resources used in abstraction, transportation and treatment. It results in secondary economic loss also, in the form of, damage to the pipe network. Public health concerns as it increases the risk of bacterial contamination of drinking water resources in the cities for human consumption, and can increase pollutant loads into the environment.



Figure 1: A Typical Water leakage Location

Many countries have recognized the need to replace the ground Water Infrastructure and their Challenges. Millions kilometers of pipes beneath the streets need to be replaced because as pipes age, the problems of infiltration and exfiltration due to leaks increase in water pipes and can lead to potential problems such as the collapse of a pipeline or damages to nearby assets [1].

City / town population is continuously increasing every year. It has an impact on the increased clean water consumption. Therefore, the actual data of water volumes is required for the demand fulfillment of how much the water is needed. Data analysis need to be highly needed in the measurement, control processes, formulate information from the available data, and help make decisions based on the available data and predictions [2].

On primary estimates of requirements of bathing women who engage in moderate physical activity in above-average temperatures, a minimum of 7.5 liters per capita per day will meet the requirements of most people under most conditions. This water needs to be of a quality that represents a tolerable level of risk. However, in an emergency situation, a minimum of 1.8 liters is required. A higher quantity of about 26 liters per capita per day should be passed to take care of basic hygiene needs and basic food hygiene. Laundry / bathing might require higher amounts unless carried out at source.

Local government drinking system, which manages the distribution of water to towns / cities and their catchment areas. Distribution of clean water from a number of sources to meet fully established in some developing countries. This is due to the limited volume of water availability and the lack distribution system management or financial difficulties. The water distribution department must be able to distribute sufficient quantity of quality water to all users to meet their needs [3].

Most government departments are not implementing the

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Scott C. Dulebohn



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