ethics in common

Self-referral

"What are the rights and duties of scientists and their institutions when faced with the environmental crisis?"

October 2023



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This Guidance was translated from the French by Glyn Orpwood (<u>https://www.glyneltconsultant.com/profile</u>).

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Preface

The following Guidance¹ was undertaken as a result of a request received on our website at the end of 2022: it concerns the rights and duties of research personnel when confronted with environmental issues and was approved by the Committee at the meeting of the 25 September 2023, who considered it important enough to take on the project at their own initiative.

In its current form, this Guidance reports the discussions held between personnel from the four organisations. Additional contributions were provided by a number of teams, including participation from of a collective discussion in Nantes with local research teams, also by exchanges with the presidents of the organisations, and discussions with COMETS, the CNRS ethics committee, which has recently published two other Guidances on environmental issues.

In a context of rapidly evolving environmental issues, this Guidance is not intended to bring this debate to a close, but is simply a snapshot on the current state of thinking. The Committee invites all those who read it, to comment and share their thoughts, in order to clarify or supplement the current Guidance.

Any input would be appreciated.

Michel Badré Chairman of the Ethics in Common Committee

1. A series of publications providing guidelines and recommendations





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"What are the rights and duties of scientists and their institutions when faced with the environmental crisis?"

> Reflections in response to a question raised from a researcher on the Éthique en Commun website



The question asked was: "What rights and duties do scientists and their institutions have when faced with environmental issues?"

That every scientist must adhere to rigour, integrity and respect for ethical rules, goes without saying. However, this question of rights and duties is being raised in a new and pivotal way due to evolving environmental issues. These issues not only concern all citizens in their daily lives but are also of particular concern to scientists who are experts in the field. Their knowledge of the mechanisms at work creates new responsibilities, while also imposing new constraints. The question of their rights and duties has been the subject of two recent Guidances published by the CNRS Ethics Committee [1] [2]. This does not keep us from trying to add more weight to the debate, building on the work already undertaken, but adding a new perspective.

It is nevertheless a complex issue with several dimensions:

- the practice of research itself and its environmental impact;
- the choice of research topics by research organisations, teams and personnel;
- the expression of scientists in the public domain.

Reducing the environmental footprint of research

As this point has been covered in detail in the CNRS Ethics Committee's Guidance n°. 2022-43, we will simply draw on this work and adopt several of its conclusions.

Firstly, the authors of the Guidance call for the environment to be taken into account as a fully-fledged component of research ethics. To be effective, this requires the development of tools, based on a "scientifically sound" methodological framework, to measure the environmental impact of research, both in terms of research practices (field work) and research topics. These tools should be adopted by each laboratory so that an in-house debate can take place and strategies can be collectively developed. The guidance recommends that this reflective work should be pursued by both organisations and scientific communities. It should also be noted that INRAE, prior to this guidance, had already begun this task in

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 \rightarrow 2021, by setting up a department for "Social and Environmental Responsibility" to produce an action plan².

This initiative was preceded by an outstanding collaboration on the part of research personnel. The "Labos 1point5" collective created in 2019, set up a GDR (joint research group) in 2021, which is supported by the CNRS, INRAE, INRIA and ADEME [3]. We encourage research personnel, laboratories and organisations to ramp up their own initiatives in this area.

COMETS Guidance no. 2022-43 does not make environmental impact measurement a criterion for deciding whether a research programme should be maintained or not. It proposes, on the one hand, that a principle of proportionality should be applied, whereby the environmental impact of a research project should be weighed against all expected benefits; and on the other hand, that thought should be given to alternatives that provide comparable benefits with less impact. This formulation nevertheless raises the question of how to define and assess the expected benefits, and in particular, the reference standards against which these benefits are measured. It should also raise the question of who are the associated beneficiaries: the supposed benefits of research for society as a whole? But who speaks for this society? Benefits for the institution to which the research personnel belong? Benefits for the scientists themselves? As it stands, we believe that the evaluation criteria for both organisations and research personnel should be reviewed.

2. Additional information 8 November 2023: the four organisations INRAE, Cirad, Ifremer and IRD wish to provide additional information to indicate that this reflective work is already underway.

INRAE has been deploying a sustainable development approach since 2009 via a dedicated delegation, followed in 2021 by the creation of a Societal and Environmental Department with the resources to take action. A 2021-2025 master plan sets out the social and environmental policy. Specific projects have been authorised in the Contract of Objectives, Resources and Performance (COMP).

