

Long Range Low Power Sensor Networks for Agricultural Monitoring - A Case Study in Kenya

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kenya

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- Manual monitoring of greenhouse parameters affects most farmers in Kenya.
- Its ineffectiveness leads to prevalence of pests and diseases, low crop yields, increased labor costs and wastage of resources.
- Lack of data storage services for future inferences.

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- Measurements based on individuals feeling and comfort
- Regular manual checking of greenhouse parameters.
- This system gives real-time data analysis, visualization and feedback.
- Saves water, pests and crop diseases mitigation hence optimum crop conditions.



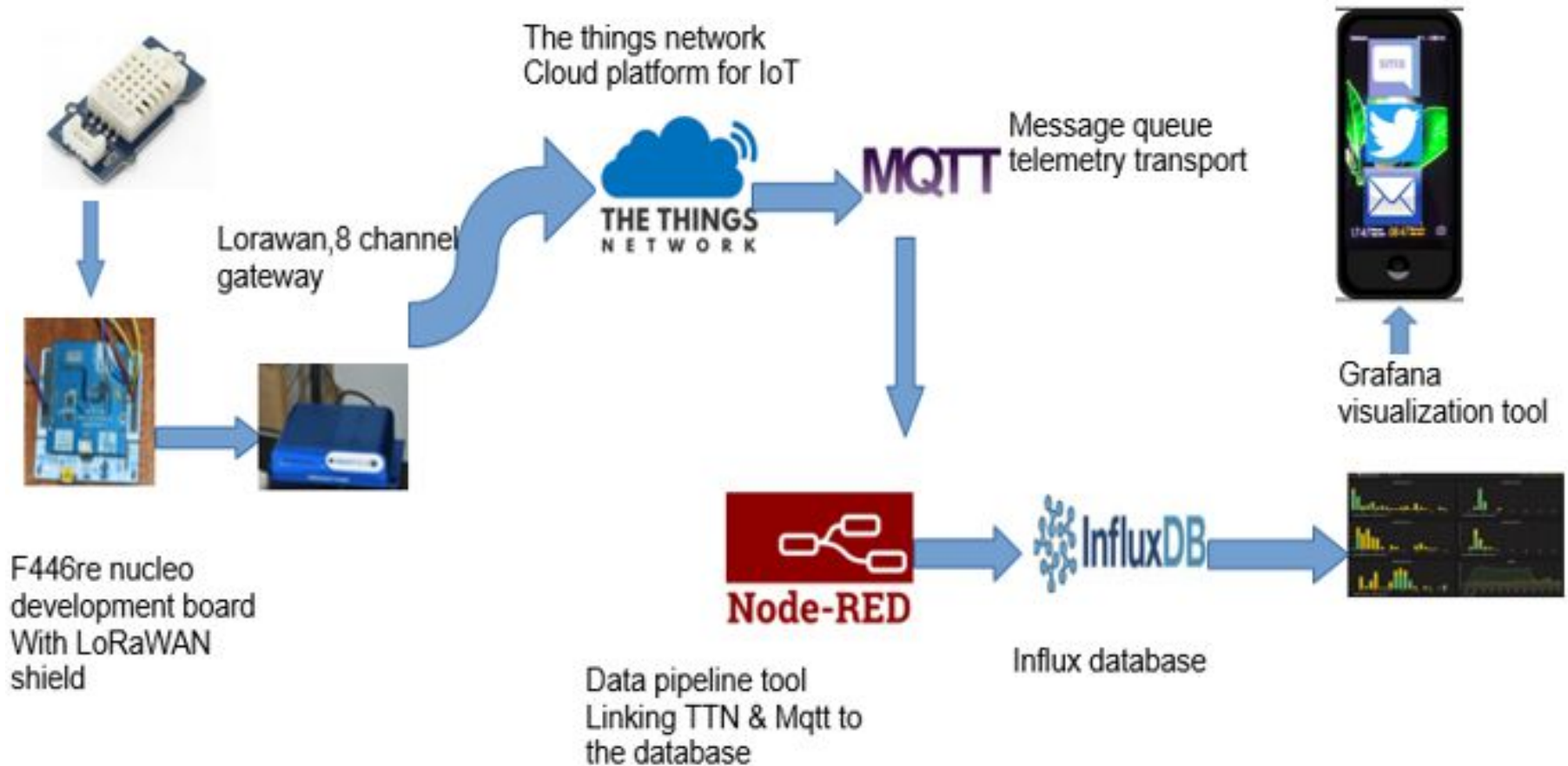
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- To collect, store, analyze and visualize greenhouse data on;
 - Ambient temperature.
 - Soil moisture.
 - Soil temperature.
 - Relative humidity.
 - Light intensity and
 - Air quality.
- Give feedback, insights to the farmer via SMS, email or a tweet using open source tools.

