SEN4MOZ

Copernicus Data for Mapping Agricultural and Vegetation Dynamics in Conservation Areas of Mozambique

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Scientific Background and Objectives

Rural populations in Mozambique rely on agriculture as a key livelihood for food production and income generation.

Smallholder farming may cause adverse effects on biodiversity and carbon storage around protected areas.

Balancing land use and conservation in and around protected areas requires spatially explicit information on the extent and dynamics of agriculture and vegetation recovery.

Photo credit: N. Ribeiro

Project goal: Supporting the dialogue between protected area managers and local communities using Copernicus data.

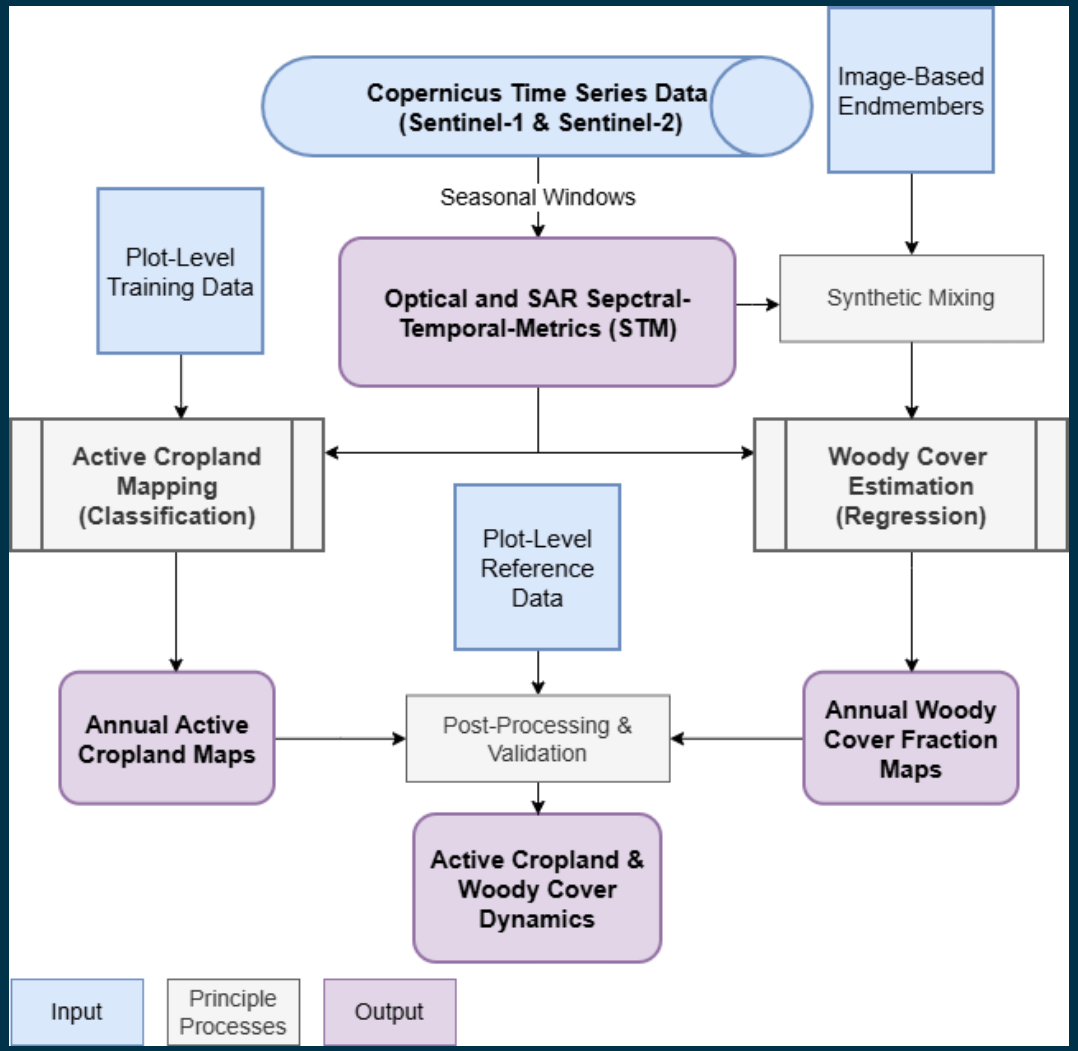
Specific objectives:

