Ethical Infrastructure: Guiding Values for the Observatory



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[1] PU = Public
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Executive summary

This document presents the Ethical Infrastructure, consisting of shared values, ethical guidelines based on them, an operational framework including ethical expectations, ethical risks, and tools and processes to implement the framework. The Guiding Values were co-developed in collaboration with the consortium in two phases of surveys, supported by cross-work-package discussions. The framework consists of five core values and five supporting values, translating them into four operational domains.
This framework is designed to stay adaptive. It will be used as the basis of the ethical risk assessment of the Observatory, the project outputs and the policy recommendations.

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List of abbreviations, acronyms

AI Act	Artificial Intelligence Act
EI	Ethical Infrastructure
EFSA	European Food Safety Authority
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
LL / LLs	Living Lab / Living Labs
NDA	Non-Disclosure Agreement
OECD	Organisation for Economic Co-operation and Development
RRI	Responsible Research and Innovation
WP	Work Package

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1. Introduction

The ECO-READY Observatory is a real-time, data driven, and policy-relevant system whose outputs ought to provide information and guidance on the complexity of food systems, climate change and biodiversity trade-offs, leading to decision making on funding priorities, regulatory processes, and food security anticipatory and contingency planning responses. As such, the Observatory operates in contexts where evidence, robustness and science-based relevance are crucial for both the quality of its outputs and the level of impact derived from interpretation of these results.

Whether ECO-READY's outputs are used, accepted, and sustained beyond the lifetime of the project depends fundamentally on the consistency and reliability of the data, and robustness and clarity of methodology carried on during the project timeline. In other words, the vehicle for accountability and quality of the delivery of the Observatory tool lies in the trust granted by its users. Without trust, even scientifically robust evidence can be discounted, misinterpreted, or politicised. Therefore, trust is a core condition for ECO-READY's ability to deliver lasting value.

Trust does not automatically emerge from the production of data or evidence. It is shaped by how evidence is generated, interpreted, communicated, and governed over time (Oreskes, 2019)[1]. In complex, policy-relevant systems such as the ECO-READY Observatory, trust is closely linked to ethical considerations like how uncertainty is handled, how assumptions are made explicit, how responsibilities are allocated, and how risks are anticipated and managed (Moat, Lavis, & Abelson, 2013).

For this, ethics in ECO-READY is not understood just as a compliance exercise. It is not only limited to data protection requirements, one-off ethics reviews, or isolated deliverables. Instead, ethics is recognised as an ongoing and shared responsibility that influences how decisions are made and how the project evolves over time (Stilgoe, Owen, & Macnaghten, 2013). In this regard, ethics functions as a key mechanism for building, maintaining, and protecting trust.

This report hence displays how the ECO-READY project anticipated and provides assurances of the consistency and quality of its data extraction and methodological interpretation both from its internal processes to its final product long-term characteristics. The report starts by showcasing the relevance of Ethical Infrastructure (EI) within such complex scientific research structures, the methodological process leading to its tailoring to the project characteristics and the outcomes generated. Finally, the report illustrates how the Guiding Values from the EI of the ECO-READY project are now reflected within its Observatory, and what conditions are tied to its long-lasting maintenance.

[1] Scientific evidence alone is not sufficient for policy uptake. Institutional credibility, legitimacy, and trust shape whether evidence influences decisions. (Oreskes, 2019; Wuttke, 2021).

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1.1. Ethical Infrastructure as a systemic response

To operationalise this understanding, ECO-READY adopts the concept of EI. The concept was first originated in the area of organisational ethics, where Tenbrunsel, Smith-Crowe and Umphress (2003) defined the EI of an organisation as an interconnected set of organisational components, both formal (codes of conduct, policies, reward and sanctioning system) and informal (organisational culture, behaviour of peers and shared norms) which altogether define the ethical effectiveness of an organisation. One of the key insights in this literature is that ethical commitment does not equal ethical practice: while organisations that rely on declared values alone find them compromised in tough times, organisations that embody their values in structural and routine aspects remain ethically effective even facing difficult circumstances. EI thus refers to a set of interconnected elements that embed ethical considerations into everyday practices, decision-making processes, and governance structures across the project.

This organisational ethics perspective has since been taken up in research policies, especially through the framework of Responsible Research and Innovation (RRI). According to RRI, scientific and technological development cannot be governed retrospectively. Instead they should be continuously steered while research is still in the making (Owen et al., 2012). Stilgoe, Owen and Macnaghten (2013) summarised this into four procedural dimensions: anticipation (reflection on anticipated impacts before they occur), reflexivity (analysing the purpose and framing of the research process itself), inclusion (opening decision-making processes to stakeholders and public), and responsiveness (making use of these insights to adjust the process accordingly). In the European research context, these four dimensions have been standardised through Horizon 2020 and Horizon Europe where ethical considerations, gender equality, public engagement, and open science are cross-cutting requirements rather than additional features of projects (European Commission, 2024). The ECO-READY EI could be interpreted as an application of these dimensions at a project level where the precautionary principle and sustainability values constitute anticipation, reflective and iterative learning executes reflexivity and responsiveness, and inclusiveness and accountability operationalise inclusion.

The integration of ethics is increasingly referred to as “embedded ethics” or “ethics-by-design,” criticising conventional compliance approaches where ethics is seen as gatekeeping procedure confined to certain control points (e.g., ethical approval prior to data collection, review before publication), since such “checklist approach” arrives too late and too short to influence actual research decisions (McLennan et al., 2020; Tigard et al., 2023). Instead, it proposes integrating ethical analysis into the entire process of research and development through continuous, interdisciplinary and iterative reflection. Experiences of large interdisciplinary projects prove that this requires not just good intentions but also reflective moments, and tools allowing non-experts in ethics to integrate ethical thinking into their decisions (Willem et al., 2024). Recent work extends this reasoning explicitly to research infrastructures, arguing that systems, including data platforms and observatories need to be designed in such a way that ethical responsibilities are included into its workflow, access regimes and governance (van Rijssel & Boenink, 2026).

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Rather than being a limiting or controlling process, EI offers a structured way to facilitate responsible action within conditions of uncertainty, pressure of time and high societal relevance.[2] This is particularly applicable to the topics of ECO-READY (food-security, climate change, biodiversity), which deals with contested values, incomplete evidence and direct policy relevance, where formal processes of compliance would not suffice. An EI ensures that ethical considerations are integrated into the Observatory's design, data practices, policy-relevant outputs, and communication activities.