Since 2015, Cirad has maintained a Quality and Sustainable Development Delegation, which became the Delegation for Quality, Corporate Social Responsibility and Research Infrastructures in 2018. A 2022-2023 Sustainable Development and Corporate Social Responsibility master plan has been published and nurtures one of the three pillars of Cirad's Contract of Objectives, Resources and Performance (COMP), which is currently under negotiation.

Ifremer is committed to "Implementing a sustainable development and corporate social responsibility policy" action, in its Contract of Objectives and Performance (COP) drawn up with its supervisory ministries (2019-2023), which involves all its personnel. This engagement will be reinforced in the future State-Ifremer Contract of Objectives, Means and Performance (COMP, 2024-2028).

IRD has devoted one of the three ambitions that structure its COMP Etat-IRD 2021-2025 to its social and environmental responsibility, with a series of actions that favour a participatory approach.

The choice of research themes

More and more people are questioning the rationale of their work in the face of the current environmental crisis. Examples of "bifurcation" are multiplying, and the scientific world is no exception. In an article on the subject, published in Le Monde [4], some of the people interviewed had not hesitated to radically change their field of research, for example, moving from neuroscience to human and social sciences. However, not everyone is in a position to make such a change. Moreover, many research personnel have a strong attachment to their speciality and have no wish to change subject. What, then, can be suggested as avenues for reflection and action?

Situated knowledge

We might ask what room for manoeuvre research personnel have when it comes to determining their themes and working methods. Their work is bound by a maze of constraints:

- Research personnel are members of an institution that has been given a mission and which, in exchange for funding, must include its activities in a contract of objectives and performance negotiated with the public authorities: this disposition has an impact on the way their laboratories operate in terms of research themes and targeted research "products", a term coined by Le Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur – Hcéres.
- They are encouraged to find research partners and funding, whether from public funding bodies (Region, ANR, Europe, etc.) or private companies. In the case of national public funding, projects must be part of major programmes whose orientations have been validated by the government. In the case of private funding, the research themes must be in line with the objectives of the funding body.
- They can be encouraged to embark on an innovative approach that is likely to contribute to "growth", which is still a major focus of public policy, even though it is seen by other players as adverse to environmental transition.

In short, the academic freedom enshrined in law is in fact limited by the constraints of the research system. Whether research personnel like it or not, whether they are aware of it or not, they are in fact "committed", for better or for worse, insofar as their work is part of a socio-economic-environmental institutional project that is partly beyond their control. Similarly, major research programmes cannot be detached from the objectives that justify them, even though they are the result of political choices that are not necessarily the subject of consensus. From this perspective, even if research personnel in their daily, local, individual work of research and expertise, have degrees of freedom in the face of →

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→ collective choices made by organisations and or governments, the knowledge they produce is always "situated". Even though it may be solid, objective and reliable, it is still part of a particular framework
 - the nature of the questions asked, the purpose of the work and the identity of the players involved in its production - which is undeniably the conveyor of a political vision in the broadest sense. As such, research is not neutral.

It is therefore difficult to deal with the question of the rights and duties of research personnel without collectively reflecting on the way research operates in organisations and the negotiations between the different levels of research structuring, both European and national, and at the level of organisations, Joint Research Units and individuals. Research personnel can legitimately object to being subjected to contradictory demands that sometimes clash with their own convictions. A global reflection on research policies, collegial and if possible open to civil society, must be pursued at the level of the organisations.

Integrating ethical dimensions into the policies of organisations All the organisations that this committee aims to guide in their reflection on ethics promote as part of their missions: environmental protection, climate change mitigation, adaptation to its effects and sustainable development. However, while there is some convergence on the problems we face (climate change, decline in biodiversity, etc.), identifying the root causes of these problems remains controversial, and perhaps what is even more controversial, is to identify the path we should take to try to remedy them.