1) Develop a transferable workflow for mapping shifting cultivation dynamics and regrowth in PA of Mozambique between 2019-2025;

2) Produce annual maps of active cropland to obtain estimate of land use trajectories within PA and their surroundings;

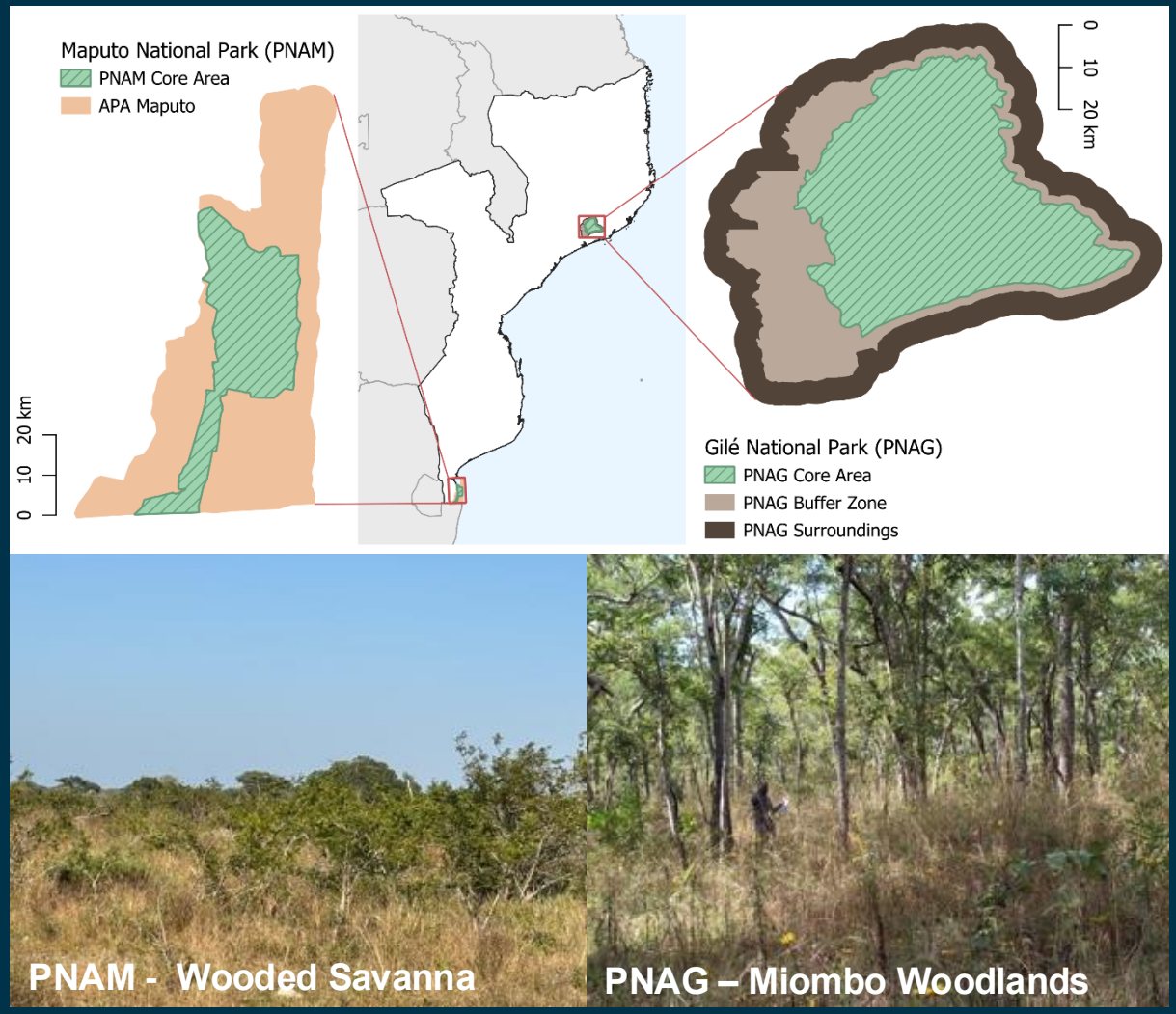
3) Map post-deforestation vegetation dynamics for quantifying woody cover loss and regrowth rates after agricultural use.