Within ECO-READY, EI comprises the following four elements, mapping a direct path from principles to practice:

- **Shared values and principles** are the normative core of the infrastructure. It consists of an articulated set of values and principles which represent what the project stands for and its commitments toward stakeholders and partners. The reasons for making them explicit are two-fold. First, ethical expectations can only be fulfilled when they are defined. If left implicit, they will remain invisible to new partners, external stakeholders, and future users of the Observatory, which means that there will be no opportunity either to evaluate, discuss, or challenge them. Second, explicit values create a common point of reference for a heterogeneous group of consortia, and in case of disagreements between researchers, policymakers, and practitioners these values could become a framework of the discussion. In ECO-READY, these include trust-promoting, participatory, fair, forward-looking, and data-related values. Values, by definition, are abstract and are supposed to be guidelines of actions rather than prescriptions, hence forming the foundation of infrastructure but not the whole of it.

- **Ethical guidelines derived from those values** clarify what a value means in practice with regard to the activities of the Observatory. A guideline operationalises, for example, what "transparency" means when presenting uncertain results of a model, what "inclusiveness" means when choosing participants for a consultation, or what "data ethics" means when dealing with data collected in Living Labs. The translation process is where the success or failure of most ethics frameworks lies. Research on organisational ethics suggests that values without the operational rules often remain symbolic (Tenbrunsel et al., 2003). Thus, guidelines should be detailed enough to enable action, but also general enough to remain relevant as the project moves forward and unforeseen issues emerge.

- **Ethical risk assessment as a periodic reflective process** introduces the process of identification, reflection and mitigation of ethical risks throughout the cycle of the project. Ethical risks are potential situations in which the activities of the project may contradict its values or harm the stakeholders in ways such as the misinterpretation of uncertain evidence in communicating policy, exclusion of particular voices from stakeholder engagement process, or the unintended consequences of the recommendations. Risk assessment is

[2] EI is understood as the embedding of ethical values, codes, and organisational practices into everyday decision-making and governance processes. (Valentine & Barnett, 2003).

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a periodic process and not a one-off process, since the ethical situation of a project changes with new activities, new sources of data and new partners, and the old methods of mitigation may no longer be sufficient. ECO-READY will arrange this process in four successive steps where the risks are identified at the start of the relevant activity, reflected on during assessment and consultation, mitigation by particular measures and reviewed as the process proceeds (identify, reflect, mitigate, review), matching the anticipatory and reflexive aspects of responsible research and innovation (Stilgoe et al., 2013).

- **Practical tools and processes that support consistent application** ensure that the previous three components will not remain stagnant. Tools provide incentives to act ethically rather than circumvent the guidelines. This is done through structured checklist of conducting ethical review of outputs, templates of declaring conflict of interest, and dashboard functionalities that provide information about level of evidence and traceability of sources. In addition to useful tools, there are processes that outline who should do what, how, when and with whom, such as who coordinates the ethical risk assessment or who reviews the policy recommendation before its publication. Essentially, ethical deliberation in practice can only be ensured by tangible instruments and tasks, and not by goodwill alone (Willem et al., 2024).

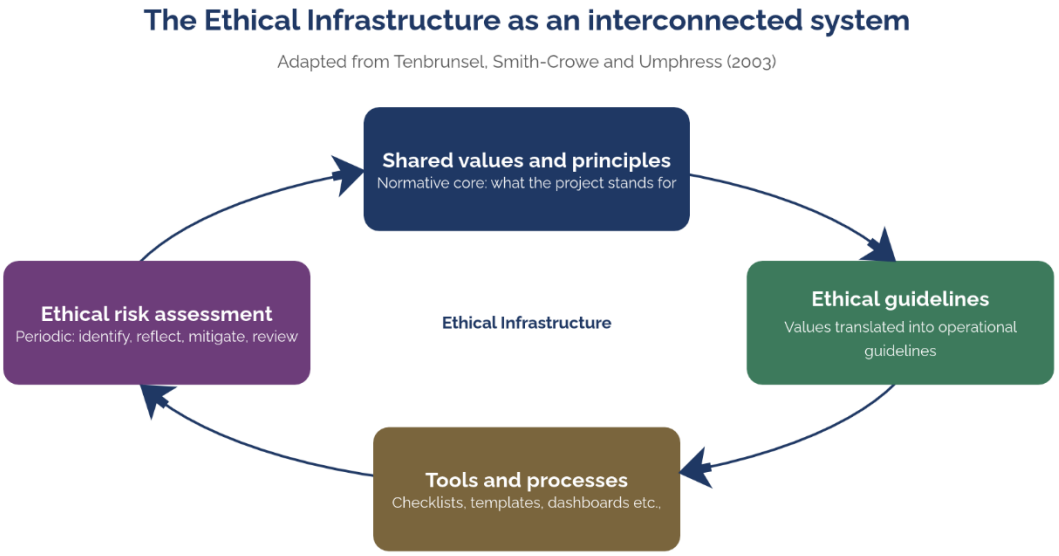

Figure 1: The four interconnected elements of the EI. Each element presupposes the others; the system works only as a whole.

These four elements are designed to operate as a system that enables the continuous application of ethics, rather than retrospectively. Each element complements the others: values provide direction, guidelines turn values into action, risk assessment ensures that the practice measures up to the values, and tools and processes implement them in practice.

1.2. Ethics as an enabler

The network of ten Living Labs spread across Europe is the main interface of the project with practitioners and local communities whose knowledge and data feed the Observatory, including farmers, agricultural advisors and regional stakeholder,

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and communities. In this context, the EI acts as a guardian of evidence quality. The input of the Living Lab data into the process of formation of policy recommendations becomes credible and valid if there is confidence in the context where this data exchange happens, that is, how it is written, how it will be attributed, kept and used. This also includes the elements of data ethics, requiring the consent of the participants, appropriate accessibility, safety, attribution and maintaining confidentiality into the engagement processes creates the context where stakeholders are willing to be open about their practices and limitations, and thus provide the very information that can hardly be obtained through quantitative models.

1.2.1. Ethical Infrastructure as a trust-building instrument in Living Lab engagement

An illustration of how the EI acts as an enabler does not come from a formal compliance process but rather is related to the interaction with the Living Lab partners themselves, through the presentation of the EI that was made during an online project work-package meeting on 22 October 2024. This instance is particularly instructive because of how it reflects the practical role of an ethical framework in a large and heterogeneous consortium. What was stated explicitly in the presentation was the obligations that the EI commits to, which were: that data supplied by the Living Labs will be processed in accordance with data ethics and privacy requirements; that the Living Lab partners will be acknowledged for the knowledge that they have, and not just treated as providers of data; and that any risks involved with their participation will be assessed and addressed in the project's risk assessment process, and not just left in the hands of the individual partners themselves. In short, the presentation did not bring anything new; it just spelled out commitments which were already there.

