



PROGRAMME
DE RECHERCHE

AGROÉCOLOGIE
ET NUMÉRIQUE

National Research Programme "Agroecology and Digital Technology"

Deadline for submission of expressions of interest (optional stage):
18/01/2024 at 11:00 am (CET)

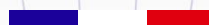
Deadline for submission of full proposals: 14/05/2024 at 11:00 am (CET)

Consultation page: <https://anr.fr/PEPR-Agroeconum-AAP>

An introduction webinar is scheduled for 11/12/2023 at 10:00 AM (CET).

The registration link will be available on the call web page.

CALL FOR PROPOSALS
20 November 2023



Abstract

Launched on 06 January 2023, the national research programme (PEPR) "Agroecology and Digital Technology: data, agricultural equipment and genetic resources in the service of the agroecological transition and adaptation to climate hazards" is one of the actions covered by the France 2030 SADEA (Sustainable agricultural systems and agricultural equipment contributing to the ecological transition) acceleration strategy. Co-led by the French National Research Institute for Agriculture, Food and Environment (INRAE) and French National Institution for Research in Digital Science and Technology (Inria), this programme has a €65 million budget over 8 years (2023-2030). This programme aims to produce innovative knowledge and build a multi-disciplinary scientific dynamic using digital sciences to meet agroecological transition challenges.

The Agroecology and Digital Technology programme is divided into four complementary areas, laid out in the scientific part of this document:

- Area 1: Shaping a socio-ecosystem conducive to responsible research and innovation;
- Area 2: Characterising genetic resources to assess their potential for agroecology;
- Area 3: Designing new generations of agricultural equipment;
- Area 4: Developing digital tools and methods for agricultural data processing and modelling, for agricultural equipment and decision support.

The Agroecology and Digital Technology programme financially supports infrastructure and research projects at the interface between digital technology and agroecology, which are implementing multi-disciplinary and systemic approaches based on the hybridisation of expertise from agronomy, ecology, digital sciences, and social sciences. The proposals submitted under this call for proposals must fall within one or more of the four areas described above. The infrastructures and equipment funded must be structuring, and provide data and methods for agroecological practices.

Ten research projects and three infrastructure projects were supported when the programme began, providing input for all four scientific areas. The objectives and expectations of these projects, already funded, and all the information on the programme, are available on its website at <https://www.pepr-agroekonum.fr/>.

This call for proposals is open to all the scientific community involved in agroecology and digital technology.

Application from partners will skills and expertise in digital sciences but who, upon submitting the proposal, have yet to make any contribution in agroecology, are welcome, provided that the consortium will include one or more partners with proven skills in agroecology.

The call for proposals aims to select innovative proposals with strong agroecological potential for funding, on topics yet to be covered by the programme.

This call for proposals, with a €22 million budget maximum, will fund research or infrastructure proposals over 3 to 5 years, with grants between €1 and €3 million.

Keywords

Agroecology, digital technology, transition, climate change, environmental footprint, adaptation, mitigation, agricultural practices, farmers, socio-ecosystems, ergonomics, renewal of agricultural activities, work hardness, measure of impact, public policies, robotics, connected objects, signal processing, imaging, modelling, algorithms, learning, digital twin, remote sensing, decision support, ecology, pedology, climatology, microbiology,

diversification, input reduction, biodiversity, genetic resources, immunophenotyping, genomics, genetics, microbial ecosystems, ecosystem services, agronomy, health, welfare, soils, livestock, plants, biological resource centres, data FAIRification, low-tech, participatory sciences.

Important dates

Webinar presenting the call for proposals

11/12/2023 from 10:00 am to 12:00 am (CET)

Registration link available on the web page.

Deadline for submission of expressions of interest

Expressions of interest (optional) are to be submitted over time until:

18/01/2024 at 11:00 am (CET)

at

<https://france2030.agencerecherche.fr/PEPR-Agroeconum-AAP-lettre>

Closing date of the call for proposals

Submission of full proposals

The application must absolutely be electronically submitted, including the documents signed by the legal representative of each partner before:

14/05/2024 at 11:00 am (CET)

at

<https://france2030.agencerecherche.fr/PEPR-Agroeconum-AAP-dossier>

ANR Contacts

PEPR-AgroEco@agencerecherche.fr

Scientific Project Manager: **Kassandra LANCHAIS**

Programme Manager: **Yves COQUET**

Please read carefully and thoroughly this document and the instructions available on the call web page and submission website.