Research Outline



SEN4MOZ active cropland & woody cover dynamics mapping workflow based on Copernicus Sentinel-1 and Sentinel-2 data.

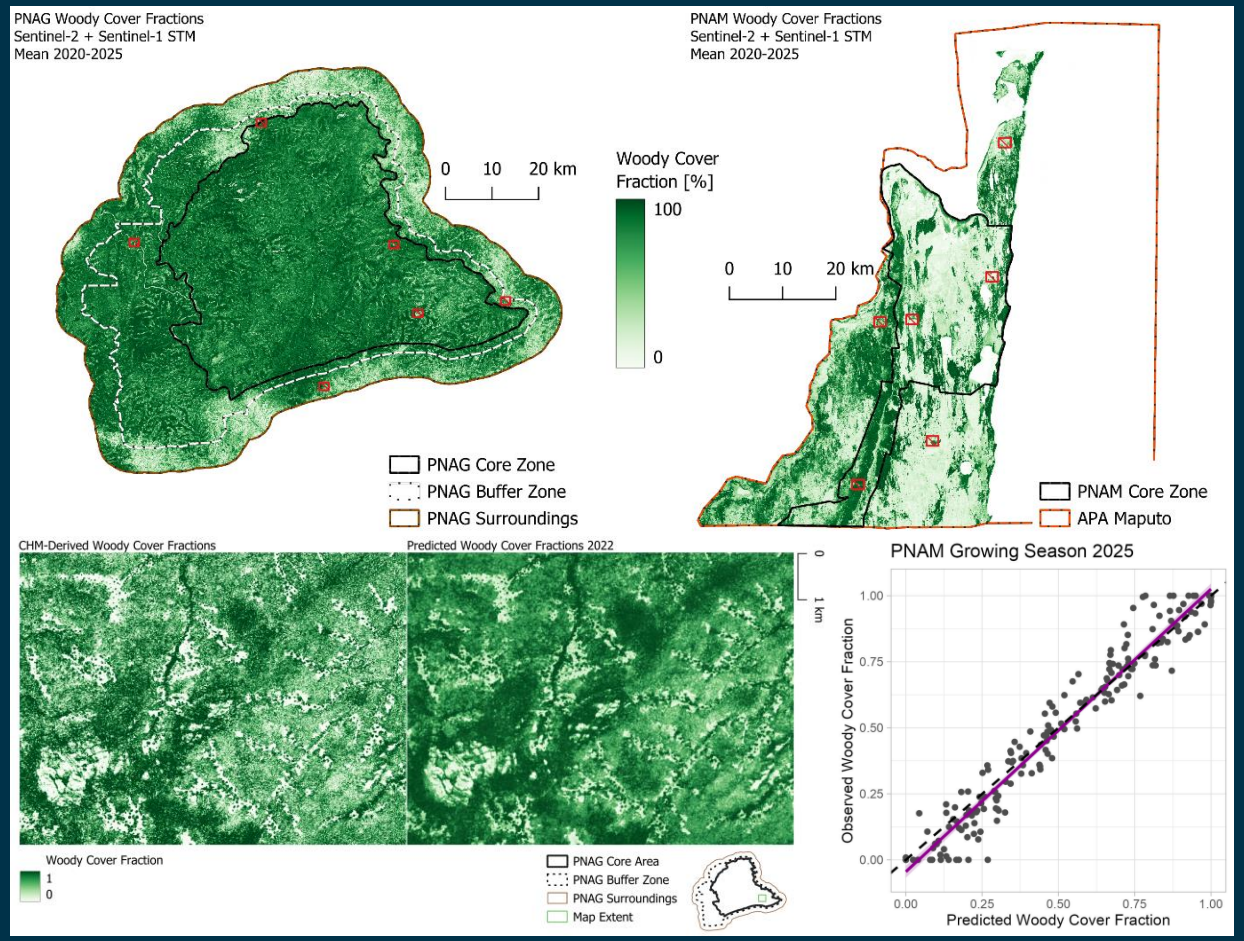
Study Area



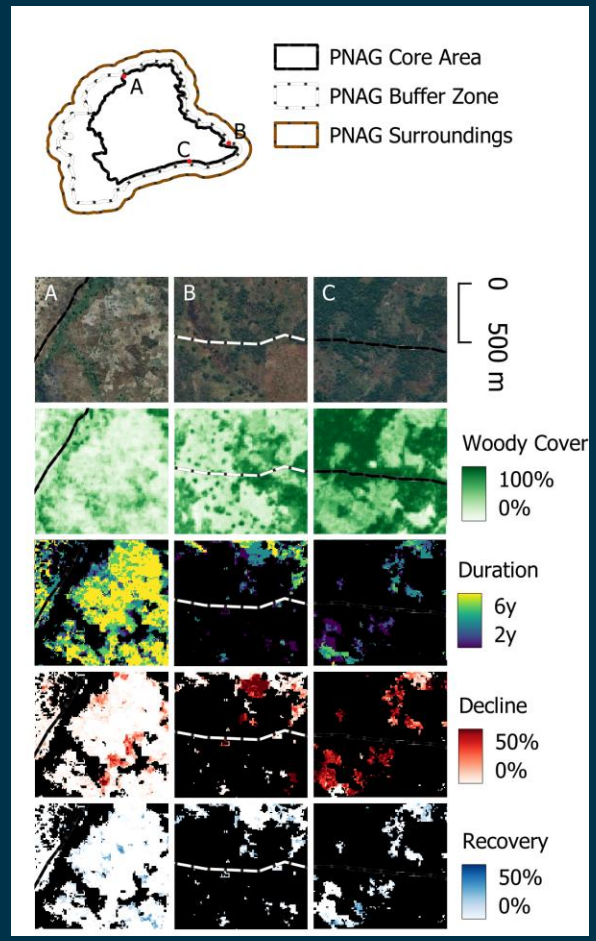
Study region: Maputo National Park (PNAM) and Environmental Protection Area (APA) and Gilé National Park (PNAG) with Buffer Zone and Surrounding Area.

