D1.2. Ethics Plan

Regions 4Climate

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List of Acronyms

AI	Artificial Intelligence
ALLEA	European Federation of Academies of Sciences and Humanities
CAP	(European) Common Agricultural Policy
CCAP	Community of Climate Adaptation Practice
CINEA	European Climate, Infrastructure and Environment Executive Agency
DE&C	Dissemination, Exploitation and Communication
DEI	Diversity, Equity, and Inclusion
DMP	Data Management Plan
DNHS	Do No Significant Harm
DPA	Data Processing Agreement
DPIA	Data Privacy Impact Assessment
EAd	Ethics Advisor
EB	Ethics Board
EIGE	European Institute for Gender Equality
EC	European Commission
EIGE	European Institute for Gender Equality
GDPR	European Union’s General Data Protection Regulation
GHG	Greenhouse gas
HE	Horizon Europe
IPCC	Intergovernmental Panel on Climate Change
ML	Machine Learning
NBS	Nature-based solution

OA	Open Access
R4C	Regions4Climate
RCR	Responsible Conduct of Research
RRI	Responsible Research and Innovation
SDG	Sustainable Development Goal
TENK	Finnish National Board on Research Integrity
UN	United Nations

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Keywords

- Ethics
- Research integrity
- Responsible Innovation
- Inclusiveness
- Artificial Intelligence

Disclaimer

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Executive Summary

Regions4Climate (R4C) project work involves the conceptualisation, testing and validation of an inclusive approach to social equity and just transition to climate resilience through the co-development of a systematic framework for just transition underpinned by detailed regional socioeconomic analyses. The just transition framework is intended to provide context for the integration of human needs and unlocking of human talent within regional planning and development strategies, giving rise to participatory co-creation processes that are capable of underpinning equitable and accessible regional and urban development processes whereby all people are equally able to contribute. Notably, the project will identify social inequalities and the most vulnerable groups within R4C demonstration regions, and map how different adaptation measures might disproportionately affect vulnerable groups in order to prevent such adverse impacts. The *Ethics Plan* is targeted to all R4C consortium partners and provides essential guidance and practical tools in support of ethical, socially responsible project work.

The R4C project has identified three main categories in addition to general ethical issues that require more specific consideration. These are Human and Personal Data, Environment, health and safety, and Artificial Intelligence. The key performance indicators adopted for evaluation of ethical issues are inspired by the European Commission (2021) publication on ethics self-assessment in EU grants and by the UN Sustainable Development Goals (SDGs). Additional indicators for evaluating the responsible research and innovation (RRI) aspects of the R4C project were identified from the MoRRI project and its continuation, SUPER_MoRRI[1]. **Guidelines, checklists and key performance indicators (KPIs) are presented throughout the *Ethics Plan* to support the ethical and responsible execution of project work.**

The Regions4Climate Ethics Board, comprised of an Ethics Manager and one representative from each of the project's 12 large-scale regional demonstration areas provides advice, guidance, tools/ templates, and other resources for the management of ethical issues and RRI within the R4C project. In addition, an external, independent expert has been appointed as an Ethics Advisor (EAd) to be consulted on issues related to research ethics or the responsible conduct of research (e.g., RRI) and to attend project meetings as needed.

The ethical norms of **impartiality**, **reliability**, **integrity,** and **responsibility** sustained in R4C provide the foundations for sincere, reliable, and confidential cooperation among the consortium members and other stakeholders. These ethical norms are closely tied with the notion of research integrity. Consortium partners of the R4C project are further committed to respecting the fundamental principle of research integrity as set out in the *European Code of Conduct for Research Integrity*[2] (ALLEA, 2017), namely **reliability**, **honesty**, **respect,** and **accountability**. The R4C ethics management structure provides on-going guidance and assessment via the Ethics Board, concomitant with the overall management of the R4C project, to ensure that good research practices are sustained in all applicable

[1] Horizon 2020 project Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI. https://cordis.europa.eu/project/id/824671
[2] https://allea.org/code-of-conduct/

contexts. Notably, all participating organisations as well as individual researchers and management staff are responsible for following good research practices, including the reporting of any misconduct that may be detected.

The R4C general communication, publication and dissemination principles are based by design on high ethical standards. Regions4Climate researchers commit to reaching agreement regarding the sequence of **authorship** in a fair and transparent manner, and R4C project partners acknowledge that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results. All members of the R4C project team acknowledge that each participant in a research activity bears individual responsibility for the **content** of any resultant publications or other communication and dissemination. The content creators must ensure that their work is made available to R4C colleagues in a **timely, open, transparent, and accurate manner**.

The R4C consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research. All partners in the R4C consortium are committed to preventing the occurrence of any kind of misconduct, disregard, or other unacceptable research and innovation practices. If concerns arise in relation to any kind of misconduct or possible violation of research integrity, the concerned party should contact the R4C Ethics Manager and R4C Coordinator right away to further investigate and seek resolution to the matter.

Regions4Climate is a European innovation action. The desired just transition towards climate change resilience requires that we simultaneously address social inequalities and implement cross-sectoral innovations to build socio-cultural, economic and ecological resilience to both extreme weather events as well as slow onset events, wherein change is realised in the longer-term. The partners of the R4C project are committed to undertaking activities designed to address current and potential future climate change-related challenges and build more resilient European communities within an innovative socially engaged, citizen-driven paradigm. As such, the project will adhere closely to international and national ethics guidelines. In particular, the R4C project team will follow the **EU's General Data Protection Regulation (GDPR) Regulation (EU) 2016/679**, 27 April 2016. The R4C project team are also committed to the **European Commission's Do No Significant Harm principle**, which states that projects must not cause significant harm to any of the six environmental objectives defined in the EU Taxonomy for Sustainable Finance (Regulation (EU) 2020/852[3]), during or after the project, and that all project measures must comply with this principle.

The R4C project has a strong collaborative approach and will widely engage stakeholders in R4C project activities including interviews, workshops, and events. Engaged stakeholders may act as a direct source of data or other information for further analysis or may provide data and other information by engaging in citizen science activities and may be involved in the co-creation of innovative solutions via various methods. The **principles of Diversity, Equity & Inclusion (DEI)** will be applied in the R4C project's recruitment and participation activities to enable the participation of different groups of individuals, including but not limited to people of different ethnicities, abilities and genders. Special attention will to be paid to informed consent procedures when collecting any sensitive data from humans and/or involving so called vulnerable groups to the study. General incidental findings policy will be implemented for all actions. The R4C project involves the development, deployment and/or use of **Artificial**

[3] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 (Text with EEA relevance). https://eur-lex.europa.eu/eli/reg/2020/852/oj

Intelligence (AI)-based systems. Details of specific AI-based technologies and the targets of development and usage of AI in research will be described in later deliverables. At present, we do not believe that the development and usage of machine learning algorithms (AI-based technologies) to provide predictive analytics using defined, openly available datasets as currently envisioned in the R4C project requires the in-depth consideration of complex and/or serious ethical issues, and thus basic information and safeguards as presented herein are currently sufficient. The rate of AI development, and the nature of each machine learning (ML) component developed within the R4C project may necessitate further exploration of ethical issues at a later date, which will be addressed within periodic reporting as well as the specific project deliverables pertaining to AI/ ML-based analytics. In relation to the SD modelling to be carried out in R4C, the experts involved will seek to apply as far as possible a compact approach that, among other benefits, reduces the simulation time due to the lower number of parameters required without compromising the significance of the results, which in turn is expected to reduce emissions.