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1. Background and objectives of the call for proposals

1.1. Background

Agroecology is one of the solutions covered by scientists and governments to ensure the agricultural transition towards sustainability, and therefore meet climate change and worldwide resource preservation challenges. Agroecology refers to ecologically and socially responsible agricultural practices combining agronomy and ecology. This includes practices based on features provided by ecosystems, with a view to reducing pressures on the environment and the use of inputs such as pesticides and antibiotics, preserving natural resources (air, water, soils, biodiversity), and reducing work hardness. The agroecological transition is conducted in a context where conditions are quickly evolving and have an impact on agricultural systems: climate change, particularly the increasing number of extreme events (drought, floods, temperature changes such as heat, cold or freezing exposure, etc.), evolving consumer demands in terms of naturalness, animal welfare, traceability. That is why farmers and all stakeholders must be provided with tools, resources and new knowledge to achieve this transition while adapting to climate hazards, by limiting their impacts and contributing to decarbonisation. Given the opportunities it opens in terms of new connected agricultural equipment, and with the aim of implementing sustainable agri-food systems, collecting accurate and massive data, management, cross-referencing and processing of any data (genetic, phenotypic, epidemiological surveillance, environmental, operational, etc.), and modelling, digital technology is a key lever for scaling up agroecology.

In 2015, the "Agroecology-innovation 2025" report identified levers for a competitive and sustainable agriculture by 2025: two systemic levers: agroecology and bioeconomy; and four technological levels: digital technology, robotics, biocontrol and genetic improvement. The agroecological transition must be based on changes in practices, the effects of which can be multiplied by activating complementary levers, such as the diversification-mobilisation of genetic resources - in line with breeding objectives - agricultural equipment and digital sciences. These levers be all the more effective if combined together, in combinations relying on the farm's socio-economic and biotechnical environment. A favourable socio-economic ecosystem must also be conceived if this transition is to be accelerated and go beyond agriculture to be considered by society as a whole. With this in mind, digital technology is a resolutely innovative component. By operating cross-functionally, data generated can be assembled and connected to produce information systems, new knowledge, decision support tools capable of moving towards system design or the implementation of agroecological technical itineraries, to foresee and adapt to changes and provide information about their food to consumers who ask for it. Unlocking knowledge requires developing a multi-disciplinary and systemic approach based on the hybridisation of expertise from agronomy, ecology, genetics, physiology, ethology, digital technology (including artificial intelligence), and social sciences (economics, sociology, management sciences, ergonomics, etc.) to co-design genetic resources, agricultural equipment and new uses which consider input, particularly synthetic reduction.

Agroecological practices may take very different forms (biological agriculture, low-tech, etc.) and this call for proposals will try to consider this priority through the proposals selected.

The development of digital technology comes with several risks: environmental impact of digital technology, technological fix, data appropriation, loss of farmer autonomy, socio-technical lock-in, etc. The proposals proposed are expected to consider these risks, which are incompatible with the agroecological transition.

This call for proposals aims to fund research proposals with a strong impact, in the longer run, on the development of agroecology. This impact may take many forms:

- Major scientific breakthroughs;
- Scientific publications in journals or prestigious conferences;
- Development of digital tools;
- Patent applications;

- Transfer of research results to agricultural stakeholders;
- Contribution to a systemic and multi-criteria agroecological metrology;
- Supporting risk taking and compromises to be considered by decision-makers, in line with experimenters.

Proposals may also be aimed at conducting methodological, applied or targeted research. In digital sciences, the concept of TRL (“Transfer readiness level”) is sometimes meaningless, because the transition from so-called low-TRLs to high TRLs can be very fast. Some research proposals may simultaneously fall within low- and high-TRLs.

1.2. Objectives of the call for proposals

With a €22 million budget maximum, this call for proposals (AAP) aims to support research and infrastructure projects covering other needs than those already funded. The list of projects already funded is available on the Agroecology and Digital Technology programme website at <https://www.pepr-agroconum.fr/>.

With this AAP, proposals are expected to contribute to:

- Digital innovations for agroecology: a growing field with important needs;
- Strengthening the section on ecology and ecosystem services in the scientific objectives and expectations of the project;
- Promoting practice decarbonisation, from manufacturing to the final user, with a systemic view on the whole value chain;
- Assessing the impact of the methodologies proposed and tools developed on global warming reduction and sustainable development goals;
- Including the multi-performance aspect (societal, environmental and economic) of the options and solutions proposed, with systemic and multifactorial approaches, with the support of digital technology, by identifying the most relevant metrics associated;
- Criteria assessment to quantify the impact of agroecological practices, and enable the establishment of labels or indicators for farmers;
- Revealing tensions between public goods, common goods, and private goods with agriculture-generated data of all kinds;
- Long-term strategic farmer decision support: decision support tools and devices, public policies with, on the one hand, the impact of existing policies and, on the other hand, the identification of the public policies sought;
- Putting the planned capitalisation of the knowledge produced into perspective;
- Developing open innovation platforms to test system-scale agroecological practices, together with field partners;
- Significantly contributing to reducing pesticide use by measuring molecule removal (ECOPHYTO 2030).

