



Post-doc proposal: 18 months (may be 36)

TRANSITOOL: a companion tool to assess step-by-step agroecological transition of a cash crop farm

Switching from conventional practices to more agroecological practices is a real challenge for the farmers. This transition can be done step-by-step or using a complete system redesign. Whatever path is chosen, fostering initial reflection between advisers and farmers is an approach that has the big interest of creating a community of exchanges and innovative practices.

The Transitoool post-doctoral project aims at **developing a digital companion tool to assess the impact of changing practices on a set of user-chosen indicators**. Digital tool because using computer modelling and simulation for producing indicators of the state of the system; Companion tool because simulation accompanies a collaborative work approach (farmers and advisers) of co-designing the possibilities to be tested; Assess because multi-criteria vision of the impact of changing practices on the farming system is needed; Change in practices because step by step evolution of practices will be tested. We will work on exploration and not on optimizing practices. Primary beneficiaries of the work will be the farmers, but the main recipients will be the advisers. Secondary beneficiaries may be education, with teachers as the category of recipients.

The project aims to meet three major challenges: i) develop an useful and usable tool, ii) develop a tool allowing a multi-criteria assessment (sustainability), iii) develop a tool mobilizing recent agroecosystem simulation approaches. To meet the first challenge, the post-doctoral fellow will follow an AGILE approach to develop, via use-cases, interfaces facilitating the work of co-design and evaluation of the practices tested. To meet the second challenge, the post-doctoral fellow will mobilize multi-criteria assessment procedures for cropping systems (eg MEANS, MASC). Finally, to meet the third challenge, the post-doc will use tools and programming language already mobilized by researchers (eg MAELIA, GAMA) and will seek to hybridize quantitative and qualitative simulation approaches. In order to properly mobilize expectations and skills, a steering committee including researchers in the field, but also professionals from the agricultural world, will be set up.

Five main steps may be followed:

1. Literature review : agroecological practices; participatory simulation ; AGILE approaches
2. Setting-up an AGILE approach : choosing the beneficiaries' group ; educating on the AGILE approach; creating the agenda for the interaction
3. Follow-up of co-design working sessions with advisers and farmer groups: setting up sessions; monitoring and analysis of interactions between participants; identification of change indicators and simulation scales
4. Development of a proof of concept: Development of mock-ups through an iterative process based on Agile practices and user experience (UX design); User tests of mock-ups; implementation of satisfaction / development indicators
5. Development of a primary simulator based on the MAELIA tool: conceptual model of needs; links with existing multi-criteria assessment tools (MEANS, MASC); simulation test sets

The project must go up to a prototype, and not a finished tool. The work will be valorised by scientific productions (papers in COMPAG, ASD or NSS. Presentation to IFSA) as well as operational productions (a prototype tool that can be proposed to a professional development expression of interest).

We are looking for a post-doctoral fellow with skills in computing science, participatory approaches. Knowledge of the agricultural and agroecology domain will be appreciated as well as on design. Self-organization and autonomy are fundamental.

The job will start on the 1st of January 2022. It will be based at INRAE, near Toulouse (Auzeville-Tolosan). It will be led by Jacques-Eric Bergez. Candidate should send before **15/09/2021** a CV (2p max) a motivation letter and 2 names of referees to <mailto:jacques-eric.bergez@inrae.fr>.