

SeqCOI, a tool for calculating and mapping GHG balances from land uses in Indian Ocean territories

At the interface between science and public policy, the SeqCOI (Carbon **Seq**uestration in the Indian **O**cean territories) tool aims to raise awareness among citizens and land managers in La Réunion, Madagascar and Rodrigues island about the impacts of land use changes on greenhouse gas (GHG) balances.

The SeqCOI tool is a decision support tool designed to support local action. It assesses the organic carbon stocks of a territory as well as the impacts of future land use changes in terms of GHG balances (emissions or sequestration) over a 20-year period.

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ENHANCING RESEARCH DATA

- The tool focuses on **GHG emissions related to soils**, which are at the crossroads of organic matter storage and gas exchange with the atmosphere.
- Impacting the soil** also means changing the amount of greenhouse gases in the atmosphere, and **therefore the climate!**
- The tool is **pre-calibrated with extensive data from research on soil organic carbon stocks** and biomass conducted by IRD (UMR Eco&Sols) and its scientific partners in Madagascar, La Réunion and Rodrigues islands.



CALCULATING IN A DECISION SUPPORT TOOL

- Calculations using territory-specific data and IPCC reference data, compiled in **relational databases**
- Calculations based on **IPCC methodologies**: activity data and emission factors

$$\text{GHG emission} = \text{Activity data} \times \text{Emission factor}$$

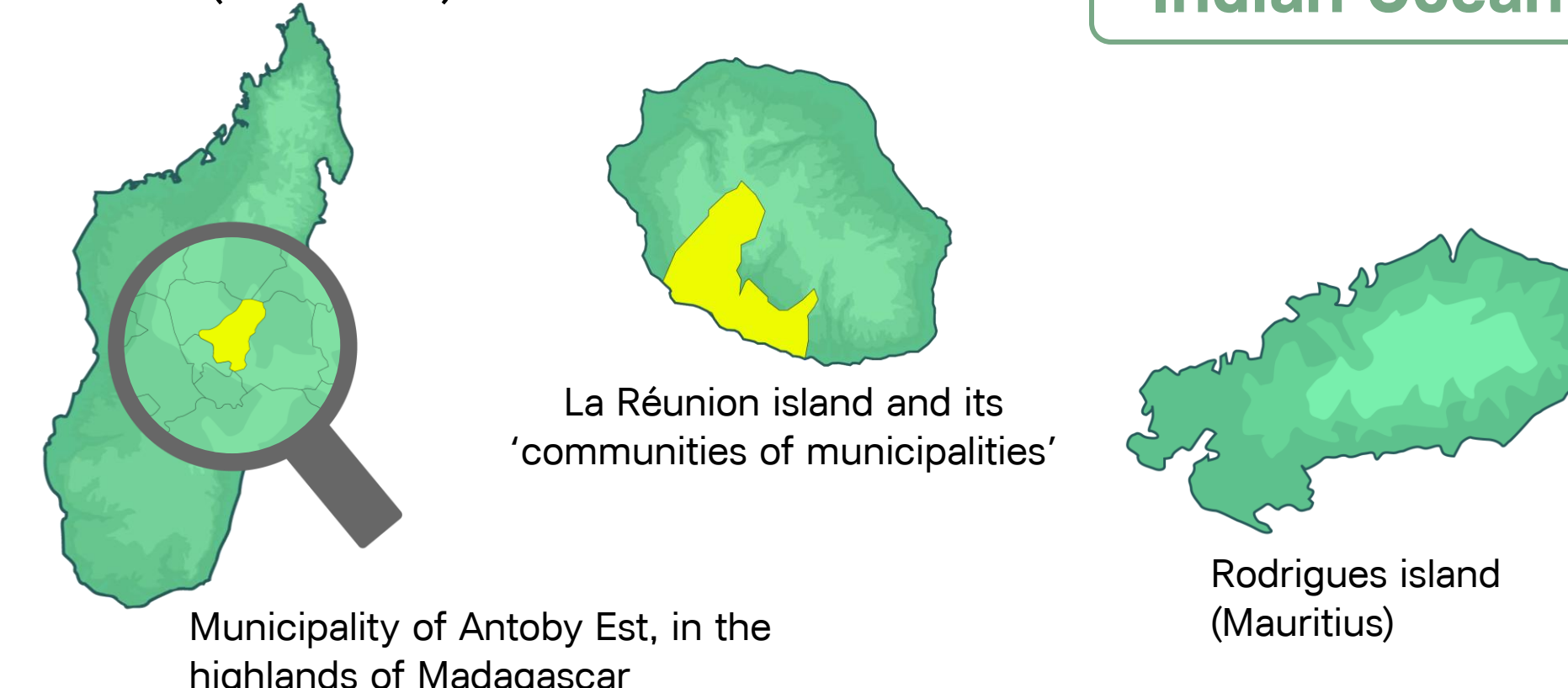
Activity data: Data related to land uses (types, areas, practices, livestock farming, etc.)