This call for proposals is intended to fund exploratory, innovative proposals with a significant impact on agroecology, without excluding research proposals that are exclusively a continuation of existing research.

1.3. Role played by PEPR directors and the ANR

The Agroecology and Digital Technology programme is co-led by INRAE and Inria. The directors, Claire Rogel-Gaillard (INRAE) and Jacques Sainte-Marie (Inria), and project managers Valentin Voisin (INRAE) and Patrick Armengaud (Inria), are working in conjunction with the programme’s scientific advisory board,

consisting of scientists with expertise in the themes of the programme (INRAE, Inria, CNRS¹, CEA², Universities, Technical institutes, Schools, stakeholders). Programme directors and managers can be reached at equipe@pepr-agroekonum.fr.

Directors are responsible for drafting the document setting out the objectives, scientific scope, and terms and conditions to submit to this call for proposals. They ensure the overall consistency within the programme and the national SADEA strategy. They are in charge of monitoring the first, optional stage of this call, based on the reception of expressions of interest and bringing together interested scientists, depending on the requirements and expectations expressed.

The ANR coordinates and implements the call for proposals. An international evaluation panel, independent from the programme's steering bodies, is responsible for evaluating the full proposals submitted. The international evaluation panel reviews the full proposals, based on the criteria listed below, in line with the objectives of the programme, and establishes a ranking. Based on this evaluation, programme directors will submit a list of proposals for funding, with the amounts that could be allocated for each one, to the French General Secretariat for Investment (SGPI). The Prime Minister, after receiving the opinion of the SGPI, chooses the recipients and amounts granted. Each selected proposal shall be the subject of a contract between the ANR and the project coordinating institution, detailing the mutual obligations of both parties.

2. Themes of the call and expected proposals

2.1. Themes

2.1.1. Area 1 - Shaping a socio-ecosystem conducive to responsible research and innovation

The agroecological transition calls for transformational change in agricultural practices and systems, which are becoming more complex. Farmers are taking a risk with this change: alternatives must be combined because their impacts are partial and fluctuate, new practices must be adopted, new knowledge must be developed, new equipment must be purchased, new products must be exploited. While emerging technologies, including those based on digital technology, are likely to improve the daily lives of farmers, they can also lead to the opposite. In this context, studying the relationship between the innovations considered, farmer quality of life and autonomy, and changing structures involved in agricultural activities, is required. Technological innovations are not enough to support farmers in a successful transition, and they must be combined with organisational, economic, institutional and political innovations. Research aiming to create an ecosystem conducive to these combined transitions is therefore a cross-disciplinary action that is essential to their success, and will mobilise research and multi-stakeholder partnerships, using participatory science approaches.

The ergonomics of decision support tools, how to show and share the results, are essential factors for their adoption, which argues for co-design approaches with stakeholders. They will be dedicated to individual (regarding the proper functioning of the farm, its strategy, tactical decisions, interventions, risk anticipation, knowledge sharing, etc.) or collective (as part of regional management, which is fundamental in agroecology) decision-making. Export-oriented farmers will also require services dedicated to international market prospects. Digital technology's main benefit is that it can surpass challenges to improve agricultural production and generate information assets with high added value, e.g., in value chains, whether short (local food) or long (international). Such data (electronic crop and farm logbooks, sanitary and phytosanitary register, secure traceability data) will develop the information that European consumers are increasingly demanding when searching for ethical, natural and local products.

Data can also be used to help monitor public policies, improve regional governance, evidence-driven environmental services (e.g., with a view to payment) associated with agricultural practices.

¹ CNRS: French National Centre for Scientific Research

² CEA: French Alternative Energies and Atomic Energy Commission

This area of the Agroecology and Digital Technology programme focuses on the following research questions:

- Proposing or using new results in digital sciences (models, tools, methodology) to develop agroecology.
- Which information assets provided by digital technology may help strengthen the creation of added value?
- Which research and innovation programmes and devices can be used to ensure the emergence and development of combined and responsible innovations, and promote the agroecological situation scale-up?
- How can we foster the adoption of responsible technologies, and therefore bring to light their ability to create added value through design and collective use?
- How can we help the government build incentive policies to promote the greenest technologies and support these many co-transitions, with a view to disseminating values across all chain stakeholders?
- How can we quantify the environmental and economic impact of agroecological innovations? While the services to the environment through agroecological practices currently have no market value, such quantification should help to compensate them..