From this perspective, it is important for in-house debates to be held with all the organisations and laboratories involved, in order to define a more explicit content for their chosen roadmap. Whether at the level of organisations, laboratories or teams, a collegial approach is essential when, as in this case, we are dealing with complex issues fraught with uncertainty. And from there, it should be possible:

- to prioritise the objectives pursued: where should the level for response to environmental issues be placed? This poses questions such as, what contractual framework and under what conditions should we develop partnerships with the different players and stakeholders?
- to decide on the need for an environmental assessment of projects prior to their implementation. The aim is to anticipate the direct effects, which are relatively easy to assess, and the indirect effects, which are far more complex to anticipate. Indeed, if such an assessment is deemed necessary, and bearing in mind that most of the indirect effects are almost always uncertain, what methods should be adopted to go further? Medical research projects, must by law, be validated by a committee that protects the rights and welfare of human subjects recruited to participate in research activities. Should we therefore consider creating a



similar environmental protection committee? Should teams be encouraged to engage in exchanges with specialists from other disciplines to enhance their understanding of the potential impact of their projects? Should they open up discussions beyond the academic circle with the stakeholders concerned? How can we ensure that these exchanges are genuinely productive for all parties? How can we avoid instrumentalising certain disciplines? As in the case of humanities and social sciences, which are all too often involved in "hard science" projects in order to obtain social or ethical approval, this should encourage caution. Regardless, training for those involved in research to be in a position to engage in environmental reflection on their projects must be implemented rapidly and could provide an initial response to the question posed. Another very interesting initiative, running in parallel, is the SEnS workshops, which was set up by a small gathering of scientists. These workshops enable a group of 5 to 15 people to work together to clarify the values which they uphold as individuals and to reflect on how these values relate to their research practices;

 to reflect on the blind spots in research policy and look for ways to remedy them. As already stated, the choice of research topics is constrained in many ways. There is often considerable pressure to develop partnerships with economic players targeted by public policy. However, the players in a position to contribute to or benefit from research collaboration, both financially and technologically, are not representative of the diversity of players involved and active in the environmental transition: small businesses, the social economy sector, voluntary organisations and local players are mostly excluded from these schemes. How can they be included in discussions on research programmes and become partners? This is a valid question, insofar as the environmental transition cannot rely solely on major companies, some of which have been or are implicated in environmental degradation.

Integrating environmental issues into the governance of organisations

If organisations claim to have a mission to safeguard or preserve the environment, how and where can they assess whether their actions are in line with this mission? Companies with a mission - which provides them with a "raison d'être" through a number of social and environmental objectives over and above the strict procurement of the economic ones, must set up a mission committee made up not only of people from outside the company, but also with people from within the company who are responsible for assessing compliance with the objectives of the company. Should a similar committee be set up in research organisations to help them refine their strategy and avoid embarking on potentially damaging programmes? How might such a committee relate to the board of directors, where the

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supervisory authorities are heavily represented, and to the scientific committee, which is a group of specialists representing the various disciplines within the organisation?

Include scientists as stakeholders in environmental issues

The critical situation in which we find ourselves, the multiplicity of fronts for debate and the proliferation of uncertainties can create discrepancies between the way in which each organisation apprehends its possible contributions and the way in which individuals within the institution consider that it should grasp them, creating a feeling of unease among the latter. Rather than ignoring these discrepancies, it is preferable to use them as an opportunity to increase the reflexivity of research collectives. This leads us to three proposals:

- 1. All research personnel should be free to report to their in-house superiors any environmental aspects which they consider to be questionable in their research programmes or expert appraisals carried out by their organisation, whether this concerns the content of the research programmes or expert appraisals or the funders of these programmes or other operations, and provision should be made for collective handling of such alerts and publicising the results. If, following arbitration, the programme in question is maintained, despite the existence of uncertainties about its potentially harmful nature or disagreements between benefits and harm, the personnel concerned should be free to apply for a right of withdrawal and given an option of being assigned to another project.
- 2. All research personnel should be able to refuse a consultancy assignment, particularly one entrusted by their organisation's supervisory authorities, which is defined in a scientifically questionable manner; they should be able to publicly state their disagreement.
- **3.** All research personnel should have the opportunity to flag an unaddressed research question that could be of environmental importance, and-following an approved review, the details of which would have to be specified - internal funding for work on this question. There should be an in-house budget dedicated to this kind of work, which may not interest, or even concern, the economic and political players.



There is little doubt that the presence of scientists in the public domain is essential if we are to take account of environmental issues. They are the key players that constantly shed light on current phenomena, gather data, propose ways of interpreting the mechanisms involved, assess the effects of policies, simulate the evolution of ecosystems and devise possible solutions to problems as part of their expert missions. Their role as whistleblowers, alone or alongside other players, has been highlighted many times. It is now legally regulated and must be carefully protected. As the recent COMETS Guidance stresses, the challenges we are collectively facing give this issue particular prominence, given the intensity of the debates and the place of scientific expertise in the discussion.