The response of the Living Lab representatives during the meeting is significant for assessing the implementability of ethics frameworks. The existence of the EI was mentioned by several partners as a reassurance for their work within the framework, assuring that their involvement would be based on clear and transparent rules and not goodwill or informal understanding. Predictability is the prerequisite for open and sustained participation of organisations contributing local knowledge and information. This level of trust cannot be gained after collecting the data; it has to exist from the beginning, as it dictates the way knowledge is shared from the start. Where stakeholders cannot foresee how their contribution will be treated, the rational action to take is to share it cautiously, but once the rules of engagement are explicit, the quality of participation rises considerably.

This incident supports the central claim made in this deliverable regarding how trust is built not through enforcement but with active communication of the framework. The three main observations drawn from this experience are as follows:

- First, transparency is more of a process and not a document. The framework became effective when communicated, discussed and confirmed.
- Second, recognition is an ethical commitment with practical advantages. The assurance of the attribution of Living Labs contribution makes accountability and inclusiveness an incentive for the stakeholders.

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- Third, EI reduces the transaction costs of collaboration and acts as a single, stable reference point.

In addition, the trust developed at the Living Lab stage went beyond the data relationship. Partners who witnessed the ethical commitment within the project became more willing to engage in further consultation and validation activities. This reinforced reliability will need to be maintained at stages beyond the period of the project itself, such as in the case of the Observatory Policy Hub.

1.2.2. Communicating uncertainty without losing the message

Another instance, where the role of the EI as an enabler of quality concerns a particular challenge faced by all projects that generate policy-related scientific outputs: how to communicate the results in a way that is both efficient and retained by the recipient without neglecting the limitations of the methodology used and without oversimplifying the complexity of the message itself. This dilemma was discussed during the January 2026 Brussels conference, where ECO-READY's EI was presented, addressing the risks associated with communicating predetermined scientific outcomes.

The challenge was more structural rather than incidental since it stems from the very nature of scientific communication. Scientific findings convey their meaning together with their conditions of validity, such as, sample coverage, assumptions, model limitations, uncertainty margins, the range within which the finding is applicable, and the boundaries beyond which it is not. A communication format that strips these details for the sake of clarity not only simplifies the message but also alters its meaning, to the point of reversing it in certain conditions. A modelled finding that lacks its uncertainty margins is seen as a prediction; a recommendation without conditions of application can be read as universally applicable. This risk is particularly critical in policy context, where policymakers operate under time constraints, and may act on the simplified interpretation of scientific results.

The discussion at Brussels confirmed that there is no way to resolve this dilemma by taking a side. A communication strategy that is based on readability at the expense of accuracy violates values like credibility, transparency and integrity. This, in turn, also opposes the precautionary principle formulated in the EI that requires stating uncertainties in the findings. Conversely, a communication approach that gives priority to completeness at the expense of readability does not serve the intended user and does not conform to the ethical value of inclusiveness. Thus, the EI formulates this conflict not as an optimisation task, but as a recurring design task for each output which answers what the receiver needs to retain, what cannot be lost, and what form should carry both.

Several working principles emerged out of our discussion. Firstly, communication design should be grounded on the decision that the user needs to make, not on the outcomes that the project wants to highlight. Secondly, uncertainty should be communicated as part of the structured information about the takeaway, not as disclaimers added later. Thirdly, limitations should be formulated as limits within which the finding is valid and not as weaknesses. Fourthly, traceability should be

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kept so the reader can trace it back to its sources and assumptions when necessary. These principles bear direct correspondence to the practical tools that bring about the credibility value in the Observatory through uncertainty dashboards, policy outputs with evidence robustness, and traceable sources.

Policy Recommendations should therefore include in their communication the contextual elements associated with validity, applicable conditions and limitations, making them more useful than they might be otherwise, as a means of avoiding misuse.

Hence, EI in ECO-READY is not designed to slow down scientific work or limit innovation. On the contrary, it supports and strengthens the Observatory and associated policy activities by providing clarity, consistency, and shared reference points when difficult decisions arise. It serves to align and reinforce existing practices across ECO-READY's Observatory and policy work. It helps ensure that as outputs scale and gain visibility, they do so in a manner that preserves scientific integrity, legitimacy, and trustworthiness.[3]

1.3. Anticipating ethical challenges in the Observatory

Operating a real-time, policy-relevant Observatory at European scale inevitably involves ethical challenges. The ECO-READY Observatory integrates real-time and potentially sensitive data, combines cross-sectoral information, produces policy-relevant outputs, and generates insights that are shared with a broad public audience.

Such conditions give rise to predictable ethical challenges, including data uncertainty, tensions between policy urgency and scientific caution, risks of misinterpretation of indicators, the handling of locally or community-sensitive data, and unequal data representation. These challenges are not failures, nor are they unexpected. Rather, they are characteristic of systems that operate at the science-policy interface.[4]

A distinct set of challenges arise from the assistance functions provided through Artificial Intelligence (AI). The responses given by AI could be convincing and incorrect at the same time, and the invisibility of the dependence on the data that was used to train the system puts the transparency value under strain. In the policy context, there is an added risk of over-reliance where fluent AI summaries of the evidence could gain more credence than necessary. Such challenges are not grounds for excluding the use of AI but rather for explicitly stating how the AI should be governed. Such governance includes informing the user about the fact that they are interacting with an AI system, specifying how the inquiries are recorded and used, and taking an explicit stand that AI is meant to support but not replace evidence-based analysis and policy advice (see in Section 3.4 and Annex F).

[3] This is consistent with the *'Ethics by Design'* approach of the Horizon Europe Strategic Plan, stating that integrating ethical requirements is not a limitation, but a core prerequisite. (European Commission: Directorate-General for Research and Innovation, 2024)

[4] The unavoidable trade-offs between relevance, credibility, and legitimacy in science-policy interfaces are identified and categorically analysed in Sarkki et al., 2014; Tremblay et al., 2016

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The critical issue is therefore not whether such challenges arise, but whether appropriate structures are in place to identify, reflect on, and respond to them responsibly.

2. The guiding framework for ethics in ECO-READY

To address these challenges, ECO-READY is developing a guiding framework for ethics. The purpose of this framework is explicitly practical. It is designed to integrate ethics into Observatory and policy workflows, translate shared values into concrete practices, and support long-term trust in ECO-READY outputs.

