Informing Public Policies and Public Debate at INRA

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Unit for Collective Scientific Assessment, Foresight and Advanced Studies (DEPE)

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Delegation for Collective Scientific Assessment,
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Best practices for collective scientific assessments and studies designed to inform public policies and debate

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Foreword

Like any research institution, the National Institute for Agricultural Research (INRA) has the primary mission of producing scientific knowledge in its own particular fields of expertise: agriculture, the environment, the processing of agricultural products, food and the bioeconomy. Among the many missions resulting from this primary vocation, providing expertise, disseminating scientific culture and shedding light on public policies and debates are important dimensions of the institute's activities. Furthermore, society's expectations of INRA continue to grow as societal challenges considering the INRA's fields of competence. Previously conducted in separate units, the collective scientific assessments and foresight activities developed by INRA to respond to these issues were brought together in 2010 within a Unit for Collective Scientific Assessment, Foresight and Advanced Studies (DEPE), working closely with INRA's CEO. The central mission of DEPE is therefore to provide the necessary scientific insights to questions legitimately posed by public authorities and society as a whole regarding agriculture and the use of agricultural products.

The role of public research organisations in supporting public policy is reflected in various actions, all based on the results of scientific research. Before public policies can be developed and in order to understand issues and the agronomic, biological, environmental, economic and social phenomena on which public action is intended to intervene, decision-makers and all stakeholders need to be provided with a review of the available scientific knowledge, not overlooking that which could be described as acquired, uncertain, insufficiently documented or incomplete. This is the very principle of the collective scientific assessments (known by the French initials ESCo) conducted by INRA. Complementary approaches such as advanced studies and foresight work are intended to deepen or extend these knowledge bases in order to make them even more intelligible and usable in the reflections of various actors working on public policies. This work requires the definition and implementation of a rigorous and shared methodology between all stakeholders in accordance with the National Charter on Institutional Scientific Expert Reports that INRA, like its partners in public research, signed in 2011. This methodology aims to ensure the credibility, legitimacy and relevance of the scientific elements provided through this intermediary to the public debate and made available to public and private decision-makers.

Beyond the Charter on Institutional Scientific Expert Reports, DEPE supports its work with a set of procedures, described in the form of precise and detailed files but whose volume and format make it difficult to publish in their raw state. And yet, it seems useful

today, even necessary, to make available to the actors and users of this work (sponsors, partners, scientific leads and experts, stakeholders and various publics) the working methods and the rules that preside over to the conduct of these operations. The purpose of this booklet is to make public how we conduct with all possible rigour and impartiality this type of complex, difficult, sensitive but crucial work for an effective and constructive relationship between science and society.

I would like to thank and pay tribute to INRA's DEPE team for the quality of the work they have completed in recent years and for taking the time to summarise in this booklet the rules and principles of their work. Through this sharing of our practices, we hope to better understand and appreciate the advantages and also the limitations of the exercises we are conducting in this area.

Philippe Mauguin, INRA president

Introduction: collective scientific assessments, studies and foresight to inform public debate

Created in 2010, INRA's Unit for Collective Scientific Expertise, Foresight and Advanced Studies (known by its French initials, DEPE) is responsible for informing public decision-making on complex societal issues and, at the same time, fostering the Institute's reflections on its own scientific orientations. Through three types of exercises, most often conducted at the request of public authorities, DEPE is at the interface between policy makers, stakeholders, scientific institutions and experts.

First developed in 2001 at INRA, Collective Scientific Assessments (known by their French initials, ESCo) involve making available to society the most intelligible possible review of validated scientific knowledge in response to a complex question. The latter is often sent to the Institute (and sometimes to its scientific partners) in the form of a request from one or more ministries, agencies, public or parapublic bodies in connection with the implementation of a public policy (the opportunity to introduce a dedicated policy, adaptations to regulations, environmental health or public health issues etc.). A critical analysis of the international and multidisciplinary academic bibliography is carried out by a collective of scientific experts. The results of the expert appraisal are made public and widely disseminated to inform public decision-making and debate. The challenge is to distinguish the achievements of the research, the outstanding issues, the uncertainties which are still the subject of work and controversies in knowledge which have not yet been resolved. These reports provide an inventory of the knowledge produced by science and reviews research needs without making recommendations to decision makers.

Initiated a few years earlier (in 1993) at INRA, foresight activities seek to shed light on current decisions with regard to possible futures by developing and exploring scenarios of contrasting evolutions at distant horizons, tracking potential breaks and hypotheses about the future. In order to be rigorous and credible, foresight must be built on a solid base of knowledge of the field to be explored and therefore a good understanding of contemporary scientific achievements and their uncertainties. These are shared in a working group, which is more of a participatory approach and is therefore open to stakeholders during the scenario development phase.

More recently (since 2010), advanced studies (or studies in the text) aim to overcome some of the limitations of ESCo, especially when the only available scientific literature is insufficient to answer clearly or precisely the question asked. It then uses other sources of information (articles in technical journals, reports, individual expertise) and/or it carries

out additional work processing data, particularly quantitative data (statistical analysis and simulations) and future projections of certain trends. Also conducted by groups of scientific experts, studies cover a smaller scientific scope than ESCo and provide answers more directly usable in operational approaches.

While each of these three types of exercise has its own identity, there is a continuum between ESCo, studies and foresight. While ESCo still focus on large-scale bibliographic summaries, they may require a blend of knowledge from more diverse backgrounds to better contextualise the results obtained and to draw conclusions from results that are not overly generic. Three types of studies are then positioned in the extension of an ESCo:

- Some take forms directly derived from ESCo by proposing an in-depth and most often quantified analysis of bibliographic corpora mobilised via the use of textual analysis, systematic review or meta-analysis methods.

- Others incorporate additional calculations or simulations to produce original or contextualised indicators from national databases, original simulations made using existing and unmodified models.

- Finally, others are closer to the foresight approach and are based on more or less distant projections of a so-called 'reference' scenario, accompanied by sensitivity analyses via the elaboration of 'alternative' scenarios.

For their part, the most recent foresight studies try to combine exploration of the future via complete qualitative scenarios with quantitative simulations of these scenarios (or a part of them) to explore the consequences.

Although ESCo and study exercises follow rather similar methodological principles, they are quite distinct from the foresight approach. This is why this booklet only focuses on the activities of ESCo and studies, foresight being the subject of another booklet. All exercises must meet the four principles of the National Charter of Expertise: competence of the experts, impartiality of the final product, multiple disciplines and approaches, and transparency about the methodologies.

The key elements of each of these two types of exercise (ESCo and studies) are presented here in a condensed format. They come from a 'Guide to DEPE procedures' used internally, identifying the specifications of the NF X50-110 standard. This booklet is intended for all audiences interested in these approaches, including research units or structures wishing to carry out ESCo or studies to inform public action. It is also a tool that translates a methodology based on practices which has been developed for several years at DEPE.

The project's instruction phase is the subject of Chapter 1. It begins with the receipt of the request and gives rise to numerous exchanges and discussions within the Institute,

with the initial and potential sponsors, research partners etc. The question arises of INRA's institutional and scientific positioning vis-à-vis the request, its legitimacy to lead the project and its scientific interest. The challenge is to choose the appropriate response (between collective scientific assessment and study, or even a foresight approach) and management (DEPE, department, metaprogramme etc.). Depending on the case, INRA will accept or reject a project, offer reformulations or restrictions on the questions asked, broaden the request, suggest co-management or a scientific partnership etc.

Throughout the duration of the project, several committees formed during the instruction phase support the working group; they allow sponsors to follow the work's progress and to inform the exercise's actors and stakeholders about the conduct of the exercise, as well as to express themselves on the issues associated with it. They are essential spaces for discussion which also make it possible to identify work (in particular unreferenced reports) or data useful for the project and can facilitate its access by the working group.

Chapter 2 presents the logic for forming the working group. This group is based on a multidisciplinary group of scientific experts specialised in the subject and selected for their skills, which are certified by their publications. It is chaired by scientific leads and supported by a DEPE project team. One of the issues in the coordination of this group is to develop a constructive approach and a shared vision between the experts of the questions posed by the sponsors, taking into account the divergences in points of view and arguments which by nature traverse the collective of experts and which must be summarised and clarified as a result of the ESCo or study.

Chapter 3 deals with the principles of creating and using the bibliographic corpus which is at the heart of ESCo and studies. The process of collecting, sorting and selecting references from which the group of experts extracts the elements to answer the question posed by the sponsors determines the robustness of the exercise. Currently, settling on a clear and transparent work strategy is all the more crucial in view of the exponential growth in the number of scientific articles identified in bibliographic databases.

Each exercise leads to the production of three types of documents, detailed in Chapter 4: an extended report of several hundred pages which brings together all the critical analyses written by the experts on the basis of the sorted and selected bibliographic corpus and the list of bibliographic references; a condensed report (about 80 pages) for the exercise's sponsors (managers/ministerial policy makers) and, more broadly, for all stakeholders in society and/or those interested in the issue (associations, professional organisations etc.); a summary report (eight pages) intended to communicate the major conclusions of the work as widely as possible. These documents are disseminated during a public feedback seminar summarising the conclusions of the ESCo or study which is designed to stimulate debate with stakeholders.

Chapter 1. Instruction, governance and monitoring of ESCo and studies

ESCo and studies are generally conducted in response to external requests, either from a public structure (ministry divisions, agencies such as France's Environment and Energy Management Agency (ADEME) etc.), parapublic bodies (agricultural technical institutes) or even voluntary groups if the topic at hand concerns public policy. Requests from an internal co-sponsor (for example, INRA's Board of Directors or one of its metaprogrammes) are also eligible.

Sponsors finance the running costs of the exercise (costs related to the staging of meetings, editing of documents, organisation of the public feedback seminar and, possibly, the remuneration of a manager contracted for the exercise). The salaries of DEPE staff and the experts mobilised remain the responsibility of INRA or their parent organisation. ESCo and studies are different from the services (full cost) that can be ordered from a scientific consultancy; the final specifications of an ESCo or study are co-constructed by INRA, which must find a scientific interest in the exercise. As a result, the results of ESCo and studies remain the property of INRA, and sponsors cannot restrict their dissemination, that is to say the free access to all of the documents resulting from these exercises (see Chapter 4).

ESCo and studies can be jointly led by INRA and one or more partners. These partners are other public structures having scientific expertise: research organisations and sometimes agencies when part of their mission concerns research.

Applications for ESCo and studies are formalised by the sponsors in an official request sent by mail to the INRA President or are the subject of a more informal request. Project instruction begins with the receipt of the request and corresponds to the period of dialogue with the sponsors which results in the drafting of the exercise's specifications and the signature of the agreement which binds INRA to the external sponsor(s). The ESCo or the study officially starts on the date of the agreement's signature.

The first phase of instruction seeks to define the positioning of INRA vis-à-vis the request (institutional and scientific backing), to identify the format of the most appropriate response and the way work should be conducted[1] (Section 1.1). In the event that INRA (and, more precisely, its Board of Directors) decides to lead the project and entrusts its coordination to DEPE, a second instruction phase comprises of drawing up the specifications (Section 1.2), establishing the agreement (Section 1.3) and setting up the

[1] Coordination by DEPE or another INRA division (scientific board, research centre, metaprogramme or other research unit).

various committees that will support the ESCo or study (Section 1.4). Sections 1.2 to 1.4 apply where DEPE is designated to coordinate the operation.

The entire process, which requires many discussions and exchanges, lasts on average six months between the receipt of the request and the signing of the agreement, to which is annexed the co-constructed specifications validated by INRA, its potential partners and the sponsor(s).