Finally, the use **inclusive language** while preparing R4C materials, events and in all communication activities, either internal or external, is paramount. Speaking and writing are actions that not only depict but can also shape reality. When we express things in a specific manner, we generate mental images or strengthen existing ones. Inclusive language is sensitive, non-discriminative, and treats everyone equally by choices of word, tone of speech and manner of conversation. The use of inclusive language is essential in creating environments that are respectful, psychologically safe, and welcoming to all individuals (APA, 2021). Guidelines on the use of inclusive language as well as links to further reading are provided in the *Ethics Plan*.

1. Introduction

1.1. Introduction to the Regions4Climate Project

The ambition of Regions4Climate (R4C) is to advance community-level adaptation to climate change by collaboratively building with local and regional stakeholders smarter, more inclusive, and more resilient regional ecosystems. To achieve this goal, R4C will co-create and validate a suite of user-centred tools and frameworks to support socially just regional climate resilience transitions across Europe. Regions4Climate will link new knowledge, innovative technologies and decision-making processes and tools with an in-depth understanding of the social fabric of communities. Learnings from regional demonstrations of co-created cross-sectoral solutions within Åland, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Greece, Italy, Portugal, Spain and Sweden will provide input for the co-development of recommendations for long-term politically adopted and secured resilience strategies. Partner regions will engage deeply with their stakeholders to collaboratively develop and implement (further) robust climate resilience action plans that are attuned to the specific regional context and based on the latest available evidence and information. This should effectively serve as a testing ground for the replicability, adaptability, and scalability of a variety of climate resilience innovations.

Ethics and the responsible conduct of research is of critical importance in all project work, but particularly in R4C due to the great extent to which the partners in the project consortium will engage with local and regional stakeholders. Regions4Climate project work involves the conceptualisation, testing and validation of an inclusive approach to social equity and just transition through the co-development of a systematic framework for just transition underpinned by detailed regional socioeconomic analyses. The just transition framework is intended to provide context for the integration of human needs and unlocking of human talent within regional planning and development strategies, giving rise to participatory co-creation processes that are capable of underpinning equitable and accessible urban development processes whereby all people are given the opportunity to contribute in the way that works best for them. In practical terms, this can mean direct involvement if they wish, or more indirect so as not to overload them with many tasks that can cause stress (e.g., in the case of particularly vulnerable groups). Notably, the project will identify social inequalities and the most vulnerable groups within R4C demonstration regions, and map how different adaptation measures might disproportionately affect vulnerable groups to prevent such adverse impacts. The *Ethics Plan* provides essential guidance and practical tools in support of ethical, socially responsible project work.

1.2. Purpose and Target Group

The purpose of this *Ethics Plan* is to describe how the R4C project will address the core ethical standards to be followed by all Horizon Europe projects, focusing on specific ethical issues within the R4C project identified at the present time. The *Ethics Plan* covers the governance structure related to relevant ethical issues as well as Responsible Research and Innovation (RRI) by presenting procedures for management of ethical issues during the project. The present document provides a description of and information about ethics management in the R4C project. It gives an overview of the ethical issues and procedures to ensure compliance with ethical standards under the Horizon Europe programme, including a more detailed description of the R4C project's ethics governance structure. Herein, we present a detailed plan to address the identified ethical issues within the R4C project - Human,

Personal Data, Environment, health and safety, and Artificial Intelligence. Finally, this document provides practical information on the usage of inclusive language and a discussion of potential negative externalities such as green gentrification or green colonialism in climate research.

The *Ethics Plan* is targeted to all R4C consortium partners and provides key information and tools useful beyond the R4C project. The main intended audience is members of the Regions4Climate consortium to provide the necessary guidance to ensure adherence to applicable Ethics rules and regulations during all project activities. The Regions4Climate *Ethics Plan* can also provide useful guidance to others wishing to replicate the climate resilience building actions demonstrated in R4C partner regions or to exploit R4C project outputs in their own unique resilience-building activities.

1.3. Ethics Management in Regions4Climate

The Ethics Self-Assessment carried out for the R4C prior to project initiation did not identify very complex or serious ethical issues as defined by the EC. However, due to the project's planned extensive engagement with citizens and other stakeholders (including engagement with vulnerable populations), the large project size and the focus of project work on facilitating a socially just and equitable transition to climate resilience, the structure and processes for management of ethical concerns, and the related *Ethics Plan*, are relatively comprehensive in nature.

Management of ethical issues and RRI within the R4C project is underpinned by the Horizon Europe ethics appraisal procedure to ensure that all provisions on ethics rules and regulations are respected. An Ethics Manager internal to the R4C project provides guidance for the development of ethical guidelines, etc., specific to the project activities (Figure 1). In addition, the R4C project consortium has appointed an external, independent expert as an Ethics Advisor (EAd) to be consulted on issues related to research ethics or the responsible conduct of research (e.g., RRI) and to attend project meetings as needed.

Figure 1. Conceptual diagram illustrating ethics management in the Regions4Climate project.

An Ethics Board comprised of the project's Ethics Manager and one representative from each R4C demonstration region will meet at least three times per year to discuss issues related to ethics and the responsible conduct of research and innovation activities. The Ethics Board will also convene during consortium meetings to review ethical issues, with additional meetings and/or workshops organised as needed. The creation of an Ethics Board comprised of representatives from each of the demonstration regions is important because the main ethical issues identified in the R4C project's initial ethics self-assessment were related to the engagement of and gathering of data and information from people within regional innovation actions, including the active participation of local citizens and other stakeholders in the many activities and events of the project.

1.4. General Ethical Issues

1.4.1. Research Ethics

Research ethics as a general concept addresses all the ethical viewpoints and evaluations related to research and innovation activities. Ethics are norms of conduct that distinguish between acceptable and unacceptable behaviour. As people can interpret ethical norms in different ways considering their own values and life experiences, it is necessary to establish common definitions and rules in the framework of the project.

The R4C project adopts the European Commission's (2012) definition of research ethics (EC 2012, p.2):

"*The consideration of ethical issues, starting at the conceptual stage of a proposal, enhances the quality of research, increases its likely social impact, promotes research integrity, promotes a better alignment of research with social needs and expectations and, finally, supports the societal uptake of the fruits of research because high ethical standards generally merit public trust. In this spirit, the Commission aims to build a relationship between the research process and ethics that is collaborative and constructive (rather than negative and inhibitive).*"

The partners in the R4C consortium view research ethics as the vital basis for conducting high-quality research and are committed to act in accordance with and the principles of research ethics. In particular, the ethical norms sustained in R4C are:

- ***Impartiality*** *– all decisions and outputs are based on objective and relevant criteria, without bias or prejudice*
- ***Reliability*** *– results are consistent over time and an accurate representation of the total population under investigation*
- ***Integrity*** *– verifiable methods are used to define, perform, and evaluate research and innovation activities; reporting of results follows applicable rules, regulations and/or guidelines; commonly accepted professional codes or norms are followed in all project activities*
- ***Responsibility*** *– multiple principles and values are recognised, interpreted, and acted upon according to the standards within a given context*

These norms stress the importance of good and responsible practices and provide the foundations for sincere, reliable, and confidential cooperation among the consortium members and other stakeholders. These ethical norms are closely tied with the notion of research integrity.

