

Cloud computing solution for monitoring arid rangeland dynamics:

case of Moroccan highlands and southern ecosystems

LAHSSINI Said¹, MOUKRIM S.^{2,3}, MHARZI-ALAOUI H.², RIFAI N.², EL WAHIDI F.⁴

¹. National School of Forest Engineering, Salé, Morocco; Contact: marghadi@gmail.com

². Water & Forestry Department, Morocco;

³. Mohammed V University in Rabat, Faculty of Sciences, Morocco

⁴. Cadi Ayyad University, Marrakech, Morocco



Introduction

Dray Lands

Cover almost 90% of Moroccan territory. Water scarcity shaped very specialized species and ecosystems with very low cover that contributes to the provision of ecosystem services necessary for human well-being.



Within this special lands, local population have developed ingenious systems and sophisticated strategies to cope with the challenging conditions over centuries including livestock rearing, and very located rainfed and irrigated crop agriculture.

Changes affecting social structure of rural population have had different **impact on arid ecosystems**, that need to be **assessed and monitored**.

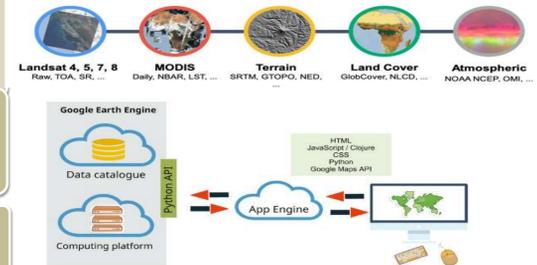
Materials and Methods

Data & computation platform

Remote sensing data

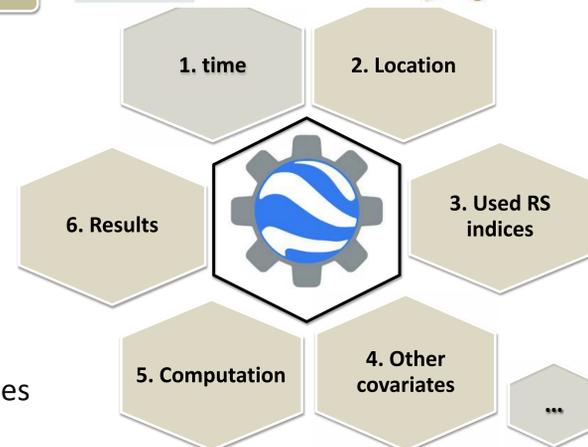
Algorithm & CC orchestration

GUI: GEE JS API



Computation:

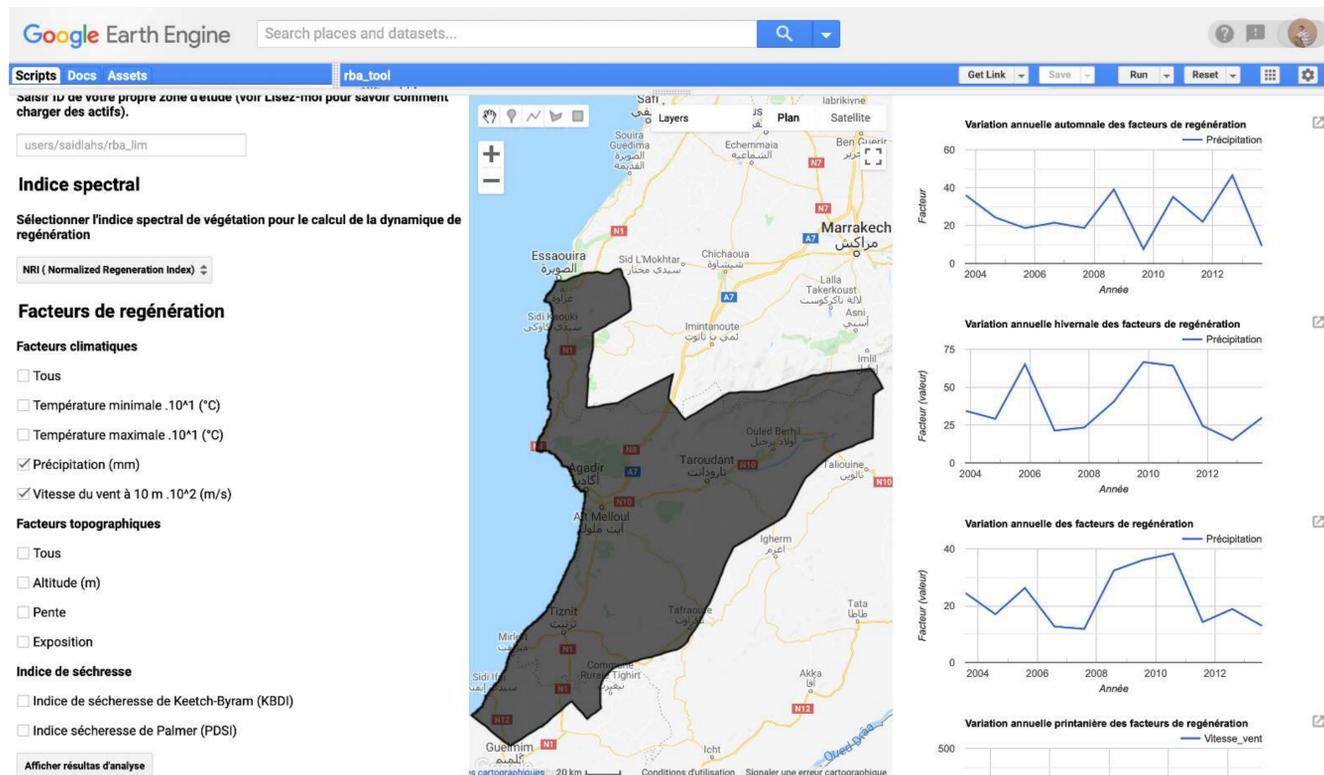
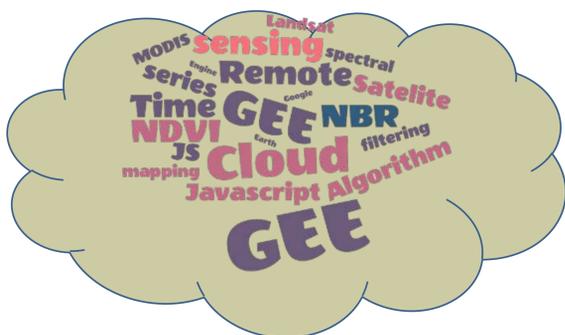
- Define spatio-temporal analysis frame and used data;
- Choice of images corresponding to criteria (cloud. . .);
- Compute spectral indices for each scene ;
- Auto referencing composite indices scenes ;
- Aggregation & Maps & time series graph edition



Results and Discussion

GUI (graphical user interface) hides the implemented processing logic. In order to be useful by users without RS or programming background;

Developed solution facilitate, through the use of remote sensed data, identification of vegetation trends while visualizing the main climatic covariates trends.



Conclusions and Implications

Moroccan Arid lands face several **difficulties and fragilities** that are related, in addition to bioclimatic context, to : the high human pressure. Conservation of this natural capital and its future **viability** relay on monitoring of these ecosystems.

The developed solution, help manager, to **identify area prone to degradation trends** that could be planned for **restorative activities** and those with cover improvement trends **to be opened to** grazing.



Acknowledgements