The framework is built around a set of interconnected components:

- Values and principles that articulate the ethical foundations of ECO-READY;
- Ethical guidelines that translate those foundations into clear expectations; and
- Tools and processes that provide practical support for embedding ethics into everyday work.

These components are mutually supportive. Values and principles provide direction, guidelines provide clarity, and tools and processes enable application. If any one of these elements is absent, ethics remain abstract rather than operational.[5]

2.1. Co-development of Guiding Values

At the core of ECO-READY's EI are its guiding values. These values were not defined through a top-down process. Instead, they were developed through an iterative, participatory approach involving the project consortium.[6]

Firstly, a shared understanding of the EI and guiding values were established through in-person and online meetings during the project timeline. Later, the values that were drawn from the literature and from ethical frameworks relevant to the Observatory were shared and tested by a consortium-wide survey, conducted in two phases. The first phase focused on identifying and articulating shared values across the project which were refined and clarified. This was followed by a second survey to validate and strengthen them. This process was complemented by cross-work-package discussions and ongoing feedback. The survey results were clustered and discussed in meetings, and presented at the ECO-READY workshop "Delivering Impact: Building the ECO-READY Legacy for Food Systems", 28-29 January 2026,

[5] ECO-READY's EI is informed by the OECD's Public Sector Integrity Framework, which categorises the core components with three interlocking pillars: guidance (values and principles), management (guidelines, tools, and awareness), and control (processes and reviews) (OECD, 1998), superseded by (OECD, 2017a).

[6] This participatory and iterative approach is consistent with stakeholder-driven methods used in the development of ethical frameworks, where values and principles are refined through consultation, discussion, and consensus-building with those involved in implementation. (Corbie-Smith et al., 2018)

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Brussels, Belgium.

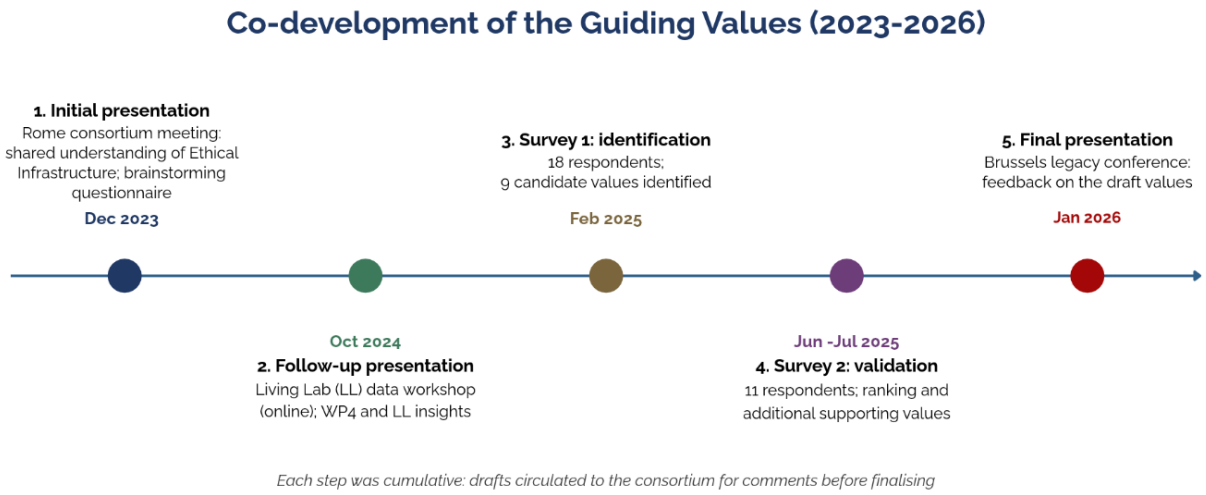

Figure 2: Iterative, participatory co-development process of the ECO-READY Guiding Values (Annex A of this deliverable).

As a result, the guiding values reflect the input of consortium partners and their practical relevance. They are shaped on the basis of how the Observatory has been designed, developed, and used, making sure that the ethical framework resonates with those responsible for implementing it.

These values have been shaped by internal surveys, collaborative discussions, and ethical principles relevant to the Observatory's scope, providing timely, credible, and equitable access to data on food systems, agriculture, and climate resilience.

2.1.1. Limitations

The participation in the surveys was low, hence the values represent the views of those who took part. To enhance the credibility, the results from the surveys were discussed in meetings and deliberated upon by different consortium partners. Further validation by stakeholders and Observatory users is expected as part of the review process (Sections 4 ,5 and 6).

2.2. Foundations of the Framework

2.2.1. Core Guiding Values

This document outlines a proposed set of Guiding Values to inform the development, governance, and long-term sustainability of the ECO-READY Observatory and the policy recommendations. These values received strong support from the respondents (see Annex D) and are proposed as foundational to the Observatory's ethical and operational design. The values are informed by relevant literature on ethics, governance, sustainability, and responsible research, as well as internal consultation and collaborative consultations within the consortium.

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Table 1: Overview of the core and supporting Guiding Values.

Core Values	Supporting Values
Credibility	Data Ethics and Privacy
Transparency	Accountability
Inclusiveness	Transformative Change
Sustainability	Precautionary Principle
Integrity	Reflective and Iterative Learning

Table 2: Definitions of the core Guiding Values (adapted from the sources cited).

Value	Definition
Credibility[7]	Credibility refers to the scientific quality of the evidence and arguments; whether the information is perceived by users as scientifically sound and trustworthy. (Modified from Cash et al., 2003; Rieh and Danielson, 2007)
Transparency[8]	Transparency refers to the timely and systematic declaration of information relevant to decision-making, processes, data, methods etc., enabling stakeholders to evaluate actions. (Modified from OECD, 2017b)
Inclusiveness[9]	Inclusiveness refers to the consideration and incorporation of diverse stakeholders, knowledge systems, and perspectives, including local and underrepresented communities into scientific and policy processes. (Modified from IPBES, 2019; Díaz-Reviriego et al., 2019)
Sustainability[10]	Sustainability refers to assuring long-term functionality and societal relevance of the Observatory through adaptive governance, stakeholder engagement, capacity building, and alignment with policy objectives over a longer term. Sustainability here refers to the Observatory's own long-term continuity and viability. (Modified from OECD, 2023a; Armenia et al., 2019)
Integrity[11]	Scientific integrity refers to honesty, accuracy, objectivity, and responsibility in research and Observatory activities. (Modified from National Academies, 2017)

2.2.2. Supporting Values

These values add to the ethical depth and address relevant dimensions for platform governance and long-term trust.