1.4.2. Research Integrity

In addition to these high-level principles of research ethics, good research practices are based on the fundamental principles of *research integrity*. Research integrity emphasises acting with honesty and integrity in all research activities. Consortium partners of the R4C project are committed to respecting the fundamental principle of research integrity as set out in the *European Code of Conduct for Research Integrity*[4] (ALLEA, 2017), namely:

- ***Reliability*** *in ensuring the quality of research as reflected in the design, methodology, analyses and use of resources.*
- ***Honesty*** *in developing, undertaking, reviewing, reporting, and communicating research in a transparent, fair, full, and unbiased way.*
- ***Respect*** *for colleagues, research participants, society, ecosystems, cultural heritage, and the environment.*
- ***Accountability*** *for the research from idea to publication, its management and organisation, training, supervision, and mentoring, and for the wider impacts of research activities.*

In addition to following European guidelines on research ethics and research integrity, each of the R4C project partners must also adhere to other relevant international and national research integrity guidelines. For example, VTT is committed to complying with the guidance of The Finnish National Board on Research Integrity TENK's Responsible Conduct of Research, RCR[5].

1.4.3. Contexts of Ethical Research Practices

Good research practices – which are based on the concepts of research ethics and research integrity – apply to different contexts of the project's processes. These contexts are defined by ALLEA (2017) as:

- *Research Environment*
- *Training, Supervision and Mentoring*
- *Research Procedures*
- *Safeguards*
- *Data Practices and Management*
- *Collaborative Working*
- *Publication and Dissemination*
- *Reviewing, Evaluating and Editing*

The R4C ethics management structure provides on-going guidance and assessment via the Ethics Board, concomitant with the overall management of the R4C project, to ensure that good research practices are sustained in all these contexts. Notably, all participating organisations as well as individual researchers and management staff are responsible for following good research practices. This includes reporting of any misconduct that may be detected

[4] https://allea.org/code-of-conduct/
[5] The official website of the Finnish National Board of Research Integrity TENK for the Responsible Conduct of Research (RCR) https://tenk.fi/en/research-misconduct/responsible-conduct-research-rcr

directly to the Project Coordinator and Regions4Climate Ethics Manager. Together they will ensure that reported potential misconduct is handled appropriately, ethical procedures are strictly followed, and corrective action is promptly implemented.

1.4.4. Ethics in Communication and Dissemination Activities

The R4C general communication and dissemination principles are based by design on high ethical standards. The basic principles of these activities are defined in the Regions4Climate *Project Quality Management Plan* (Deliverable 1.1; Wendling et al. 2023). These principles will be addressed in further detail in the forthcoming Regions4Climate *Plan for Dissemination and Exploitation including Communication activities* (Deliverable 7.2). Thus, herein the discussion is limited to essential principles related to ethics in the communication and dissemination activities of the project with particular focus on scientific and technical publications as authorship, content, and accessibility of publications are core ethics-related considerations (ICMJE, 2023).

1.4.4.1. Authorship

Regions4Climate researchers commit to reaching agreement regarding the sequence of **authorship** in a fair and transparent manner. Regions4Climate partners acknowledge that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results. Publications generated by R4C consortium members must acknowledge all work and **intellectual contributions**, including collaborators, assistants, and funders. The Finnish Advisory Board on Research Integrity recommendations for research publications (AGREEING ON AUTHORSHIP, 2018[6]) provides additional guidelines regarding this topic.

All published outcomes of the R4C project must acknowledge the financial support provided by the EC by including in the publication's acknowledgements section the following statement:

This work was part of the Regions4Climate project supported by the European Climate, Infrastructure and Environment Executive Agency (CINEA) as part of the European Union's Horizon Europe research and innovation programme, funded under Grant Agreement No. 101093873 for call topic HORIZON-MISS-2021-CLIMA-02-04 "Large scale demonstrators of climate resilience creating cross-border value".

All visual communication activities and products must also include the following disclaimer:

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

[6] https://www.tenk.fi/sites/tenk.fi/files/TENK_suositus_tekijyys_EN.pdf

Additional guidelines regarding the use of logos, R4C visual identity elements, and Regions4Climate *Plan for Dissemination and Exploitation including Communication activities* (Deliverable 7.2)

1.4.4.2. Content

All members of the R4C project team engaged in a given research activity acknowledge that each participant in the research bears individual responsibility for the content of any resultant **publications** or other communication and dissemination outputs, unless otherwise specified. The content creators must ensure that their work is made available to R4C colleagues in a **timely, open, transparent, and accurate manner**, unless otherwise agreed. All members of the R4C project team must be transparent and accurate in their communications with the public and media representatives, and as open as possible whilst respecting the R4C terms of confidentiality as outlined in the project's Consortium Agreement.

1.4.5. Research Misconduct and Other Unacceptable Practices

The R4C consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research.

Research misconduct is the act of fabrication falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results[7]:

- ***Fabrication**, or making up results and recording them as if they were real*
- ***Falsification**, such as manipulating research materials, equipment or processes or changing, omitting, or suppressing data or results without justification*
- ***Plagiarism**, i.e., using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs*
- ***Misappropriation**, or the unlawful presentation of another person's result, idea, plan, observation, or data as one's own research*

On occasion, actions that comprise misconduct in research and innovation activities may not be clearly identified as fabrication, falsification, plagiarism, or misappropriation. In these instances, the actions can be understood as disregarding the principles of responsible conduct of research. Examples may include, but are not limited to:

- *denigrating the role of other researchers in publications*
- *reporting results and methods in a careless manner, resulting in misleading claim,*
- *inadequate record keeping and storage of results and data*
- *publishing the same results many times as novel results (self-plagiarism)*
- *misleading the research community in other ways*

[7] https://ori.hhs.gov/definition-research-misconduct

Other unacceptable practices in research and innovation activities that violate ethical norms include, but are not limited to:

- *manipulating authorship*
- *exaggerating one's own achievements (for example, in a curriculum vitae)*
- *self-plagiarism, or re-publishing substantive parts of one's own earlier publications without duly acknowledging it*
- *citing selectively to enhance own findings or to please editors, reviewers, or colleagues*
- *withholding research results*
- *intentionally delaying publication of the work of other researchers, for example by delaying the peer-review process*
- *allowing funders/sponsors to jeopardise independence in the research process or reporting of results*
- *accusing a researcher of misconduct or other violations in a malicious way*
- *exaggerating the importance and practical applicability of findings*

All partners in the R4C consortium are committed to preventing the occurrence of any kind of misconduct, disregard, or other unacceptable research and innovation practices.

If concerns arise in relation to any kind of misconduct or possible violation of research integrity, the concerned party should contact the R4C Ethics Manager and R4C Coordinator right away to further explore and seek resolution to the matter as already noted in section 1.4.3.

2. Main Ethical Dimensions and Issues in Regions4Climate

2.1. Ethics Self-Assessment

The R4C project has a strong collaborative approach and will widely engage stakeholders in R4C project activities including interviews, workshops, and events. Engaged stakeholders may act as a direct source of data or other information for further analysis or may provide data and other information by engaging in citizen science activities and may be involved in the co-creation of innovative solutions via various methods. The groups targeted by the R4C project's Dissemination, Exploitation and Communication (DE&C) strategy reflect a broad range of stakeholders in the domains of decision-making, climate science, ecology, sustainability, environmental conservation and restoration, citizen science, and co-creation, and outline the use of targeted tools and strategies to reach diverse types of stakeholders.

