

ABSTRACT

Ngoro Industrial Park (NIP) Mojokerto is one of the strategic industrial areas located in Mojokerto Regency, East Java, which is one of the supporting regencies of the East Java provincial capital. Spanning approximately 480 hectares, Ngoro Industrial Park serves as a significant industrial hub in the Ngoro District and is one of the largest industrial zones in East Java. It plays a crucial role in accommodating various industrial activities including manufacturing, warehousing, logistics routes, distribution, and production.

However, the absence of smart factory systems in the Ngoro industrial area, which could enhance production efficiency and improve security, underscores the background for this research. In this study, researchers will analyze the coverage and capacity of LoRaWAN networks to support sensor monitoring in industrial zones. LoRaWAN, as a Low Power Wide Area Network (LPWAN) wireless communication technology, offers advantages such as extensive coverage and low power consumption, making it an ideal choice for industrial applications. This study evaluates the performance of LoRaWAN in complex industrial environments, focusing on network coverage and capacity.

The research results indicate that, based on the signal level and signal-to-noise ratio obtained, SF-12 can cover the entire Ngoro Industrial Park (NIP) area, accommodating 30,628 sensors within the industrial zone. The network performance standards tested using parameters such as RSRP, SINR, and throughput demonstrated optimal results, indicating that LoRaWAN is a suitable choice to support sensor monitoring in NIP. This study is expected to contribute to enhancing sensor monitoring at NIP, which is an integral part of implementing Industry 4.0 in the Ngoro Industrial Park.

Keywords: *LoRaWAN, coverage, capacity, sensor monitoring, industrial zone.*