

Title of the symposium:

Satellite and UAV (Drone) systems for assessing and monitoring of ecological landscapes of Africa

Detail of organizer(s):

Responsible

Name:	Moses
Surname:	Azong
Email	Mcho@csir.co.za
Organisation/Affiliation:	Council for Scientific and Industrial Research
Telephone:	+ 27 12 841 2911
Country:	South Africa
Address:	

Co-organizer(s)

Co-organizer

Name:	Henry
Surname:	Bulley
Email:	Hbulley@bmcc.cuny.edu
Organisation/Affiliation:	BMCC, City University of New York
Address:	
Country:	USA

Co-organizer

Name:	Jane
Surname:	Bemigisha
Email:	Bemigisha@yahoo.co.uk
Organisation/Affiliation:	ESIPPS International Ltd.
Address:	
Country:	Uganda

Co-organizer

Name:	Yazidhi
Surname:	Bamutaze
Email:	Yazidhibamutaze@gmail.com
Organisation/Affiliation:	Makerere University, College of Agricultural and Environmental Sciences
Address:	
Country:	Uganda

Co-organizer

Name:	Aniko
Surname:	Polo-Akpisso
Email:	Anikopolo@gmail.com
Organisation/Affiliation:	Laboratory of Botany and Plant Ecology Faculty of Sciences, University of Lomé
Address:	

Country:	Togo
----------	------

Symposium abstract

The goal of this full-day special session is to address the advances and challenges to using satellite and Unmanned Aerial Vehicles (UAVs) or drones derived imagery to effectively characterize, assess and monitor ecological landscapes of Africa, with view of supporting sustainable development in African countries. The landscapes include agricultural areas, peri-urban areas, watersheds and the fate of natural environment. As the human population of Africa grows, the growing demand for land to increase food production and urban development poses serious challenge to ecosystems integrity in the Anthropocene across the continent. Improved agricultural productivity is considered vital to achieving the 2030 SDGs and 2063 African Union agenda for socio-economic transformation of the continent, and to sustain the 2 billion people expected on the continent by 2050. However, agricultural and urban landscapes are expanding at the expense of natural habitats, thereby limiting the ability of the latter to provide vital ecosystem services, including biodiversity, food, drinking water, and fisheries. These change processes are taking place across varying spatial and temporal scales, from farmlands to regions. Furthermore, land cover changes and fragmentation of natural habitats need to be monitored at the appropriate spatial scale. The availability of timely information on crop condition at the appropriate scale is indispensable to sustainable agricultural production in Africa. Recent advances in high-resolution Earth Observation satellites, coupled with the reduced cost of building and launching the Unmanned Aerial Vehicles (UAVs) or drones, have opened up great potential for enhanced capacity in African countries to integrate remotely sensed data to characterize and assess agricultural landscapes such as crop condition, as well as environmental conditions including watershed and habitat degradation. However, no single sensor meets all the requirements for assessment and monitoring of diverse ecological landscapes in Africa because of the varying spatial, spectral and temporal resolutions of these sensors. Therefore, there is the need to develop remote sensing data integration protocols to effectively characterize the changing human–environment interactions and support sustainable development and agricultural productivity in rapidly urbanizing landscapes of Africa.

We will like to propose a full day special session (morning symposium and afternoon panel session) at the 10th International Association of Landscape Ecologists (IALE) World Congress in Milano, Italy in July 2019. This proposal is supported by the Africa Regional Chapter of International Association for Landscape Ecology (Africa-IALE). We will invite scholars, researchers, environmental and resources managers from within and outside Africa to join us to discuss recent advances in integrating satellite and drone data applications to landscape assessments to characterize human–environment interactions, including land use

and land cover change (LULCC) at multi-scales. We are particularly interested in women, early career scientists, and graduate students.

How your symposia will improve landscape ecology science?

The Anthropocene reflects significant impacts of human activities the earth's ecosystems, which in turn affects the sustenance of livelihoods. Nowhere is this more evident than in rural areas of Africa and elsewhere, where people's livelihoods are intrinsically linked to the ecological integrity of the environment. Hence harnessing new tools for monitoring ecological changes across anthropocentric landscapes is of vital importance today. Using satellite and Unmanned Aerial Vehicles (UAVs) or drones derived imagery to effectively characterize, assess and monitor ecological landscapes constitutes new field of study with new challenges and opportunities in landscape ecology science especially in African countries. This is an innovative way of integrating spatial technologies to respond to ecological transitions and integrity of ecosystems services in Africa countries.

Indeed, every effort is made to improve agricultural productivity while protecting vital ecosystems such as rivers and watersheds is essential to achieve the 2030 SDGs and 2063 African Union agenda for socio-economic transformation of the continent. Therefore, by bringing together researchers from within and outside Africa to address the proposed topic, this will contribute in strengthening the foundation of Landscape Ecology Science, especially in Africa. These contributions include:

- addressing the need of capacity building in Landscape Ecology Science for researchers from African countries.
- developments in methodological framework for the integration of drone data with satellite imagery in Landscape Ecology studies.

Ecological landscapes in Africa offer unique opportunities, to examine and understand how landscape ecological principles and concepts can provide a framework for sustainable agriculture and development in the Anthropocene.

Broad thematic areas

Broad thematic areas 1st choice: Technologies and landscape ecology (remote sensing, geomatics, ...)

Broad thematic areas 2st choice: Landscape ecosystem functions and services

Free Keywords

Unmanned Aerial Vehicles (UAVs or Drones)

Remote sensing
African landscapes
Satellite imagery
Remote sensing

Outcomes of symposium

Special issue in a scientific journal (to be negotiated)

Notes

We are proposing a full day special session comprising two formats. The first will be a morning session will be in the form of a symposium and focused mainly on technical/paper presentations. Given the extensive nature of issues in Africa, we also anticipate the potential of two symposium (Part 1 and Part 2). The second afternoon session will be organized mostly as a panel panel with 2-3 keynote speakers and and a discussant, followed by an open forum discussion to synthesize the key points.