1.1. Receipt of the request by INRA

1.1.1. Decision on **INRA's** institutional support for the exercise

Upon receipt of an official referral or, failing that, when a request is sent to INRA, a first phase of reflection is initiated to clarify the subject and identify the interest and legitimacy for INRA to support the operation at an institutional level. In particular, this mobilises INRA's Board of Directors (CEO, DGDS[2] and DS[3] concerned by the scope of the application), DEPE (essentially the Director at this stage) and, according to the case, representatives of other research organisations concerned and the issuers of the application (future sponsors). The following reasons may, for example, lead INRA to decline the exercise:

- The subject is already the focus of the work of another research body or organisation and/or does not fall directly within INRA's fields of competence (for example, a subject on risk assessment should preferably be dealt with by the corresponding agency).
- The sponsor(s) and INRA (and possibly any other organisations involved) do not reach a satisfactory shared formulation of the request.
- The scientific interest is weak or is real but concerns questions that have been insufficiently worked to ensure that the knowledge acquired is sufficiently robust to be the subject of a pertinent summary of available knowledge.
- The demand is of scientific interest but of little interest to society as a whole (the issues and concerns underlying the request are not motivated by the public interest and/or are not the subject of a policy public, and an ESCo or study would not support a consistent public debate).

[2] Deputy director general for scientific affairs
[3] Scientific director

In the case where several organisations are involved in the same request and where INRA does not consider it legitimate or relevant to support the project at the institutional level, it can participate as a scientific partner if researchers from the Institute are potentially involved in the expert collective that will be formed. As such, it participates in the scientific management of the operation but does not bear the responsibility for its operational coordination. Therefore, it is one of the other partners which coordinates the operation. If the latter does not have experience in institutional coordination of ESCo-type exercises or studies, DEPE can provide methodological support: a DEPE project manager is then mobilised to support the operation's project manager, without being part of the project team.

1.1.2. Decision process regarding **DEPE's** coordination of the exercise

When INRA agrees to support the operation at the institutional and scientific levels, then the nature of the most appropriate institutional support must be defined according to the nature of the subject and its associated issues.

The coordination of the exercise may be appropriate for DEPE or another INRA entity (scientific director, department or research centre, metaprogramme etc.). The criteria which favour DEPE taking over the operation are as follows (non-exhaustive list):

- The nature of the request and the formulation of the question (demand to shed light on public policy and public debate based on summaries of knowledge, supported or not by additional work, and not on the basis of assembling expert opinions).

- The strategic importance of the subject for INRA (in particular according to the societal acuity of the request).

- The multidisciplinary dimension of the question asked (in particular the combination of questions relating to various biological and biotechnical sciences and social sciences).

- The geographical context to which the question applies (France at a minimum, Europe or the world).

- The existence of academic scientific literature to answer, at least in part, the request.

- The capacity of DEPE to take charge of coordinating the operation, taking into account the mobilisation of its work capacity on other projects.

In cases where it is decided that INRA will support the request but not directly through DEPE, the latter is likely to intervene in providing methodological support to those structures leading the operation whether they be from INRA or not (help in setting up the project, locating experts, coordination of working groups, structuring of the questions to be treated, organisation of the feedback seminar and deliverables etc.). In addition, DEPE is responsible for the implementation of the National Charter of Expertise at INRA and is likely to participate in the monitoring bodies for the operation to ensure compliance with the rules of conduct for ESCo and studies.

1.1.3. Decision on type of exercise, ESCo or study

DEPE must also arbitrate on the form of response that is *a priori* the most adapted to the request: ESCo or study (even foresight work). This decision is based on the following:

- The field of the question and its generic character (ESCo) or, on the contrary, more technical nature (study).

- The extent of the coverage of the subject in a geographical context required by the academic literature (ESCo) or the need for a significant use of grey literature (study).

- The existence of an explicit request for the creation of new data (study) which requires carrying out simulations, statistical analyses etc.

1.2. Subject instruction

1.2.1. Developing the specifications

Once INRA has responded positively to a request and has decided to conduct an ESCo or study coordinated by DEPE, a second phase of exchanges is undertaken with the twofold objective of confirming (or redefining) the scope of the request and to translate sponsors' questions (stemming from political and societal concerns) into scientific questions covering both the biotechnical and socio-economic aspects. The outcome of these exchanges is formalised in writing in a set of specifications.

These exchanges are coordinated by DEPE (the director and a 'pre-project team'[4]). These exchanges involve the Board of Directors (the Scientific Director (DS) who will monitor the operation), the heads of scientific departments (CD) concerned by the themes being addressed, the representatives of any other institutes called upon if necessary and

[4] Project team in constitution

the sponsors. Beyond DS and CD, it is also preferable to call on scientists working on the topics addressed as 'discussants'. If scientific leads are identified relatively early, they can be integrated into these exchanges[5].

This instruction phase should be supported as much as possible by a premier diagnosis of the bibliographic material available on the subject of the ESCo or study. Utilising its skills in Scientific and Technical Information (STI), DEPE carries out a preliminary exploration of the existing academic bibliography in databases (mainly the *Web of Science* and *Scopus* and specific bases for certain disciplines: *Francis* for sociology and *EconLit* for economics). At this stage, it is only necessary to have a general idea of the number of existing articles in order to identify:

- Questions that are the subject of an abundant literature, possibly requiring the clarification, reframing and circumscription of the request.

- Conversely, questions on which the literature is limited and which, for lack of sufficient sources, may be excluded from the outset of the field of operation.

The exploration of the bibliography carried out on this occasion also aims to establish a list of the most qualified authors to answer all the questions in the specifications. This list of authors is used to select potential experts who may be asked to participate in the exercise (see Chapter 2).

Particular attention should be paid to social science issues (sociology, economics, political science, geography, law and philosophy) that are present in almost all ESCo and studies. Experience shows that academic publications contain little work focused on issues such as those raised at INRA within the framework of ESCo or studies with a strong agronomic or biological focus. The analysis of the available bibliography must decide on the relevance and reliability of the transposition of results obtained on related subjects, in order to avoid the pitfall of general theoretical considerations or poorly documented discourse on the advantages and limits of public policy instruments.

It is therefore appropriate not to include in the specifications relevant but overly ambitious objectives (for example, the production of cost-benefit analyses which sponsors often request).

In the more specific case of studies, this instruction phase must also establish a first diagnosis on the availability of data and the adaptability of the methods and tools for processing it or simulations that the work complementing the examination of the bibliographic corpus will require.

[5] Reflections aimed at identifying the potential scientific pilots of the ESCo or the study can begin early, as soon as the decision is oriented towards institutional and scientific porting of the project by INRA

1.2.2. Specifications

The specifications comprise a document of a few pages in which are formulated (i) the societal, political and regulatory context and the subject of the request, (ii) the scope of the ESCo or study, and (iii) the main scientific questions which the exercise proposes to answer. This document is co-constructed and validated by INRA, its potential partners and sponsor(s). It is written mainly by DEPE and the project team, with the possible help of the scientific leads. In contrast to the initial request (which expresses the concerns and expectations of the sponsor or sponsors), this document is considered the reference formulation of the content and objectives of the ESCo or study. This wording should suit both sponsors (non-scientists) and future experts. The specifications must include:

- The context of the request and the issues associated with it (political, regulatory etc.): why has it been formulated? How do sponsors plan to use the results? Etc.

- A description which is as precise as possible on the purpose and scope of the exercise (and what is included and excluded from this scope).

- All the questions to be dealt with, subject to the existence of scientific literature, as well as those that cannot be answered.

- In the majority of cases, a summary schedule showing the approximate duration of the different work phases.

- The organisation of the governance of the exercise (see Section 1.4).

These specifications have the status of a 'scoping paper': at the time the agreement is signed it has not been submitted to the group of experts (since the group has not yet been formed) and may, to a certain extent, evolve following a request from INRA and its partners to the monitoring bodies of the ESCo or study (see Section 1.4). This special status is a compromise making it possible to:

- Have a confirmed formulation of the questioning to which the exercise must respond, and thus to start it on the basis of a first document shared between INRA, its potential partners and sponsors.

- To have a sufficiently precise formulation of the scientific questioning in order to be able to identify the disciplinary skills which need to be solicited.

- To provide a certain room for manoeuvre for the expert group, whose first mission will be to specify the way in which each question can be approached in view of what the literature will make possible (refined diagnosis of feasibility).

When drawing up the specifications, two classic pitfalls must be avoided by the organisations leading the ESCo or study and its sponsors:

- In the case of an ESCo or study whose objective is to examine the potential impacts of a phenomenon, the formulation of questions in the form of a list multiplying the types (environmental, social, agronomic, health etc.) and the targets (environmental

compartments, organisations etc.) of the impacts open the way to a limitless extension of the scope of the work and can be a source of misunderstanding which is difficult to manage in the course of operations. It is therefore important to define the characteristics of the impacts to be included in the scope of the work.

- While it may be legitimate on the part of public authorities and stakeholders, the desire to have a complete cost-benefit analysis can constitute a trap in the conduct of ESCo and studies whose vocation is to present the state of knowledge available, whether that be acquired, uncertain or open to debate, relating to a set of phenomena with potentially antagonistic effects. At most, this exercise can suggest a multi-criteria analysis of the various effects of a phenomenon or a practice, and the uncertainties and causes of uncertainties relating thereto. Their consolidation into a single indicator in the form of a balance sheet of the positive and negative effects is not, except in exceptional cases, within the remit of this type of exercise.

1.3. Production of the agreement linking INRA and sponsors

ESCo and studies are the subject of one (or more) agreement(s) between the sponsor(s), INRA and its possible partners. The agreement defines the purpose of the request made to INRA, the procedures for carrying out the exercise and the financing arrangements between the sponsors and INRA and its partners to cover the operating budget of the exercise. In the annex, the agreement includes:

- The specifications of the operation.
- The estimated budget of the operation.
- The estimated timetable of the operation.

The signature of the agreement by the parties marks the end of the instruction phase and the real start of the exercise with the formation of the working group. The production of the ESCo or study can begin only from this step.

The main points for vigilance regarding the content of the agreement relate to:

- The duration of the exercise's execution, established at 18 months from the date of signature - or even 24 months if one wishes to include post-seminar exploitation activities (translation and publication in the form of a book for certain deliverables, participation in seminars or conferences promoting the dissemination of the results and conclusions - see Chapter 4).

- The deadlines for payments to INRA and delivery of deliverables: certain payments may be conditional on the delivery of an intermediate deliverable (for example, a progress

note). The nature of these intermediate deliverables and their status are specified: they are not preliminary results of the work and cannot be disseminated beyond the sponsors.

- The nature of the relationship between the signatories of the agreement: it does not constitute a commercial relationship and does not refer to the delivery of a report solely for the purpose of the sponsor. The different deliverables of the exercise are public and are not the property of the sponsors (see Chapter 4).

- The status of the deliverables: the extended report and condensed report are written under the responsibility of the experts, the condensed report is presented to the sponsors in an almost final version for verification of the adequacy between the specifications and the final report, but is not subject to their approval, and the summary report (8 pages) is written under the responsibility of INRA and communicated to the sponsors for advice and suggestions before final validation by INRA's CEO; the intellectual property rules applicable to the results of this work are derived from these principles.

- Monitoring progress of the exercise: the role of the committees in which the sponsors appear is explicitly specified in the agreement (see Section 1.4).

As far as possible, it is preferable to rely on an example of a standard convention already signed for a previous operation of a similar nature. This example may serve as a basis for the development of the definitive agreement and is therefore subject to change depending on the form of financing that the sponsor(s) wants to implement.

1.4. Establishing governance and monitoring of ESCo and studies

Two committees are designed to organise monitoring of the progress of the exercise for the sponsors and to inform socio-economic stakeholders of progress in these exercises. These spaces for exchange can also help to identify complementary issues as well as useful work (including unreferenced study reports) and data and to facilitate working group access to them.

1.4.1. Monitoring committee

The monitoring committee provides the interface between the working group (see Chapter 2) and the sponsors, including INRA's scientific hierarchy and its potential partners. It is informed about progress in the operation and the difficulties that may be encountered by the leads, experts or project team, informs the working group about

changes in the political and regulatory context in which the request is placed and takes part in discussions about the results.

It is composed of representatives of the sponsors, INRA as the lead institute (the scientific management concerned and DEPE) and its potential partners. This committee is set up from the start of the work. It is coordinated by DEPE and classically meets three times during the course of an ESCo or study:

- At the beginning of the exercise, when the agreement is signed, the committee discusses and validates the specifications (see Section 1.2.2.)