Defining how scientists should express themselves to the public Scientists are constantly invited by the media to express themselves on issues on which they are deemed expert. It is preferable for them to be free to contribute their knowledge to the debate. However, in many cases they are asked to give their opinion on controversial issues. Of course, scientists can present scientific facts, at least in their own field, but very often, by expressing their own views, they take part directly or indirectly in the debate: a case in point, is the way in which the problem is posed from a scientific point of view and the way the investigative methods are employed, which becomes debatable. This intertwining of science and politics runs counter to the received wisdom that scientists, when questioned, should confine themselves to providing facts and nothing but the facts in order to steer clear of debate.

Some research organisations have chosen to draw up charters of public expression to guard against what others may consider to be excesses - expressing a personal opinion when speaking "as a scientist". INRAE has produced such a document, which is both nuanced and subtle. Its recommendations seem simple at first glance: you can only claim to be an INRAE agent in a public communication if you can show "a direct link between the subject of the expression and the activities carried out and the skills mobilised as part of the missions entrusted to you by the institution ". It must be made clear that the contribution cannot be mistaken for the official position of INRAE; the scientist must be transparent about his or her links of interest and opinion, and "take a critical look at the nature of the contribution and qualify it explicitly", *i.e.* specify whether what is being shared is factual information, a summary of expertise based on the state of the art, a recommendation, a point of view, etc. Finally, it is necessary to "clarify the status of the scientific content of the expression":

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 \rightarrow formulation of hypotheses, expected results, results on which there is consensus or which are opposed to other conflicting results³.

The programme is demanding, and it is true to say that if media appearances by scientists were subjected to this filter, few would meet all the criteria. Moreover, scientists rarely have any control over the way the content of their statements is used following an interview with a journalist. Finally, although on the surface simple, the definition of what constitutes a "direct link" between the subject of the intervention and the person's work and skills leaves room for debate.

Although INRAE currently considers these recommendations to be guidelines for individual action rather than binding standards, we must ask ourselves what room for discretion they leave to an administration that, depending on the period, might be less benevolent and more respectful of public freedom. Shouldn't these texts be amended to limit misuse, or, alternatively, should there be procedures for dealing with cases of non-compliance with the stated principles? Environmental issues call for a strong presence of scientists in the public domain, which must not be hindered by overly restrictive regulations.

From public expression to engagement

Research personnel, on the basis of their expertise, may be asked to explicitly support a citizens' movement or an association. It is clear that the value of the support relies on the quality of the person giving it: avoiding mentioning the person's scientific status or that of the organisation to which they belong, weakens its impact. How would the charters of public expression qualify this type of position? They would probably classify it as unacceptable behaviour: in fact, the INRAE charter recalls in its preamble the obligation of neutrality, which implies "not using one's professional position or using it to publicly express personal opinions (whether philosophical, political, religious, etc.)". But scientists are also citizens, and their commitment as citizens may be perceived as a conflict of interest in all sorts of academic activities. Here again, it is important to make it clear that research activity can be both politically oriented insofar as the questions it seeks to answer fall within more or less defined horizons and frameworks, and nevertheless rigorous in terms of its practices.

Should we abandon the idea of neutrality in research and develop standards accordingly? This is what a recent report by the University of Lausanne [6] advocates in favour of the "engagement" of

3. These recommendations are in line with those set out in the European Code of Conduct for Research Integrity: "Authors are transparent in their communications, outreach and public engagement about assumptions and values influencing their research as well as the robustness of the evidence, including uncertainties and gaps in knowledge." [5]



academics and universities. The report defines engagement as public intervention whose content has a normative aspect. The research carried out prior to the drafting of the report shows that it is difficult, if not impossible, for people to separate different roles, and in particular the role of scientist from that of citizen: it is well known that the choice of certain research subjects can stem as much from curiosity about this or that phenomenon as from the desire to participate in the resolution of certain types of problem, in other words to become politically implicated if we consider this to be citizen involvement. Provided that the rules of professional ethics are respected and that there is a clear distinction between scientific findings and personal viewpoints, the report considers that it should be possible, and even desirable, for scientists to express committed stances.