Annex 1 of the present document provides a checklist to guide the preparation of stakeholder activities in R4C.

The initiation of Communities of Climate Adaptation Practice (CCAPs) is planned through a series of in-person and online events to engage and inform citizens and provide them with the tools necessary to contribute observations of climate events and local (ecosystem) condition, etc., to a common data hub. This approach employs citizen science to obtain data that complements scientific monitoring and research processes. Wherever possible, citizen science applications focused on climate and observations of local and/or regional social-cultural-economic-political-environmental-technolofical-legal ecosystems will be merged with existing programmes and applications to foster rapid uptake. A dissemination program for the promotion of all applications and initiatives implemented within the R4C project will be developed to include local/regional tourism and information websites and media platforms. Each Community of Climate Adaptation Practice will showcase their work directly to the public through experimentation with science engagement during regional events.

Personal data (e.g., contact details) will be collected in relation to these activities, in addition to information and data requested for the development of the project (e.g., feedback, opinions). All data will be pseudonymised, and/or where possible fully anonymised. A Data Protection Impact Assessment will be performed if target groups may be considered vulnerable (e.g., minors, aged, disabled, low-income population, or minorities) or if any information that can be considered sensitive (such as political opinions, ideological statements, health related feedback) is collected for further analysis. The forthcoming Regions4Climate *Project Data Management Plan* (Deliverable 1.3) will describe in detail the project's anticipated datasets and management of different data types. Specific safeguards will be developed and implemented for the project for the citizen science activities, when collecting observations from the environment. This action will both protect the citizens and preserve the environment. The personal data of EU citizens will not be exported to any non-EU country.

Artificial intelligence (AI) and/or machine learning (ML) algorithms will be employed to enable forecasting of climate and land use impacts on ecosystems and their services based upon user-defined scenarios (e.g., data recombination

as specified by users to generate visualisations of future ecosystem services delivery scenarios). No issues related to human rights are foreseen as a result of the use of ML/ AI-enabled data processing applications. However, issues related to quality, security and integrity of data and those related to AI tools design for different types of end-users will be explored and assessed.

2.2. Compliance with Ethical Principles and Relevant Legislation

All participants in the R4C project are committed to the responsible application of professional principles and codes of conduct and will conform to applicable legislation and other regulations in the countries where the research and innovation actions are carried out. All partners in the R4C consortium are committed to rigorously apply the ethical standards and guidelines of Horizon Europe (HE) in all work regardless of the country in which the research and innovation is carried out. The R4C project complies with the Charter of Fundamental Rights of the EU, and we subscribe to the requirements within Horizon Europe to deal with ethical issues following the Regulation (EU) 2021/695[8], Article 19 (1), which states:

"*Actions carried out under the Programme shall comply with ethical principles and relevant Union, national and international law, including the Charter and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols. Particular attention shall be paid to the principle of proportionality, to the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of a person, the right to non-discrimination and to the need to ensure protection of the environment and high levels of human health protection*."

Annex 2 of the present document provides a checklist to guide the conduct of research and innovation activities in R4C in line with ethical principles and relevant European legislation.

Regions4Climate is a European innovation action. As such, the project follows international and national ethics guidelines. In particular, the R4C project team will adhere closely to the EU's General Data Protection Regulation (GDPR) Regulation (EU) 2016/679, 27 April 2016, which supersedes the Data Protection Directive 95/46/EC as of May 2018 as the primary law regulating how organisations protect EU citizens' personal data; with the EU's E-Privacy Directive 2002/58 on Privacy and Electronic Communications; and with Commission decisions on the adequacy of the protection of personal data in third countries, as well as Privacy Shield that supersedes International Safe Harbour Privacy Principles as of 2015.

The R4C project has identified three main categories in addition to general ethical issues that require more specific consideration. These are Human and Personal Data, Environment, health and safety, and Artificial Intelligence. The key performance indicators (KPIs) adopted for evaluation of the ethical issues are inspired by the publication by European Commission (2021) and UN Sustainable Development Goals (SDGs). The preliminary selection of SDGs

[8] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013

should guide and inform the sustainability of R4C activities (Table 1). Additional indicators for evaluating the RRI aspects of the R4C project were identified from the MoRRI project and its continuation, SUPER_MoRRI[9] (Table 2).

Table 1. Preliminary selection of UN Sustainable Development Goals per Regions4Climate activities.

Dimensions	SDG Goals	Potential SDG targets for R4C
Economic	SDG 9: Industry, innovation, and infrastructure	9.1: Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
	SDG 12: Responsible consumption and production	12.2: By 2030, achieve the sustainable management and efficient use of natural resources. 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
Social	SDG 3: Good health and well-being	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. 3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.
	SDG 5: Gender equality	5.1: End all forms of discrimination against all women and girls everywhere. 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life.
	SDG 10: Reduced inequalities	10.2: By 2030, empower and promote the social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
Environmental	SDG 11: Sustainable cities and communities	11.7: By 2030, provide universal access to safe, inclusive, and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

[9] Horizon 2020 project Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI. https://cordis.europa.eu/project/id/824671

	11.a: Support positive economic, social, and environmental links between urban, peri-urban, and rural areas by strengthening national and regional development planning.
SDG 13: Climate action	13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Table 2. Potential MoRRI indicators preliminarily selected for Regions4Climate.

RRI dimensions	Potential MoRRI indicators for R4C adapted to fit the project
Ethics	E1a: Ethical considerations during the development of regional innovations
Gender Equality	GE1: Share of research-performing organisations with gender equality plans
	GE2: Female researchers involved in R4C
	GE10: Female participants involved in R4C regional innovations and activities
Science Literacy, Scientific Education	SLSE2: RRI related training for the R4C consortium
Public Engagement	PE1: Involvement of citizens in R4C workshops and regional innovations
	PE2: Policy-oriented engagement in science
Open Access	OA1: Open access literature generated in R4C
	OA2: Data publications generated in R4C
	OA3: Social media outreach of R4C

2.3. Human and Personal Data: Involvement of Humans in Research

All R4C innovation actions will bring together key cross-sectoral stakeholders, including public administrations, scientific/technical experts, private service providers, and citizens, within CCAPs to collaboratively build regional climate resilience. Whilst each region experiences some unique socio-economic and ecological challenges, common themes to be addressed during the project include social and economic disparities within regional communities; climate-change related risks and vulnerabilities; biodiversity decline; and limited citizen engagement in decision-making processes. The frameworks and tools that are collaboratively developed and validated in R4C will address these core challenges, and the regional innovations implemented in partner regions will provide a suite of proven, scalable and easily replicable climate change adaptation solutions to trigger societal transformation among key community systems that are central to resilience building and sustainable growth.

The R4C project activities inherently rely upon stakeholder engagement including the collection of personal data. Thus, careful attention to ethical considerations regarding the involvement of humans in research as well as those concerning the processing of personal data is essential for the execution of the project.

