

PEER CYCLE 5: Delivering crop yield nowcasts and forecasts by integrating satellite data and crop modelling in Sub-Saharan Africa

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Introduction

Africa nations share challenges in addressing current and future climate risks, have significant gaps in their ability to produce and deliver near real-time crop health information and mainstream these in national decision making process. This project seeks to develop rapidly large scale near real-time (NRT) crop production/health mapping tools and enhance African government's capacity to deliver reliable early warning information for decision support in food security management.

Materials and Methods

The project has four tasks; 1) Integrating Earth Observation (EO) data, complementary field work on smallholder farms and free open source crop modeling tools to generate near real-time crop health nowcasts and weather forecasts data, 2) Dissemination of nowcasts and forecasts data, 3) Capacity Building to deliver digital data and 4) Policy advocacy to target delivering of nowcasts and weather forecasts data to smallholder farmers in SSA.

Results

Task 1: generating crop health and weather nowcasts and forecasts data

a) A baseline household survey comprised of 288 households in Uganda and 216 households in Zambia (504) was conducted to determine farmer seasonal Early Warning information Needs. The study reported that the nowcasts and forecasts information required by farmer includes the following; Start Of Season (SOS), Fertilizer application date, Crop health status, Harvest date, End of season (EOS), Pest/ disease prevalence, Weather forecast data, Market prices. Upto 2 (two) draft manuscripts available

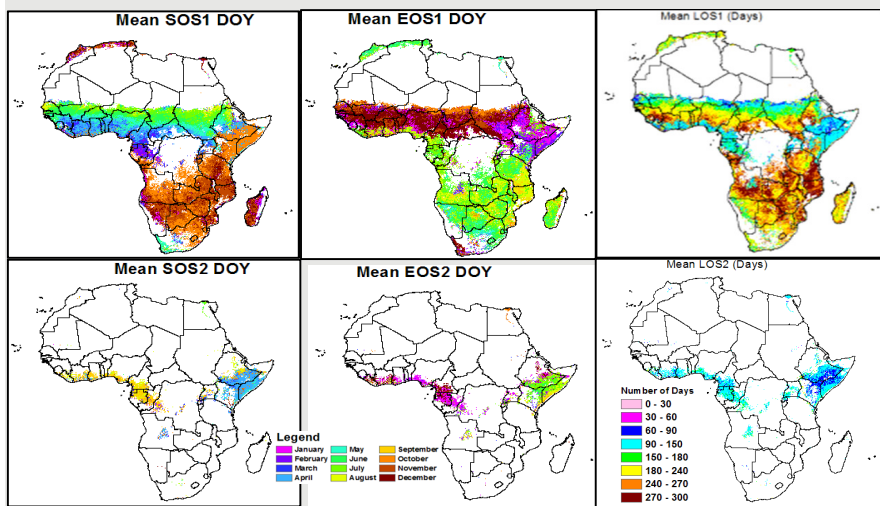


Fig. 1 phenological metrics for SSA

Task 2: Development of Online webGIS-based system for disseminating near real-time (NRT) crop production/ Health monitoring information and smartphone app services (Fig. 2).

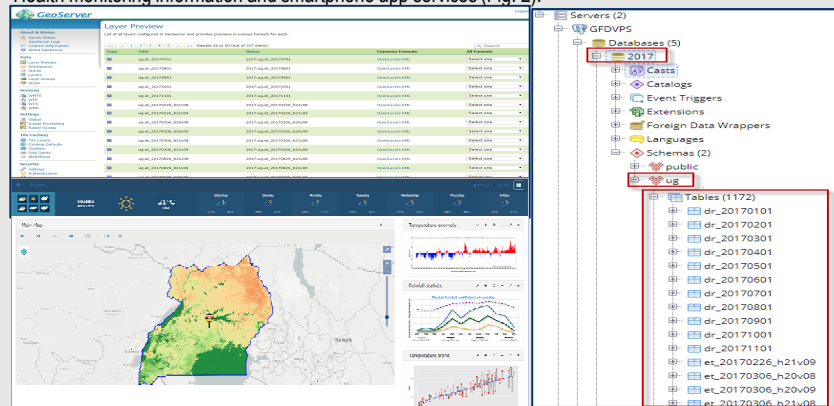


Fig. 2: Online webGIS-based system for disseminating near real-time (NRT) crop production/ Health monitoring information in SSA

Task 3: Capacity Building

•Capacity building has been achieved by on-going training graduate students of two (2) MSc student, one (1) PhD and one (1) BSc as follows; Ms. Chiseche M. Banda from Zambia, MSc. Studies at University of Zambia. The title of his research is: Breeding tropical maize for multiple resilience to heat and drought stress,

Mr. Denis Ekakoro from Uganda, MSc. studies at Makerere University. The title of his research is: Using Space-Time Features to extract seasonal cropping patterns from MODIS Time Series vegetation indices,

Mr. Stanley Peter Ddungu, PhD Student. Thesis title: Economics of climate change – ICT adoption in climate information provision and use in improving farmer's agricultural resilience and production in Uganda and Zambia,

Mr. Augustine Opadaka from Uganda, studies in mathematical and computer biological modeling of crop growth at Makerere University.

Task 4: Policy Advocacy

We have reviewed policy and barriers to Early Warning Information to assess gaps and strength of Early Warning System to manage disasters in Uganda and Zambia. About 70 stakeholders have been interviewed in Uganda and Zambia, data analysis is ongoing. Two (2) draft manuscripts are being prepared.

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