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ABC'Terre : Integrating soil organic carbon variation into cropping systems greenhouse gases balance at a territorial scale

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ABC'Terre

Integrating soil organic carbon variation into cropping systems greenhouse gases balance at a territorial scale

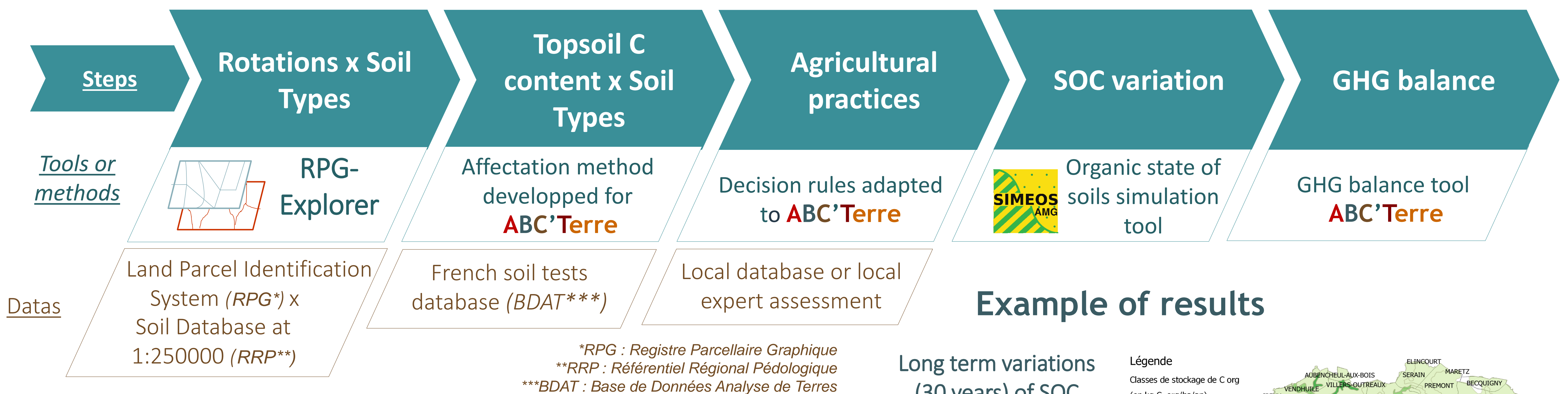
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Context

The agricultural sector contributes up to 20% to the global greenhouse gases (GHG) emissions in France. Nevertheless, this sector is also able to store carbon in soils, counterbalancing a part of these GHG emissions. In addition, an evaluation of GHG emissions and carbon sequestration in soils has to be included, since 2016, in territorial climate plans. We propose a method allowing to do both of these evaluations, while mobilizing local actors in order to design the actions plan.