2.3.1. Regional Stakeholder Engagement

As part of the Stakeholder Analysis to be carried out in Task 7.1 and to support stakeholder engagement in different activities in Regions4Climate, all regions will prepare an engagement plan, including a schedule, methodology and identified target groups (recruitment criteria and procedures). Target groups have been preliminarily identified but a more detailed definition and identification of target stakeholder groups and locally appropriate recruitment processes will be described in regional engagement plans, including a timeline of activities. Engagement plans will be updated if new target groups are identified, or if new engagement methodologies are introduced. The basic procedure (Figure 2) for the involvement of participants in the activities of a research and innovation project is comprised of three steps:

1) *Awareness (informing potential participants about the project and activities)*
2) *Interest (define with stakeholder common vision and targets for the action and participation)*
3) *Commitment (continuous interaction between stakeholders and shared understanding of further actions)*

The informed consent procedures that will be adopted for the participation of humans in R4C research and innovation activities will follow EU GDPR and two basic principles:

1) *Provide adequate information about the study, including the purpose and duration of participation in each action and the management of study data to the potential participants*
2) *Comply with all applicable legal and ethical aspects of data acquisition and management as described in the Regions4Climate Data Management Plan and periodic updates (Deliverables 1.3-1.5)*

The informed consent forms will additionally state the possibility of the participant to withdraw consent from the research actions. Similar procedure will be adopted both for in-person and virtual interaction with the participants. Special attention needs to be paid to the informed consent procedures when collecting any sensitive data from humans and/or involving so called vulnerable groups to the study. The informed consent process and document

templates are briefly presented in Annex 3. The forthcoming Regions4Climate *Data Management Plan* (Deliverable 1.3) and periodic updates (Deliverables 1.4 and 1.5) will describe in detail what data are collected and how these data are managed.

General incidental findings policy will be implemented for all actions, including the abovementioned informed consent process. According to the Office for Human Research Protections[10], incidental findings are *"discoveries of individual-level findings that are unrelated to the goals of the study".* Although incidental findings are often medical in nature and related to clinical research, they can also occur in innovation and social research, such as that conducted by Regions4Climate. When talking about incidental findings, it is important to consider potential so-called "returns". The return of an incidental finding could simply mean that the researchers involved directly inform the research subject about the finding, but it could also mean contacting the relevant authorities, such as social services.

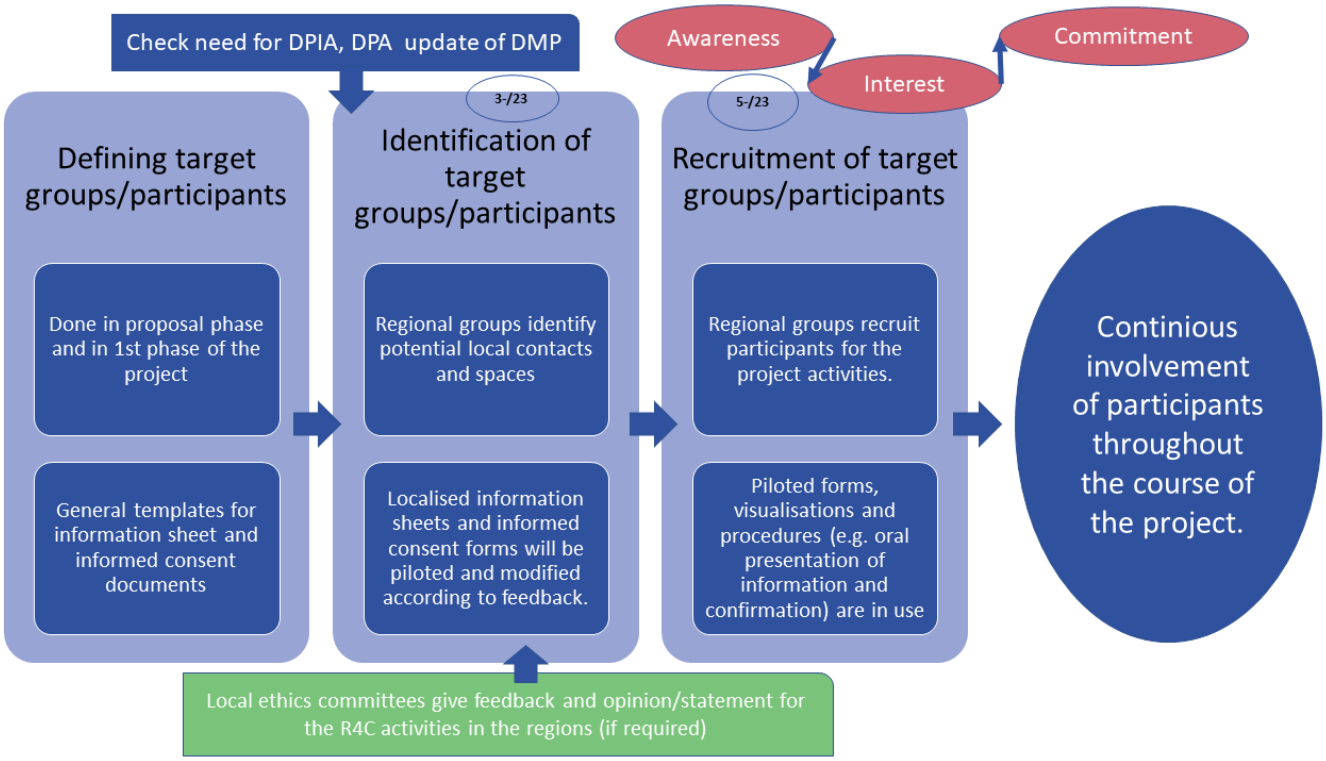

Figure 2. Regions4Climate stakeholder engagement procedure.

[10] Office for Human Research Protections (2017): "Attachment F - Recommendations on Reporting Incidental Findings". https://www.hhs.gov/ohrp/sachrp-committee/recommendations/attachment-f-august-2-2017/index.htm

2.3.2. Principles of Engagement Processes

The principles of Diversity, Equity & Inclusion (DEI) will be applied in the R4C project's recruitment and participation activities in order to enable the participation of different groups of individuals, including but not limited to people of different ethnicities, abilities and genders. Specifically, R4C project participants will seek to remove barriers to the widespread participation of a diverse group of stakeholders in project activities (inclusion), promote and integrate a diversity of perspectives in collaborative processes (diversity) and provide fair access to opportunities during the project and its resultant benefits (equity). Thus, when planning engagement activities, it is important to consider how to attract diverse participants and to identify possible barriers for participation by different groups. Long distances, language barriers, inability to take time away from work, insufficient resources (time and funds), childcare responsibilities, lack of technical skills (regarding online activities), cultural or religious barriers, and lack of interest and understanding are examples of barriers to participating in research activities.

Members of the R4C consortium must consider practical ways to ensure that diverse participants are able to engage in R4C activities. Practical means of enabling participation by a diverse group of stakeholders may include, for example, organising meetings at a range of different times including during the day when children are at school or in the evening after normal working hours, providing childcare during R4C activities and events, organising activities in a hybrid manner to minimise travel and time requirements, providing translation services, and ensuring that the information about the research project is communicated in a culturally-appropriate and understandable manner.

