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## WSN-Based Data Acquisition System for Collecting Environmental Pollution Factors for Green City

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Abstract: Implementation with a portable, intelligent weather station is to upgrade the system for environmental management and monitoring. This gadget measures and assesses meteorological and air quality data by real-time implementation through the Internet of Things technology to provide important environmental condition insights. The monitoring station's hardware parts include the ESP32 board, MQ2, MQ3, and MQ135 sensors for gas detection. Such an intelligent weather monitoring station can easily be deployed in different environments due to its portability and versatility. This small station size and its wireless link will enable effective data collection and transfer and integration into other systems of the present day. The existing environmental monitoring system takes the temperature and humidity and measures ammonia, benzene, alcohol, smoke, and carbon monoxide. Therefore, data is brought to the monitoring station, where it communicates in real time for the users to review and analyse on the online platform Blynk. It enables users to easily make data presentations and create notifications and dashboards using a mobile app of Blynk and the web platform, enabling them to create interfaces that meet their satisfaction easily. Users may also upload the uploaded data to a web server for remote access and analysis, which eases scalability and flexibility. Portable intelligent weather monitoring station has significant areas of influence on applications like public health, urban planning, and environmental monitoring, among others. It thus provides decision-makers with information on pollution management and climate resilience. This provides a sustainable and resilient future; it is approachable since the interface used in the system is accessible, befitting the two settings: urban and rural. The Intelligent Portable Weather Monitoring Station provides great usefulness in the disclosure, development, innovation of technology, and practice in the quest for meeting challenges of the environment with the promotion of sustainability. This not only allows smarter and more sustainable city development with effective environmental monitoring and management that includes IoT technologies but can also allow flexible data transmission facilities.

**Keywords:** Environmental Monitoring, Data Acquisition System, IoT Technology, Green City, Sustainability, Air Quality, Pollution Factors, Real-time Data Analysis