[7] (Cash et al., 2003; Rieh & Danielson, 2007)
[8] (OECD, 2017b)
[9] (IPBES, 2019; Díaz-Reviriego, Turnhout, & Beck, 2019)
[10] (Armenia, Dangelico, Nonino, & Pompei, 2019); (OECD, 2023a)
[11] (National Academies of Sciences, Engineering, and Medicine, 2017)

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Table 3: Definitions of the supporting Guiding Values (adapted from the sources cited).

Value	Definition
Data Ethics and Privacy[12]	Data ethics and privacy refers to the responsible handling and use of data while respecting privacy, consent, human rights, dignity, and values of the society. (Modified based on European Parliament and Council of the European Union, 2016, Articles 5-9)
Accountability[13]	Accountability refers to responsibility of individuals and organisations for their actions, decisions, and ethical obligations, supported by transparency and responsiveness. (Modified from OECD, 2017b; OECD, 2022b)
Transformative Change[14]	Transformative change refers to systemic changes addressing the underlying drivers of biodiversity loss, food insecurity, and climate issues in a long-term perspective. (Modified from O'Brien et al., 2025)
Precautionary Principle[15]	The precautionary principle refers to taking proportionate actions despite scientific uncertainty where there is a risk of environmental, societal, or public harm. (Modified from OECD, 2023b)
Reflective and Iterative Learning[16]	Reflective and iterative learning refers to the continuous reflection and evaluation of assumptions, practices, feedback, and results in order to enable adaptive response. (Modified from McLoughlin et al., 2020)

3. Operational Ethical Framework

The following operational ethical framework converts the Observatory's guiding values into an operational set of ethical expectations and awareness of risks along with a balanced approach to implementation.

Rather than treating each value separately, the framework groups related values into operational domains for better clarity, avoiding duplication, and support the implementation process.

[12] (European Parliament and Council of the European Union, 2016)
[13] (OECD, 2017b; OECD, 2022b)
[14] (O'Brien et al., 2025)
[15] (OECD, 2023b)
[16] (McLoughlin, Thoms, & Parsons, 2020)

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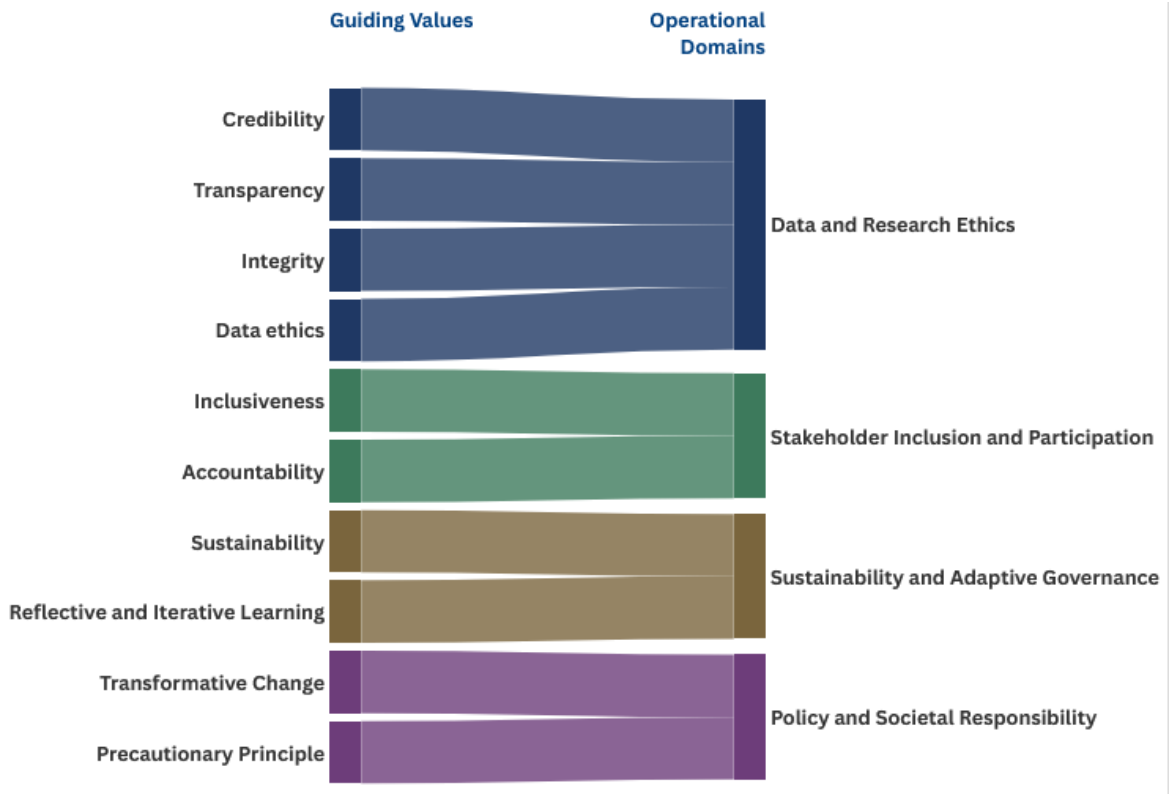

Figure 3: Mapping of the core and supporting Guiding Values to the four operational domains of the framework.

This operational framework aims at facilitating ethical decision-making within the Observatory's development, data integration, monitoring, stakeholder engagement, and policy-support activities.[17]

3.1. Data and Research Ethics

This domain reflects the values of credibility, transparency, integrity, and data ethics and privacy. It entails ensuring that the data and methodology used in the Observatory, along with the analyses and outputs are sound from a scientific and ethical perspective.[18] [19]

Ethical Expectations

The Observatory is expected to:

- Support scientific and methodological rigour in data collection, integrations, and analysis.
- Provide clear documentation of methodologies, assumptions, limitations, and uncertainty levels.
- Choose reliable and validated data sources wherever feasible.
- Apply appropriate privacy, confidentiality, consent, and responsible data

[17] Because many of the Observatory's values overlap with implementation, grouping them into operational areas helps translate these values into integrated and actionable ethical expectations, risks, and practical tools. (Stilgoe, Owen, & Macnaghten, 2013; Burr & Leslie, 2023; Floridi et al., 2018)
[18] (National Academies of Sciences, Engineering, and Medicine, 2017)
[19] (OECD, 2022a)

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governance principles.
- Present results accurately and with sufficient transparency, without overstating certainty.
- Ensure transparency about the origin, quality, and limitations of data.