Results

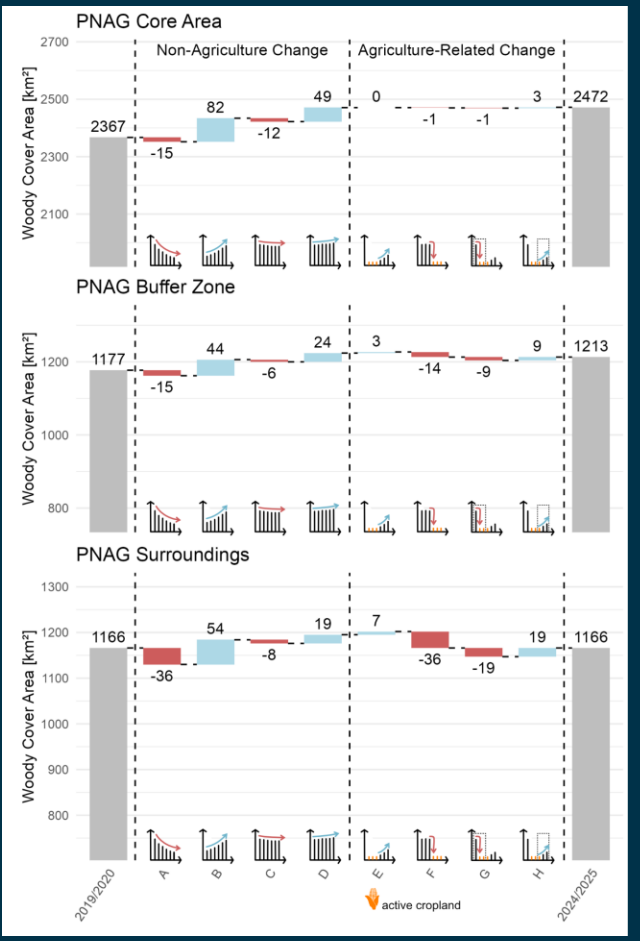
Further work



Mean woody cover fractions for the study period 2019-2025 for PNAM and PNAG (top). Comparison with woody cover derived from canopy height model for PNAG using 2m threshold (bottom left) and scatterplot comparing reference and predicted woody cover fractions in PNAM for 2025, reaching RMSE = 0.079 and R^2 = 0.94

