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Towards The Connection of Agriculture With The IoT In Colombian Farms

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INTRODUCTION

The increase in temperatures recorded in the last 25 years has produced a decline in rice production in various parts of the world, between 10% and 20% (Órtiz, 2012). In Colombia, the "Institute of Hydrology, Meteorology and Environmental Studies" IDEAM and the Ministry of Agriculture, have developed study projects in the region where a main result being alerts towards the communities of farmers and researchers in order to establish deep field studies that generate particular solutions and strategies to mitigate the climatological effect on rice production in the region (Fernández, 2013) (Cortés & Alarcón, 2016). Given the aforementioned climate change scenarios, a negative water balance could be expected, especially in the second half of the year, associated with few precipitation contributions in Tolima, an increase in reference evapotranspiration rates and an increase in maximum and minimum air temperatures.

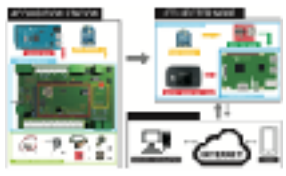
For this reason, it is advisable to make a thorough analysis of crops, irrigation systems and water storage systems in order to improve the sowing of the rice crop, the management of irrigation and finally study strategies to mitigate the negative impact in the crops (Murcia, Gonzalez, & López, 2017).

MATERIALS AND METHODS

FEDEARROZ

Variables selection and definition of parameters design

Electronic, Mechanical and Software Design



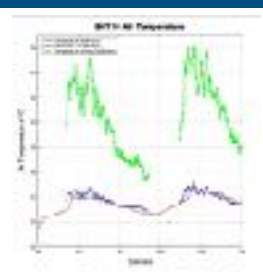
Network configuration

User Interface implementation and field test validation

OBJECT

Developing a remote and autonomous acquisition system to monitor the agrometeorological variables of a crop by using the IoT.

RESULTS



a)

b)

c)

d)

Figure 1. a) Calibration process; b) electronic prototype; c) Final implementation and d) Online remote monitoring

CONCLUSIONS

A supervision system for agrometeorological information of crops is proposed in this paper from the design to the implementation, and its effectiveness is tested via experimental data acquisition by using IoT remote connection. The stations implemented on crops have energetic autonomy, low cost (around 40% of the cost of commercially-available stations) and are a convenient tool to monitor the sunlight and temperature and humidity variables from soil and air into the crops. Moreover, the system can be migrated to indoor living, greenhouses, climate and forest monitoring.

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