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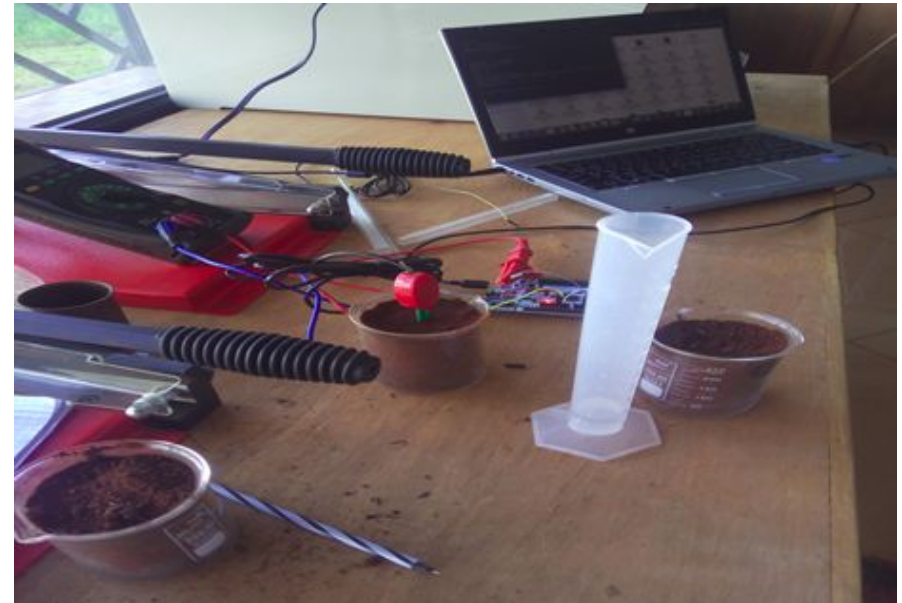
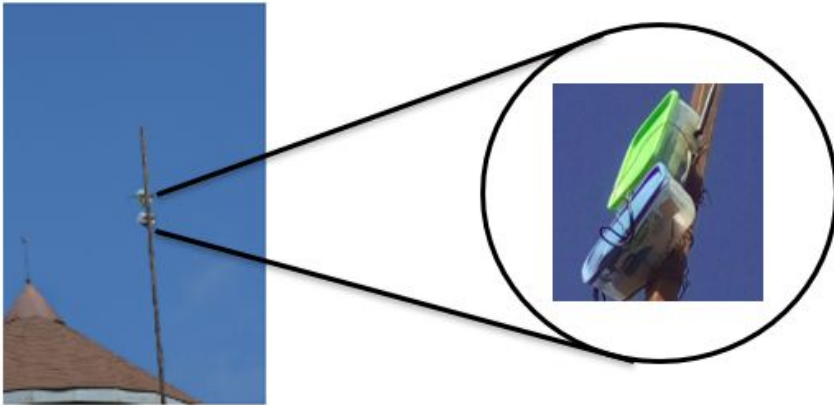
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The case for LoRa