Main Ethical Risks

If the principles of data and research ethics are ignored, it could result in:

- Risks related to scientific credibility due to poor or non-verifiable methodologies.
- Risks to policy when decision-making processes are based on unreliable or biased information.
- Risks related to privacy and data protection in case of misuse or improper handling of sensitive data.
- Reputation and public trust risks in case of lack of transparency or integrity.
- Misinterpretation of outputs due to poor communication of limitation/uncertainties.

Practical Measures and Tools

Possible solutions and supporting tools that can be used:

- Steps for data validation and source verification.
- Pre-dissemination processes for ensuring transparency and credibility.
- Processes for documenting methodologies and assumptions.
- Data privacy and consent forms to ensure proper data governance.
- Limitations and uncertainty statements.
- Conducting conflict of interest declarations.

3.2. Stakeholder Inclusion and Participation

This area is characterised by the values of inclusiveness and accountability. The objective is to promote meaningful stakeholder inclusion and equitable participation, and ethical responsibility within Observatory operations.

Ethical Expectations

The Observatory is expected to:

- Include diverse stakeholder groups, including traditionally underrepresented communities.
- Work to facilitate meaningful stakeholder participation.
- Offer forums for continuous consultation and feedback.
- Provide information in understandable formats.
- Clarify responsibilities and accountability mechanisms across Observatory activities.
- Respond transparently to ethical concerns, mistakes, or misuse where relevant.

Main Ethical Risks

Failure to adhere to stakeholder inclusion and accountability may lead to:

- Exclusion and equity risk due to stakeholders being underrepresented or unheard.

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- Legitimacy and trust risks if Observatory outputs are seen as irrelevant to stakeholders.
- Responsibility risks if there is no attention to ethical concerns.
- Decrease in stakeholder involvement and confidence due to lack of transparency.

Practical Measures and Tools

Possible measures and tools that can be used are:

- Stakeholder mapping and engagement plans.
- Accessible ways for communication and consultations.
- Mechanisms for feedback collection and reporting.
- Ethical incident reporting procedures.
- Correction actions and accountability tools.
- Tools to document roles and responsibilities.

3.3. Sustainability and Adaptive Governance

This area reflects the values of sustainability and reflective and iterative learning. This area focuses on maintaining the functionality and relevance of the Observatory along with its ethical responsiveness.

Ethical Expectations

The Observatory is expected to:

- Sustain continuity through appropriate governance and sharing of knowledge.
- Sustain learning and adaptation in response to stakeholder feedback, changing risks, and technological advances.
- Remain aligned with evolving food security, biodiversity, and climate policy priorities.
- Support capacity-building through training and guidelines.
- Periodically assess ethical practices and procedures.

Main Ethical Risks

Failure to ensure sustainability and adaptive governance may lead to:

- Risk of continuity if the Observatory becomes unsustainable after the project period.
- Risk of relevance if the outputs fail to meet changing policy contexts and societal needs.
- Lack of institutional development due to lack of learning or ethical reflection.
- Stakeholder disengagement if feedback is not taken into consideration.

Practical Measures and Tools

Possible measures and tools include:

- Planning checklist for sustainability and governance.
- Periodic ethical reviews.
- Feedback from the stakeholders.
- Training materials and onboarding guidance.

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3.4. Policy and Societal Responsibility

This domain is informed by the values of transformative change and the precautionary principle. It focuses on making sure that the Observatory's activities support evidence-informed, ethically aware, and forward-looking responses to the challenges of food security, biodiversity, and climate.

Contribution of the Observatory to policies operates through a sequence from **evidence** to **advice:**

Evidence → Interpretation → Advice

The Observatory bases its outputs on scientifically robust **evidence**, with data and knowledge related to food security, biodiversity and climate, and information pertaining to the Living Labs. The **interpretation** angle of these raw data is currently supported by an in-house agent tool delivering a written summary of the information requested by the Observatory user, using the database of the information hosted by the Observatory. The interpretation provided allows users to get contextual information, allowing comparison between products, timelines or geographical and climatic contexts. In the context of the use of AI within this section of the Observatory, the Ethical Infrastructure requires the Observatory to be transparent toward the user and shall include informing the user of the use of AI and responding to user questions (see Annex F). The AI component is communicated to the users at the time of interaction with a notice displayed in the chat box, informing the users that the outputs generated are automated and may include errors. The mitigation of risks arising from AI, especially the generation of hallucinations, depends on the measures specified in Annex F in conjunction with the criteria laid out in this framework where the AI output should only be used as a supporting mechanism and never as a replacement for evidence-based analysis or policy advice. The outputs from AI should always be traceable to the attributed data sources of the Observatory, uncertain evidence should never be presented as certain, and there should be a way for users to report any erroneous outputs generated.

The transformation of these interpretations towards **advice** goes through a co-validation process, further defined in the Deliverable 5.4, *Policy Hub Functions and Integrations in Post-project Sustainability Plan*. During this phase, the Ethical Infrastructure requires that accountability rest with human stakeholders only, to safeguard the integrity of the policy recommendation process and facilitate the implementation of the generated policy outcomes.

Ethical Expectations

The Observatory is expected to:

- Support informed and responsible policy dialogue with evidence.
- Highlight uncertainties and emerging risks where scientific evidence is lacking.
- Support consideration of precautionary and proportionate action in uncertain situations.
- Support systemic understanding of food, agriculture, biodiversity, and climate linkages.
- Ensure policy-facing outputs remain balanced and evidence-based.

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Main Ethical Risks

Failure to address policy and societal responsibility could result in:

- Delayed or insufficient response to emerging environmental and food systems risks.
- Misunderstanding or over-reliance of Observatory outputs in policy contexts.
- Lack of development in ethical terms where the Observatory functions only as a data bank.
- Risks of public confidence and credibility if societal aspects are overlooked.

Practical Measures and Tools

Possible measures together with the supporting tools include:

- Precaution assessment and uncertainty templates.
- Early warning and risk-monitoring indicators.
- Policy reflection and scenario analysis approaches.
- Policy recommendations review process.
- Reviewing societal and ethical implications of Observatory outputs periodically.

4. Governance, Roles and Capacity Building

The ethical governance of the Observatory is one of shared responsibility and joint governance. The Observatory does not rely on highly formalised forms of governance. It rather emphasises the use of proportionate and flexible coordination tools which aim to be transparent, accountable and ethical but also realistic in their resource requirements. Ethical considerations are integrated into routine Observatory activities wherever possible, including data management, stakeholder involvement, communications, and policymaking.

