## UAVs and Agricultural Remote Sensing



Arnold Bett University Of Nairobi Nairobi, Kenya **Bill & Melinda Gates Foundation Grant** 

TITLE: Remote Sensing as a Monitoring Tool for Small holder's Cropping Area

Determination in Tanzania and Uganda using Sweet potato as a Pilot Crop

FOCUS OF PROJECT: Small holder agriculture; remote sensing; crop statistics

#### **IMPLEMENTING ORGANIZATION/LOCAL PARTNER(S):**

International Potato Center (CIP)/University of Missouri/National Statistics Bureaus and University Of Nairobi

**GOALS/OBJECTIVES:** Provide local institutions with an effective and lowcost methodology for gathering data on smallholder agriculture cropping areas.

#### **Objectives:**



Develop, test and ground-truth products generated by a remote sensing platform for surveying crops in sampling areas

Adapt algorithms and software for the data fusion combining very high resolution data with data from coarse resolution satellite images

Validate the technology by comparing results with information provided by the sampling framework used by the National Agricultural Bureau in Kumi District of Uganda plus ground truthing

Elaborate an upscaling plan, impact pathway, and theory of change for this innovation.



**OUTPUTS/OUTCOMES:** 

Outputs:

Library of spectral signatures of crops and other vegetation available in CIP 's web site.

Low-cost UAV-based Agricultural Remote Sensing Platform (UAV-ARSP) for surveying crop statistics in sampling areas.

A prototype Agricultural Remote Sensing Information System (ARSIS).

Sweet potato statistics for the Lake Zone (Tanzania) and the Kumi District (Uganda).

A theory of change, impact pathways, and upscaling plan for the innovation.

Outcomes:

Local institutions use the tools developed for improving national crop statistics.

Implementation of the upscaling plan by relevant partners in African countries.

## e-farming



#### Soil Quality Analysis



### **Embedded Systems**





## Wireless Devices



nRF24L01 Module

Jennic JN5148



#### Sensors

Spectrometer





Multispectrol Camera







# UAV











#### OpenSource and Commercial UAV



#### 3D Printed UAV





### **Results Collected**



**QGIS** Stitching

Stitching several images captured at 90m Altitude to create mosaics.



Thank You Grazie Asante Sana