- During the exercise, the leads and project team present progress in the work and any provisional elements, it is not a question of intermediate results but elements for shared reflection in the expert collective, who structure the work in progress and can lead to a slight reorientation. The leads and the project team also mention any difficulties that may help the monitoring committee to clarify or modify certain parts of the questions listed in the specifications.

- At the end of the exercise, shortly before the public release of the results, an almost final version of the condensed report and summary report (8 pages) is sent to the members of the monitoring committee for reading and advice. A last meeting of the committee is then held to collect the opinions of the sponsors and to validate the provisional programme for the final seminar on the basis of a proposal produced by DEPE (see Chapter 4).

It is not the role of the monitoring committee to validate the content of ESCo or study deliverables. It is consulted for an opinion on the condensed report and summary report, but the comments expected relate only to the readability and comprehension of the elements presented, and their relevance with regard to the questions which motivated the request. The working group remains responsible for following up on the comments and suggestions made. The condensed report is not sent to the monitoring committee before it is finally submitted and put online on the INRA website.

The monitoring committee applies strict confidentiality rules until the publication of the results on the INRA website: any document sent to it, provisional versions of the extended report, condensed report, summary report etc. cannot be disseminated beyond the members who meet in session.

1.4.2. Stakeholder advisory committee

The stakeholder advisory committee (known by its French initials CCA) is the framework in which stakeholders are informed of the directions and conclusions of the ESCo or study. While the monitoring committee is a decision-making body, CCA meetings do not

go beyond the collection of concerns, issues, interests and questions of the actors about the operation which is underway.

On the basis of a proposal made by DEPE, its composition is decided jointly with members of the monitoring committee, which in turn makes CCA members an integral part of the exercise. It aims at bringing together representatives of all the actors in society likely to be concerned by the conclusions of the exercise and to use the results: ministry services interested in the ESCo or study but not being part of it, French or European agencies, environmental and consumer associations, local authorities, professional organisations, economic actors in the agri-food sector, scientific interest groups etc. Each of its members participates as a representative of the organisation to which they belong.

Coordinated by the director of the DEPE, classically the CCA meets twice:

- After the launch of the exercise, to present the exercise to stakeholders: the request, issues, organisation and planning of the operation and the framework elements resulting from the reflections of the expert collective. The purpose of this session is twofold: to inform stakeholders about the launch of the exercise, its outline and the methodology that will be used, and to gather their opinions on the transcription of the questions asked with regard to specific or complementary issues.

- At the end of the exercise, between the final meeting of the monitoring committee and the final seminar, for a 'preview' presentation of the exercise's major conclusions. The goal is to allow stakeholders time to prepare their reactions, comments and opinions before the public seminar. This session also allows their first reactions to be heard, which is useful for good preparation of the seminar, in particular the discussions following the presentation of the conclusions (see Chapter 4).

1.4.3. Technical group (optional)

For studies, the additional work required to complete the analysis of the scientific literature may lead to the exploitation of data not directly accessible to the working group (for example, unpublished results of field experiments). Moreover, the analysis of such data sometimes requires the use of skills from outside public research organisations, which cannot be included in the collective of scientific experts. In order to benefit from these data and skills while guaranteeing the independence of the expert committee vis-à-vis non-scientific actors, it is possible to set up a technical group.

This group offers support to scientific experts in discussions about certain choices made within the expert group, for the interpretation of certain technical and/or field data, provides an opinion on the choice of situations not described in the bibliography which are interesting to study, issues an opinion on the coherence of work conducted under the 'study' component (simulations, field surveys etc.) using the field knowledge they have at

their disposal etc. For example, people who could be useful include 'research and development' engineers from ministry technical centres, technical institutes and Chambers of Agriculture.

The members of this group are solicited *intuitu personae* and not as representatives of their organisations (this institutional representation is found within the CCA). Their contributions are formalised in writing, the expert group remaining the sole judge of the follow-up to be given to the proposals formulated by the technical group. The members of the technical group are not among the authors of the study's deliverables and do not accept responsibility for its results. The information exchanged between the study's expert group and the technical group formed for the occasion remain strictly confidential until the publication of the study's results.

Chapter 2. Constitution and roles of ESCo and study working groups

An ESCo or study working group is organised around two entities: the group of scientific experts (chaired by the scientific leads) and the project team. The project team is formed and scientific leads identified early in the project, as they participate in the instruction phase (see Chapter 1). Scientific experts other than the leads are identified once the draft specifications are confirmed and are contacted after the agreement is signed.

Each project mobilises a multidisciplinary group of about 20 scientific experts specialised in the subject, extracting from the international academic literature the elements relevant to public action, supplementing them with data processing and assembly in the case of studies, and collectively write a report. The project team and the scientific leads co-coordinate this work. The role of the leads is to set the project's scientific direction, to lead the collective and multidisciplinary production of the results, to verify that the experts have fully mobilised the bibliography and available knowledge and to build the general conclusions. The project team is responsible for the overall coordination of the project within the deadlines and in accordance with the methods and procedures established by DEPE. It is also responsible for producing the deliverables that make the results and conclusions of the exercise available to the public (condensed and summary reports - see Chapter 4).

The first three sections of this document describe how members of the expert group and project team are identified and their respective roles. The fourth concerns the way in which the links of interests that experts are likely to have with different spheres of society are tackled and analysed.

2.1. Scientific leads

2.1.1. Identification

Regarding scientific content, the expert group is coordinated by scientific leads. Their appointment is the subject of a reflection by the scientific management which follows the instruction and DEPE (Director). Ultimately, the pilots are appointed by INRA's CEO and the heads of partner institutions if the exercise is supported by several organisations. Thoughts on identifying the scientific leads of an ESCo or study start fairly early in the instruction phase, as the decision moves towards INRA's institutional and scientific

support for the project. Heads of departments concerned by the subject of the request can then be asked for advice and suggestions.

Leads are INRA scientists (and from potential partners), most often senior and recognised for their scientific competence, ability to step back from the questions asked, broad knowledge of the scientific fields concerned, openness and curiosity of mind, and their capacity for collective work. Indeed, recognition of the leads by the scientific community in general and experts in particular is essential. When identifying them, vigilance should also be given to possible conflicts of interest (see Section 2.4.) that they might have and the necessary capacity to summarise diverse scientific knowledge in response to questions that pertain to political decision-making. Finally, leads must of course be sufficiently available during the entire project: their mobilisation in an ESCo or study is estimated at an average of about 30-40% of their working time, with a variable distribution of this working time according to the project phase. Once informed of the workload, responsibilities and roles related to this position, a prospective scientific lead must be able to say 'no' if they do not feel ready to commit to the role.

Experience of past exercises underlines the merit of having two scientific leads, allowing the points of view of complementary disciplines to be combined. A single lead must take full responsibility for the scientific coordination and the workload of this role alone is difficult for one person. Conversely, with three leads and more the interactions with the project team are multiplied and project organisation and planning become more complicated because of the difficulties in finding times when all leads are available. Nevertheless, in some cases where a specific skill is required, or in situations where several organisations are supporting the exercise, a three-lead operation may be considered.

2.1.2. Lead responsibilities, interactions with experts and the project team

Scientific leads interact strongly with the project team during all phases of the exercise and work closely with the project manager to co-coordinate the work. Good contact between the project team and leads must be established, based on trust and a shared vision of each other's responsibilities.

Together, throughout the exercise, leads and the project manager:

- Work during the instruction phase on the formulation and scope of the request with the sponsors and the DS(s), and co-write the specifications with the project team (see Chapter 1).
- Identify scientific experts (see Section 2.2).

- Prepare expert meetings, share their facilitation, ensure work dynamics are maintained between one meeting and the next and maintain interest in the collective work.

- Ensure that expert contributions are written in accordance with deadlines, review all versions of contributions and interact individually with each expert to guide the finalisation of the writing.

- Ensure the experts adhere to the work plan (report plan in which the contributions are integrated, structure of the summary).

- Verify the quality of the work produced (response to the request made by the sponsor, objective and complete use of the scientific literature, and preparation of written documents in accordance with DEPE procedures).

The specific role of the leads, in relation to that of the project manager, lies in the fact that they are responsible for the scientific coordination of the work. They guarantee consistency between the questions posed by the sponsors and the answers provided by the work in compliance with the specifications. To do this:

- They ensure the coherence of the arguments developed in each contribution, each chapter and at the overall extended report scale, and ensure the scientific basis of the conclusions (which must be substantiated by the scientific literature and, in the case of studies, the results of the complementary data processing and assembly).

- They facilitate and stimulate the confrontation of the individual contributions from experts in order to structure the general conclusions of the work, which they are responsible for writing (final chapter of the extended report).

- They ensure that the experts distinguish in their analyses that knowledge which is considered as acquired and confirmed from that which is more uncertain. They also ensure that the extended report reflects the scientific controversies that may exist and knowledge gaps.

- They define with the relevant experts the data processing, data assembly and simulation methodology underlying the study component, and coordinate its implementation.

- They make the link, with the experts, between the general conclusions formulated in the extended report and the structure of the condensed report: passing from the extended report to the condensed report (written by the project team) is often considered confusing by experts who do not immediately perceive the need for the latter, so leads must ensure that experts appropriate the logic of summarising and adhere to it.

- With the experts, they take scientific responsibility for the content of the deliverables, which they validate.

Scientific leads also have the role of representing the expert group during the meetings of the different committees set up for the duration of the exercise (monitoring committee,

stakeholder advisory committee, see Chapter 1). They also represent the expert group when they present progress and the results of the work to INRA's board of directors.

Finally, leads take part in the diffusion and exploitation of the results. First of all, they present the results of the work during the final seminar which examines the exercise's conclusions, then with different groups: in-house scientists, national and international conferences, stakeholder groups, media, professional audiences, voluntary groups etc. Secondly, they define the strategy and facilitate the academic exploitation of the **exercise's** results; this can take the form of summary publications or scientific seminars dedicated to the construction of a publication plan and subsequent monitoring.

2.2. The expert collective

2.2.1. Identification

Experts are scientists identified within French or foreign public research or higher education institutions (researchers, engineers and teachers-researchers). The identification of potential experts is carried out during the project instruction phase in accordance with the four main principles that underpin ESCo or study activities:

- Competence: the experts are first chosen on the basis of their scientific publications in peer-reviewed scientific journals and on themes consistent with the field of the particular exercise. For studies, depending on the nature of the data processing and assembly component, their skills in handling certain tools or their expertise on the necessary data are also taken into account (use of models, production of meta-analyses, construction of indicators etc.).

- Plurality of disciplines and approaches: this manifests itself in the diversity of the scientific disciplines represented in the expert group[6] and the institutional origins of the experts, non-INRA experts representing, if possible, at least 40% of the collective in order to avoid the possible institutional endogamy of the approaches. Nowadays, the integration of foreign experts into the collective is desirable.

- Impartiality: this is evaluated at the level of the expert collective and guaranteed by declarations of the links of interest that each expert is likely to have with different spheres of society and stakeholders who are the subject of the exercise (see Section 2.4.);

- Transparency: the principles of the constitution of the expert group are disseminated via this document. The mobilisation of experts is conducted transparently vis-à-vis their scientific hierarchy and their qualification is explained in the final report of each exercise.

[6] Combining biogical, biotechnical, and social sciences in order to treat subjects issue from societal concerns

In practice, a list of potential experts, with more names than necessary in case of possible refusals, is drawn up. All stages of its constitution through to the final list of experts who have confirmed their participation are tracked internally by the project team. Some 20 or so experts (15-25) are classically used in an ESCo or study, although some exercises can mobilise larger groups (up to 50 experts). In these cases, specific working methods can be adopted: work in sub-groups led by an expert chapter coordinator, distribution of experts according to their role in the exercise process (bibliographic analysis, meta-analysis, modelling and simulations) etc.

The preliminary exploration of the bibliographic databases carried out by the project team during the instruction phase to evaluate the existing bibliographic mass makes it possible to identify those authors who publish most on these topics. French authors are examined first, but special attention is paid to the extension of the collective to foreign authors. Nevertheless, preferably they are French-speaking or understand French without necessarily being able to write it in order to facilitate the mostly French dialogue within the collective.

