Monitoring and prediction of land use land cover changes in a hotspot mining landscape in Ghana

How to cite:

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Version: Poster

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INTRODUCTION

- The operations of both large and small-scale mining impacts on existing land use and land cover (LULC) and poses great threat to humans and their environment
- Analysis of the historical trends and rates of current and future LULC changes are crucial in the sustainable planning and management of natural resources.

RESULTS

- Four unique epochs of LULC dynamics in relation to mining:
  - Invisible mining footprints (1986 map);
  - Visible mining footprints (2002 map);
  - Radical mining footprints (2008 & 2015 maps), and
  - Contracted mining footprints (2020 map)
- The net area of change in mining from 1986 to 2020 was an increase of 5,589 ha
- A total forest cover lost of 27,333 ha (36%) at an average annual deforestation rate of 1.07% from 1986 to 2020
- Increased cropland of 13,593 ha from 1986 to 2020 in favour of perennial cash crops such cocoa and palm plantations

CONCLUSIONS

- Mining is intricately related to all the LULC classes, and significantly drives the observed LULC changes
- The CA-Markov model successfully predicted the future LULC changes under ‘business as usual’ and ‘remedial’ scenarios.
- The integration of remote sensing/GIS and ethnographic methods in understanding LULC changes offer elaborate and robust insights into LULC dynamics compared to using either RS/GIS or ethnographic approaches.