2.1.2. Area 2 - Characterising genetic resources to assess their potential for agroecology

Agricultural system diversification has been singled out as a lever for action and acceleration of the agroecological transition, and for adaptation to climate change hazards. It requires greater diversity in production systems and in the genetic resources used (genotypes, varieties, breed, and species). There is no unique elite genetic for a species, which is compatible with all systems and environments. Therefore, developing research capable of optimising the use of intra- and inter-species genetic diversity to support changing agricultural systems is required.

The genetic resources stored in France represents a widely unknown national wealth, including their potential for agroecology. Established over time, they include *in situ* population and collections stored by biological resource centres, with two characteristics: 1) storage most often initiated before the emergence of genomics (no genomic accession characterisation) and 2) lack of phenotypic measures in line with agroecological selection objectives. Therefore, it is important to characterise the genomic diversity of all genetic resources available to identify promising genotypes and phenotype them in priority, in agroecological production conditions. High-throughput genomics and immunophenotyping generate large data falling under digital technology for agroecology.

The objective of this theme is to support proposals focusing on:

- The genetic and genomic characterisation of the animal and plant genetic resources available;
- The study of the epigenetic variability and its impact on adaptability;
- The study of symbiotic and commensal microbial communities contributing to the phenotypic variability of their hosts (at holobiont scale) and their interactions with the host;
- The design and feasibility of the integrative approaches combining the genetic and epigenetic variability of the host with that of the microbiota, to study the holobiont phenotypic plasticity in agroecological conditions;
- The development of immunophenotyping for agroecological traits, with the identification of the most relevant and cost-effective measures to consider new objectives relating to the environmental footprint, resilience to climate hazards, efficiency, health, animal welfare, etc.;
- The reassessment of the role played by soils in production cycles and services impacted or promoted by these new approaches (e.g., by exploiting InfoSols databases);
- The diversification of plant species of interest with neo-domestication and pre-breeding approaches.

2.1.3. Area 3 - Designing new generations of agricultural equipment

Adopting agroecological practices brings a need for research that is spreading in agricultural equipment and associated digital technologies (sensors, data, software), to make them compatible with new technical itineraries and reduce work hardness. The idea is to adapt these new technologies to provide better management for agroecological systems subject to many unforeseen events, with greater uncertainty than conventional systems, whether due to climate or more difficult pest management.

The objective of this theme is to support research projects in agriculture and farming, including:

- **Agricultural robotics, with expectations including:**
 - The automatic adjustment of measures to varying and changing conditions (sol, weather, interaction with living organisms, farming operations);
 - Mobile handling (manipulator arm integrated on an autonomous robotic platform);
 - Cooperation between several robots to carry out complex work, and their interoperability with conventional agricultural machinery;
 - The development of new approaches, such as locomotion, in soft robotics (soft, recyclable materials, etc.) or with low-tech/low-cost equipment;
 - Ensuring that controls, the task to be performed (i.e., its proper execution), and associated data are secure and intact;
 - The contribution of AI to detection, guidance and control;
 - Sensors and modelling to monitor agricultural system conditions (plants, animals, etc.);
 - The development and assessment of energy-efficient agricultural equipment with a low environmental impact.
- **Connected livestock buildings and grazing lands, with expectations including:**
 - The development of sensors and observation systems for animal tracking;
 - The identification of animal welfare indicators and their integration with decision support tools;
 - Considering the impact of digital technologies in redesigning livestock buildings and systems.

2.1.4. Area 4 - Developing digital tools and methods for agriculture data processing and modelling, for agricultural equipment, and for decision support

Data is essential for several levels used in this new type of agriculture: to guide contributions more closely to the needs, alert farmers, adjust agronomic models, or build consumer trust (traceability, production conditions and environmental impact). There are many scientific obstacles in the data chain, and they include, at every step of the way: (i) sensors and data acquisition methods (robustness, cost, interoperability) to measure and assess the state of plants and animals (physiological, sanitary, emotional, growth, needs) and the environment, anticipate climate events, but also control the safety of machines and prove their reliability; (ii) methods to incorporate massive and heterogeneous data; information systems (system interoperability, frugal data storage and access systems, development of participatory and secure information systems, exploitation of traceability data, e.g., for environmental certifications); (iv) construction of hybrid models (combining formalised knowledge on existing agronomic models, expert knowledge and data-inferred knowledge). These models are required, on the one hand to design sensors to compensate for the lack of real data, and, on the other hand to serve as the basis for these decision support tools.