From engagement to the duty to intervene

Some even raise the question of "duty to intervene" for scientists, which, if it were not applied, could be sanctionable as "nonassistance to humanity in danger". This duty would be based on the scientist's status as a knowledgeable person, which would distinguish him or her from an ordinary citizen. This approach confers exceptional status on scientists and science. Is this really justified? Individuals may be in a position to know about the actions of people or organisations that are damaging for the environment, but not necessarily illegal. Why not subject them to the same obligation? Anyone can, in different circumstances, be placed in a situation of this type. The exception for scientists therefore seems unsustainable, although this in no way prevents citizen-scientists from launching or joining in initiatives to challenge climate nonintervention, for example:

Rather than creating a duty to intervene, everything must be done to preserve freedom of speech for scientists, encourage and support their expression in the public domain, and protect whistleblowers, whether they be scientists or non-scientists.

The scientist's duties: integrity, ethics, humility

It should be emphasised that the rights of scientists go hand in hand with duties: respect for ethics, rigour in research practice and research integrity. These duties, which apply to all research personnel, take on particular significance in the case of public expression because, as COMETS Guidance no. 2023-44 emphasises, by engaging, scientists are putting not only their moral responsibility at stake but also their reputation, that of the organisation to which they belong, and even that of research as a whole, which may be undermined by ill-considered statements.

It is also essential not to give the impression that science has all the answers and that a single scientist is capable of covering all the issues on a given subject: research is concerned with specific questions, designed so that they can be dealt with by existing methods and instruments or those in the process of being put in

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→ place. Nevertheless, we again agree with the recommendation expressed in the COMETS Guidance: a scientist can express himself on subjects outside his strict field of expertise, as long as he specifies the limits of his knowledge of the subject and conflicts of interest.

The role of scientists in the public domain should be to establish a dialogue with all those who feel concerned by the subject, recognising the limits of scientific expertise and the contribution of other forms of expertise⁴. It should not be a one-sided dialogue but should open up discussion on the research itself and the issues it addresses.

Be aware of the risks of public expression

Any discussion concerning research personnel expressing themselves in public, must take into account the fact that anything stated, is instantly placed beyond the control of the speaker, due to mainly to the growth of social media. The exchanges it provokes in society are based on practices that are often far removed from "peer review" as developed in scientific communities. The public expression of scientists is generally expected in areas where society is in conflict, but it will not always be received with the necessary objectivity and rigour of analysis by those who read it. It is important to be aware of this and to take it into account, whether in anticipation of speaking out for the first time or in reaction to controversies in which speaking out can be exploited. The possible consequences of these controversies on the scientists themselves, on their teams and indeed on their families can be far reaching: in the case of highly controversial subjects, a collegial discussion within the teams working on the issues in question will certainly be useful, even essential, in determining the appropriate course of action to be taken.

4. These limitations are recognised in two European reports dealing with the role of scientific recommendations for European policies, both of which highlight the need to involve stakeholders in the development of recommendations on complex issues. [7] [8]



Commitment to partners in the Southern Hemisphere

To varying degrees, the four organisations are involved in research and sometimes in research-action projects in developing countries. For these projects, in addition to the constraints and obligations already mentioned, there are additional responsibilities due to the greater vulnerability of the terrain and the characteristics of the players and interests involved in the projects. This requires extra vigilance on the part of research personnel to adapt institutional directives on a case-by-case basis and create the conditions for genuine participation by local stakeholders. To build a collective vision of the future, it is important to attempt to clarify the motivations and assumptions implicit in each of the partners.

Far and beyond these few very general remarks, the committee would like to reflect on these issues in greater depth and, in particular, to establish a dialogue with the personnel concerned in order to fully understand the issues and questions with which they are confronted.

Further information on this specific point may be provided at a later date, following consultation with the research organisations and teams.

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Appendices



Appendix 1

Composition of the INRAE-Cirad-Ifremer-IRD ethics committee:

Michel BADRÉ, Chairman of the Committee.

Ingénieur Général des Ponts, des Eaux et des Forêts, former Chairman of the French Environmental Authority (2009-2014), former member (2015-2021) and Vice-Chairman (2018-2021) of the French Economic, Social and Environmental Council (CESE) as a member of the Environmental Associations Group. Member of the French National Consultative Ethics Committee (CCNE). Chairman of the "orientations" commission for the radioactive materials and waste management plan.

Bernadette BENSAUDE-VINCENT, Vice-Chair of the Committee. Emeritus professor of philosophy of science and technology at the University of Paris 1 Panthéon-Sorbonne and member of the Académie des technologies. Vice-President of the Ethics Committee.

Madeleine AKRICH, research Director at the École des Mines de Paris (Centre for the Sociology of Innovation), an engineer from the École des Mines de Paris with a PhD in the socio-economics of innovation.

