Job Offer

Post-Doctorate : Design, modelling, and evaluation at different organizational levels for environmentally friendly livestock systems integrated into their territory

The French National Research Institute for Agriculture, Food and the Environment (INRAE) is a public research institution with a workforce of 12,000 people, comprising 268 research, service, and experimental units located in 18 centers across France. INRAE is among the world's leading research organizations in agricultural and food sciences, as well as plant and animal sciences. Its research aims to develop solutions for high-performing agriculture, quality food, and the sustainable management of resources and ecosystems.

MISSION AND ACTIVITIES

- The position spans two research units. The successful candidate will preferably be based at the PEGASE Joint Research Unit (INRAE - Institut Agro, Rennes-Angers) at the INRAE facilities in Saint-Gilles (10 km from Rennes, accessible by Rennes metropolitan bus). However, for personal reasons, it is possible to be based at the SELMET Joint Research Unit (INRAE - CIRAD - Institut Agro, Montpellier) at the Institut Agro in Montpellier, on the Gaillarde campus (10 minutes by bike from the city center and train station). Travel to the other site will be required during the duration of the assignment.

Livestock farming is currently facing significant challenges due to its environmental, social, societal, and economic impacts. The specialization and intensification of farms and agricultural land have largely contributed to environmental problems. Numerous efforts have been made across various livestock production sectors to design and evaluate levers for reducing inputs and pollution, based in particular on the principles of agroecology. These levers have most often been designed and evaluated at the individual animal, group, farming system, or farm level, without considering their local context and associated effects, and with a frequently absent or very limited consideration of the context in which they must be implemented. However, the ability of livestock farms to respect the environment also depends on their integration with other agricultural activities in the region. In particular, diversified livestock systems that leverage the potential complementarities between crops, livestock, grasslands, and semi-natural areas (SNAs) appear to be a solution for environmentally responsible livestock farming (Garrett et al., 2020 https://doi.org/10.5751/ES-11412-250124 ; Moraine et al., 2014 https://doi.org/10.1017/S1751731114001189 ; Catarino et al., 2021 https://doi.org/10.1016/j.agsy.2021.103066).

Given the urgent need to reduce livestock farming's contribution to exceeding planetary boundaries, the main objective of the CEDRE project (PEPR Sustainable Livestock Farming 2026-2031 - France 2030 - 9 partner institutes encompassing 18 research units) is to design environmentally friendly livestock farming systems that leverage, at the plot, farm, and territorial levels, the following principles: 1) complementarity between animal species, 2) complementarity between crops, pastures, livestock, and semi-natural areas, and 3) animal density, while taking into account the necessary trade-offs between the needs of existing sectors and the limiting resources of the territories.
To achieve this, a model-assisted design approach for environmentally friendly livestock farming systems is proposed, applied to 7 contrasting territorial case studies (5 in mainland France and 2 in overseas territories). For each case study, the aim will be to describe and understand the situations under investigation; explore and design territorial scenarios; evaluate and simulate these scenarios; and finally, contextualize these scenarios in relation to other socioeconomic issues. Dedicated methodological work

packages (design, evaluation, and modelling) are planned to develop methods and tools to address the project's specific questions, provide service offerings and support for implementing the approach, and ultimately capitalize on and generalize the results produced in each case study.

For this purpose, it will be necessary to coordinate levers implemented at different organizational scales to design, simulate, and evaluate these livestock systems within territorial scenarios of agricultural activities. Articulation between design, modeling, and evaluation for the design of agricultural systems is already well established within the project's scientific community (e.g., Catarino et al. 2021). Furthermore, the consideration of changes in scale is already the subject of theoretical developments and applications in modelling. (e.g. Ewert et al., 2011, https://doi.org/10.1016/j.agee.2011.05.016). However, there is a methodological hurdle to overcome in order to manage the different levels of organization of the complementarities between crops, grasslands, livestock and semi-natural spaces, while linking design, modelling and evaluation with a view to designing environmentally friendly livestock systems.

The missions of the person recruited are positioned in task 1 of the CEDRE Transversal WP which aims to build a conceptual and operational framework for designing environmentally friendly livestock systems integrated into their territory according to animal density and the diversity of livestock systems, by articulating design-modeling-evaluation approaches.

- You will be specifically responsible for building the conceptual and operational framework on which the project will be based, in interaction with the project's work package (WP) leaders, and for defining the mechanisms to be implemented across the various case studies. To achieve this, you will go through the following steps:

  - Review and synthesis of existing literature on approaches to the design, modeling and evaluation of agricultural systems, and livestock systems in particular, and on the links between the three approaches, with particular attention to issues of scaling up associated.
  - Construction of an initial conceptual and methodological framework, articulating several levels of organization, based on the bibliographic synthesis and the contributions of the methodological WPs of the project (WP Design, WP Modeling, WP Evaluation).
  - Organization and co-facilitation of a workshop to refine and expand upon the initial framework.
  - Development of the final conceptual and methodological framework and drafting of a scientific article.
  - Drafting of an operational methodological guide for the preparation of a research school for project partners.

- Specific working conditions:

The work will be jointly based at the PEGASE Joint Research Unit (Saint-Gilles – dept 35) and the SELMET Joint Research Unit (Montpellier – dept 34). Travel to the other site will be required, as well as occasional travel within France and possibly abroad.

PROFILE EXPECTED

- Recommended background: PhD in agronomic sciences (livestock and/or crops) based on systems approaches, and demonstrating skills in the design, modeling, and/or evaluation of agricultural systems.
- Desired knowledge: conceptual frameworks of agroecology and planetary boundaries, levers for complementarity between crops, livestock, grasslands, and semi-natural areas.
- Expected experience: Development and/or implementation of participatory science initiatives.
- Required skills: The position also requires a strong interest in interdisciplinary and collaborative work, as well as excellent oral and written communication skills.

YOUR QUALITY OF LIFE AT INRAE

By joining INRAE, you will benefit from the following, depending on your contract type:

- Up to 30 days of vacation + 15 RTT days per year (for full-time employees)
- Parenting support: childcare vouchers (CESU), leisure activities;
- Skills development programs: training, career guidance;
- Social support: advice and listening, social assistance and loans;
- Holiday and leisure benefits: holiday vouchers, preferential rates for accommodation;
- Sports and cultural activities;
- On-site catering.

↘ Working modalities

- Units: UMRs PEGASE et SELMET
- zip code + city : 35590 Saint-Gilles
- Type of contract : Fixed-term contract
- Duration of contract: 12 months minimum
- Start date: October 2026 or November 2026.
- Gross monthly salary: from 3559 € /month to 3948 € /month according to experience

↘ Application procedure

Cover letter with motivations and CV to :
Florence Garcia-Launay et Fabien Stark

- Par e-mail :

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fabien.stark@inrae.fr

✖ Deadline for application: **July 14th 2026**