From the DEI perspective, another significant aspect in citizen engagement and participatory research activities is benefit sharing. This involves ensuring that the role of citizens and other stakeholders as participants is not limited to subjects or "givers" (time, knowledge, effort) in research activities, but that citizens and other stakeholders are also recipients of the benefits, or "fruit", of research activities. This typically entails planning and developing meaningful participatory activities in which participants are well informed, disseminating research outcomes in an inclusive manner and consistently working to maximise access of all stakeholders to the project's tangible outputs.

In this regard, the goal of dissemination is to maximise the use and benefits of research findings. However, dissemination of scientific and technical information is frequently limited to traditional academic publishing (peer-reviewed journals, books) and scientific and technical meetings (workshops and seminars), and public engagement through social media activities. Whilst all the aforementioned actions are important aspects of research dissemination, they may not be sufficient to reach all relevant audiences (Ross-Hellauer et al., 2020). Despite an increase in the relative proportion of Open Access (OA)scientific and technical publications[11], many scientific outputs remain accessible only to those with academic affiliation. Internet access is frequently cited as a key barrier to accessing information, and despite substantial increases in the proportion of individuals with Internet access it remains a potential barrier for around one-third of global society[12]. There is a relatively higher degree of Internet access and use in Europe, with 93% of EU households possessing Internet access in 2022[13]. According to Eurostat digital economy and society statistics, 89% of EU individuals from 16 to 74 years of age used the Internet at least

[11] https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/open-science-monitor/trends-open-access-publications_en
[12] https://www.statista.com/statistics/209096/share-of-internet-users-worldwide-by-market-maturity/
[13] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_households_and_individuals

weekly during 2022. The language of dissemination can also present a barrier, particularly where document formats prevent discovery of text and translation to a local language using common translator applications.

In the R4C project, we will maximise the accessibility of research outputs by publishing scientific and technical articles as Gold OA or Green OA, making these documents available to the widest possible audience. Regions4Climate partners will capitalise on the high rate of Internet use in Europe whilst maintaining awareness of potential limitations that reliance on online means of dissemination and communication may pose to some – albeit a small proportion - of individuals. Specifically, R4C partners will seek to exploit a range of appropriate and open dissemination and communication channels based upon the local/regional context. All R4C project outputs will be made available in English. Careful consideration will be given to the translation of key documents or other communication materials, and to project outputs that are specifically targeted to non-scientific audiences.

Benefit sharing is always an important consideration, but particularly when engaging with vulnerable or marginalised groups. In addition to sharing knowledge and resources, it is important to understand how power can be shared and all participants be empowered through research and innovation activities. Therefore, benefit sharing will be examined as part of the R4C review of regional governance structures and processes.

To summarise, Table 3 provides a checklist for evaluating research and innovation activities involving humans and Table 4 lists key performance indicators related to the handling of personal data. In addition, the content in this section is complemented by Checklist for the Preparation of Stakeholder Activities included in Annex 1.

Table 3. Checklist for evaluating the ethical involvement of humans in research and innovation activities

Element of ethical involvement of humans in research	Assessment
All necessary ethical considerations have been made to ensure the rights of participants	Yes/No
Informed consent forms have been distributed • in a language and terms that participants can fully understand • that describe the aims, purpose, methods, duration, and any foreseeable risks • clearly stating that participation is voluntary • that state how personal data will be collected and handled • if applicable, the informed consent forms have been prepared specifically for vulnerable groups (e.g., minors) and will be collected from the responsible parties (e.g., parents, legal representatives) • if applicable, the informed consent has been obtained digitally (e.g., during registration) in case of virtual participation in the research activity	Yes/No
If the research activity involves humans representing minority and/or vulnerable groups, all necessary ethical considerations has been made to ensure the protection of their rights	Yes/No

Participants involved in research activities have been selected considering the representation of different stakeholder groups and gender balance	Yes/No
The criteria for choosing the research participants have been documented	Yes/No
The information sheets and informed consent forms have been prepared and adjusted for the research activity and will be collected from research participants	Yes/No

Table 4. Key performance indicators for evaluating the ethical protection of personal data of persons engaged in project activities

Key performance indicator	Evaluation criteria
All the necessary informed consent procedures have been arranged and the necessary permissions to collect and use the data have been obtained	Yes/No
The intended purpose of collecting personal data has a legal basis, and collection and processing of the data have been conducted in accordance with national and EU legislation	Yes/No
The collection of personal data has been justified as necessary to fulfil the research task, and the relevancy and purposes of collecting this data are explained in the project's data management plan	Yes/No
The methods for collection, processing and storage of personal data have been documented in the data management plan	Yes/No
The requirements to ensure the privacy of participants have been adopted (e.g., anonymisation or pseudonymisation of personal data)	Yes/No
If applicable, justification of the reasons not to anonymise/pseudonymise personal data has been documented	Yes/No
Ethics risks related to data processing have been identified and processed	Yes/No

2.4. Environment, Health, and Safety

The desired just transition towards climate change resilience requires that we simultaneously address social inequalities and implement cross-sectoral innovations to build socio-cultural, economic, and ecological resilience to both extreme weather events as well as slow onset events, wherein change is realised in the longer-term. The partners of the R4C project are committed to undertaking activities designed to address current and forecasted climate change-related challenges and build more resilient European communities within an innovative socially engaged, citizen-driven paradigm.

The European Commission's Do No Significant Harm (DNSH) principle is relevant with respect to both Environment, health and safety considerations and inter-generational ethics. In R4C, DNSH compliance will be investigated in regional activities and supported by the 2023 Flagship Technical Support Project[14]: "Ensuring optimal alignment between public investments from different funding sources and the DNSH principle" (see Section 2.4.1).

Incidental findings policy will be implemented within R4C to consider situations wherein participants may feel uncomfortable. The project aims to avoid situations or project activities where people may feel stress or anxiety. However, climate change as such is a theme that will raise worries about the future both at personal and global level. Regions4Climate project partners will take care to communicate with project participants and stakeholders in an open and honest yet sensitive manner, understanding that the impacts of climate change can create feelings of fear and uncertainty, or even hopelessness. By focusing on positive yet realistic messaging and empowering local and regional communities to act based on scientific evidence, using validated tools and processes, the R4C project team will seek to engender hope and optimism among the project team and engaged stakeholders. In addition, R4C partners will actively care for the well-being of colleagues and research participants by encouraging them to contact their local health care services if stress, anxiety, or other negative feelings are expressed.

Table 5 lists the key performance indicators for evaluating the activities having potential impact on environment, health and safety.

[14] https://reform-support.ec.europa.eu/integration-environmental-dimensions-public-finances_en

Table 5. Key performance indicators for evaluating R4C contributions to Environment, health and safety aspects of research ethics.