Several potential experts are identified for each of the scientific questions or fields identified in the specifications. They are solicited according to an order taking into account several criteria[7]:

- The adequacy between the expert's publications and the topic on which it is envisaged to solicit them.

- The scope of the topic on which the expert is likely to be competent: the thematic field assigned to a given expert in an ESCo or study often exceeds that on which they publish. It is therefore undesirable to mobilise overly specialised experts because they may not have enough perspective to analyse a bibliography which is slightly off their main research area.

- The experience of the expert in the writing of bibliographical summaries and how accustomed they are to working collectively.

- *A priori* availability of the expert: deduced from the knowledge of the project manager and scientific leads of the expert's involvement in other projects and the responsibilities they have (such as unit management etc.) etc. One option to consider is to form groups of experts in two 'circles': (1) a first circle of coordinating experts, requiring sufficient availability to take on the role of expert (literature analysis and writing) and coordination of the work (combination of contributions and formulation of multidisciplinary conclusions) and (2) a second circle of contributing experts whose role is 'limited' to that of expert (see Section 2.2.2.). Depending on their availability, the prospective experts may be placed in one or other of these circles.

[7] Where the first expert does not respond favourably to the contact, the following name will be solicited.

- The absence of 'major' links of interest which may be detrimental to participation as an expert: this information, *a priori*, can be deduced from the knowledge of the project manager and scientific leads about an expert's membership in certain think tanks, decision-making bodies etc. However, it is only partial (of course no specific investigation of a prospective member's personal life is conducted) and is completed *a posteriori* by the experts themselves in a declaration of interest form (see Section 2.4.).

Depending on the nature of the exercise and the scope of the request, additional skills can be identified beyond the examination of authors who publish on the topics of interest: in particular engineers for the performance of more technical operations (conducting simulations, development of computational methodologies etc.), which are not necessarily published in peer-reviewed journals and therefore do not appear in the preliminary exploration of the bibliography.

More broadly, if the examination of authors' networks does not make it possible to identify experts on certain specific topics, the identification of additional skills requires the knowledge of the teams internally and the questioning of scientific hierarchies. Any identification of additional experts during the project (where a need for complementary skills is identified after the start of the exercise) must follow the procedure described above.

Once the list of experts has been confirmed, each expert is contacted by the project manager and/or the leads through an 'official' and personalised email, to which are attached the initial request from the sponsors and the draft specifications. Because ESCo and studies work on organisational principles that are not systematically known to experts, it is important that each expert contacted takes into account the work they will be asked to complete. A preliminary meeting with each expert is preferable to ensure that the method and their expected implication are well understood and compatible with their personal schedule.

Once the expert confirms their participation in the project, two elements formalise their commitment:

- The declaration of links of interest which they may have (see Section 2.4.).

- A letter signed by INRA's CEO (and, if applicable, the CEOs of partners), which acts as a mission letter. A copy of this letter is sent to the expert's scientific hierarchy (the unit director, head of department and scientific director concerned) to inform them of this mobilisation.

2.2.2. Roles and responsibilities of experts

In ESCo, experts analyse the published scientific literature, extract the acquired knowledge, that which is uncertain or controversial and identify gaps in scientific knowledge. In studies, in addition to examining the scientific literature (certified or 'grey'), the experts carry out analyses and complementary data processing. The experts collectively develop the scientific content of the ESCo or study and bear the responsibility for it. Their work differs from research activities and requires adaptation and 'know-how'. In particular, it is necessary to be open to the diversity of bibliographic sources and approaches. Each expert is responsible for reporting all streams and approaches, even minor ones, once they have been found.

On average, the time investment by an expert is estimated at about 15 to 20% of their working time, with significant variations over time. From each expert it is expected:

- That they establish (with the help of archivists) a relevant bibliographic corpus to respond to the issues in question.

- They read the selected references in full to support their analysis in order to answer the questions posed by the sponsors.

- They develop, with the other experts, a methodology for processing and/or assembling data or even conduct simulations in order to produce the 'study' component.

- They write a referenced summary (around 15 pages) and thereby participate in the collective drafting of the extended report.

- They take part in the plenary meetings (3 to 6 meetings during the project), contributing to the collective discussion of the general conclusions and to the final seminar.

Subsequently, the experts participate in the dissemination of the results of the work, and are encouraged to publish the results of the project in peer-reviewed journals and to further share them by establishing new collaborations.

When the range of questions asked requires the mobilisation of a large number of disciplinary skills, it is conceivable to set up expert groups in two circles: coordinating experts and contributing experts (see Section 2.2.1.). In this configuration, coordinating experts have specific responsibilities. In addition to being contributors (the role defined above), they support scientific leads in the coordination of the exercise by facilitating the writing of the chapters of the extended report. With this objective:

- They share the report plan with the contributing experts whose work they coordinate.

- They are responsible, with the help of the project team, for bringing together/contacting the contributing experts they coordinate to take stock of the progress of their analysis and drafting, and verify the proper integration of their contributions in the plan.

- They take part in the plenary meetings and share the decisions taken with the contributing experts they coordinate.
- They write an introduction and a conclusion in the chapter they coordinate.

Some exercises may require the consultation of experts who do not belong to public research organisations. For example, the analysis of the geographical, regulatory, economic or social context in which the questions are posed to experts may require information on the national or European situation from experts not belonging to a public research organisation but to technical centres or specific ministry services, parapublic or professional bodies (statistical agencies, experts in agencies such as ADEME, CEREMA, operators etc.). In this case, these experts are not integrated into the collective but can be interviewed. These contributions in the form of hearings are formalised in writing, the expert group remaining the sole judge of the follow-up to be given to the proposals made. If they are included in the study report, the particular status of this information in relation to the rest of the constituent elements of the report is explicitly specified. The additional experts heard do not appear among the authors of the study's deliverables and do not take responsibility for its results.

2.3. Project team

2.3.1. Identification

Each ESCo or study is coordinated by a project team established by DEPE. The project team is responsible for the conduct of the exercise at both the institutional and functional levels, and guarantees respect for the working principles adopted at DEPE, in accordance with the National Charter of Expertise.

Putting together the project team begins during the instruction phase. As soon as DEPE is designated by the executive management as coordinator of the future project, a project manager ('team leader') and a person in charge of logistical and financial management are identified.

Depending on the nature of the operation and the need for different competences, one or more mission heads, most often recruited on fixed-term contracts, can complete the project team; their specific skills complementing those of the DEPE engineers (for example, data engineering skills).

One or more archivists are mobilised as early as the instruction phase. They are identified, within INRA, from among the archivists in the Delegation for Scientific and Technical Information and/or departments or research units and according to the internal

procedures and organisations of the other organisations possibly associated with the exercise.

When available, one of DEPE's engineers can participate in the project team with a variable level of involvement: either in support of the project manager for the coordination of the exercise or, with less involvement, in project monitoring.

2.3.2. Roles and responsibilities of the project team members

The project team has two main tasks.

Primarily, it is responsible for coordinating the project from the instruction phase, ensuring that the project organisation follows the principles and working methods developed in the procedures produced by DEPE. In concrete terms, it sets the project schedule and organises the work to ensure compliance. It leads or coordinates the facilitation of expert meetings. It must also be vigilant about transparency in selecting references that support the findings of the collective scientific assessment. The production of ESCo and studies depends primarily on establishing a sustainable work dynamic and the project team must maintain links between experts over time (especially between meetings). Finally, it acts as an interface between the working group and actors outside the group (sponsors, institutions and stakeholders).

The project team also participates in the construction of ESCo and study results in various ways:

- Firstly, it assembles multidisciplinary knowledge in order to build an argumentation capable of answering the questions posed by the sponsors. It is in charge of writing the deliverables intended for a non-scientific public (condensed report and summary report) from experts' written work and subject to their validation.

- Secondly, it can support the experts (particularly through the project managers) in carrying out certain technical/computational operations to produce quantitative results and/or to support studies which are complementary to the bibliographic analysis: textual analysis of the corpus, context analysis based on technical literature etc. In all cases, the project team does not replace the collective of scientific experts: it supports but does not endorse the scientific responsibility of the results it helps to produce.

Each project team member has a specific role:

- The project manager is responsible for the coordination of the team. He/She writes the project's summary report (8 pages) and coordinates and participates in the writing of the larger condensed report in collaboration with the other members of the project team.

-- The role of mission heads is generally twofold: they take part in certain operations such as data preparation and processing, textual analysis of the corpus, conducting

simulations, analysis of the context of the request etc. In this case, even if they are part of the project team, they may spend a significant part of their time with one of the leads or scientific experts. Depending on the operation in question, they can also participate in the general organisation of the exercise to support the project manager (or even the archivists): organising meetings, writing deliverables etc.

- The logistics and financial management officer organises the material conditions for the completion of the work. They take care of project management logistics and all aspects related to the financing of the project.

- Archivists establish and develop the bibliographic corpus. They conduct the preliminary exploration of bibliographic databases during the instruction phase, developing the requests for the collection of references in interaction with the experts, then putting these corpuses at their disposal, supporting experts in the sorting of references, creating lists and the use of reference management software etc. Ultimately, they develop the final list of references cited in the ESCo extended report or study and conduct a bibliometric analysis.

- Where possible, another DEPE engineer joins the project team to monitor the progress of the work. They are not involved in the organisation of the project, do not interact with the experts and do not take part in the drafting of the deliverables, but attend the plenary meetings of the working group. This monitoring of the work, looking in from the outside compared to other members of the project team, means they can fulfil the role of a 'discussant' within DEPE.

On average, the time invested by project team members is estimated as follows:

- Project manager: full-time if they work alone in the project management role, 40% of their working time if not.

- Mission head: full-time.

- Logistics and financial management officer: around 30% of their working time.

- Archivist(s): variable according to the nature of the operation, around 30% for an ESCo, 10 to 40% for a study.

- Possibly, a DEPE engineer to support the project manager: 5% of their working time.

2.4. Identification and analysis of links of interest

In keeping with the principles of impartiality and transparency that govern ESCo and studies, DEPE ensures the identification of any existing conflicts of interest between experts and stakeholders, which are not limited to the economic and socio-professional sphere but also includes the non-profit sector. The transparency of experts' commitments in a professional or personal capacity related to the topic of the collective scientific

assessment is guaranteed by a declaration of interest (DI) which they must provide before the beginning of each exercise.

As far as possible, potential conflicts of interest [8] must be detectable at the time the expert group is formed (see Section 2.2.) to avoid soliciting a potential expert who would subsequently be excluded from the collective because of the late identification of a major conflict of interest. Nevertheless, links of interest that the experts maintain are only partially known during the forming of the collective, and they are therefore asked to explain them (exhaustively) in a declaration of interest.

The aim is not to limit the group of experts to only those experts who do not have any links of interest with stakeholders, because to carry out their research activities researchers and engineers in public research organisations are encouraged to work in partnership with the private sector. Instead, the idea is to consider that by collective reflection we will be able to correct and neutralise possible individual biases through the adversarial approach and transparency within the exercise. In this way, beyond major conflicts of interest, it is important to ensure the balance of links of interest at the scale of the entire collective so that they do not affect the orientation of collective reflections and do not prejudice the formulation of general conclusions encompassing potentially contradictory results and interpretations. A group of experts where the majority have links of interest with the same category of actor is not desirable.

The DI form currently used by DEPE is based on the model suggested by the decree of 9 May 2012 and the decree of 5 July 2012[9], it contains information concerning:

- The expert's primary and secondary activities over the past 5 years.

- The activities which they direct and which have received funding from a private for-profit or non-profit organisation, and whose subject falls within the thematic scope of the exercise.

- Financial interests in the capital of a company whose corporate purpose falls within the thematic scope of the exercise.

- The mention of close relatives who are employees and/or who have financial interests in any structure whose corporate purpose falls within the thematic scope of the exercise.

- Other links of interest which should be made known, especially partners and non-public funders of research projects in which the experts participate

- In the annex, not made public, the amount of any remuneration is noted.

[8] A conflict of interest is defined as "A potential conflict arises where a public official has private interests which are such that a conflict of interest would arise if the official were to become involved in relevant (i.e. conflicting) official responsibilities in the future". European Court of Auditors. Management of conflict of interest in selected EU Agencies. *Special Report* no 15. 2012; ISBN 978-92-9237-876-9; DOI:10.2865/21104 [PDF] 106p.