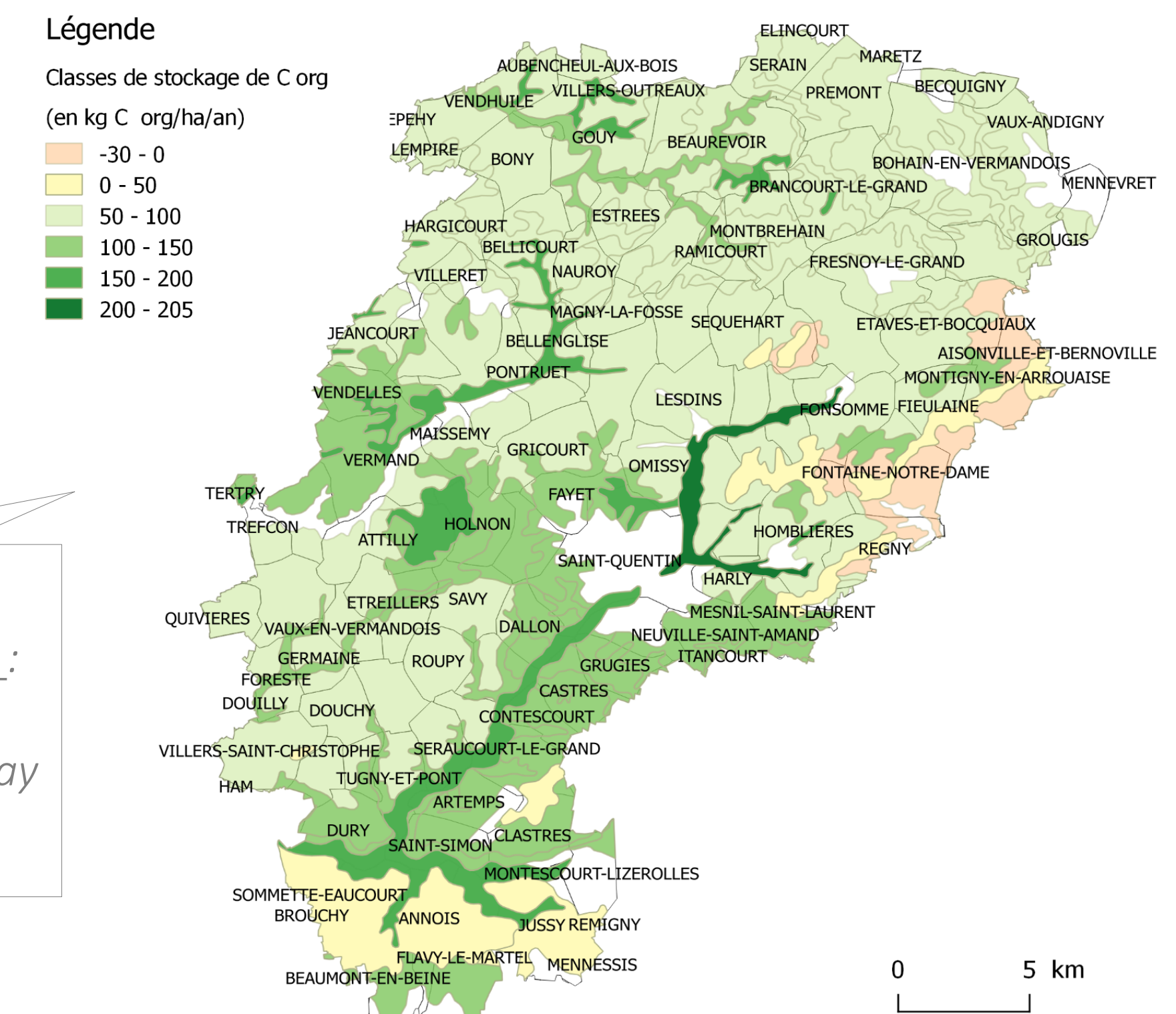
Method

ABC'Terre is a spatially explicit method designed to quantify, at a territorial scale, the impacts of agricultural practices on the long-term variation of soil organic carbon (SOC) stocks and to include this variation in a GHG balance. It consists in five steps :



Example of results

Long term variations (30 years) of SOC stocks (0-30 cm) in the territorial case study of « Saint-Quentinois » and « Vermandois »