Key performance indicator	Evaluation criteria
The precautionary principle has been applied to limit negative effects on environment, health and safety	Yes/No
All the required environmental impact assessments and/or environmental authorisations have been obtained before executing the local actions	Yes/No
The activity is executed in accordance with national and EU legislation so that it does not cause harm to animals, plants or the environment	Yes/No
Do No Significant Harm principle has been considered (see Table 6 in Section 2.4.1), including the identification of activities - that lead to significant GHG emissions - that lead to an increased adverse impact of the current climate and the expected future climate, on the activity itself or on people, nature or assets - that are detrimental to the good status or good ecological potential of bodies of water, including surface water and groundwater, or to the good environmental status of marine waters - that lead to significant inefficiencies in the use of materials or in the use of natural resources (e.g., non-renewable energy sources, raw materials, water, land), including in terms of durability, reparability, upgradability, reusability or recyclability of products, or a significant increase in the generation, incineration or disposal of waste. - that lead to a significant increase in the emissions of pollutants to air, water or land as compared with the situation before the activity started. - that are significantly detrimental to the good condition and resilience of ecosystems, or detrimental to the conservation status of habitats and species.	Yes/No
If the activity concerns endangered flora/fauna/protected areas, all the necessary precautions have been made and all authorisations have been obtained to safeguard them	Yes/No
Aspects possibly leading to green gentrification have been considered during the project planning and execution procedures	Yes/No

2.4.1. Do No Significant Harm

The European Commission's Do No Significant Harm principle states that projects must not cause significant harm to any of the six environmental objectives defined in the EU Taxonomy for Sustainable Finance (Regulation (EU) 2020/852[15]), during or after the project, and that all project measures must comply with this principle. The DNSH principle is relevant to ethics and RRI in particular with respect to intergenerational ethics, or our moral obligation to respect the welfare of future generations. The EU Taxonomy regulation defines criteria for sustainable economic activity and the transformation of the EU economy to achieve the targets outlined within the European Green Deal. The six environmental objectives of the EU Taxonomy Regulation are:

1. *Climate change mitigation*
2. *Climate change adaptation*
3. *The sustainable use and protection of water and marine resources*
4. *The transition to a circular economy*
5. *Pollution prevention and control*
6. *The protection and restoration of biodiversity and ecosystems*

Sustainable economic activities are those that contribute to at least one of the six environmental objectives and do no significant harm to any of the other objectives, whilst respecting basic human rights and labour standards. Definitions of "substantial contributions" and "significant harm" to each of the six objectives of the EU Taxonomy regulation are briefly outlined in Table 6. The R4C project primarily targets substantial contributions to the Climate change adaptation objective. Do No Significant Harm compliance will be investigated in regional activities and supported by the development and implementation of tailored monitoring and evaluation plans. These monitoring activities will assess the impacts of project activities on regional resilience to climate change. The specific selection of impact indicators, parameters to be assessed and monitoring protocols will be adapted to each region and the resilience-building activities implemented therein and will also assess harm to each of the six environmental objectives of the EU Taxonomy regulation.

[15] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Text with EEA relevance). https://eur-lex.europa.eu/eli/reg/2020/852/oj

Table 6. The six environmental objectives of the EU Taxonomy Regulation and the definition of activities that contribute substantially to their achievement, and activities that cause significant harm to each objective[15].

Objective	Substantial Contribution to objective	Significant Harm to objective
Climate change mitigation	Activities that contribute substantially to the stabilisation of greenhouse gas (GHG) concentrations in the atmosphere at a level which prevents dangerous anthropogenic interference with the climate system consistent with the long-term temperature goal of the Paris Agreement through the avoidance or reduction of GHG emissions or the increase of GHG removals, including through process innovations or product innovations	Activities that lead to significant GHG emissions
Climate change adaptation	Adaptation solutions that prevent or substantially reduce the risk of the adverse impact of the current climate and the expected future climate on people, nature, assets, or a particular economic activity, or substantially reduce that adverse impact, without increasing the risk of an adverse impact on other people, nature, or assets	Activities that lead to an increased adverse impact of the current climate and the expected future climate, on the activity itself or on people, nature or assets
The sustainable use and protection of water and marine resources	Activities that either contributes substantially to achieving the good status of marine or freshwater bodies, including bodies of surface water and groundwater, or to preventing the deterioration of bodies of water that already have good status	Activities that are detrimental to the good status or good ecological potential of bodies of water, including surface water and groundwater, or to the good environmental status of marine waters

The transition to a circular economy	Activities including waste prevention, re-use and recycling: reduced use of primary raw materials; increased durability, reparability, upgradability or reusability of products: increased recyclability; reduced content of hazardous substances in materials and products: prolonged use of products: increased use of secondary raw materials; prevented or reduced waste generation; increased development of waste management infrastructure for prevention, preparing for re-use, and recycling waste; minimised waste incineration and avoided waste landfilling; and avoided and reduced litter.	Activities that lead to significant inefficiencies in the use of materials or in the use of natural resources (e.g., non-renewable energy sources, raw materials, water, land), including in terms of durability, reparability, upgradability, reusability or recyclability of products, or a significant increase in the generation, incineration or disposal of waste.
Pollution prevention and control	Activities that prevent or reduce pollutant emissions to air, water, or land (other than GHGs), improve levels of air, water or soil quality, precent or minimise adverse impacts on human health and environment from production, use or disposal of chemicals; or cleaning up litter and other pollution.	Activities that lead to a significant increase in the emissions of pollutants to air, water or land as compared with the situation before the activity started.
The protection and restoration of biodiversity and ecosystems	Activities that contribute substantially to protecting, conserving, or restoring biodiversity or to achieving the good condition of ecosystems, or to protecting ecosystems that are already in good condition.	Activities that are significantly detrimental to the good condition and resilience of ecosystems, or detrimental to the conservation status of habitats and species.

2.5. Artificial Intelligence

According to the initial ethics self-assessment carried out by R4C project participants, the project involves the development, deployment and/or use of Artificial Intelligence (AI)-based systems. Details of the technology and targets of development and usage of AI in the research, will be described in later deliverables. However, at this point we believe that the development and usage of AI will not directly lead to the consideration of complex and/or serious ethical issues, thus basic information and safeguards are sufficient at present. The development and implementation of AI may raise questions such as:

- *Could the AI based system/technique potentially stigmatise or discriminate against people?*
- *Does the AI system/technique interact, replace, or influence human decision-making processes?*
- *Does the AI system/technique have the potential to lead to negative social (e.g., on democracy, media, labour market, freedoms, educational choices, mass surveillance) and/or environmental impacts either through intended applications or plausible alternative uses?*
- *Does this activity involve the use of AI in a weapon system?*

These questions will serve as an initial guide to the careful investigation of AI-based technology and the context of usage and careful consideration of ethical issues related to AI systems in R4C.

If the AI to be developed/used in the project were to raise any other ethical issues not covered by the questions above, these will be also considered on a case-by-case basis in the development and implementation of AI-based technologies in regional innovation demonstration activities. The Ethics by Design approach (EC, 2021; EC 2023; SIENNA, 2020) is useful to consider in relation to any ethical or critical issues, although it is recommended to be applied for more serious and complex cases of developing and/or using AI than those planned in the R4C project. Table 7 lists the key performance indicators for evaluating the activities involving the use of AI.

Table 7. Key performance indicators for evaluating the contributions to AI ethics

Key performance indicator	Evaluation criteria
The participants have been informed about their interaction with AI tools	Yes/No
Risk assessment of using AI systems has been documented in the Regions4Climate *Data Management Plan* (Deliverables 1.3 - 1.5)	Yes/No
Explanation of ethics risks and their mitigation measures has been documented	Yes/No
Potential negative social and/or environmental impacts of using the AI tools have been assessed	Yes/No

3. Inclusive Language in Regions4Climate

3.1. Inclusive Language

Speaking and writing are actions that not only depict but can also shape reality. When we express things in a specific manner, we generate mental images or strengthen existing ones. According to the European Institute for Gender Equality (EIGE 2019), language mirrors our beliefs, whether apparent or concealed, and influences individuals' beliefs about what is acceptable or customary. Particularly when referring to individuals or communities, this has significant consequences since language may perpetuate pre-existing discriminatory biases and prejudices (United Nations, 2023). Thus, it is paramount to use inclusive language while preparing R4C materials, events and in all communication activities, either internal or external (see Figure 3).