[9] Relating to public declaration of interest and transparency in public health and safety

A review panel[10] analyses all DIs for an exercise in order to produce a diagnosis on the balance of links of interest of the experts at the collective scale. To do this, in addition to the individual DIs of all the experts, the project manager provides a 'mapping' of the links of interests in the collective, providing a summary representation of the types of links of interests represented. In the event that the group has a majority of links with certain actors in society or a category of actor, the panel examines in more detail (expert by expert) these links of interests whose over-representation within the collective is likely to prejudice the balance of the project. Special attention is paid to the DI of the leads. When the panel considers that the DI is insufficiently complete through the inattention or misunderstanding on the part of an expert, it may have to ask the expert to complete or check the completeness of their declaration. Some experts who have major commitments with one of the stakeholders may be dismissed by DEPE and replaced[11] by another expert with the same or similar skills. Possible public statements are also carefully examined and may eventually lead to the substitution of experts. The signed declaration of interest remains the responsibility of its signatory.

All completed and signed DIs must be in possession of DEPE before the first expert meeting. The DIs are archived and can be consulted (with the exception of their annex) if an external request is received. They are subject to regulation (CNIL, Commission Nationale de l'Informatique et des Libertés) and experts have a right to their access and rectification.

The mapping of the links of interests is maintained by the collective and its analysis is joined to the extended report of an ESCo or study in order that this important element of the composition of the group of experts is made public.

[10] Including, at a minimum, members of INRA's ethical monitoring committee, a representative of the scientific director(s) concerned and DEPE's director.

[11] On the proposal of the project team, the DG of INRA decides whether or not to make substitutions

Chapter 3. Creation and use of documentary corpuses in ESCo and studies

The purpose of this chapter is to present the principles adopted in ESCo and studies to ensure the most exhaustive bibliographic research possible and the traceability of the corresponding reference collection processes. The creation and analysis of the documentary corpus during an ESCo or study are key steps in determining, from the outset of a project, both the relevance of the selected bibliography and the choice of the experts who will participate in the exercise.

The main steps in the creation and bibliometric analysis of the documentary corpus are presented here. It describes the main sources used to form the corpus(es), from the available scientific and technical literature, and the specificities related to the disciplines concerned (life sciences, social sciences, law and philosophy). The main stages of the creation and refinement of corpus(es) are then presented. Finally, we address the qualitative and quantitative uses of the corpus(es) used to describe the corpus(es), to visualise its content, to reduce it (sorting and selecting relevant references) and to produce the summary. These analyses aim to refine and select the questions to be included in the specifications of the exercise, according to the themes treated in the literature, to divide the corpus between experts in accordance with their thematic competences, to describe the characteristics of the corpus actually used by experts etc.

3.1. Typology of the documents used to form the corpus

ESCo and studies are based on so-called 'certified' references, that is to say, evaluated by scientists and deemed robust from the point of view of the working method (experimental protocol, choice of primary data etc.) adopted to achieve the results that are the subject of the reference. It is therefore necessary to specify the way in which the references that make up the corpus are certified.

Two main types of literature form the bibliographic corpus. The first, which must always claim the major share, is the international academic literature. When this is insufficient to be directly mobilised in the geographical or institutional context or when the field of study, particularly social sciences or law (see Box 2 and Section 3.1.3), is not the subject of publications in peer-reviewed journals, it can be supplemented by so-called 'grey' literature. In the particular case of law, in the notable absence of international academic literature on French law, the experts carry out a legal survey of the corpus of statutory texts relating to the purpose of the ESCo or study with a view to an analysis of the applicable law.

3.1.1. So-**called 'academic'** literature: peer-reviewed journal articles and books

ESCo and studies rely primarily on scientific articles published in peer-reviewed international scientific journals and indexed in international databases (see Box 1). It should be noted that bibliographic databases provide not only peer-reviewed articles, but also references considered to be grey literature (see Section 3.1.2.).

The publications referenced in journals in the *Journal of Citation Reports* (JCR)[12] and the lists of HCERES journals (for SHS) are considered automatically certified. These scientific publications constitute the largest share of the bibliographic corpus of ESCo and studies (around 85 to 90% of the references cited in the final extended reports).

The works published by major international publishers, which are known to have a reading committee and an arbitration process, constitute another type of reference which can be assimilated with the academic literature. An indicative list of these publishers is presented in Box 1. Chapters published in these books are considered automatically certified.

3.1.2. So-called grey literature[13]

Grey literature refers to a diversity of documents produced by governmental bodies, multilateral or non-governmental bodies, education and public research, trade, industry, NGOs and other think tanks, in paper or digital format, which are not controlled by commercial publishing, and which are made available directly by the creator. This category includes reports, dissertations, theses, technical publications, statistics etc.

In some cases (where scientific knowledge is poorly contextualized, unconfirmed or incomplete), the exploration of grey literature can provide additional information and recent insights (studies not yet published in the scientific literature) which is useful to complete the elements extracted from the academic literature.

[12] The *Journal of Citation Reports* is produced annually by the Institute for Scientific Information (ISI©) and lists, mainly based on citation criteria, about 6,000 journals in the fields of science and technology (*JCR Web Science Edition*) and about 1,700 journals in the field of social sciences (*JCR Web Social Sciences Edition*).

[13] According to AFNOR (Association Française de Normalisation), grey literature means any typewritten or printed document, often of a temporary nature, reproduced and distributed in fewer than a thousand copies outside the commercial channels of publishing and distribution.

Box 1. Sources used to build the corpus of ESCo and studies

- International bibliographic databases

There are different bibliographic databases that list scientific publications. Only those for which INRA has subscribed and, possibly, those accessible via project partners (ESCo or studies) will be used for the compilation of the bibliographic corpus.

Bibliographic databases accessible to INRA:

- *Web of Science™ Core Collection* (WoS) which refers to about 10,000 science and technology journals with limited social science coverage.
- *Medline* focused on the biomedical literature
- *Food Science Source* focused on food science and agriculture
- *EconLit* focused on economic literature.

Description of the bibliographic databases: http://www6.inra.fr/reselec/Bases-de-donnees

Other bibliographic databases that may be used:

- *Scopus*, a trans-disciplinary database launched by the scientific publisher Elsevier in 2004, references 21,000 scientific journals, 600 industrial publications, 350 collections of books, as well as 764 conference proceedings. Compared to its main competitor (*Web of Science*), *Scopus* offers greater coverage of human and social sciences and non-English-language journals.
- *CAB Abstracts*® (publisher CAB International) focused on applied disciplines related to life sciences.
- *Pascal*: French bibliographic database (managed by CNRS) in science and technology. It covers seven themes: Energy, Environment, Materials, Nanosciences and nanotechnologies, Security, Cognition, and Information-Communication-Digital.
- *Francis*: French bibliographic database (managed by CNRS) in the humanities and social sciences
- *Repec*: bibliographic database of work done in economics.

Open archives

- *HAL*: https://hal.archives-ouvertes.fr/

Examples of major publishers

- Cambridge University Press http://www.cambridge.org
- CABI Publishing http://www.cabi.org/bk_AllTitles.asp
- Wageningen Academic Publishers http://www.wageningenacademic.com
- John Libbey Eurotext http://www.jle.com/fr/index.md
- Springer http://www.springer.com
- Wiley-Blackwell http://eu.wiley.com
- Elsevier http://www.elsevier.com/wps/find/authors.authors/bookauthorshome

Box 2. Specificity of bibliographic corpuses relating to social sciences

Literature on the social sciences is often scarce: few academic articles are available, especially on topics of a technical or specialised nature in which INRA is most often involved. The results of work carried out in these disciplines are also published in national journals which are not referenced in international bibliographic databases or in the form of works in national languages. As in the life sciences, grey literature is, in these areas, difficult to collect exhaustively and to sort. This literature is also rarely applied to the specific questions included in the scope of each exercise.

Given this situation, and in particular for ESCo, it may be relevant to steer the analysis towards mapping of the research which relates to a wider subject than that of the exercise in order to describe the various ways in which the theme of the exercise is approached in social sciences. The objective is to situate the specific problem of the exercise in relation to other issues dealt with in the social sciences. The conclusions of such an analysis then constitute a fine diagnosis of the state of social science research and the identification of knowledge needs, in particular to answer the questions specifically asked by the sponsors.

Sources considered as automatically certified for original publications or journals, come from journals inventoried by CNRS (Centre National de la Recherche Scientifique), ERIH (European Reference Index for the Humanities) and HCERES (High Council for Evaluation of Research and Higher Education). A compilation of these lists and JCR Social Sciences was done internally at INRA by CREBI. The heads of INRA's 'Social Sciences, Agriculture and Food, Space and Environment' and 'Science for Action and Development' departments can also be consulted for opinions on the validity of certain sources of literature.

In this type of literature, we find:

- Articles in non-peer-reviewed journals, scientific conference proceedings[14] and working papers (often in the social sciences), partly accessible via international databases.

- Theses and dissertations submitted by French and/or foreign students, also largely available via international bibliographic databases.

- Reports produced by French or international bodies or working groups that carry out scientific assessments or studies in accordance with working procedures similar to those applied by DEPE: for example, expert panels and/or international programmes such as IPBES, IPCC, European Joint Research Centre, European or international agencies, multilateral bodies such as FAO, OECD, IIASA etc. By the way these results are produced, these references are often considered to be robust from a scientific point of view and, in any case, are difficult to circumvent in the corpus to be mobilised.

- Various reports produced by national or international NGOs such as WWF or Greenpeace and think tanks such as the World Resource Institute (WRI) whose production volume, importance in debates, success and interest are growing.

[14] Presented as either a full text of more than one page or as a half-page abstract.

- Finally, other types of information can be used: raw or analysed results of surveys (for example, the Agreste documents produced by the statistics and foresight department of the French Ministry of Agriculture), publications resulting from collective actions (including websites, blogs etc.), technical literature produced by technical institutes, various institutional 'reports' (parliamentary, ministerial, Court of Auditors, European) etc.

Unlike academic literature, grey references cannot be exhaustively identified or considered as automatically certified. Therefore, care should be taken that the use of these sources is parsimonious in order to limit the bias introduced by the lack of completeness and that their use is well-defined and limited to certain phases of the summary work (see Section 3.3.). Finally, the selection and certification of these sources can only be placed under the responsibility of the expert group and scientific leads, who will have to evaluate the robustness of the methodology and the generic nature of the results as they would if they had to evaluate the work if it was submitted to a peer-reviewed international journal.

3.1.3. Special case: corpuses of statutory texts

Regarding law, there is very little academic literature on French law so constructing a summary of scientific analyses of regulatory texts is not possible. Past experience has shown that it is in the interests of sponsors, particularly French ones, to have an objective study of the applicable French law. To do this, we suggest to the legal experts mobilised that they conduct legal engineering work designed to examine the coherence of the corpus of regulatory texts applicable to the set of questions in the ESCo or study (French and European legislation according to the particular field). Their assessment is therefore based on the application of legal reasoning to a body of texts.

The publications used by the legal experts are at the same time regulatory texts, analyses of case law and comments on the legislation. Sponsors and other ministerial services may be required to identify regulatory texts for inclusion in this specific corpus.

3.2. Creation and refinement of the corpus

The creation of most of the bibliographic corpus takes place from the beginning of the activities of the expert group and then runs throughout the exercise. This work is done by and with the archivists, experts and the project team. In applying the principle of transparency in the working methods adopted in ESCo and studies, all the stages of the creation and refinement of the corpus are formalised and provide written traceability.

From the main keywords of the request, supplemented by keywords suggested by the scientific leads and experts, an 'initial' corpus is created by interrogating international, multidisciplinary or specialised bibliographical databases. The experts suggest keywords corresponding to the themes they are responsible for in the exercise. This initial corpus allows the experts to identify major works on the subject (summaries, seminal articles, articles often cited etc.). In order to conduct a diagnosis of what the international literature allows them to address and identify, other keywords provide the means of developing more accurate queries in bibliographic databases. The aim is to provide a corpus that can be analysed by the experts, giving priority to the relevance of the references in relation to the subject and its context (for example, the focus on a particular geographical area, the search for articles concerning temperate zones and whose results can be transposed in France).