Emission factor: Ratio between the amount of GHG emitted by an activity and the unit amount of that activity

- Emission flows calculated for **3 GHGs** (CO₂, CH₄, N₂O)
- On each **spatial object** described by its **soil, climate and land use**, for even finer calculation



- Calculations based on the **territories of the municipality of Antoby Est (99 km²) in Madagascar, La Réunion island (2,512 km²) and Rodrigues Island (108 km²)**

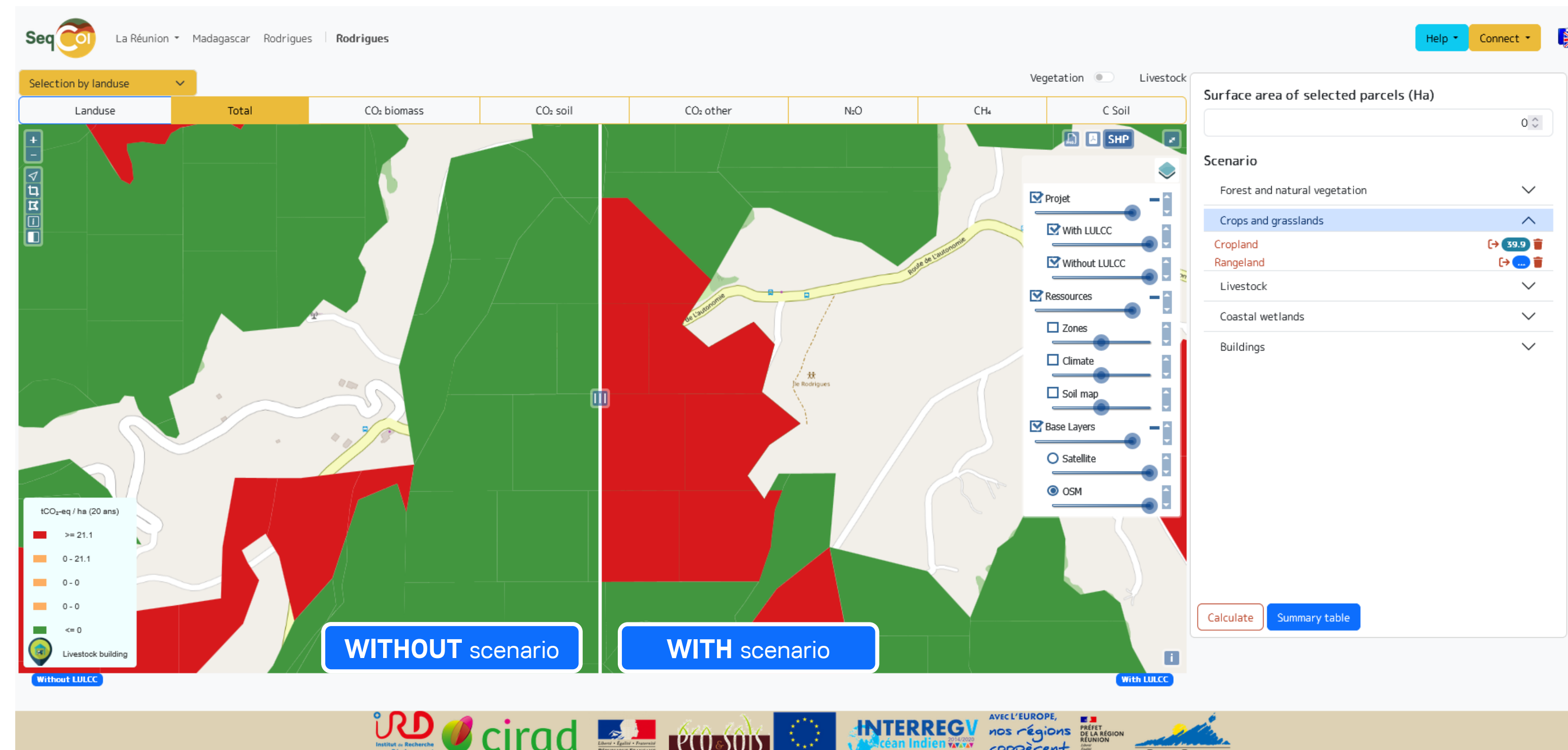


MAPPING GHG BALANCES

GHG balance « **without scenario** » of land uses

- Results** in the form of **maps** to locate 'GHG emission hotspots', whether **positive** (sources) or **negative** (sinks)
- Results** in the form of **tables** to identify the origin of these emissions more precisely.

« total amount of greenhouse gases (CO₂, CH₄, N₂O) emitted into the atmosphere or sequestered in soils and biomass »



Compare **WITHOUT** and **WITH** scenarios, using maps and tables for each GHG and their sources of emissions or sequestration.

GHG balance of « **your scenario** » of land use changes

- Scenarios of land use changes can be simulated **within the area of your choice**
- Results** « with scenario at t + 20 years » in a **single click**
- Find out whether your scenario has a **positive** or **negative** impact on the **total GHG balance!**

SeqCOI, your SOILutions

The SeqCOI decision-making tool, free and accessible online, was developed to support public policies for agroecological transition and climate change mitigation at the territory level. Users can propose their own solutions for reducing GHG emissions and/or sequestering carbon in soils and biomass in their territory.