RURAL TECHNOLOGY DEVELOPMENT CENTRE

GOVERNMENT COLLEGE OF ENGINEERING KANNUR

ENVIRONMENTAL MONITORING USING END TO END SECURE LOW POWER WIRELESS COMMUNICATION

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ABOUT THE PROJECT :

This project aims at establishing a sensor network in a village while giving importance to the Air pollution monitoring and filtering. This project includes the monitoring of various gases like CO2, CO, SO2, NO2, NH3, VOCs in the air and to exactly measure their concentrations. The sensing involves various electro chemical and MOS sensors as arrays and concentration of each gas will be monitored using signal processing. Second part of the project involves filtering of the air to remove toxic gases by converting them to non-toxic compounds. The data coming from the sensors need to be protected and send over a secure a wireless communication system. For the implementation of such a system it is required to design a low power, low cost and secure communication system using the concept of LPWAN to be integrated with the sensors.

OBJECTIVES :

1. Identify the presence of toxic gases in the environment which are harmful to the health.
2. Ensure that these predicted concentrations are accurate by comparing it with standards.
3. Use low power wireless communication system for these resource constrained end node devices.
4. Use secure wireless communication so that eavesdropping can be avoided.
5. Use filtering methods to filter the toxic gases and converting them to non-toxic gases.

OUTCOME :

Implemented the air pollution monitoring system using sensor nodes, Wifi communication to the cloud environment, using low cost sensors. The communication of sensor data using secure MQTT protocol is also achieved. Presently working on LORAWAN based communication protocol which can be used for long distance communication. It will be more preferable using commercial sensors to accurately measure the data and the mathematical model is being implemented to be incorporated in the end nodes for accurate measurement of gas concentrations.