Divided into thematic and/or disciplinary sub-corpuses, this initial corpus is then gradually refined by the experts to achieve, at the very end of the project, the 'final' corpus, in other words those articles actually quoted in the extended report. On average, an expert deals with an initial corpus of several hundred publications, eventually selecting one hundred. The refining of the corpus is done in several complementary ways. Through iterative steps, experts eliminate and add references to the corpus that the archivists have transmitted to them.

Those eliminated are:

- Through the reading of titles and abstracts, those references deemed to be beyond the topic of the request. Indeed, although queries are built from keywords specific to the themes of the exercise, it is never possible to develop queries collecting only relevant references. Many references beyond the subject in question are collected.

- Redundant references, including old references whose results have been repeated and updated in more recent articles.

- The primary bibliography cited in reviews considered particularly relevant, the reviews being preferred by the experts because they already represent an overall analysis of the scientific literature.

- References that experts consider to be methodologically unreliable, insufficiently generic or cannot be transposed to the particular context.

Conversely, experts add to these corpuses:

- References from their personal bibliographic database that are not collected by keyword searches: in particular these include references to fields related to the scientific assessment and considered essential by the expert to treat or clarify the issues they are dealing with; some may come from non-indexed journals in bibliographic databases, which experts know about through the bibliography they have constructed as part of their own research activities.

- References from grey literature.

During the process of refining the corpus, experts must explain why they reject or add references, and the criteria by which they certify references from grey literature. These justifications can be integrated into the extended report. Experts also make a general and qualitative commentary on the particularities of their corpus: the main subjects treated, the strong representation of an author or team, the existence of a report/series of works which are authoritative in the field, the geographical context of the work (interesting if we are considering the transposition of the results to France) etc.

In this phase of refining the corpus, care must be taken to ensure that the elimination process does not reject those references that make it possible to draw up a table of current scientific controversies, on which some experts may have an overly entrenched position. Similarly, additions may tend to broaden the subject to be addressed by experts beyond the specifications, potentially unbalancing or distorting the response to public authorities.

3.3. Qualitative and quantitative analyses of the corpus

The huge increase in the number of scientific articles published annually - an exponential trend that does not seem to be slowing - increases the difficulty of the process of selecting the corpus and the critical summary work required of the experts. To support this process, automatic methods of corpus analysis are increasingly being used. These textual analysis tools, which are similar to qualitative analysis methods such as correspondence analysis, make it possible to quickly and easily map and visualise an extensive set of texts (publications most often seen through their title, abstract, keywords, authors and the institutions to which they belong) by positioning them in relation to each other according to the co-occurrences of the main keywords they contain, or the authors or institutions which lead these publications. These automatic procedures make it possible to understand the various themes present in the corpus and thereby the way in which the scientific literature has tackled over time the different facets of the questions posed during the ESCo and studies. They also make it possible to assess the significance of certain currents, certain authors or networks of authors.

These tools can be used for many purposes. First of all, they are useful for distributing the global corpus between the various experts according to the themes they are dealing with. They can also be used to identify current themes, their evolution over time, the relationships between them and their affiliations, as well as, by default, questions which have received little or no focus in the scientific literature. These maps and the analyses that accompany them, themselves a result of ESCo or studies, can be performed on both the initial corpus and the final corpus, in other words the corpus actually used by experts to develop their summaries. The comparison between the analyses carried out at each of these stages makes it possible to identify any possible deformations in the corpus arising from the selection process in order to better explain the criteria actually used in this process.

In addition, the question of traceability or the explanation of the reasons justifying the selection or rejection of publications during the selection process is a crucial question which, if it is poorly or insufficiently documented, may taint the credibility of the assessment itself. This is why increasingly experts are being asked to come closer to the traceability standards defined by systematic review approaches. These approaches, from the biomedical field and on subjects more restricted than ESCo or the studies considered here, lie somewhere between ESCo and meta-analysis. The approach they adopt is based on a process of systematic analysis of publications based on a harmonised analysis grid that identifies the reasons for the choice or rejection and, where applicable, the main information and conclusions to be drawn from the publication. This type of approach is interesting in the process of selecting publications because of the homogenisation and traceability the analysis grid imposes. The harmonised synopses can also be used as support for some studies that more or less explicitly include meta-analysis-type objectives as well as the more classical summary work done by experts during the ESCo or reviews they regularly conduct. Nevertheless, in the case of ESCo, experience has shown that the mobilisation of only the synopses resulting from a systematic review process is often insufficient to conduct a critical summary of the results contained in the corpus under analysis and to discuss in depth robustness, genericity, transposability to various contexts, determinants of variability, sources of uncertainty etc. It is often necessary, for the experts who wish to use these synopses, to return at one time or another to all or some of the publications themselves to extract more precise or more specific information.

Finally, alongside 'certified' scientific literature, ESCo or studies conducted according to DEPE procedures must examine the complementary contributions of so-called grey literature. As we have seen, this is of increasing importance but it cannot, however, meet the double criterion applied to scientific literature: the exhaustiveness of its identification and the 'certification' of knowledge related to the peer-review process used by scientific journals. This is why the use of this literature in ESCo and studies must be subject to certain rules. Firstly, before it is incorporated in the corpus, experts are asked to conduct a critical analysis of the methodology used, the analytical tools employed and the modes of interpretation and discussion of the results, just as they would if working for an academic journal. Moreover, and considering the central role that this literature must play in framing the questions asked, societal issues that refer to them and the terms of the socio-technical debates and controversies they engender, the results from them cannot be considered sufficient to provide 'acquired knowledge' on their own and thereby be sufficient for drawing reliable conclusions. They can be mobilised to confirm results acquired elsewhere, while refining them with reference to the specific contexts in which they were obtained and are interesting with regard to the questions asked in DEPE's ESCo and studies. When these results position themselves, alone, in contradiction or as a counterpoint to published scientific results, they cannot be considered as directly participating in the scientific controversy; at most, they can be seen as questioning

scientific results and, as such, fuelling public debate and socio-technical controversy. They must then be examined carefully with a view to further work and additional research needs.

3.4. Bibliometric analysis of the final corpus

At the end of the exercise, archivists conduct statistical, bibliometric and cartographic analyses of the bibliographic corpus cited in the extended report. Subject to the quality (level of completeness, homogeneity) of the metadata associated with the references that constitute the corpus, which are automatically collected at the time the corpus is compiled, this descriptive analysis can relate to different items:

- The typology of documents: academic articles, reviews, conference proceedings, statistics, reports etc.
- The thematic breakdown: number of references per chapter
- The year of publication of the references
- The main formats of the publications
- The main authors by theme
- Keywords and/or thematic descriptors of the references

Depending on the case, textual analysis tools to represent the co-occurrence of networks, geographical distribution and mapping of concepts or keywords can be used.

These different analyses are integrated into the final extended report.

Chapter 4. Deliverables process and dissemination of ESCo results and studies

ESCo and studies seek to inform public policies and foster public debate, and their results are made available to as many people as possible and made public and freely accessible on the INRA website. Deliverables from these exercises are not the property of the sponsors.

ESCo and study deliverables do not include any advice or recommendations (unlike risk assessment agencies, for example on health, where they may be ventured).

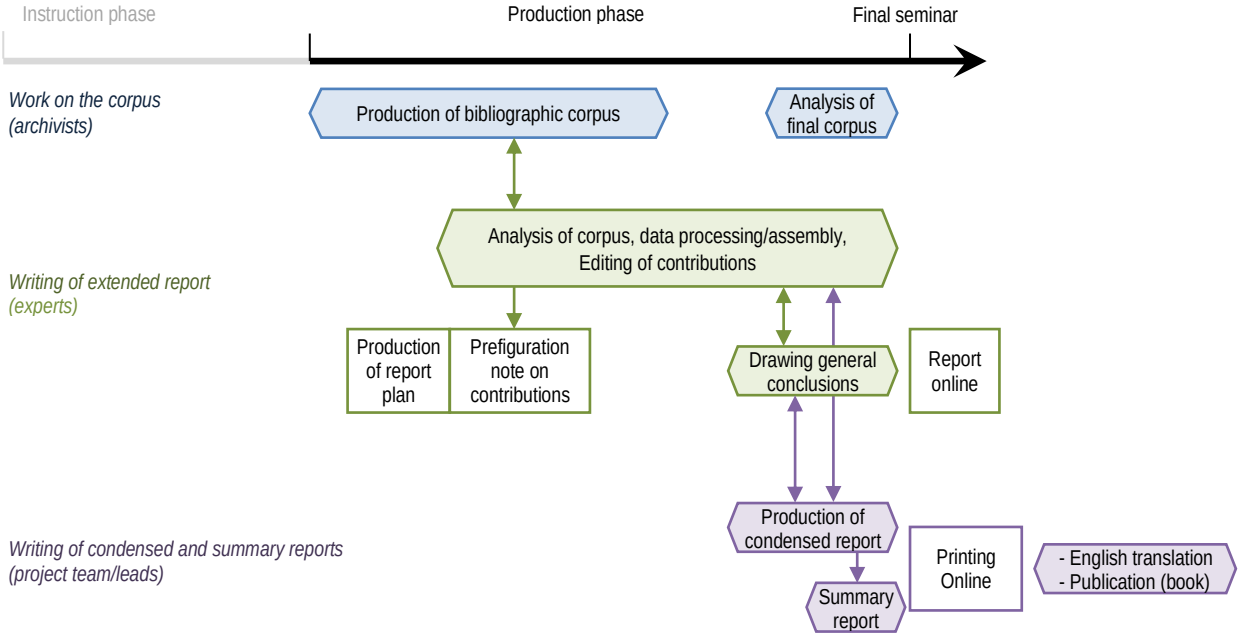
These exercises lead to the writing of three types of deliverables. The extended report, often voluminous, brings together all the critical contributions and analyses written by the experts on the basis of the bibliographic corpus (see Chapter 3) as well as the list of these bibliographical references. In the case of studies, it also includes a description of the data assemblage and processing methodologies developed by the experts, as well as details of the results of their implementation. The extended report serves as a basis for the writing of a condensed report, intended for the sponsors of the exercise (policy makers and decision makers, operatives in ministries or agencies), and more broadly to the societal actors concerned and/or interested in the problematic (associations, professional organisations, stakeholders in value chains etc.). Finally, a summary report (usually 8 pages) is intended to communicate more broadly the major conclusions of the work.

The results and conclusions of ESCo and studies are also made public and discussed with stakeholders at a seminar which is open to all. The condensed and summary reports are then disseminated.

Finally, the scientific exploitation of the results in the form of academic publications is also a major objective of these exercises.

A schematic flow of the extended, condensed and summary reports of an ESCo or study is presented on Figure4-1.

Figure 4-1. Schematic flow of the extended, condensed and summary reports of an ESCo or study



4.1. Extended report

In ESCo and studies, each expert writes a contribution summarising the elements they have extracted from the bibliographic corpus assigned to them, accompanied, in the case of studies, by the results of the complementary analyses, statistical treatments or specific simulations which have been conducted. All the experts' contributions as well as the lists of bibliographical references and descriptions of the complementary treatment methodologies on which analyses are based constitute the heart of the extended report, which also contains elements framing the subject as well as the general conclusions of the work. The report is several hundred pages long.

4.1.1. Structure of ESCo and study extended reports

An ESCo's extended report is usually structured as follows:

- A framing chapter presents the work methodology adopted by the group and the elements allowing the initial request to be contextualised as well as the bibliographic analysis carried out by the experts. This chapter is partly based on grey literature and can mobilise statistical data to describe the purpose of the work and provide elements for understanding the institutional and geographical context in which the question is posed through the ESCo.

- The contributions written by experts are organised in several analytical chapters (each with several contributions). The scope of contributions is defined according to the area of expertise of the experts. Each contribution thereby responds through its construction to a disciplinary logic. The chapters are structured around the scientific issues dealt with in the exercise. Each chapter ends with conclusions that integrate the messages provided by the contributions that compose it. Attached to each chapter is a list of the bibliographic references cited in the chapter contributions.

