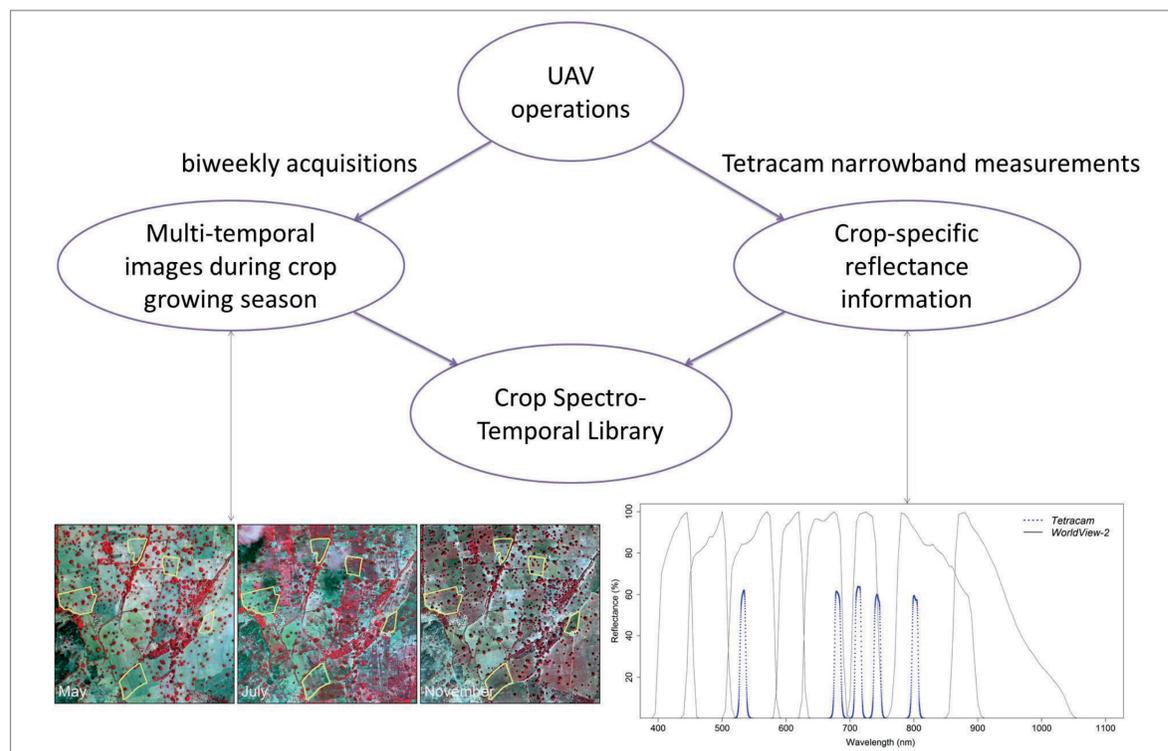


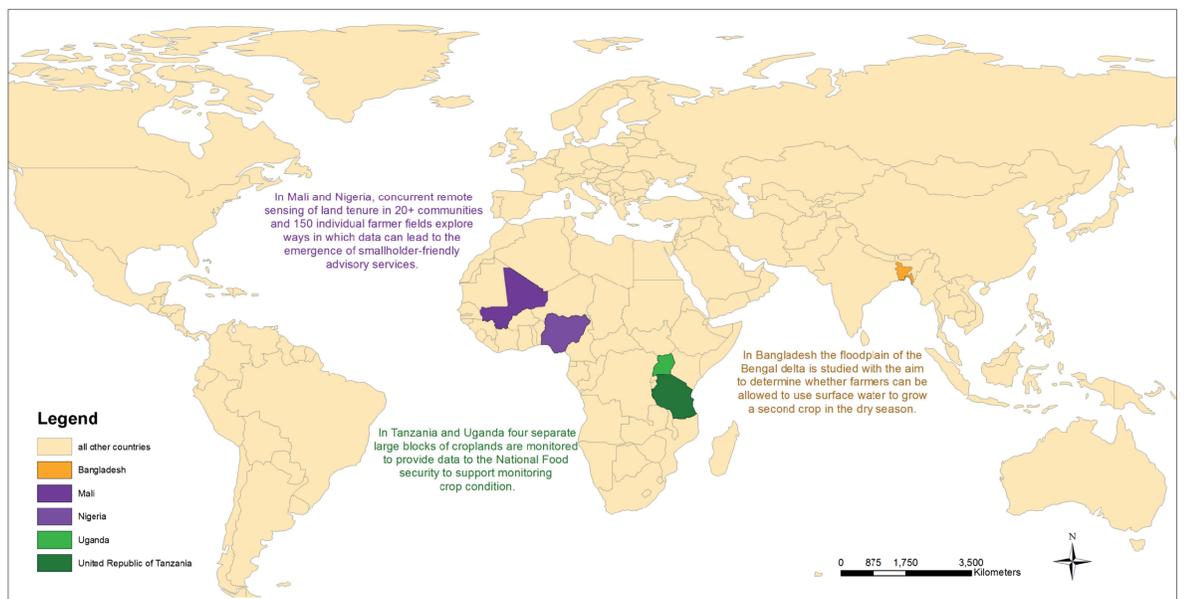
STARS - Monitoring smallholder farming in sub-Saharan Africa and South Asia from an UAV perspective

STARS is a coordinated effort to improve our understanding of the use of remote sensing technology in monitoring smallholder farming. It is developed by ITC, University of Twente (ITC) in collaboration with the Commonwealth Scientific and Industrial Research Organization of Australia (CSIRO), the International Center for Research on the Semi-Arid Tropics (ICRISAT), the University of Maryland (UMD) and the International Maize and Wheat Improvement Center (CIMMYT). The STARS project collects quantitative field measurements, UAV-based images and satellite image products during the crop growing season in different parts of the world with the aim to establish time-dependent crop spectra and image analysis algorithms which will be distributed openly as global public goods.



UAVs play a key role in this project as they provide information at a transitional scale between the well-studied in-situ data and the highest spatial resolution satellite imagery. In STARS, we work with Visible/NIR multispectral cameras mounted on fixed-wing eBee and with mini-MCA (Tetracam Inc.) and thermal cameras mounted on octocopters. For the mini-MCA, we used 10nm bandwidth spectral filters (Andover Corporation).

For the study areas, biweekly UAV acquisitions offer detailed temporal information on crop development and early warning signs of crop failure throughout the growing season. UAV data with such a fine temporal and spatial resolution, coupled with extensive in-situ measurements and complemented by very high resolution satellite imagery, provides the source for establishing a publicly available spectro-temporal and textural crop signature library.



Contribution to Society: To increase wealth for some of the world's poorest communities and provide site-specific crop information to the farmer, which will help them establishing sustainable farming practices. Stakeholders and decision makers can take advantage of tailored crop trends and statistics of their investments. At a national level, to deliver information products to help decision makers on regulating food security.

Contribution to Science: STARS main objective is to analyze the spectral information of the multi-scale dataset collected from different remote sensing platforms; first by establishing a spectro-temporal crop library from information extracted from the different remote sensing sensors during the growing season and second to develop algorithms tailored to smallholder agriculture field delineation and crop detection.