ABSTRACT

This research discusses the design and analysis of 5G networks to support flood monitoring systems in Gowa Regency, South Sulawesi. This region often experiences flooding which has a major impact on the social and economic life of the community. To overcome these problems, Internet of Things (IoT) technology is combined with 5G networks to create a more accurate, fast, and reliable flood monitoring system. IoT sensors placed at strategic points are able to detect water levels in real-time, while the 5G network ensures data transmission takes place at high speed, low latency, and optimal stability. In this research, the network design is carried out using the 700 MHz frequency and considering the coverage and capacity of the network. The analysis process is based on the Urban Macrocell Non-Line of Sight (UMA-NLOS) propagation model using Atoll software version 3.4. The simulation results show that as many as 22 gNodeBs are required to cover the entire area with fairly optimal results. Based on measurements, the average SS-RSRP value obtained is -83.76 dBm, SS-SINR is 12.66 dB, and throughput reaches 138.5 Mbps. Meanwhile, in the network capacity analysis, it is known that one gNodeB is able to handle monitoring at 98 sluice points, proving that the designed network infrastructure has high efficiency. The conclusion of this research shows that the utilization of 5G networks in flood monitoring systems provides significant advantages in terms of speed, accuracy, and reliability of data transmission. With real-time information, authorities and communities can take faster and more appropriate actions in anticipating and overcoming floods.

Keywords: *Internet of Things, 5G Network, Flood Monitoring*