

UNIVERSITI TEKNOLOGI MARA
TECHNICAL REPORT

CONSUMER WATER USAGE PROFILE BASED ON
FUZZY C-MEANS CLUSTERING METHOD

P10S19

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IN THE NAME OF ALLAH SWT, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

Estimation of domestic water consumption normally involve variables related to individual water usage activities. Therefore, knowledge about individual water usage is very crucial to provide accurate estimation of total water usage in a residential premise. In this research, fuzzy consumer water usage profile is generated from consumer data using Fuzzy C-Means (FCM) clustering method. The generated cluster centres were used to create fuzzy membership functions to represent the amount of water usage for six age categories which are baby, kids, teenager, youth, adult and senior citizen. To demonstrate the applicability of the generated fuzzy consumer profile, a series of experiment were conducted to estimate total individual water usage in a residential premises using Sugeno Fuzzy Inference. The finding show that the predicted values are comparable with the total consumption calculated based on the official per capita consumption (PCC) and the consumption based on the average of meter reading estimated by the consumer. The fuzzy consumer water usage profile may also be used to analyse the consumer water usage behaviour.