EXPERIENCE WITH IOT IN AFRICA

Dr. Mamour DIOP
IoT Week 2018 – Bilbao, Spain
June 6, 2018
There are many opportunities for IoT applications in Africa

- Irrigation
- Livestock farming
- Fish farming & aquaculture
- Storage & logistic
- Agriculture
- Environment
EU and African cooperation action targeting sub-Saharan African countries. It aims to accelerate innovation in Africa through cutting edge IoT cost-effective communication and big data technologies deployed on PaaS and know-how.

OPEN SOURCE project addressing the IoT needs and demand of the developing countries and to tailor the IoT and Big-data PaaS platform in the context of Africa in order to offer value-added cost effective, reliable and energy efficient services.

Other benefit to African developers who mostly rely on lower entry level innovations.

12 partners coming from 4 African countries (Togo, Ghana, Senegal, Burkina Faso) and as many European countries (France, Germany, Portugal, Italy).
Moisture/ Temperature of storage areas

Physical sensor

10-15kms

Physical sensor

Physical sensor

Arduino Pro Mini @3.3V

Physical sensor mgmt

Very Important

AES encryption

Very Important

Physical sensor mgmt

Activity duty-cycle, low power

Long-range transmission

Logical sensor mgmt

setup

measure

(encrypt)

transmit

sleep

wake-up

READEY-TO-USE-TEMPLATES
LOW-COST INTEGRATION

Less than 10€/device

https://github.com/FabienFerrero/UCA_Board

1-click order

https://github.com/FabienFerrero/UCA_Board
Build low-cost, low-power, Long-range enabled generic platform
Methodology for low-cost platform design
Technology transfers to user communities, economic actors, stakeholders,…
In Africa, the practice of animal husbandry has always been and still remain farmers’ livelihood and incomes.

Their main problem in this activity remain the cattle rustling and some families are put in dramatic situation after a theft (reported 2 billions CFA losses)
LOW-COST BUOY FOR FISH FARMING

In Sub-Saharan Africa, the volume of natural captured fish doesn’t meet half of the population demand.

Increasing production of aquaculture will help reduce the quantity of imported fishes in Africa.

The aim is to monitor in real-time different parameters to control water quality and prevent some diseases that could affect fish in order to improve the quality and quantity of the production.
KUMAH FARM, GHANA

- The Kwame Nkrumah University of Science and Technology (KNUST)

- Located on the campus of the Kwame Nkrumah University of Science and Technology in Kumasi, Ghana.

- The farm comprises 30 constructed fish ponds, a farm house, a recirculating aquaculture system (RAS) laboratory and store houses.
SANAR FARM, SENEGAL

- Farm located at less than 2 km from UGB.

- One pond is dedicated for the Waziup application: 50x25m, average depth of 0.5 meters, populated by 4000 individuals of saltwater tilapia.

- The basin is irrigated via a water supply system fed by a river in proximity.

- The water in the pond is changed every 10 days.
HATCHERY EXPERIMENT, BURKINA FASO

- Laboratory named Laboratoire d’Études des Ressources Naturelles et des Sciences de l’Environnement (LERNSE)

- NAZI BONI University in a small village of Bobo-Dioulasso city

- Sensors are placed in a hatchery and the box is placed outside of the building
SOIL HUMIDITY SENSOR FOR AGRICULTURE

Monitoring soil moisture and other parameters to provide insightful recommendations and notifications to farmers, and advisors.
UBG FARM, SENEGAL
NASSO SITE, BURKINA FASO

Bananas field

Papayas solos field

Banana plant

Papaya tree
Urbannatic gardens, Togo
In agriculture, different factors can be monitored. Having the ability to control those factors is the key to increase the productivity.

Agriculture MVP requirements:

*Obtain and produce weather related information which will be used to advise the farmers!*

Get local weather measurements

Weather Web App

Pilot sites: Senegal, Togo, Ghana, Burkina Faso

Combine with open weather data to get more accurate predictions
**DISSEMINATION**

- **WAZIUP** tightly involves end-users communities in the technical development and dissemination loop with frequent training and hackathon sessions organized across Africa.
  - **WAZIHacks**: Senegal, Ghana, Togo
  - **WAZIUP Workshops**: IST-Africa 2017 & 2018
  - **Trainings**: Rwanda, Uganda, Ghana, Togo, Senegal, Tunisina, Cameroon, Maroc
  - **IoT clubs**: Togo, Benin, Ivory Coast
CALING UPI

Feb 2016 - 2019

May 2018 - 2021