Ref: Fundamentals of IoT - Data Science Africa 2018 presentation by janjongboom

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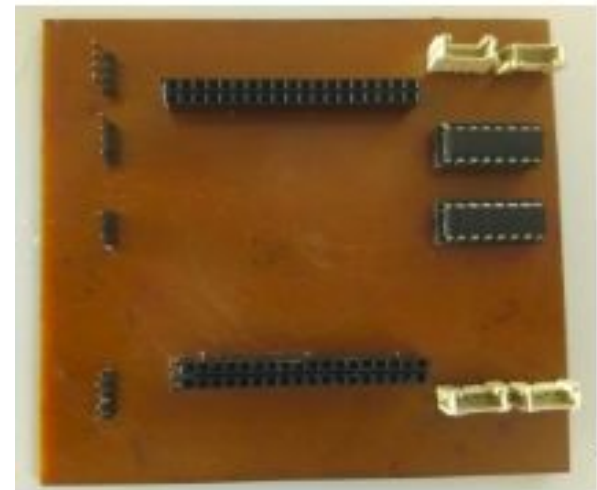
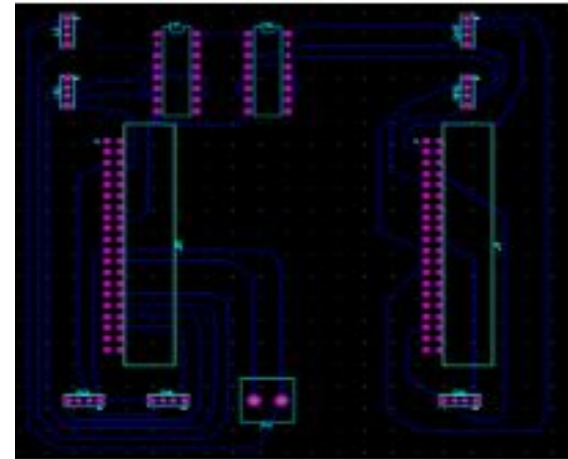


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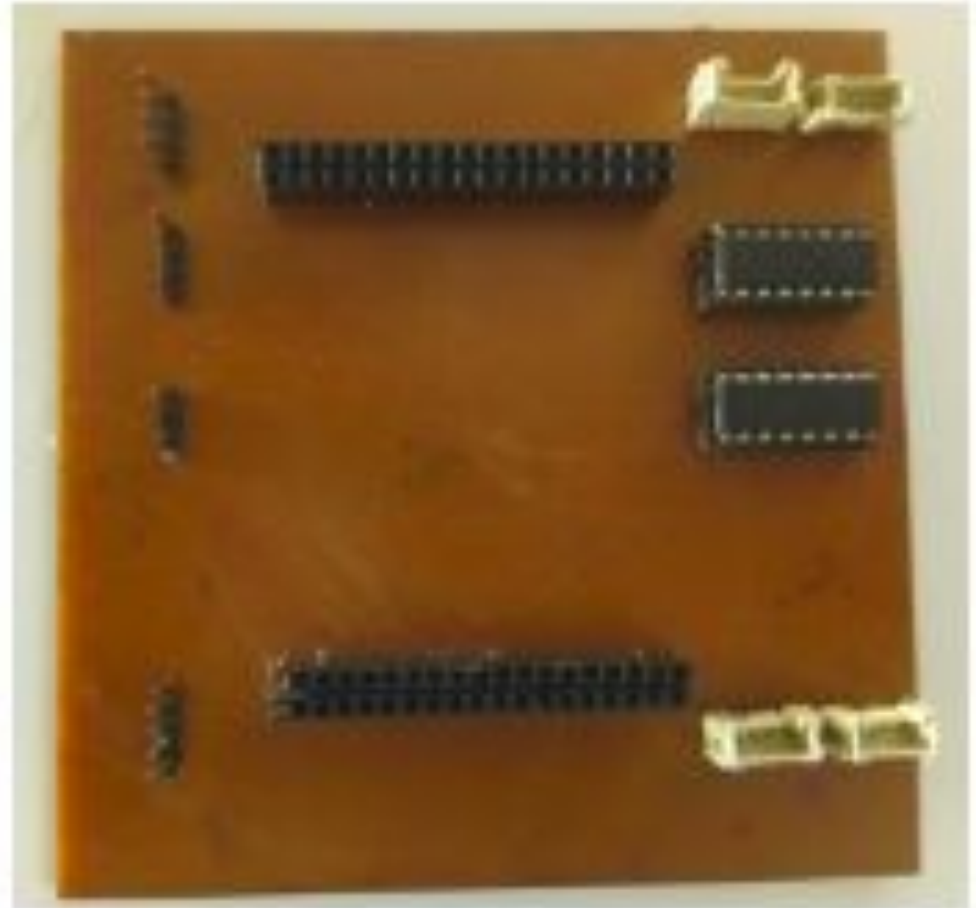

```

92  }
93  }
94
95  if (SOIL_SENSORS) {
96    payload.addAnalogInput(4, soil_temperature);
97    payload.addAnalogInput(5, soil_moisture);
98    payload.addAnalogInput(6, Rsensor);
99
100    printf("Ambient Temp=%f Ambient Humi=%f Soil temp=%f Soil moist=%f light=%f\n", temperature, humidity,
101
102  }
103  }
104
105
106  if (dust_updated) {
107    dust_updated = false;
108    printf("Measured concentration = %.2f pcs/0.01cf\n", dust_concentration);
109    payload.addAnalogInput(1, dust_concentration / 100.0f); // save space
110
111

