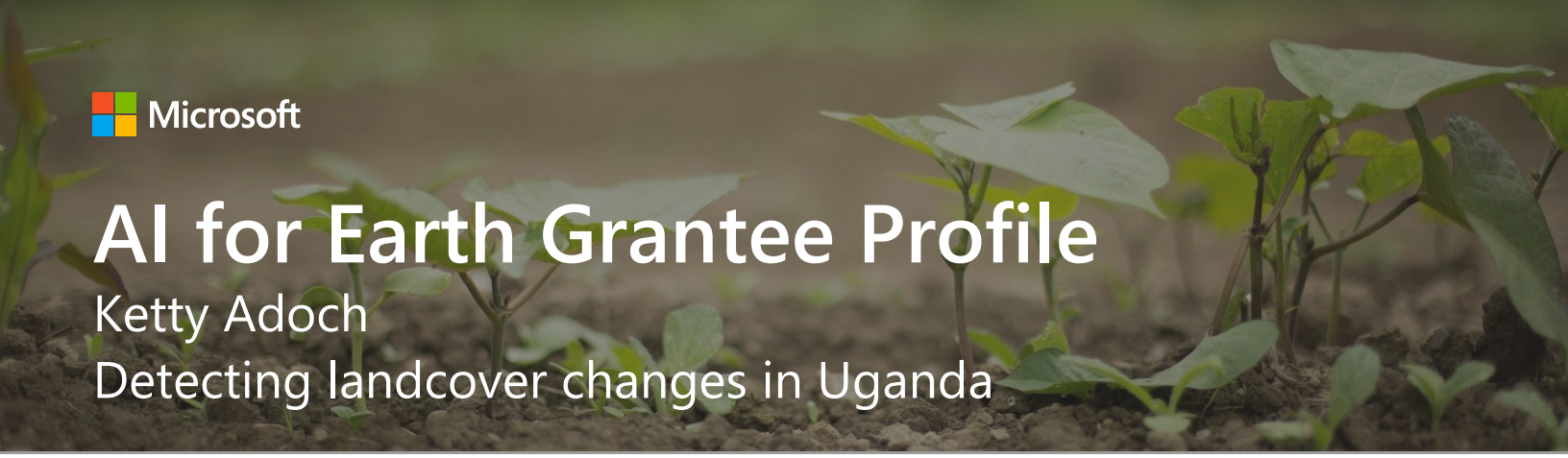

Microsoft

AI for Earth Grantee Profile

Ketty Adoch

Detecting landcover changes in Uganda

Summary

The wilderness of the Murchison Falls National Park and nearby Lake Albert in Uganda is threatened by development for oil production. However, the potential impact is difficult to assess without knowing what changes are happening to the land. Through a Microsoft AI for Earth grant, Ketty Adoch will be applying machine learning to analyze aerial imagery of the landscape, tracking the changes in the previous and upcoming decades. These algorithms and analyses will support conservation efforts going forward.

Assessing the impacts of development in Uganda

Murchison Falls National Park—Uganda's largest and oldest national park and home to elephants, giraffes, hippos, and chimpanzees—acts as a conservation area for untamed wilderness and savannahs. Nearby Lake Albert and the surrounding area support fishing and agriculture, sources of income for many within the region. And yet the discovery of oil in the region has the potential to upset all of this.

Since 2008, oil companies have been investing heavily to build the infrastructure for oil production. Civil society organizations in Uganda and neighboring Democratic Republic of Congo (DRC) have concerns over the potential for oil activities to affect people's livelihoods, wildlife conservation, and tourism. However, it is hard to assess the impact of this development without knowing what changes are happening to the land—something that hasn't been tracked in a decade.

Detecting land cover changes through aerial imagery and AI

Ketty Adoch, a geographical information systems specialist with a background in computer science and physics, sees an opportunity to fill this information gap using AI. As Adoch explains, "I'm a huge advocate for applying technology tools to geography data, especially remotely sensed spatial data like images captured using satellites." She plans to use supervised image classification and machine learning to detect changes in the shape or sizes of patches of land cover types—for example, changes in tree cover due to deforestation—to highlight evidence of urbanization and infrastructure development. She'll conduct these analyses both historically (2009–2013 and 2013–2017) and then, once promising algorithms have been developed, on an ongoing basis for the coming decade (2018–2022 and 2023–2027).

Through a Microsoft AI for Earth grant, Adoch now has access to Microsoft Azure tools that provide ubiquitous, convenient, on-demand computing resources (such as data storage and processing bandwidth) to support the project. The key outcomes—algorithms and maps to document the findings—will enable researchers, scientists, conservationists, and technologists to monitor land cover change in the area, build a picture of the impact of oil activities, and support conservation efforts going forward.

About Ketty Adoch

Ketty Adoch is a Geographical Information Systems Specialist with a background in computer science and physics from Makerere University in Kampala, Uganda. Since 2011, she has worked on a wide range of environmental projects with international organizations, research organizations, government, and the private sector. Her past and present work involves developing technology tools to manage geography data in areas such as agriculture (developing algorithms for food security management), energy (developing models for off-grid energy planning), and environmental sensitivity mapping for oil and gas projects in East and West Africa, including organizational capacity building at national, regional, and continental levels.

Ketty Adoch, Geographical Information Systems Specialist from Uganda. [Photo courtesy of Ketty Adoch.]

Adoch is currently Principal and Consultant at Mara Arwot GeoSpatial, an organization which provides a range of open-source geography consulting services in Uganda and East Africa. During her free time, she volunteers as a contributor and mapper for the OpenStreetMap project, which is a global crowdsourcing project for open map data. Her goal is to develop and explore technology solutions to solve emerging environmental challenges through a combination of skills, knowledge, passion, and experience.

Resources

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Press

Microsoft and National Geographic Society announce AI for Earth Innovation grantees