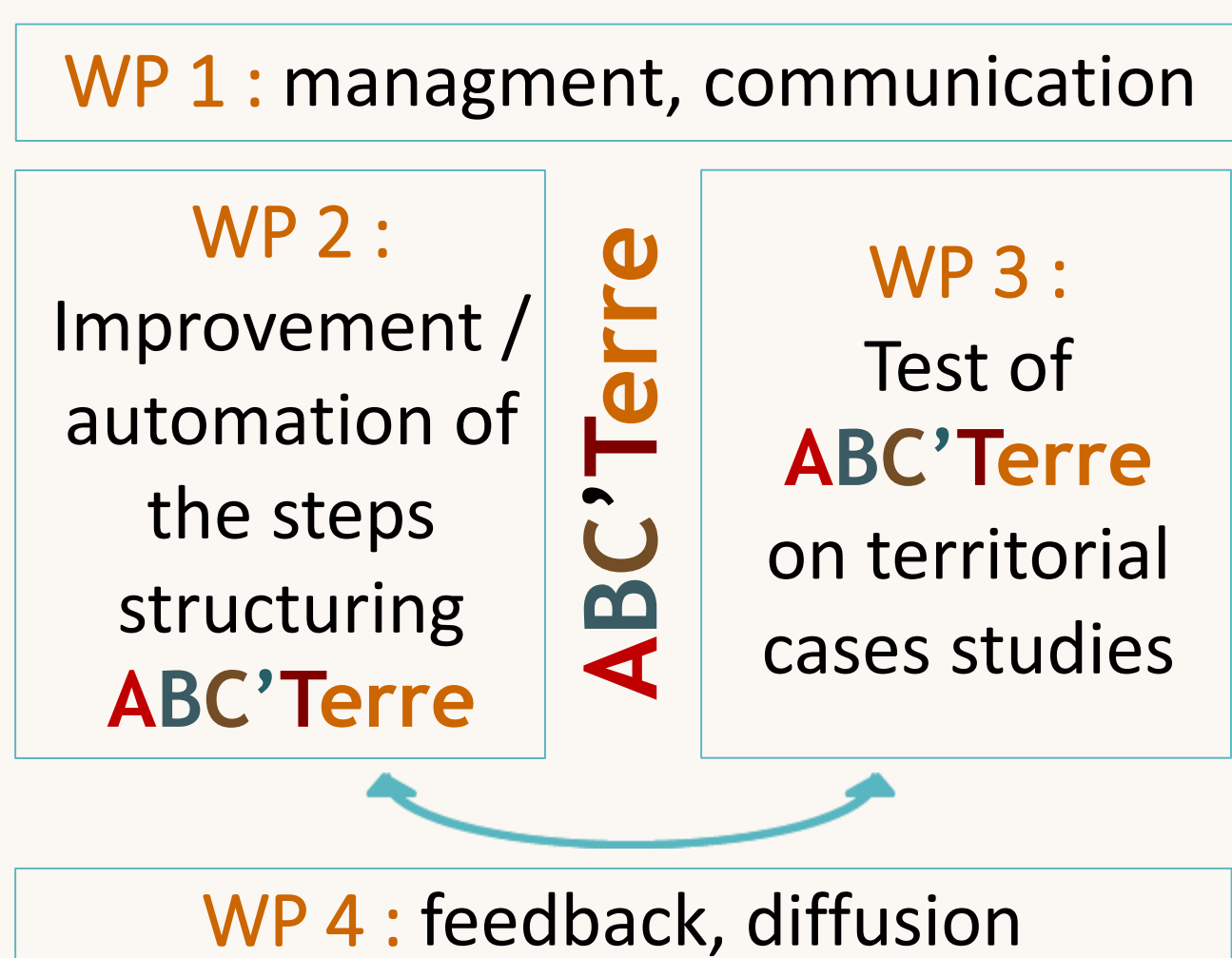


Climate : temperate
Dominating cropping system : Sugarbeets – Cereals
Dominating soil type : deep clay loam, chalky in places

ABC'Terre-2A (2017-2020, ADEME GRAINE 2016)

The major objectives of the project ABC'Terre-2A are : (i) improving and automating the method; (ii) testing it on territorial cases studies, in order to continue to improve the method and to evaluate its appropriation by the local actors; and (iii) studying the diffusion modalities of the method.

