

# Monitoring System For Agronomic Variables Based In WSN Technology On Cassava Crops

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## Abstract

Agriculture, and natural resources associated to its development like water, soils and forests, have a relevant role in the future of countries and environmental conservation. The optimization of these resources is made with the implementation of technological strategies and tools that make it possible. In this sense, we developed a monitoring prototype for agronomic variables in cassava crops (*Manihot Esculenta Crantz*) in the Atlántico department (Colombia) based in WSN using Z1 motes as hardware platform and the temperature and soil moisture sensor SHT11. The operating system used was Contiki, and the routing protocol was RPL. The Network Performance Metrics evaluated were packet loss, RSSI (Received Signal Strength Indicator), LQI (Link Quality Indicator) and network convergence time. Then, a deployment model using Schläfli notation to determine the location and number of nodes, also we calculated the coverage range of the nodes to keep network uniformity. With these calculations, we obtained the linkage budgets between specks, and results were validated with RadioMobile software. Then, test fields were made in a cassava crop located in the city of Manati, Atlántico. Finally, with the help of server client architecture XAMPP, all data was stored and visualized through SIMCA (Agricultural Crop Information and Monitoring System), a web application developed by authors.

## Keywords

6LoWPAN; Contiki; RPL; Soil Measurement; Wireless Sensor Networks; WSN.