In agriculture, many phenomena of interest (plant growth, development of diseases, etc.) are based primarily on know-how and mechanical, physical or biological concepts. Nevertheless, nowadays agriculture generates lots of rarely used data, because it is heterogeneous and obtained in various ways (grown- or vehicle-based sensors, remote sensing, pathogen or pest monitoring, etc.). Exploiting this data is the key to developing agroecology, in order to foresee changes in crops or ecosystems. To progress in this area, it is vital to use existing models or develop new models (possibly combining conventional approaches with data science) to provide farmers and people working in consulting with accurate and

high-performance decision support tools complementing the expertise acquired by each individual. Participatory tools are included in the description provided below.

With this theme, we must thrive, by combining and supplementing defined and limited initiatives, to help implement a genuine agroecological metrology (multi-criteria methodology and associated DSTs) to make objective measurements of the action and its impact.

Without going into excessive detail, the list below provides research themes that may receive funding:

- Data acquisition, representation and processing in = remote sensing or proxy-detection;
- Modelling (physical, mechanical, biological, multi-scale, etc.), optimisation, learning and stochastic methods;
- Coupling of models and data (changing models, data assimilation, hybridisation between various modelling approaches, etc.);
- Decision and diagnostic support tools, frugal digital techniques and models, digital twins;
- Implementation of open and shared digital platforms for algorithms and data sharing, including agricultural equipment;
- How to improve working conditions / reduce work hardness, including the issue of stress caused by the greater use of digital tools.

2.2. Main proposal characteristics

Through by this call for proposals, the Agroecology and Digital Technology programme seeks to encourage interdisciplinarity and aims to contribute to structuring the French public research landscape. Projects managers are expected to combine several scientific disciplines and diverse research teams contributing to acquiring and mastering new knowledge and structuring the research areas of the relevant research areas.

This call for proposals aims to support major proposals lasting 3 to 5 years, with funding ranging from €1 to €3 million. This funding should foster the emergence of ambitious projects bringing together several institutions and partners (see below). They must include a part in leading the scientific community, beyond those already involved in each proposal, for instance by organising seminars and conferences open to a large audience.

2.3. Partners

Only research institutions and research and higher education institutions or consortia of these institutions may receive funding under this call for proposals. However, private institutions that contribute to the performance of public service in higher education and research, falling under Article L.732 -1 of the French Code of Education, may be funded after review by the ANR, an opinion from the MESR and approval by the SGPI. Qualified national institutes contributing to the performance of tasks of general interest, falling under Article D823-1 of the French Rural and Maritime Fishing Code, may be funded after review by the ANR.

However, where relevant to the consortium, involving foreign partners in the proposals, as well as stakeholders from the socio-economic world, NGOs, communities, etc., is encouraged. They may not receive direct ANR funding, but may appear as non-funded partners.

The objective is to encourage scientific expertise and knowledge sharing between the various stakeholders from the academic and socio-economic world, to provide field data whose analysis and processing will benefit all stakeholders. Contributions from private partners, e.g., through access to demonstration sites or field data, will bring value to the proposals.

3. Review of the proposals submitted

3.1. Selection process

The expected proposals are part of an interdisciplinary approach, bringing together communities who are not necessarily used to work together. These communities must meet and get to know each other in order to develop these proposals. By ensuring overall consistency, these proposals must stand out from proposals already funded by this Agroecology and Digital Technology programme, and from those supported by France 2030's Advanced Plant Breeding and Growing and Protecting Crops Differently programmes.

In this context, as previously mentioned, the submission procedure consists of 2 stages:

- **Stage 1, optional:** submission of expressions of interest. Those interested are invited to submit an expression of interest outlining the purpose of the proposal, the issue raised and, where relevant, the skills not yet available within the consortium considered, on the dedicated ANR platform, as the need arises and until Thursday 18 January 2024. This stage is implemented and monitored by the coordinating team of the Agroecology and Digital Technology programme, as a means of bringing together the expertise and skills of the various scientific communities interested.
- **Stage 2, mandatory:** submission of a full proposal, to be evaluated by ANR-operated independent evaluation panel. The call for proposals is open until 14 May 2024 at 11:00 am (CET)

3.1.1. Stage to submit expressions of interest

In this stage, the programme's steering committee proposes to bring together people or teams with complementary research topics and skills. If the consortium considers that it does not cover all the expertise required for its ambition, it may report it in its expression of interest. Then, programme directors and managers may suggest meetings, in formats yet to be defined (initial contact, workshops, thematic activities, etc.) to foster exchanges and develop the proposals, to meet the demands and needs expressed. This stage does not constitute an evaluation stage for the final proposal to be submitted.