The project structure



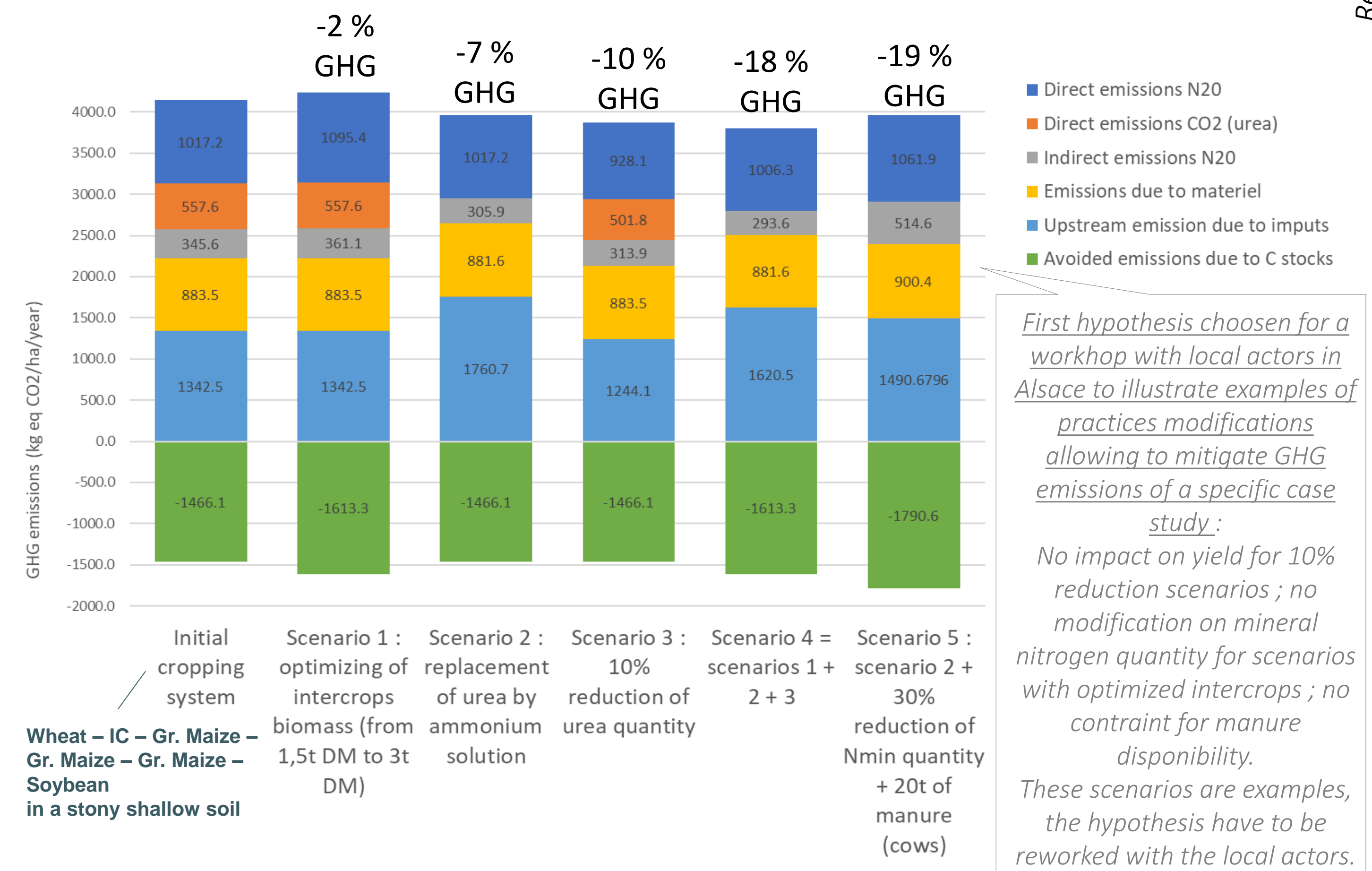
Territorial cases studies



A participative approach

Once the initial diagnostic done, the results are discussed with the agricultural actors. These meetings aim to understand the explicative factors of C and GHG dynamics on the territory and to highlight the possible modifications of cultural practices to store more carbon in soils and mitigate GHG emissions. Through participative workshops, alternative scenarios are established and simulated with ABC'Terre. Then, the comparison between the different scenarios allows to determine which ones will be retained to design an actions plan in coherence with the actors issues.

Comparison of GHG emissions of different practices modifications scenarios



Perspectives : The construction of alternative scenarios thanks to the workshops with the local actors are in progress. The simulation results compared to the initial diagnostic, as well as the territorial actions plan, are expected for the end of 2019.

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