```



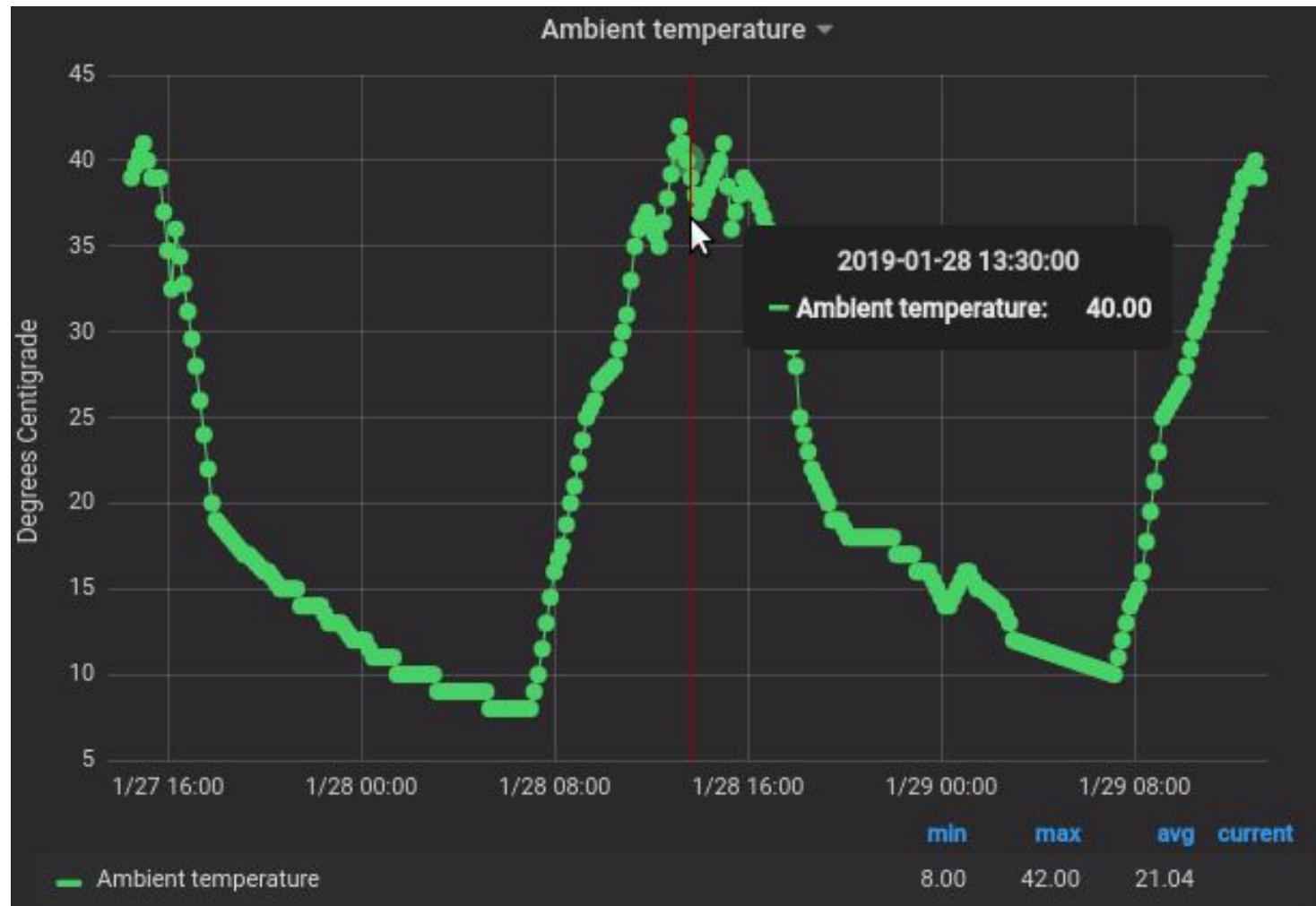
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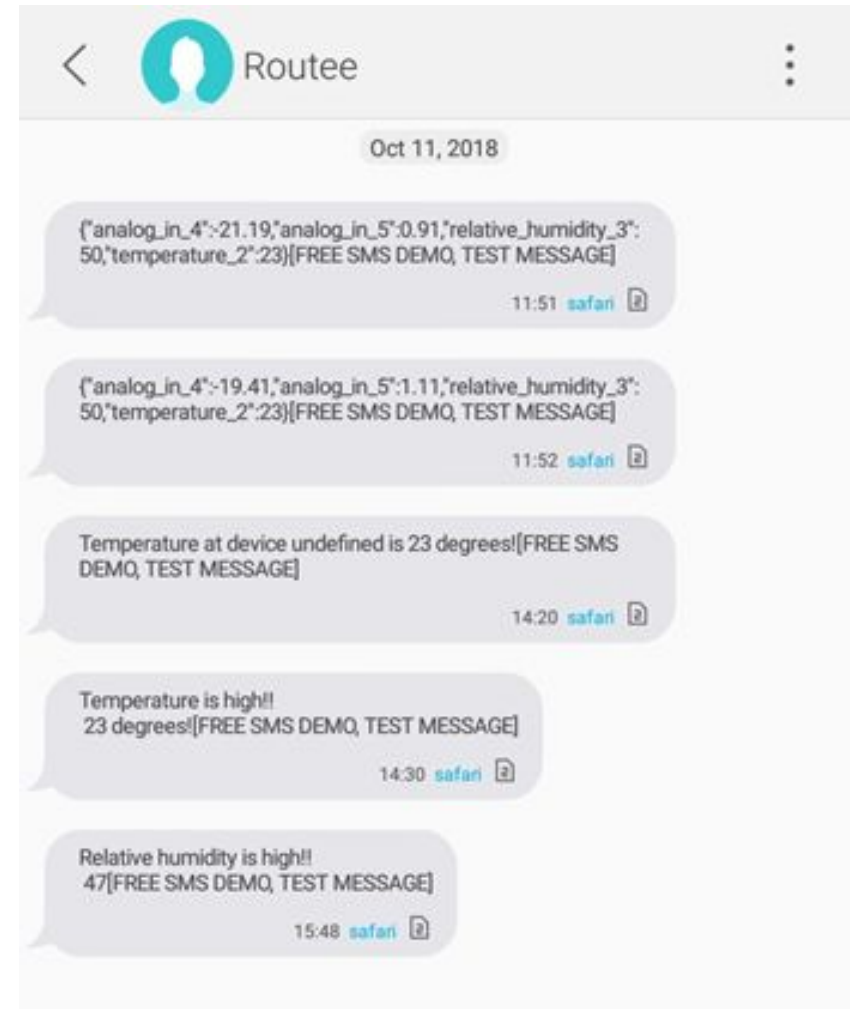
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Message from Node-RED Inbox x

 kimutaingetich5@gmail.com
to me ▾

Temperature is high!!
23 degrees!

me	Message from Node-RED - Light intensity is high!! 1
me	Message from Node-RED - Temperature is high!! 23 degrees!
me	Message from Node-RED - Relative humidity is high!! 47



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- Real time monitoring of greenhouse and field conditions using LoraWAN.
- Analysis on the data for meaningful insights and integration with android and web applications.

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Thank you

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