The expression of interest, of three pages maximum, excluding the letterhead and summary, may be drafted in French or English, and must be submitted on the ANR website before Thursday 18 January 2024 at 11:00 am. The template is available on the ANR website for this call for proposals.

During stage 1, expressions of interest must include the:

- Background and challenges, scientific objectives and provisional work areas;
- Suitability with the call for proposals;
- Brief description of the current consortium;
- Expected impacts for the agroecological transition;
- Any missing expertise in the consortium that is required;
- Whether or not the consortium needs to be put in contact with potential collaborators who have the expertise required to complete the consortium;

Key points:

- This stage is only an opportunity to be put in contact, and does not constitute support to define or draft the proposal to be submitted.
- During this interaction stage, programme directors and managers agree to ensure that the information provided remains confidential. Only general information will be shared with potential partners.
- Programme directors and managers will be the only individuals with full knowledge regarding interaction requests. No sensitive information will be disclosed.
- A single project manager may only submit one letter of intent.

3.1.2. Submission of the full proposal

The full application consists of two fully completed documents:

- The scientific document, drafted in English, of 20 pages maximum, includes a description of the proposal considered, which may be supplemented by an appended list of scientific publications made in the last three years by the researchers/teams proposing the project (10 pages maximum).
- The administrative and financial document, including the administrative and budgetary description of the project, signed by all partners.

Both documents to be completed can be found on the ANR website at <https://anr.fr/PEPR-Agroecum-AAP>.

Full proposals must describe:

- The state-of-the-art and opportunities that the proposal represents for the programme;
- The scientific proposal, its key stages and deliverables;
- The composition and relevance of the consortium proposed;
- A detailed proposal of the project's budget and the funding requested, in accordance with the financial regulations of the programme, and the requested duration of the project.

3.2. Acceptability criteria for full proposals

IMPORTANT

The applications that do not meet the acceptability criteria will not be submitted to the evaluation panel and will in no way be eligible for funding.

- 1) The application must be filed in full on the ANR submission website before the call for proposals closing date and time. Moreover, the financial and administrative document signed by each partner institution and scanned, must be filed on the ANR submission website before the time and date listed in page 4.
- 2) The scientific project document (20 pages maximum, preferably drafted in English + 10-page max. appendix of publications) must follow the template available on the call for proposals website and be submitted under unprotected PDF format.
- 3) The project must last 3 to 5 years.
- 4) The amount of aid requested should be at least €1 million and €3 million maximum.
- 5) A single project manager who has already received funding under the Agroecology and Digital Technology programme may not be responsible for another project of this call.
- 6) The Coordinating institution must be a French higher education and research institution.
- 7) Proposals that could cause significant environmental harm are excluded (application of the DNSH – Do No Significant Harm – principle) by virtue of Article 17 of the European taxonomy regulation.

3.3. Evaluation criteria for full proposals

The ANR coordinates and implements this call for proposals, and organises the evaluation of full proposals. An international independent evaluation panel will assess eligible proposals (cf. § 3.2), independently from programme directors.

Where relevant, the evaluation panel may call on external peer reviewers and may conduct an interview with project coordinators. Following its proceedings, the evaluation panel will provide directors of the Agroecology and Digital Technology programme with a report including:

- The comments attributed to the proposals evaluated, in accordance with the criteria listed below;

- The list of proposals ranked by the panel, based on their quality and evaluated in accordance with the criteria listed below, and recommended for funding;
- The list of proposals which the panel recommends not to fund due to insufficient quality on at least one of the criteria listed below.

Each proposal evaluated will be subject to an argument justifying its ranking. The panel may submit an opinion on the amount of funding requested.

The Prime Minister, after receiving the opinion of the SGPI, chooses the recipients and the amounts granted. Each proposal shall be the subject of a contract between the ANR and the project coordinating institution, detailing the mutual obligations of both parties.

The members of the evaluation panel and eventual external peer reviewers called upon undertake to comply with the rules of ethics and scientific integrity set up by the ANR. The ANR's Code of Ethics and Scientific Integrity is available on its website. The ANR ensures strict compliance with the rules of confidentiality, the absence of personal connections between panel members or external peer reviewers and project coordinators and partners, as well as the absence of conflicts of interest for panel members and external peer reviewers. If there is a duly noted breach, the ANR reserves the right to take any action it deems necessary to remedy the situation. The composition of the selection panel will be posted on the call for proposals publication website at the end of the selection process.

External peer reviewers and members of the evaluation panel are called upon to review project proposals according to the evaluation criteria below, grouped into three main categories.