Against this backdrop of shared responsibility, contributors to the Observatory are asked to take on the following ethical responsibilities:

- taking ethical consideration into account while performing data collection, analysis, and dissemination;
- identifying and addressing ethical risks related to work of the Observatory;
- communicate transparently and responsibly;
- engaging stakeholders in an inclusive and respectful manner; and
- periodically review the ethical resources, tools, and guidance materials.

Any ethical questions and uncertainties beyond ordinary practice may be discussed in a coordinated, reviewed or project management processes as appropriate, and any lessons from ethical considerations and operations can be incorporated into further updates of practices and guidance of the Observatory.

Capacity is essential for shared governance to be effective since the contributors can only fulfil these duties when they comprehend the ethics framework and can act on it in a balanced way. Ethics, in other words, is not assumed but is practiced

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continuously, and requires ongoing attention and learning. In helping contributors in this task, the Observatory offers:

- guidance notes in terms of ethical principles and practices;
- checklists on data ethics, transparency, stakeholder engagement, and responsible communication;
- onboarding material for new contributors.

Training and guidance materials may be periodically reviewed and updated, where feasible, to reflect evolving ethical challenges, stakeholder needs, and technological advances.

5. Integration into the Observatory

The proposed elements of the ethical framework are not expected to stay only in the realm of concepts, but are transformed into specific attributes and features of the Observatory. This transformation takes place within the context of the EI sequence, which transforms values into practice:

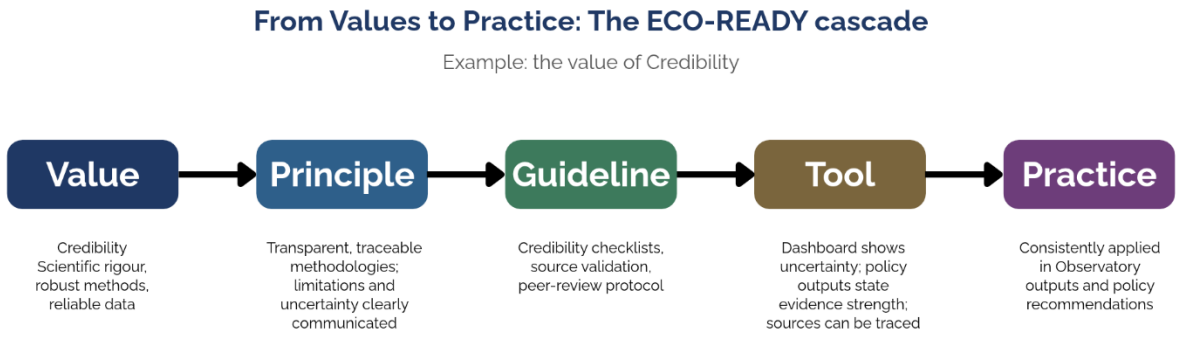

Figure 4: The EI cascade translating shared values into everyday practice (example: Credibility)

The different values are being transposed into the Observatory following this cascade, leading to different features. (See Annex F) As such, uncertainty is communicated in relation to model outputs and policy outputs include the evidentiary base of outputs to inform the user about how trustworthy the information provided by the Observatory is. Traceability of sources makes sure that a user is able to trace results to the source. There is also a Policy Hub component within the Observatory that presents welcome text explaining what its purpose, features and the policy recommendation process explained. These features represent various values at the interface level to know how the information is prepared and how trustworthy it is.

The framework is also embedded into how the Policy Hub manages its external engagement. The lessons learned from stakeholder engagement during the course of the project, along with the values developed in the framework, have developed concrete features. These include mapping of stakeholders, criteria for selecting experts, a consultation process, and feedback to the contributors with guidance on confidentiality and attribution (detailed in Deliverable 5.4).

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6. Continuity within the Post-Project Sustainability Plan

The ethical framework was designed in such a way that it would endure even after the completion of the ECO-READY project, in accordance with the aim that the EI persists beyond the project timeline and continues to influence the post-project outputs. However, for this purpose to be achieved, certain criteria need to be satisfied. Drawing on the project's own experience with sustaining external advisory mechanisms (Deliverable 5.4, Section 2.2.4) and on literature on sustainable governance of research infrastructures and integrity systems (Armenia et al., 2019; OECD, 2017a; Tenbrunsel et al., 2003; van Rijssel & Boenink, 2026), four conditions for continuity can be identified:

Institutional anchoring: Continuity of the EI requires that responsibility for it is tied to a specific position in the future governance structure of the Observatory, and not individuals or the consortium as an organisation. A coordinating position that takes care of the ethical resources and acts as the point of contact for all ethical matters is necessary.

Capacity for maintenance and update: Secondly, the framework requires a small, ongoing capacity for maintenance so that guidance documents and risk assessments can be reviewed and updated in the light of new information, stakeholders and policy environment.

Preservation and availability: Thirdly, the EI Guidelines and the principles derived from it should remain available and easily accessible in connection with the Observatory, because a framework that is not available cannot be used.

Practical use after the project: Finally, for future users the framework will serve as a practical guide rather than a compliance document: those who generate policy recommendations on the basis of Observatory data are encouraged to refer to the Guiding Values, operational framework, and risk assessment.

Review: Where feasible, the Observatory may periodically:

- review ethical risks and measures for mitigating such risks;
- assess the effectiveness of ethical tools and practices;
- consider stakeholder feedback in future revisions to guidance;
- adapt the procedures based on ethical, technological, and/or policy development.

This approach is intended to ensure that the Observatory remains credible, inclusive, transparent, and sustainable over the long term.

7. Conclusion

The EI of the ECO-READY project has been provided in this deliverable, including the rationale as a systemic response to the ethical issues of the policy-relevant research

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infrastructure and its Guiding Values. The EI of the project was demonstrated to be an enabler rather than a constraint, since it fosters cooperation with the partners whose engagement the project depends on, disciplines the dissemination of scientific outcomes without compromising the essence, and serves as a point of reference for decision-making under uncertainty.

Methodology: The Guiding Values were created through a collaborative and participatory process involving the entire project consortium over the course of the project. Based on the shared vision of EI established through presentations and cross-work-package discussions (2023-2024), values identified from the literature were tested and analysed through two successive surveys within the consortium, whose results were clustered, discussed in project meetings and consolidated. The final set of five core values and five supporting values were presented and discussed during the project conference "Delivering Impact: Building the ECO-READY legacy for Food Systems" (Brussels, January, 2026) and revised accordingly. The methodology used was consultative where the goal was to select the values that the partners and stakeholders responsible for the implementation of the framework find relevant.

