AIR POLLUTION MONITORING SYSTEM IN THE KEMIREN VILLAGE ENVIRONMENT USING MQ-135 AND GP2Y1014AU0F SENSORS WITH THINGSPEAK MEDIA

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ABSTRACT

Air pollution is an environmental problem that requires serious attention, including in rural areas like Kemiren Village. Despite its rural location, air quality in this area remains potentially polluted due to various activities, particularly mining operations in the surrounding area. This situation necessitates continuous air quality monitoring to maintain safe levels for public health. As a solution, an Internet of Things (IoT)-based air pollution monitoring system equipped with an air-neutralizing fan was designed. This system uses an MQ-135 sensor to detect carbon monoxide (CO) and a GP2Y1014AU0F sensor to measure the concentration of fine dust particles in the air. Both sensors are connected to a microcontroller, which serves as the system's control center. Measurement data is sent in real time via an internet connection to the ThingSpeak platform, allowing air quality to be monitored directly in graphical form. The microcontroller is programmed to read sensor data and control a DC fan. If carbon monoxide levels exceed 10 ppm and dust particle concentrations exceed 50 $\mu g/m^3$, the system automatically activates the fan to increase air circulation. This process aims to help reduce air pollution levels within approximately 1 to 2 minutes. Using ThingSpeak as a monitoring tool allows the community and relevant parties to easily monitor air quality and detect any increases in pollution early. With the implementation of this system, it is hoped that air quality in Kemiren Village can be monitored more effectively and contribute to efforts to control air pollution in the surrounding area.

Keywords: DC Fan, GP2Y1014AU0F, MQ-135, Air Pollution, ThingSpeak