1) Scientific excellence and ambition:

- Relevance of the proposal to the objectives of this call for proposals;
- Innovative, ambitious and multi-disciplinary nature of the proposal;
- Clarity of research objectives and hypotheses,
- Relevance of the methodology;
- Scientific contribution to speed up the agroecological transition;
- Possible links with other SADEA strategy measures (PEPR Advanced Plant Breeding, *grand défi Robotique Agricole*, *grand défi Biocontrôle et Biostimulants*, demonstrators, challenges), the Future Skills and Professions programme, programmes that are funding pre-maturation and maturation projects (e.g., ASTRAGAL), European programmes (e.g., *Testing and Experimentation Facilities*).

2) Quality of the consortium, resources deployed and governance:

- Skill, expertise and involvement of the project manager: ability to coordinate multi-disciplinary and ambitious consortia, academic background, international recognition,
- Quality and complementarity of the scientific consortium with regard to the objectives of the proposal;
- Mobilisation of diverse and complementary disciplinary skills;
- Balance between the human and financial resources deployed (including those requested within the framework of the project) in relation to the objectives to be reached;
- Relevance of the timetable (especially for long-term projects), management of scientific risks and alternative solutions, credibility of the proposed milestones;
- Relevance and efficiency of the project governance (steering, organisation, coordination, introduction of Advisory Boards, etc.).

3) Impact and consequences of the proposal:

- Ability of the proposal to meet the research challenges raised by the Agroecology and Digital Technology programme;

- Structuring of national communities around the subject covered by the proposal;
- Acceleration capacity implied by the research results expected;
- Application/exploitation prospects eligible to pre-maturation/maturation calls;
- Strategy to disseminate (*ongoing* and *ex-post*) and exploit the results, compliance with FAIR principles, Open Science and the promotion of scientific culture.

4. General provisions for funding

4.1. Funding

The calls funded under the Agroecology and Digital Technology PEPR are of an innovated, exploratory and cross-disciplinary nature, and differ from recurrent funding from higher education or research institutions.

The funding granted provides additional resources intended for new actions. They can be used to launch innovative research proposals and fund, for instance, the purchase of equipment as well as expenditure on staff specifically assigned to these projects and all operating costs.

Eligible expenses are specified in the financial regulations on the allocation of grants under the PEPR initiative. Financial support will be provided in the form of a grant, whose disbursement is made by the ANR for the project coordinating institution, according to the timetable set out in the agreement, over the duration of the project.

This call for proposals will be presented to the European Commission as part of the French National Recovery Plan and under the Recovery and Resilience Facility (RRF).

4.2. Consortium agreements

A consortium agreement, which may consist of a set of agreements between the coordinating Institution and each partner institution individually, specifying the rights and obligations of each Partner Institution, regarding the completion of the project, must be provided by the Coordinating Institution within 12 months maximum from the date of signature of the grant agreement. In the event of multiple agreements, the Coordinating Institution guarantees the consistency (absence of contradictory provisions) of this set of agreements.

All Partner Institutions that set resources aside for the Project are signatories to this/these agreements, even if they do not receive a share of the grant.

This agreement specifies, depending on the type of proposal funded:

- The terms and conditions to exploit the results generated at the end of the research, and share their intellectual property;
- The distribution of tasks, human and financial resources, and deliverables,
- The regime for publication/dissemination of results,
- The governance, including the name of the project manager for the coordinating institution;
- The promotion of digital educational tools and/or products created.

The Coordinating Institution sends a copy of this agreement, signed by all parties, along with any amendments, directly to the ANR.

This agreement will assess the absence of an indirect aid granted to Enterprises through higher education and/or research institutions.

The absence of this document may result in the end of project funding and the implementation of the provisions of Article 6.6 of the Financial Regulation (aid suspension and recovery).

There is no need to draw up a consortium agreement if there is already a framework agreement containing the provisions above binding Partner Institutions. A copy of this framework agreement or a certificate must be submitted before the grant agreement is signed. When the aforementioned agreement expires, if

it is not renewed, the consortium agreement will then be required.

4.3. Open Science

As part of the ANR's contribution to the promotion and implementation of Open Science, and in line with the French National Plan for Open Science (NPOS) and International Plan S, recipients of the France 2030 grant undertake to ensure immediate open access to peer-reviewed scientific publications and to adopt, for research data, a FAIR (Findable, Accessible, Interoperable, Reusable) approach in line with the "as open as possible and as closed as necessary" principle. Thus, all scientific publications from proposals funded within the framework of this PEPR will be available in open access, under the Creative Commons CC-BY license or equivalent, using one of the three following methods:

- Publication in a natively open access journal,
- Publication in a subscription journal that is part of a transformative agreement or transformative journal³,
- Publication in a subscription journal. The publisher's version or the manuscript accepted for publication will be deposited in the Open archive HAL by its authors, under a CC-BY license, implementing the Rights Retention Strategy (RRS), according to the terms specified in the Special Conditions of the Funding Decision or Agreement.