Limitations: There are certain limitations in the framework that need to be recognised. First, the participation in the surveys was modest and hence the values reflect those of the people who participated in them; the discussion in cross-partner meetings reduces but does not eliminate the bias. Secondly, the values have only been validated internally; external stakeholders and future users of the Observatory were not consulted in relation to the values, although they are among the people the framework is meant to protect. Thirdly, since the finalisation of the values was towards the end of the project, their systematic use in engagement and policy making processes is going to take place in the future, through the Policy Hub and the post-project mechanisms of the Observatory.

Ways forward: The continuity of the EI in the post-project sustainability strategy relies on the four aspects mentioned in the section 6: a coordinating role in the governance of the Observatory in the future, capacity for maintaining and updating the framework periodically, the accessibility of the Guidelines as a permanent document of the Observatory, and the active use of the Guidelines by future actors who formulate policies based on the data generated by the Observatory.

Three priorities follow: first, the infrastructure must be validated beyond the consortium, broadening the effect of building trust demonstrated with the Living Labs to the community of stakeholders and Observatory users as a whole. Second, the infrastructure must stay alive and not become stagnant, integrated into the structure of the Observatory in its interface and co-validation processes, thus meeting the ethical criteria within the process of regular use of the platform. Third, the framework must be regularly evaluated and adjusted so the infrastructure performs its functions of maintaining the credibility of evidence and transparency of interpretation and advice.

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Annexes

Annex A. Overview of the co-development process

The guiding values were developed in the following steps.

Table 4: Overview of the co-development process.

Step	Date	What happened	Output
Presentation	06.12-07.12.2023	Presentation to build a shared understanding of EI in ECO-READY	Questionnaire suggesting guiding values
Follow-up presentation	22.10.2024	Building on the previous presentation and questionnaire results	Perspective and relevant insights shared from Work Package (WP) 4 and Living Labs
Survey 1	13.02.2025	Identification of values considered important for the Observatory and policy recommendations	9 values were identified
Survey 2	25.06.2025	Follow-up survey for validation and gain more insights	Ranking of values; additional supporting values identified
Final Presentation	28-29.01.2026	Presentation of the process and the proposed values	Feedback to revise the draft

The process was consultative with the objective of identifying and testing the values that are considered important by the consortium partners regarding the Observatory and not to conduct a statistical survey to gauge opinions. Every step in the process was cumulative in nature, and the draft was sent to the consortium for their comments before finalising the document.

Annex B. Presentation

An initial presentation was given at the ECO-READY Annual Consortium meeting, held at Rome, on December 6-7, 2023. The presentation was given to the project consortium partners on “Building a strong and sustainable EI for the ECO-READY Observatory,” to build a shared understanding of the concept and process.

The presentation covered the concept of an EI, its formal and informal systems, as well as the climate that supports these systems. A form was shared to brainstorm and deliberate the main guiding values of the Observatory. The presentation and follow-up discussion contributed to designing the EI.

Annex C. Follow-up Presentation

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A follow-up presentation was given at the ECO-READY LL data workshop in the scope of the Observatory, held online, on October 22, 2024. This presentation was designed to build on the initial presentation and further explain the integration of ethics into the development of the Observatory, giving an overview of the concept and its purpose. Partners from the WP 4 along with the Living Lab representatives welcomed the values and the approach.

The presentation concluded with gaining more insights from the participants on the following:

- What are your perspectives on EI?
- Please share experiences and relevant understanding regarding ethical practices.

Annex D. Surveys

First survey - The aim of the first survey was to identify and articulate the values that consortium partners consider important for the ethical framework, governance, and use of the Observatory and policy recommendations.

An online Google form was designed, open from 13.02.2025 to 28.02.2025. Partners were invited based on the consortium contact list. The survey contained 21 questions including the role of the participants, ranking and reasoning on the values identified from the literature, and final thoughts.

18 participants responded to the survey and the results were consolidated to inform the follow-up survey.

Second survey - The aim of the second survey was to validate the results from the initial survey and gain further reflection on additional key guiding values. An online Google form was designed and disseminated to the partners, open from 25.06.2025 to 18.07.2025.

11 participants responded to the survey and the results from both the surveys were consolidated to classify them into operational frameworks. The summary of the results from the survey are produced in Annex D.1

Annex D.1 Survey results

Table 5: Summary of survey responses, Surveys 1 and 2.

Survey	Guiding Values	Number of respondents	Output
1	9 guiding values were recognised	18	8 values were identified as important
2	4 guiding values were validated	11	2 more values were identified and added to the cluster

Annex E. Final Presentation

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The final guiding values and the process behind their identification were presented at the conference on “Delivering Impact: Building the ECO-READY Legacy for Food Systems,” held at Brussels, Belgium on January 28-29, 2026. The audience consisted of the ECO-READY consortium partners.

The presentation covered the rationale behind the EI, the co-development process detailing the identification of the guiding values, and the proposed core and supporting values based on how they were rated by the respondents. Participants raised discussions on the integration of EI and link to policy recommendations. Several participants expressed their support for the framework and recognised the importance of its embedment in the Observatory and policy recommendations.

Annex F. Ethical Checklist for ECO-READY Observatory

Table 6: Ethical checklist for the ECO-READY Observatory.

Change	Where in the Observatory	What should be added
1. AI disclaimer	AI chat window, next to the chat input	A visible notice, e.g. "You are interacting with an AI assistant. Responses are automatically generated and may contain errors." This disclosure is required under the EU AI Act.
2. Terms and conditions	Sign-in / first login	A pop-up that new users must accept. Existing users get an email about the update with a deadline to accept.
3. Data source attribution and allocation	Every tab, starting with the contaminants tab	A clear line mapping the specific datasets to their sources on the page, e.g. "Data source: EFSA". Check all other tabs to ensure every specific data stream is explicitly mapped to its exact provider.
4. User data usage policy	Sign-in page and footer	A text explaining what is accessed and stored when users log in (e.g. with Gmail), plus a permanent footer link so it is always reachable.
5. Contact / bug report	Footer or main menu	A contact address or a simple bug report form.
6. Explanation for the early warning tool maps	Early warning tool page	A short text saying what the maps show and how to read them (a legend or description).

Questions for the technical team:

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Table 7: Questions for the technical team on AI chat data handling.

Topic	Question
Chat Storage	Are users' AI chat questions stored, and who has access?
Model training	Is the AI model trained on user queries? If not, they should be informed.
Data separation	Is login/identifying data stored separately from the query data?
Opt-out	Can users opt-out of the chat history storage?
Backend access	Is access restricted? Or would an NDA be feasible for those with access?

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