- The final chapter presents the general conclusions of the exercise. It is constructed from the content of the analytical chapters and therefore does not re-quote the bibliographic references previously used. The chapter of general conclusions presents the argumentation responding to the sponsors. It abandons the disciplinary logic of previous chapters and therefore offers a transversal and by necessity multidisciplinary reading of the analytical chapters. It is most often structured in relation to the questions formulated in the specifications.

- In the annex the results of the bibliometric analysis of the corpus formed by the references cited in the extended report are presented (see Chapter 3 of this document), produced by the archivists.

- The extended report also includes a description of the group of experts, presenting the disciplinary skills mobilised, as well as a summary analysis of the links of interests that the group has with stakeholders (mapping of the links of interests, see Chapter 2 of this document).

Study reports also include a framing chapter and general conclusions, but the structure of the body of the report is more variable, depending on the subject and the link between the bibliographic analysis component and the component covering data processing and assembly. The latter is often the subject of a specific section of the report presenting the objectives, methodology, data and results of each of the complementary analyses conducted. Bibliographic analysis and complementary processing of other data may also be assembled within thematic chapters.

4.1.2. Different stages, participants and their role

The extended report plan, and in particular the analytical chapters, are developed collectively by the experts in an iterative way, starting from the structuring of the subject into scientific questions and taking into account the resources actually available in the scientific literature . The project team is involved in the drafting of the framing chapter and participates alongside the scientific leads in monitoring the progress of writing and reviewing the contributions. At the end of the exercise it provides editing support, in particular the layout of the extended report and monitoring of the cited bibliographic references. In addition to its classic purpose of verifying that all references listed are identified in the text and vice versa, this final checking process is more fundamentally aimed at ensuring that any assertion advanced by the experts is well documented and supported by scientific literature.

Framing chapter

Ideally, the writing of this chapter by the project team and leads starts very early in the process of conducting the ESCo or study in order to contribute to the construction of a common culture among the experts and a shared understanding of the issues underlying the questions posed by sponsors. Many of the framing elements gathered in this chapter can be reused by the experts in writing their contribution to position the contributions of their analyses in the overall problematic suggested by the group.

Analytical chapters

At the beginning of the ESCo or study's implementation phase, an *a priori* plan is drawn up by the group in order to divide the scientific questions between experts and to identify the perimeter of each contribution. The wording of the specifications in the form of more

or less hierarchical and structured questions sometimes foreshadows an extended report plan, but does not constitute a plan imposed on the group of experts. Once the individual bibliographical corpuses have been broadly defined, the experts write a preparatory note of a few pages on their contribution, presenting a diagnosis of what the literature can deal with in relation to the scientific questions listed in the specifications, and suggesting a detailed plan of their future contribution based on this initial analysis of the corpus. These notes are discussed within the collective and this confrontation makes it possible to confirm the extended report plan.

On the basis of this note, each expert then prepares a contribution of approximately 10 to 20 pages, to which is added the list of bibliographical references and, possibly, methodological annexes. Cross-reading of the contributions by the scientific leads, the project team and other experts leads to a reworking of the content in relation to the questions and remarks made and to drawing lessons which will be useful for the collective in creating general conclusions. Complementary information is also often introduced in the extended report following the work completed on drawing conclusions and writing the summary as this work may reveal missing elements in the demonstration of conclusions or lead to a more synoptic presentation of the results (tables or diagrams etc.). Each expert writes a conclusion at the end of their contribution.

Once all the contributions of the same chapter have been written, they are assembled and combined by the experts according to the collectively agreed plan, taking care to ensure it remains easy to read (sub-titles). The diversity of writers induces a certain assumed heterogeneity of the texts. For each chapter, the experts collectively write an introduction and a conclusion that integrates the messages provided by their individual analyses.

Chapter of general conclusions

The overall conclusions of the work are developed collectively on the basis of the ‘disciplinary’ conclusions of the individual contributions and the more integrative conclusions of the chapters. Scientific leads write a first version of this chapter, taking care to distinguish between acquired and confirmed knowledge and more uncertain or controversial information, and to report any diverging opinions among the experts on certain points. This chapter also includes a section on the knowledge gaps identified by the experts that may require the implementation of new research programmes but also the carrying out of additional studies or the production of additional data or indicators. The chapter of general conclusions adopts a much summarised approach (around 10 to 20 pages) and refers explicitly to the different sections of the extended report as much as necessary in order to facilitate understanding.

4.1.3. Status and dissemination of the extended report

The extended report is signed by all the experts (including scientific leads), who are responsible for its content. It is confidential until it is put online on the INRA website and given to the sponsors. It is never communicated to the members of the monitoring committee or to those of the stakeholder advisory committee before its final validation by the experts.

The extended report has no referenced editorial status, it is not translated and is not submitted to a scientific reading committee. It is a scientific document, consulted in a rather selective way by a scientific or specialised public. It is only available online, on the INRA website dedicated to the operation, from where it is directly downloadable in its entirety[15].

How to cite the extended report

Scientific leads (coord.), project manager (coord.), experts and other members of the project team in alphabetical order (date). Document title. ESCo extended report/study, INRA - possible partners (France), xxx pages.

4.2. Condensed report

Based on the general conclusions of the extended report, the project team develops (in close relation with the scientific leads) and writes a condensed report. After providing the framework for the issues examined, this document presents answers to the specifications for a non-scientific but informed public. Primarily, it is intended for the sponsors (ministerial managers and policy makers), as well as stakeholders of the issue dealt with in the exercise. It is also written for other publics who may be concerned with the issue (scientists in other fields, teachers and students, informed public etc.). Through its drafting and length (from 50 to 100 pages), the condensed report represents an access point to the extended report, which readers can consult to deepen their understanding of points which particularly interest or intrigue them.

In general, a limited number of bibliographic references are mentioned in the text of the condensed report. The document may, however, include a final bibliographic selection when the experts believe that it is possible to establish such a limited list of key publications.

[15] http://institut.inra.fr/Missions/Eclairer-les-decisions

4.2.1. Structure of the condensed report

The condensed report is not limited to presenting the general conclusions of the exercise, already formulated in the report. It also reports on the more sectoral approach and conclusions of the analysis, and can introduce more generic elements which are useful for the non-scientific or non-specialist reader to understand the reasoning presented. It must be possible to read and understand the condensed report without the need for the extended report. Mostly intended for French public policy makers and French public policy stakeholders, it is written in French (unless specifically requested by the sponsor) but is systematically translated into English.

Its wording is based on the three levels of conclusions formulated in the extended report: the 'disciplinary' conclusions of each contribution, the more integrative conclusions of each chapter and the general conclusions, which are the most transversal and multidisciplinary.

All information presented in the condensed report must be based on the elements detailed in the extended report.

The condensed report also includes a summary of the bibliometric analysis of the final corpus conducted by the archivists.

The outline of the condensed report may be different from that of the extended report and, in particular, closer to the questions that motivated the request. Similar to the concluding chapter of the extended report, it should allow further integration of the contributions from different disciplines. Passing from the extended report to the condensed report requires a collective reflection so that the logic of its construction, different from that of the extended report, is well understood and appropriated by all the experts, and that the project team takes into account the remarks of the experts in its writing.

The size of the condensed report depends on the scope of the subject, but represents about 10% of the volume of the extended report, in other words dozens of pages rather than hundreds.

4.2.2. Different stages, participants and their roles

The condensed report is written, completely or mainly, by one or two people from the project team for two main reasons:

- The writing style must be more 'popularised' than the extended report, in order to allow a non-scientific or non-specialised public to appropriate the results of the work.

- A limited number of writers favours a more homogeneous writing of the document (unlike the extended report which deliberately presents a diversity of writing styles between contributions).

The preparation of the condensed report starts fairly early if possible, as soon as the general conclusions emerge and are confirmed. The exercise itself takes time. In addition, it may reveal shortcomings in the experts' contributions in terms of explaining certain mechanisms, stages of reasoning or the contextualisation of the results, thereby prompting the project team or leads to ask for complementary information from the experts. This means it is necessary to start writing the condensed report early in order to save time in finishing the writing of the extended report based on the needs identified for the condensed report.

Firstly, the project team suggests, in consultation with the scientific leads, a plan for the condensed report. This is discussed with the experts and a consolidated version of the plan is adopted. The project team, assisted by the leads, then prepares the condensed report in interaction with the experts, who are responsible for correcting/completing and validating the document.

A very advanced working version of the condensed report is then submitted to a number of people for proofreading:

- Scientists from beyond the working group are asked to express a critical opinion on the overall coherence and robustness of the work, and on the adequacy between the elements of response given to the sponsors by the expert group and the initial specifications. They are also asked, to the extent of their knowledge of the particular field, to point out any gaps in the issues and knowledge mobilised. This proofreading helps to measure the consensual, uncertain or controversial nature of the points developed.

- INRA Scientific Director(s), and their counterparts in partner structures if required, read the condensed report for information and appropriation of the content as the public sharing of the results approaches. Moreover, they offer a critical rereading and raise the alert over any questions or formulations which are insufficiently clear and help identify the political issues around the results of the work.

- The monitoring committee is asked for an opinion on the readability of the document, its pertinence to the questions listed in the specifications and the appropriateness of its content in order to support public decision-making, but it does not intervene on the content of the analyses nor the conclusions.

The opinions, remarks and suggestions made by these reviewers do not necessarily give rise to changes in the condensed report, as the expert group remains the judge of what follow-up there should be, though they justify any non-integration of a comment or suggestion (lack of literature, points of view not documented or insufficiently substantiated in the literature, remarks beyond the scope of the order etc.).

4.2.3. Status and dissemination of the condensed report

As with the extended report, the experts are collectively responsible for the contents of the condensed report. The scientific leads as well as the members of the project team who contributed to its writing are identified as authors on the cover page of the document. The exhaustive list of members of the working group (group of experts and project team) is included in the summary and references of this document.

The condensed report is most often distributed on the day of the final seminar and is simultaneously posted on the INRA website (and those of its partners) and remains there. This open and free access to the condensed report is non-negotiable. Several hundred copies of the document are printed for free distribution during the seminar and at other presentations, and distribution in INRA centres and among various partners. The condensed report can also be submitted for publication to a scientific and technical publisher (such as Quae etc.), most often in a reworked version.

The condensed report is translated into English and this version is also put online[16]. This version may be submitted for publication to a specialised scientific journal, usually in the form of a special issue, or to an international scientific and technical publisher, such as Springer.

How to cite the condensed report

Project manager (coord.), scientific leads (coord.), experts and other members of the project team contributing to the condensed report in alphabetical order (date). Document title. ESCo condensed report/study, INRA - possible partners (France), xxx pages.

4.3. Summary report

As a medium for institutional communication, this short document (typically 8 pages) is designed to communicate broadly and easily the results of the exercise, and to facilitate the understanding and ownership of the main lessons of the work. It is produced for broad distribution, among participants in the seminar, journalists, various publics (professionals, associations, elected officials, teachers etc.). Beyond the news of the ESCo or study, it is used by INRA, its partners and sponsors during events or meetings on the subject dealt with by the collective scientific assessment or study.

[16] http://institut.inra.fr/en/Objectives/Informing-public-policy

4.3.1. Structure of the summary report

The summary report is written at the very end of the exercise, in the weeks preceding the final seminar. This document summarises in a very brief form the context, the issues in the request and a summary of the work's main conclusions.

It is written using the condensed report as its inspiration but with a drastic reduction in volume (passing from a document of 80-100 pages to just 8 pages). Its writing is a careful balancing act, respecting accuracy and scientific rigour (avoiding excessive simplifications, loss of nuance, the caricatured presentation of some elements) while meeting the requirements of communicating the results with an audience of actors who sometimes have a strong expectation of the exercise, given the issues it represents for them.

4.3.2. Different stages, participants and their role

The content and wording of the summary report must be approved by the scientific experts, INRA's executive management and the sponsors, though the latter have no 'right of veto'. The production of this document therefore requires numerous iterations between the various interlocutors (project team, experts, management and sponsors).

