



**Scenario**  
DOCTORAL TRAINING PARTNERSHIP

**NERC**  
SCIENCE OF THE  
ENVIRONMENT

## Using satellite Earth Observation to assess the impact of migratory herdsmen on forest reserves in Nigeria (SAMFOR)

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The Fulani (or Fula) are a major group (38 to 40 million people) residing in many parts of West and Central Africa. Of that wider group, some 12 to 13 million are estimated to be migratory pastoralists. Cases of serious conflict between farmers and the migratory herdsmen have occurred over decades and this remains a major issue, especially in Nigeria. Another issue is the role of the Fulani in causing damage to forest reserves, partly through burning grassland on the edges of the reserves but also via incursion into the reserves, especially for setting up camp. Such damage can also create 'entry' pathways for crop farmers. To date there has been very little work done on the impact of such incursions on the forest reserves and this project proposes that they can be calibrated effectively using Earth Observation (EO) via high-resolution satellite imagery. Depending upon the skillset of the appointee, the project may also assess the impact on carbon cycling with the Data Assimilation Linked Ecosystem Carbon (DALEC) model. The latter would provide an analysis of the 'tipping point' where the degradation intensifies. This PhD opportunity is exciting in terms of the challenging issues being addressed and the potential for significantly wider application as several parts of the world have regular migratory movement patterns (e.g. the Masai in Kenya); an effective, demonstrated EO 'system' for the appraisal of the impacts on forests would provide valuable support for appropriate policy development.



Fulani herdsmen in Nigeria (source: Wikimedia Commons)

### **Training opportunities:**

This project would provide excellent opportunities for training in the handling and interpretation of earth observation imagery. Some modelling and programming training would be available via the Department of Mathematics at the University of Surrey, as well as access to a variety of postgraduate modules available at the Centre for Environment and Sustainability (CES).

### **Student profile:**

Applications are welcome from students with an undergraduate degree in geography, environment science, environmental management, forestry or a cognate discipline. Graduates in Mathematics are also encouraged to apply given the potential to further develop and apply the DALEC model. Having a post-graduate degree in environmental assessment, Geographical Information Systems, remote sensing as well as experience of working in Sub-Saharan Africa would be an advantage.

### **Funding particulars:**

This is a CASE project with co-funding from Earth-i.

### **References:**

Lynch,J., Maslin,M., Baltzer,H. and Sweeting,M. (2013). Choose Satellites to monitor deforestation, Nature, 496, 293-294

<https://earthispace/>

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