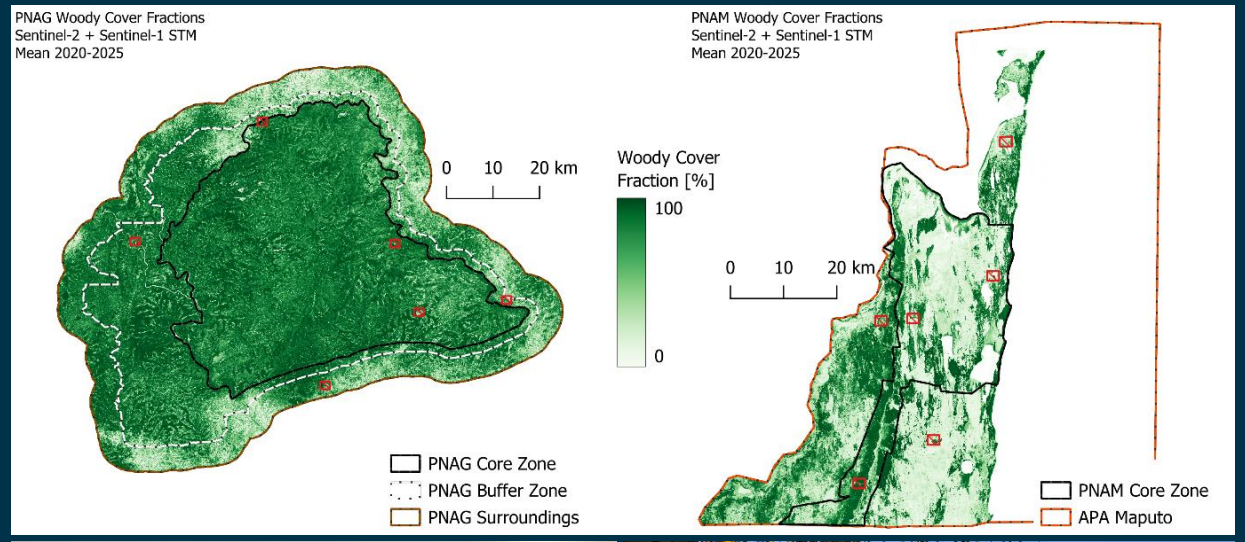


Mean woody cover, cultivation duration , woody cover decline, and recovery related to agriculture for selected sites in PNAG.



Vegetation bookkeeping analyses for PNAG and PNAM discriminating non-agricultural (A-D) from agriculture-related woody cover change (E-H) for the study period.

Layout for social media posts



Recommended image resolution 1200 x 675 pixels - landscape format

Post in LinkedIn: 600-630 characters including links

The ESA EOAfrica R&D SEN4MOZ project studied the interactions between smallholder subsistence farming and vegetation dynamics in two National Parks of Mozambique. Project outcomes were manifold including capacity building, scientific and cultural exchange, joint conference visits, field work, and of course EO mapping. The code repository and dataset supporting our insights are available via github.com/eichfussl/sen4moz and https://doi.org/10.5281/zenodo.19712566.
Stay tuned for the scientific outcome of the project providing evidence on the question whether agriculture is really a key threat to area-based conservation in the selected regions.

Post for BS (max 230 characters including hashtags)

The ESA EOAfrica R&D SEN4MOZ project studied interactions between #smallholder farming and vegetation in National Parks of #Mozambique, asking whether agriculture is really a key threat to area-based conservation in the selected regions – stay tuned!