Save the Falémé River

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Scientific Background and Objectives

Background

The Faleme river is affected by climatic change and the accelerated and uncontrolled development of artisanal gold mining which has led to a change in the river flow, a significant accumulation of sediments and chemicals elements in the river impacting water quality.
Several initiatives have been put in place for the protection and conservation of the river, but viable, long-term measures have not been put in place.

Data sources

Sentinel-2, Landsat, Google Earth imagery, JRC, HydroSheds, DGPRE, field sampling

Objectives

The main objective is to investigate, in the context of anthropic forcing how satellite imagery can be used for monitoring and assessment of water quality in the Faleme river.

- ✓ identification and mapping of anthropogenic activities around the river and its catchment;
- ✓ to investigate the possible relationships between these activities and the evolution of the water quality of the river;
- ✓ to test and apply a series of algorithms to Sentinel 2 data developed in other contexts for the detection of water surfaces and the production of water quality maps;
- ✓ monitor the effectiveness of the measures taken to preserve the river.

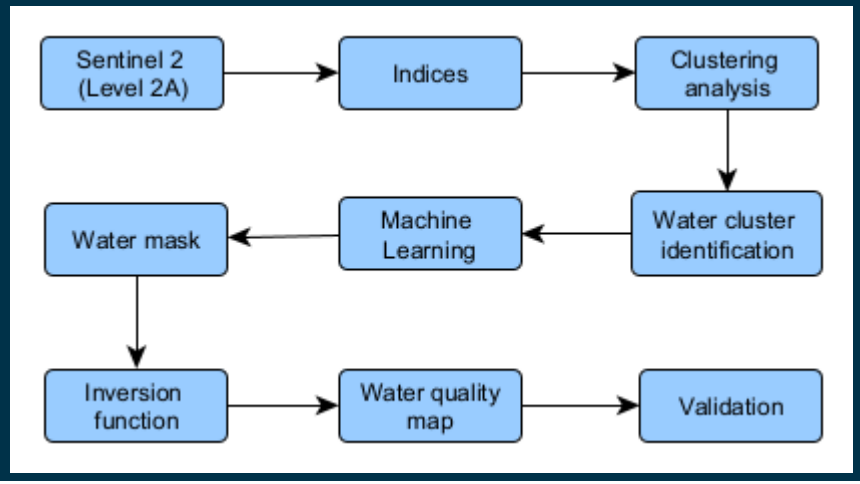
Research Outline

Methods

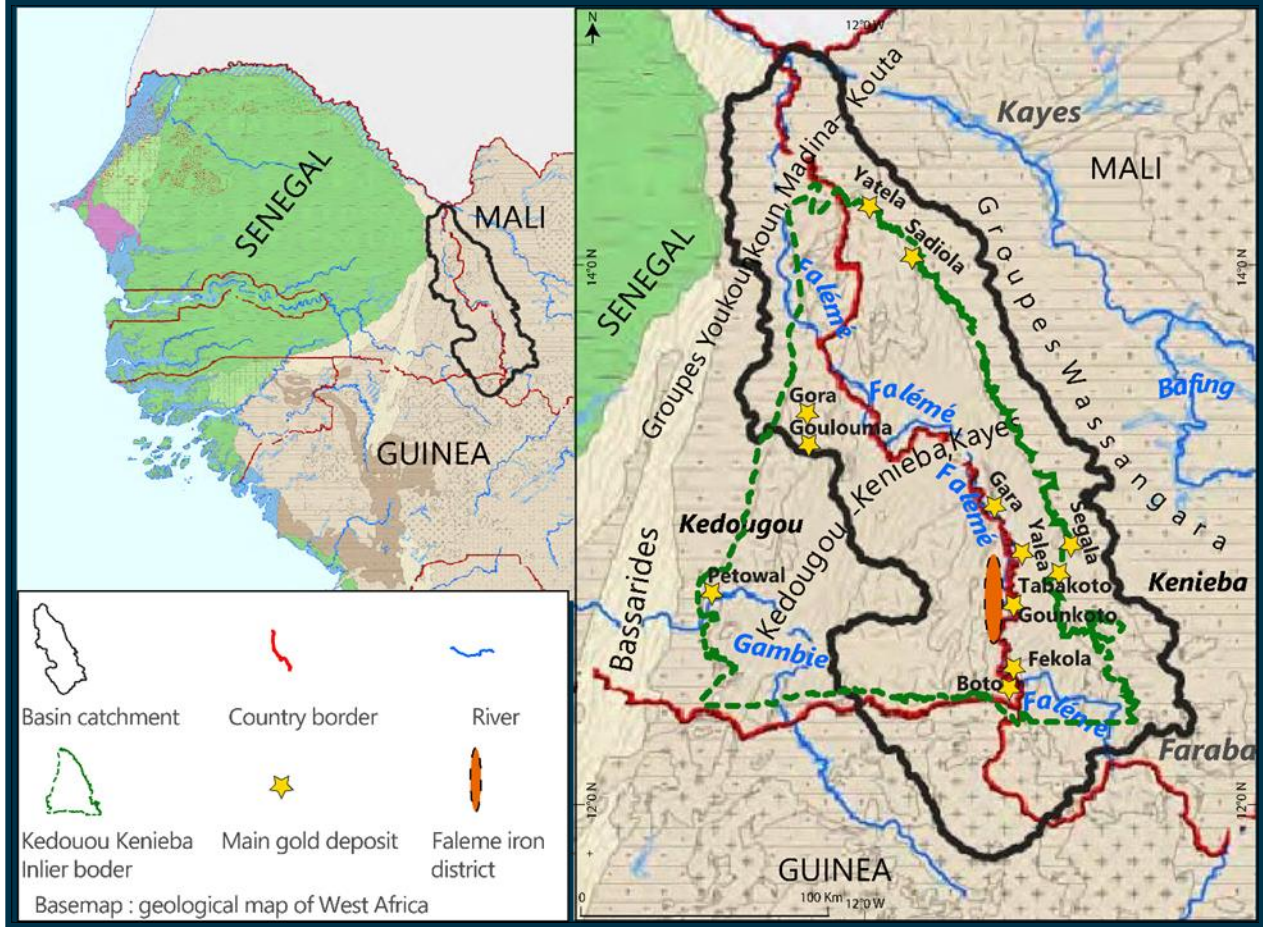
1- Field work

2- Spatial data analysis

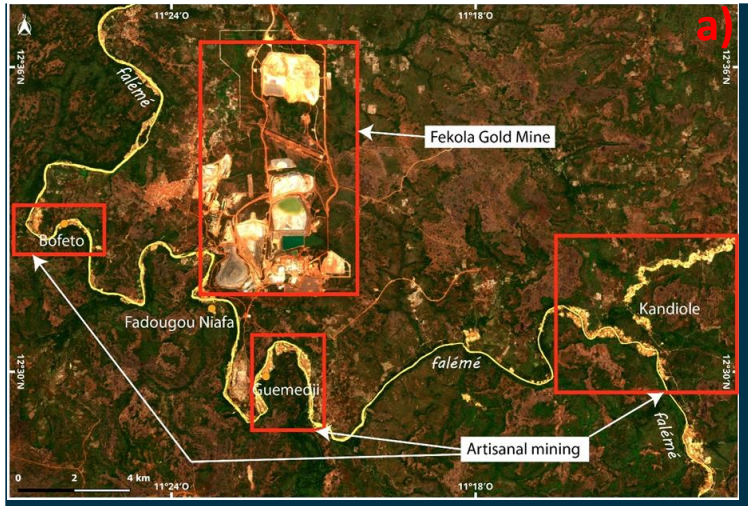
- ✓ *identification of anthropic activities;*
- ✓ *surface water area detection and monitoring;*
- ✓ *inversion of reflectance to water quality parameter value;*
- ✓ *water quality mapping and monitoring.*



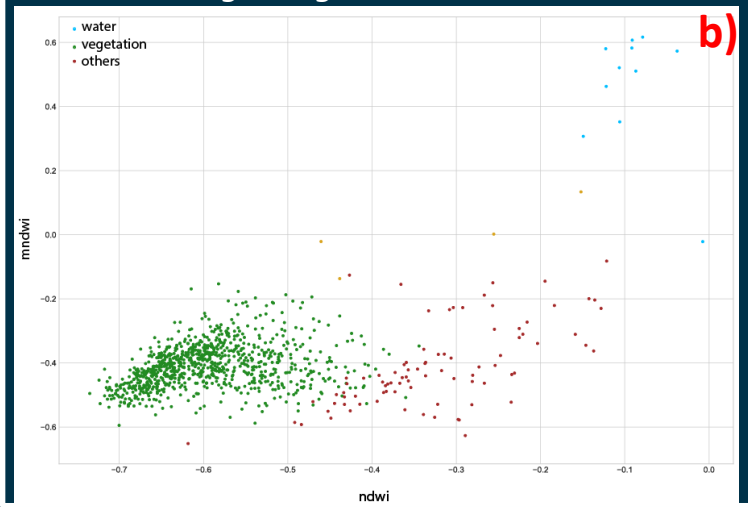
Study Area



Results



a) Extract of sentinel 2 image of the study area. Identification of industrial mining and alluvial mining along the river



b) Scatter plots of pixels plotted in MNDWI x NDWI dimensions, blue dots are water pixels, green dots are vegetation pixels and others dots are mixture. This image has the result of the clustering process, c) Watermask resulting to the application of the water detect algorithm

d) Extract of water quality map on study area using the model of Nechad. High values of SPM (up to 1000 mg/L are mapped on mining site along and around the river