Catherine BOYEN, Director of Research at the CNRS, Director of the Roscoff Biological Station (Centre for Research and Teaching in Marine Biology and Ecology, Sorbonne University-CNRS). PhD in plant biology.

Bernard BRET, Geographer, specialist in Latin America and Brazil in particular. Former professor at the University of Lyon III.

Denis COUVET, Chairman of the Fondation pour la recherche sur la biodiversité, professor at the Muséum National d'Histoire Naturelle, associate professor at the University of Lausanne and Sciences Po Paris. Agricultural engineer, PhD in evolutionary sciences and ecology.

Mireille DOSSO, Director of the Institut Pasteur de Côte-d'Ivoire, professor of microbiology. PhD in microbiology and human biology.

Mark HUNYADI, Professor of social and political philosophy at the Catholic University of Louvain; associate professor at the Institut des mines-Télécom Paris and at EHESS; member of the Orange Ethics Committee; member of the Steering Committee and the Steering Committee of the Mobile Lives Forum.

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Paula MARTINHO DA SILVA, Lawyer specialising in intellectual property and life sciences. Member of the International Bioethics Committee (UNESCO), member of the Ethics Committee of the Champalimaud Foundation and of the University Hospital of Central Lisbon.

Marie-Geneviève PINSART, philosopher, Professor at the Université Libre de Bruxelles, applied ethics research centre. Member of the IRD's Comité consultatif d'éthique pour la recherche en partenariat (CCERP).

Pere PUIGDOMENECH, Research Professor at the CSIC (Spanish Higher Council for Scientific Research) at the Institute of Molecular Biology in Barcelona. PhD in Biological Sciences, specialising in the molecular biology of plants.

Ricardo SERRÃO SANTOS, Professor at the University of the Azores. Permanent member of the Portuguese Academy of Sciences and emeritus member of the Portuguese Academy of the Navy. Former pro-rector at the University of the Azores, and President of IMAR (Inter-University Institute for Marine Research) in Portugal. Former Member of the European Parliament and Minister for the Sea. PhD in animal biology and ecology.

Youba SOKONA, Vice-Chairman of the Intergovernmental Panel on Climate Change (IPCC); member of the African Academy of Sciences; coordinator of the African Climate Policy Centre (ACPC). Professor of water, energy, the environment and sustainable development.

Laurent THÉVENOT, Economist and sociologist. Director of studies at EHESS (Chair: Pragmatic Sociology of Politics and Morals), member of the Georg Simmel Centre, and member of the French Academy of Agriculture. Engineer from the École Polytechnique and ENSAE.

The secretariat

INRAE: Christine CHARLOT and Claire LURIN Cirad: Marie DE LATTRE-GASQUET Ifremer: Marianne ALUNNO-BRUSCIA IRD: Ghislaine THIRION



Appendix 2

The principles and values of the INRAE-Cirad-Ifremer-IRD ethics committee

- The Ethics in Common Committee considers the recognition of human dignity to be a fundamental value. In its recommendations, it will endeavour to give tangible form to this value, implementing the rights set out in the 1948 Universal Declaration of Human Rights.
- 2. More generally, the Committee considers that the values of the body of declarations and conventions established over several decades by the United Nations and specialised organisations, in particular UNESCO, form part of its reference framework, including the protection and promotion of cultural expressions and biodiversity. This body of work is implemented through international standard-setting agreements.
- 3. The environment in which future generations live must not be deteriorated, and the future must not be irreparably jeopardised, in particular by depleting natural resources or undermining the balance of nature. This principle of sustainable development requires the Committee to work in both the long and very long term, not just in the short term. However, the principle of total reversibility appears utopian and impractical.
- 4. The world is a system. Any action taken on one part of it has an impact on other parts: the analysis must therefore explore the secondary and knock-on effects of an action, and the dynamics and strategies that it may encourage or promote. Problems must therefore be tackled primarily on a global basis, while at the same time ensuring compatibility between global and local, and by taking account the realities on the ground.
- 5. The Committee considers that the robustness and flexibility of a system are positive elements. Thus, even in an open society, a degree of self-sufficiency in systems of production is desirable at both the national and the regional level.
- 6. Progress implies a society that is open to technical and social innovations, in the knowledge that we need to analyse and predict the impact of these innovations on lifestyles, their contribution to human development, and ensure that the benefits they can bring are shared equitably.













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