



Diagnosing soil quality through a participatory approach to enhance preservation efforts

Principle investigator: Annick BUN-JACOB, UMR Interactions Arbres/Micro-organismes (IAM) 1136

LabEx partners: Pascale FREY-KLETT, US 1371 ARBRE

Collaborations: Matthieu GODFROY, INRAE Tous Chercheurs Nancy, Anne BLANCHART & Quentin VINCENT, Entreprise SOL & CO

Thematic action concerned: WP6, Transversal

Context –

Soils, whether located in cities, agricultural areas or forests, provide a multitude of essential benefits to human societies (e.g. biomass production, energy). These benefits are also a strong and sustainable response to multiple ecological transition issues, such as flood regulation, climate change regulation, or the maintenance of habitats that preserve biodiversity. However, soil formation is a long process: it takes several millennia to form a few centimetres of soil. It is therefore a fragile natural resource, considered non-renewable, which can deteriorate very quickly if the actions of human societies are not taken into account in terms of its quality, i.e. its physical, chemical and biological properties.

Today, soils are particularly threatened in many places, mainly due to human activities (e.g. land development, intensive agricultural practices, atmospheric deposition, pollution) which can modify the state of soils, degrade some of their functions and thus affect the benefits they can provide. It has become urgent to act to preserve soils. In order to know how to act and in what way it is possible to preserve each soil, taking into account its own specificities, it is necessary to have a detailed knowledge of the functioning and condition of these soils. At present, however, the state of many soils in the country remains unknown. These are very heterogeneous environments, and an exhaustive study conducted solely by researchers is not very realistic.

Objectives –

The objective is to develop a participatory science and research programme aimed at advancing knowledge of the physical, chemical and biological characteristics of soils, by going beyond the usual research approaches in favour of mobilising a wide range of non-scientific stakeholders, a source of experiential knowledge and useful questions for advancing scientific knowledge on soils.

Approach -

The first stage of this TOUS EN SOLS#1 project consists of:

- Create a network of researchers and professionals/citizens, representing a wide range of disciplines and practices, and explore with them outstanding research questions that would require the mobilisation of non-scientists;
- Design a course for the training of 'citizen-experts';
- Implement a 'test' course with a first group of interested non-scientists.

Key highlights —

- **Production of a summary of participatory science projects on soils in France**
Synthesis based on data from the "soil and participatory sciences" conference (Paris, 21/11/22), the ANR QUBS (Qualité Biologique des Sols) project, the CO3 Clés de Sol project, etc.
- **Facilitation of Tous Chercheurs and Sol &co consultation meetings**
In order to define the modalities for highlighting research questions on the "soil" theme that can be addressed by a participatory approach, 4 meetings were held between the Tous Chercheurs team and the Sol &co team. These meetings were used to develop the procedure and content of the individual interview guides for exchanges with researchers and professionals-citizens, and to consider the organisation of a half-day meeting with these different actors.
- **Constitution of the "researchers" and "professionals" networks**
Invitations were sent to 9 researchers and 9 professionals-citizens from the Grand Est region, known to Tous Chercheurs and/or Sol &co, to form a panel of experts. Of the 18 invitations, 13 people (8 researchers and 5 professionals-citizens) agreed to participate in the TOUS EN SOLS#1 project.
- **Interviews with researchers and professionals-citizens**
Thirteen interviews were conducted between June and October 2022
- **Face-to-face meeting and co-construction**
On 02/02/2023, a half-day co-construction meeting took place at the Tous Chercheurs INRAE offices in Champenoux: (1) Presentation of the project and its leaders, (2) Individual presentations by researchers and invited professionals-citizens, (3) Co-construction workshop on the issues, and (4) Co-construction workshop on the indicators. An analysis of the progress made during this meeting is underway. It aims to highlight a simple research question that could be the subject of a "test" course with a first group of non-scientists. It also allows the work carried out by Tous Chercheurs and Sol &co on the "Clés de sol" participatory research project kit, supported by Labex ARBRE, to be consolidated and enriched.

Perspectives - The year 2023 will aim to design and implement a "test" course for a first group of non-scientist volunteers, based on the achievements of the first phase of TOUS EN SOLS#1

Valorisation - A synthesis of the individual interviews of the researchers and professionals/citizens mobilised, and of the results of the meeting of 02/02/23 is underway to communicate on this project during different events (congress, workshops,...)

Leverage effect of the project - This project allows to enrich the participative research approaches engaged in the framework of the Clés de Sol project, accompanied by the Labex ARBRE and supported by the ADEME.