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Estimating the Economic Level of Water Losses (ELWL) in the Water Distribution System of the City of Malang, Indonesia

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Description / Abstract

All of the possible strategies to reduce water losses in piped distribution systems follow the law of diminishing returns: the higher the expenditure on water loss reduction, the lower the progressive return in terms of water saved. Therefore, water utilities need to estimate the economic level of water losses (ELWL) so that they can reduce their water loss to the level where the cost to reduce the water losses is equal to the value of the water saved. This paper aims to estimate the ELWL using four different methods: the total cost method, the marginal cost method, the cumulative cost-benefit method, and the component-based methods. This analysis is based on data (2011-2016) on the water utilities of the city of Malang (PDAM Kota Malang), Indonesia. It was found that the total cost and marginal cost methods gave almost similar results for ELWL. However, the total cost method is preferred to calculate ELWL because it is the most accurate, easier to apply, and does not need a long data series. In addition, the estimated ELWL for PDAM Kota Malang was 21.76%, which is 3.71% higher than the water loss level estimated in 2016, which means that their strategies to reduce water loss are not cost-efficient. Moreover, the lack of data is a major challenge in the estimation of ELWL in Indonesia. This study emphasizes the importance of estimating the ELWL so that water utilities, especially in Indonesia, can evaluate their strategies in reducing water loss and improving their cost-effectiveness.

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