

ABSTRAK

Pemenuhan kebutuhan air bersih masyarakat di daerah Tarutung Kabupaten Tapanuli Utara sebagian besar dikelola oleh Perusahaan Daerah Air Minum (PDAM) Mual Natio. Secara umum, kebutuhan air bersih di Tarutung telah terpenuhi dengan adanya PDAM, namun masih terdapat beberapa kondisi aliran distribusi yang mungkin belum sesuai dengan standar yang ada. Penelitian ini menganalisis kinerja sistem distribusi air bersih PDAM Mual Natio di Kecamatan Tarutung (studi kasus: Komplek Stadion) dan memetakan jaringan dengan tingkat kepuasan pelanggan menggunakan pendekatan kuantitatif dan spasial. Sampel penelitian berjumlah 87 responden dari total 649 sambungan rumah (SR) di wilayah studi. Instrumen penelitian berupa kuesioner dengan indikator: X1 (kuantitas), X2 (kualitas), X3 (kontinuitas), X4 (tekanan), X5 (keandalan/pelayanan), serta variabel dependen Y (kepuasan pelanggan). Analisis data dilakukan dengan SPSS (uji validitas & reliabilitas, analisis deskriptif, regresi linear berganda) dan QGIS untuk pemetaan jaringan pipa, sebaran pelanggan, dan peta tematik. Analisis regresi berganda memperlihatkan bahwa variabel-variabel kinerja secara simultan memengaruhi kepuasan pelanggan; secara parsial tekanan (X4) dan keandalan layanan (X5) terbukti berpengaruh signifikan terhadap kepuasan ($p < 0,05$). Variabel kuantitas (X1) terhadap Y berpengaruh sebesar 0,350, variabel Kualitas air (X2) sebesar 0,286, variabel Kontinuitas air (X3) sebesar 0,255, variabel Tekanan (X4) sebesar 0,398 dan keandalan pelayanan (X5) sebesar 0,368. Hasil pemetaan spasial menguatkan temuan statistik: titik-titik dengan kepuasan rendah dan skor tekanan rendah cenderung terpusat pada ujung jaringan distribusi dan area berrelief lebih tinggi.

Kata kunci: kinerja distribusi air bersih, pemetaan, GIS



ABSTRACT

The fulfillment of clean water needs of the community in the Tarutung area of North Tapanuli Regency is mostly managed by the Regional Drinking Water Company (PDAM) Mual Natio. In general, clean water needs in Tarutung have been met by the PDAM, but there are still some distribution flow conditions that may not be in accordance with existing standards. This study analyzes the performance of the PDAM Mual Natio clean water distribution system in Tarutung District (case study: Stadium Complex) and maps the network with customer satisfaction levels using quantitative and spatial approaches. The research sample consisted of 87 respondents from a total of 649 house connections (SR) in the study area. The research instrument was a questionnaire with indicators: X1 (quantity), X2 (quality), X3 (continuity), X4 (pressure), X5 (reliability/service), and the dependent variable Y (customer satisfaction). Data analysis was carried out using SPSS (validity & reliability test, descriptive analysis, multiple linear regression) and QGIS for mapping the pipe network, customer distribution, and thematic maps. Multiple regression analysis shows that performance variables simultaneously affect customer satisfaction; Partially, pressure (X4) and service reliability (X5) were proven to have a significant effect on satisfaction ($p < 0.05$). The quantity variable (X1) on Y had an effect of 0.350, the water quality variable (X2) was 0.286, the water continuity variable (X3) was 0.255, the pressure variable (X4) was 0.398 and the service reliability (X5) was 0.368. The results of spatial mapping confirmed the statistical findings: points with low satisfaction and low pressure scores tended to be concentrated at the ends of the distribution network and higher relief areas.

Keywords: clean water distribution performance, mapping, GIS