The project team writes a first version of the summary report based on the specifications (context and issues in the request) and the elements and conclusions of the summary. This text is first discussed with the scientific leads to ensure that its content remains faithful to the conclusions of the ESCo or study while remaining easily readable.

INRA's executive management then provides a more strategic and institutional reading of the document. Its knowledge of the severity of the issues for stakeholders helps the writers of the summary report to (re)formulate the messages so that they are intelligible to actors and publics with divergent or even antagonistic interests.

The document is then sent to the sponsors. Their remarks on its readability and comprehensibility are taken into account as much as possible, but they do not have the power to validate or intervene in the production of the document as long as it is in conformity with the exercise's conclusions.

The final validation of the document is carried out by INRA's President and Chief Executive Officer, INRA remaining the ultimate guarantor of the robustness of the exercise and the formulation of the messages that emerge from it.

4.3.3. Status and dissemination of the summary report

Unlike the extended and condensed reports, the summary report is an institutional document. Its authors are not explicitly mentioned in the document, but the project manager and the scientific leads are mentioned as contacts. It also makes explicit reference to the other deliverables of the exercise.

Like the condensed report, the summary report is posted on the INRA website on the day of the final seminar and remains so. It is also published in large quantities for free distribution at the seminar and on every occasion which is suitable for the dissemination of the work's conclusions.

It is systematically translated into English, edited in this form and posted on the institute's website.

The summary report is also disseminated on mobile media, via an application available on tablets and smartphones produced by INRA[17] to widely disseminate the results of operations conducted by DEPE. In order not to have to create a new document, imposing new edits and validations, the choice has been made to rely on the summary report and videos of the seminar to provide this content. To meet the requirements of reading on small screens, summary report text and videos are divided into thematic sections which can be searched independently of each other.

How to cite the summary report

INRA - possible partners (date). Summary report title. Summary report of ESCo/study, INRA - possible partners (France) 8 pages.

4.4. Seminar

The conclusions of ESCo and studies conducted by DEPE are made public at a seminar (typically half a day), an event which meets three requirements: (i) respect for the principle of transparency set out in the charter of scientific expertise in support of public decision-making, (ii) the need for INRA (which provides more than half of the budget dedicated to these exercises) to transfer the knowledge produced to society, represented here by stakeholders, (iii) INRA's mission of fuelling public debate and participating in the dissemination of scientific culture on the themes which are the subject of these exercises.

[17] Application produced by INRA's Vineyard Health and Agroecology unit in Bordeaux. Available free at Apple store: keywords 'DEPE Inra'. Consultable with Itunes application on PC: https://itunes.apple.com/fr/app/depe/id643591712?mt=8

The seminar programme is established by the project team, in collaboration with the DEPE director, INRA's executive management and the sponsors. The seminar is usually facilitated by a scientific journalist and organised around two central sequences: (i) a presentation of the work and results by the project team and experts and (ii) a debate of its conclusions through one or two round tables comprising of representatives of actors directly concerned by the ESCo or study. The introduction, generally provided by the sponsors, is an opportunity for them to specify their expectations vis-à-vis the exercise and the issues they face. The conclusion is most often made by INRA's President and Chief Executive Officer, accompanied by counterparts from partner institutions where appropriate, and is designed to bring outstanding issues to light, requiring new knowledge and new research. .

The seminar also provides opportunities for exchanges with the audience: following the presentation of the conclusions, the experts are present to answer questions from the public (demanding complementary information, more details etc.) and then during the round table.

The key elements that determine the seminar philosophy and programme are:

- The target audience, including stakeholders, which will vary according to the purpose of the exercise.

- The national or European dimension of the seminar.

- The position of INRA, its potential partners and sponsors in the programme (introduction and closure), according to the messages they wish to share.

- The types of stakeholders that can participate in the round tables[18] : institutional representatives or practitioners in the field?

The development of the seminar programme begins at the end of exercise, from the moment the structure of the summary and the major messages of the conclusions are confirmed. A pre-programme (general orientation, sequences and speakers) is therefore suggested and discussed within the framework of the monitoring committee. INRA's Directorate General validates the final programme with the sponsors (and possible partners), especially the introduction and conclusion sessions.

The seminar is open to all and access is free (upon registration). The announcement of the seminar is disseminated as widely as possible, especially with certain specifically targeted actors (depending on the subject in question).

The practical organisation of the seminar is handled by DEPE and INRA's Directorate General and communications department. The seminar is filmed and the videos posted on the INRA website a few days after the event. A simultaneous translation into English

[18] The summary is transmitted to the latter confidentially before the seminar to allow them to prepare their presentations.

is systematically offered so that the seminar proceedings are doubled, with an English version appearing on the appropriate section of the INRA website.

4.5. Academic outputs from ESCo and studies

While putting the extended and condensed reports online on INRA's website guarantees accessibility, it offers only limited visibility. This visibility is improved by the publication of the condensed report (often reworked) in the form of a book by a publishing company. An additional edition in English is desirable to meet European or international ambitions. The international visibility of ESCo and studies and their impacts are increased by making the most of results which are subsequently published in peer-reviewed journals, which also serves to 'certify' the scientific quality of the work.

Beyond decision makers and society, it seems necessary to bring the information that emerges during ESCo and studies to the knowledge of the international scientific community and organisations such as FAO and the European Commission and Parliament. Conducting reflections in a multidisciplinary framework, in particular bringing together both the biological and social sciences, also provides an interface that can generate unprecedented scientific questions. The work carried out is therefore an opportunity to encourage the experts to write summary publications to be submitted to peer-reviewed international journals. It is also one of the preferred ways to strengthen INRA's international influence and to let it be known that it develops collective reflections on given topics, often of worldwide interest.

However, in practice this exploitation - desirable for experts and INRA and increasingly demanded by sponsors - comes up against the difficulty of maintaining the necessary effort on the subject of the collective scientific assessment after a period of intense mobilisation which has often been detrimental to other research activities. The other difficulty lies in the impossibility of directly exploiting the outputs (extended and condensed reports), even in part, and in the need for substantial rewriting to meet the standards of scientific publishers.

During each ESCo or study, the lead(s) and project team must initiate a discussion within the expert group to try to identify several 'tracks' (3 to 4 on average) that provide the opportunity for experts themselves to write manuscripts that can be submitted to international scientific journals in the biotechnical field or to specialised journals in the economic and social sciences. Decisions on publications should be made during the preparation of the summary before the end of the exercise.

Some journals covering INRA's disciplinary fields, even journals sponsored by INRA, are ready to welcome such manuscripts, spiking the interest of their readers by presenting articles at the interface between disciplines (this is the case, for example, for *Agronomy*

for Sustainable Development, *ANIMAL*, *Annals of Forest Science*). If necessary, archivists can help leads and the project team identify target journals based on the bibliometric analyses made by INRA's Scientific and Technical Information department.

The proposals for articles are formally inventoried before the end of the ESCo or study and are then regularly monitored by DEPE in order to regularly 'stimulate' researchers who will be committed to achieving this. DEPE maintains an inventory of exercise outputs and informs the Directorate General and Research Departments of the release of any new publication (and sends them a copy).

4.6. Archiving of documents from ESCo and studies

INRA conducts institutional archiving, with a 'Repository for the management and conservation of archives' was established for DEPE with the institute's archivist (see annex). It defines the list of key documents for each project which must be kept for 20 years at DEPE and then transferred to the National Archives[19]. This provision contributes to the traceability of the exercises; in the event of a challenge to the conclusions of an ESCo or study, it would allow DEPE to demonstrate that the work procedures planned to ensure the quality of the work have been implemented.

Beyond this institutional archiving, DEPE has its own, more complete archives, preserving elements (working versions of the documents, email exchanges etc.) that may be of interest in terms of the history of science (stages in the construction of the requests, discussions on controversial points etc.).

[19] This repository applies for new files and if possible for previous files.

Reference document: management and **conservation of DEPE's archives**

INRA archives 09/11/2015
Decentralised Research Support Services unit

I.d./ Activities	Typology of documents	Conservation period at INRA	Maintenance of records (following the conservation period at INRA)	Observations (justification for conservation dates; type of medium)
Collective Scientific Assessment Reports, foresight and studies				
	- Request letter (optional document) - Convention with the sponsor(s) and annexes (including the specifications) - Minutes of monitoring committee meetings (preparatory documents in the annexe) - Budget - Correspondence with experts: • Mission letters to scientific lead(s) and experts • Letters of thanks - Validation of experts • Experts' declaration of interests • Minutes from expert validation committee - Plenary expert meetings: dossier for each meeting: • Agenda • Preparatory documents (experts' pre-contributions) • Minutes of plenary meeting - Minutes of stakeholder advisory committee meetings (for some exercises) - Minutes of technical committee meetings (for some exercises) - Extended report - Condensed report (for Collective Scientific Assessment - Reports and studies) - Summary report - Bibliographic database (for Collective Scientific - Assessment Reports) - Final seminar: slideshows of presentations and video footage (produced by the Communications Department) - Press coverage - Monitoring of exercise exploitation (scientific publications etc.)	20 years from project closing date	Transfer to National Archives	Originals of convention are on paper. Preparatory documents and the budget (to be verified) are to be destroyed.

Collective Scientific Assessments and studies conducted or assisted methodologically according to DEPE principles

• ESCo

Nutritional, sensory, health and technological properties of animal products according to rearing conditions and product processing (in progress)

Can organic farming manage without copper? (January 2018)

Artificialized land and artificialization processes: determinants, impacts and levers for action (December 2017)
ESCo in partnership with Ifsttar.

Eutrophication: manifestations, causes, consequences and predictability (September 2017)
ESCo led by CNRS in partnership with IFREMER, INRA and IRSTEA, with methodological support from DEPE

Animal consciousness (May 2017)

Roles, impacts and services provided by European livestock production (November 2016)

Cumulative impact of water reservoirs on the aquatic environment (May 2016)
ESCo led by IRSTEA in partnership with INRA, with methodological support from DEPE

Use of fertilizing residual materials in agriculture and forestry. Agronomic, environmental and socio-economic impacts (July 2014)
ESCo in partnership with CNRS and IRSTEA

Nitrogen flows associated with livestock farming. Reducing loss and restoring balance (January 2012)

Herbicide-tolerant plant varieties. Agronomic, environmental and socio-economic effects (November 2011)
ESCo in partnership with CNRS

Dietary behaviours. What factors come into play? What action, for what result? (June 2010)

Animal pain: identifying, understanding and minimising pain in farm animals (December 2009)

Agriculture and biodiversity: Benefiting from synergies (July 2008)

Fruit and vegetables in diets. Challenges and determinants in consumption (November 2007)

Drought and agriculture. Reducing the vulnerability of agriculture to an increased risk of water scarcity (October 2006)

Pesticides, agriculture and the environment: Reducing the use of pesticides and limiting their environmental impact (December 2005)
ESCo in partnership with IRSTEA.

Mitigation of the greenhouse effect: increasing carbon stocks in French agricultural soils? (October 2002)

• Studies

European agriculture, climate change and world food security: evolution scenarios towards 2050 (*in progress*)

Potential of French agriculture and forestry for storing carbon in soils at a rate of 4 per thousand (*in progress*)

Assessing services provided by agricultural ecosystems to improve their management - contribution to the EFESE programme (October 2017)

What role can the French forestry and timber sector play in attenuating climate change? A study of forestry brakes and levers towards 2050 (June 2017)
Study in partnership with IGN

Visions of the future and the environment. Major categories of scenarios emerging from international environmental foresight studies (March 2017)
Study conducted within the framework of the ALLENVI transversal foresight group

Environmental effects of land-use changes related to agricultural, forestry or territorial-scale reorientations (March 2017)

Urban food systems: how can we reduce losses and waste? (May 2016)
Study led by INRA's Food department with methodological support from DEPE

North Africa - Middle East towards 2050: towards a growing dependence on agricultural imports (October 2015)

What contribution can French agriculture make to the reduction of greenhouse gas emissions? Mitigation potential and cost of ten technical actions (July 2013)

Brakes and levers for crop diversification. Study at the level of farm and value chain scales (January 2013)

Reducing nitrate leakage with intermediate crops. Consequences on water and nitrogen balances, other ecosystem services (June 2012)