Furthermore, the Coordinating Institution undertakes to ensure that the full version of these scientific publications (version approved for publication or publisher's version) is deposited in the national Open archive HAL, no later than the time of publication, and to mention the ANR reference of the research project from which they result.

The ANR encourages the deposit of pre-prints in open platforms or archives, and to privilege permanent or unique login details (e.g., DOI or HAL Id). In addition, the ANR recommends that priority be given to publications in natively open access journals or books⁴.

Finally, the Coordinating Institution agrees to provide, within 6 months after the start of the project, a first version of the Data Management Plan (DMP), under the terms and conditions set out in the Grant Agreement.

4.4. State aid

The aid granted under this call for proposals is subject to the European Framework, i.e., the framework for State Aid for research, development and innovation No. 2022/C 414/01 of 28 October 2022 or any subsequent communication in lieu thereof. This is the aid scheme allocated under the framework scheme exempted from notification No. SA.58995 for aid in research, development and innovation based on the general block exemption regulation No. 2014/651 adopted by the European Commission on 17 June 2014 and published in the OJEU on 26 June 2014, as amended by Regulation (EU) No. 2023/1315 of 23 June 2023 published in the OJEU on 30 June 2023.

5. Terms and conditions for submission

5.1. Content of the application

The application shall include all the elements required for the scientific and technical evaluation of the proposal. It must be deposited before the closing of the call for proposals, whose date and time are listed in page 4.

Important

³ Definition of a [transformative agreement](https://www.coalition-s.org/faq-theme/publication-fees-costs-prices-business-models/) or [transformative journal](https://www.coalition-s.org/faq-theme/publication-fees-costs-prices-business-models/) : <https://www.coalition-s.org/faq-theme/publication-fees-costs-prices-business-models/>

⁴ The DOAJ website (<https://doaj.org/>) lists peer-reviewed open access scientific journals. The same applies to the DOAB website (<https://www.doabooks.org/>) but with monographs.

No additional element will be accepted after the closing of this call for proposals, whose date and time are listed in page 4.

The project manager must deposit the documents on the ANR submission website, whose address is listed in page 4. To access this service, opening an account first is required (username and password). It is recommended to register as soon as possible to obtain those elements.

The full application consists of two fully completed documents:

- 1) the “scientific document”, of 20 pages maximum, drafted in English, which includes a description of the proposed project, under the format provided, with a 10-page appended list of scientific publications made in the last 3 years by the researchers/teams proposing the project,
- 2) the “administrative and financial document”, including the administrative and budgetary description of the proposal, along with engagement letters signed by Partner Institutions.

The elements of the application (administrative and financial document in Excel format / scientific document templates in Word format) will be available on the web page of this call for proposals (see the URL on page 4).

5.2. Submission procedure

The documents of this application are to be sent by the Project Manager:

Only IN ELECTRONIC FORMAT:

- Before the closing date of this call for proposals, listed in page 4,
- On the submission website, as recommended in § 5.3.

Prior registration on the submission website is required to submit a proposal.

Only the electronic version of the submission documents available on the submission website when this call for proposals closes will be considered for evaluation.

AN ACKNOWLEDGEMENT OF RECEIPT, in electronic format, will be sent to the project manager once the documents are submitted.

NB: The signature of the commitment letters included in the administrative and financial documents certifies that project partners agree to submit the project in compliance with the conditions described in the administrative and financial document as well as the scientific document and its potential appendices.

5.3. Submission advice

It is strongly advised to:

- Open an account on the submission website at the earliest;
- Not wait until the deadline for the submission of proposals to enter data online and upload files (please note that the submission deadline must be respected),
- Check that the documents submitted in the dedicated areas under the headings “submission documents” and “signed documents” are complete and consistent with the expected elements. The application and filing of signed documents can only be approved by the project manager if all the documents have been uploaded,
- Regularly consult the programme’s dedicated website at the address listed in page 6, which includes up-to-date information on its operation,
- Contact, if necessary, the ANR at PEPR-AgroEco@agencerecherche.fr
- Contact, if necessary, the directors and managers of the Agroecology and Digital Technology programme by email at equipe@pepr-agroconum.fr.



Contacts

Information about the administrative process (compiling the application, online procedures, aid rate) may be obtained from the ANR at

PEPR-AgroEco@agencerecherche.fr