Figure 3. The importance of inclusive language in a nutshell.

Inclusive language is sensitive, non-discriminative, and treats everyone equally by choices of word, tone of speech and manner of conversation. The use of inclusive language is crucial in creating environments that are respectful, psychologically safe, and welcoming to all individuals (APA, 2021). By using inclusive language both internally and externally, consortium members can signal to colleagues, external partners, and general audience that they are accepted and valued as they are.

In practice, inclusive language is about using people-centric language that refers to a person's characteristics, such as gender or ethnicity, only when relevant to the context (see Figure 4). For example, when discussing research personnel, it is best to refer to them by their last name and professional title rather than their marital status (Mr., Mrs., or Ms.), and to avoid assuming their gender pronouns. This approach helps to avoid making assumptions and promotes a more inclusive and respectful dialogue.

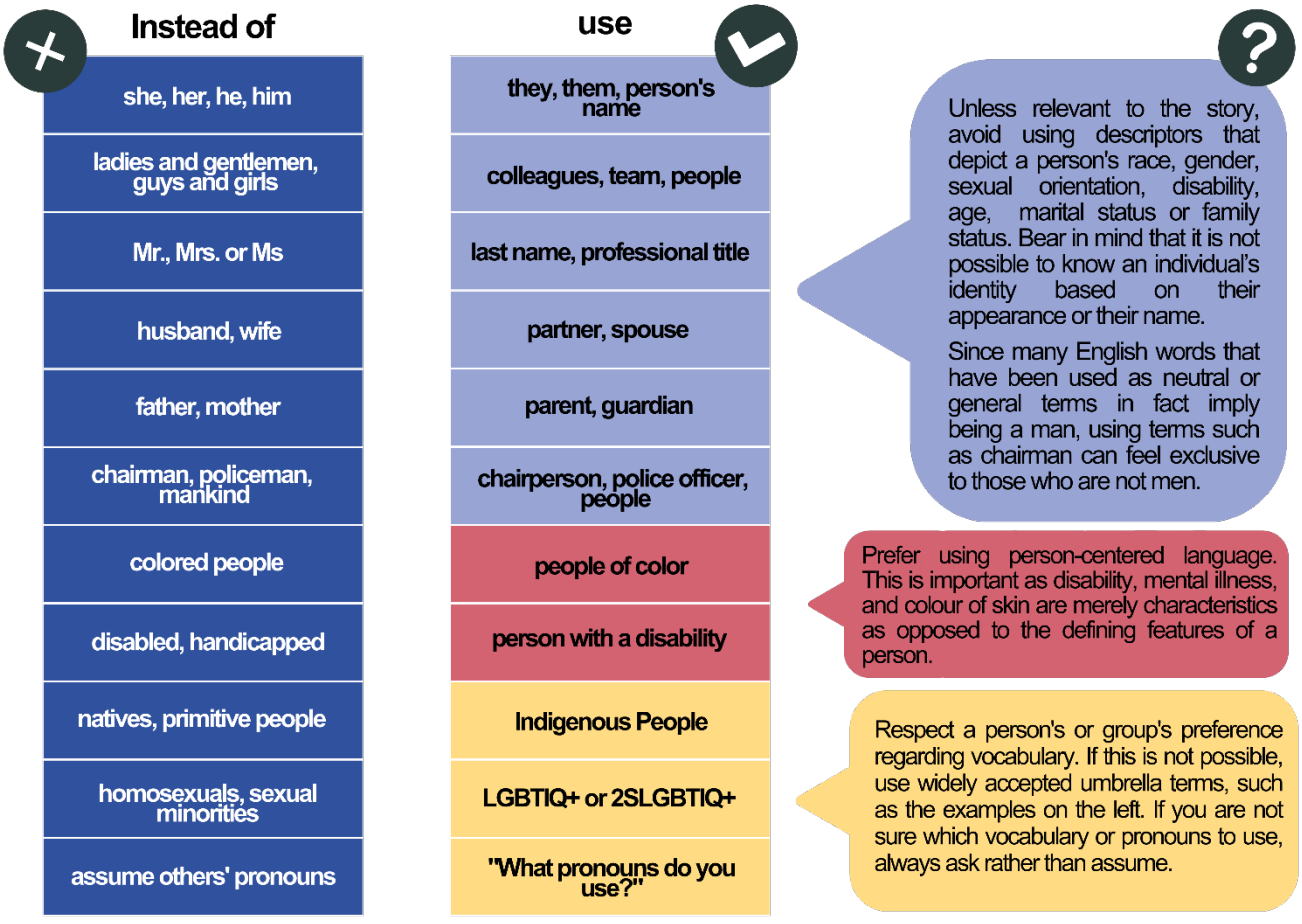

Figure 4. Inclusive language.

Adapted from APA (2021), EIGE (2016a and 2019), and Queen's University (2023).

Overall, using inclusive language in research and innovation practice is an important way to promote equity, respect, and fairness, and to ensure that everyone (beyond the consortium group) is represented accurately and with dignity.

Further reading:

- *APA (2021) Guideline on Inclusive Language in Writing*
- *Queens University (2023) Style Guide on Inclusive language*

4. Conclusions

The Regions4Climate *Ethics Plan* provides essential information about ethical issues at a general level in the context of research, innovation, and project work (i.e., research integrity). The R4C project team identified Human and Personal Data, Environment, health and safety, and Artificial Intelligence as categories in addition to general ethical issues that require more specific consideration. Both general ethical considerations and specific ethical issues and guidance within the identified three main categories of interest are detailed herein. Additionally, the *Ethics Plan* includes specific information and discussions on specific issues which were identified as relevant to the sphere of the R4C project, such as diversity, equity and inclusion in the project's engagement activities, green colonialism and green gentrification considerations, and the use of inclusive language in project communications.

Recommended KPIs for the evaluation of core ethical issues are presented throughout the *Ethics Plan* to support the ethical and responsible execution of project work. These KPIs were largely inspired by the European Commission's (2021) publication on ethics self-assessment in EU grants and by the UN SDGs. Additional recommended indicators for evaluating the RRI aspects of the R4C project were identified from the MoRRI project and its continuation, SUPER_MoRRI[16]. Additional, context-specific indicators of project performance and impact will no doubt be identified during the Regions4Climate project execution and compiled within regional monitoring plans. The KPIs identified herein can provide the basis for ethics and RRI assessment of R4C project activities.

Ethics management in the R4C project will sustain continuous interaction with all partner regions through the R4C Ethics Board. The R4C ethics management structure provides on-going guidance and assessment via the Ethics Board, concomitant with the overall management of the R4C project, to ensure that good research practices are sustained in all applicable contexts. Research ethics, the RRI approach and principles of DEI are embedded in the R4C project in such a way that any potential or realised issues under these themes can be promptly dealt with by the Ethics Board, Ethics Manager, R4C Coordinator, and/or External Ethics Advisor. Notably, all participating organisations as well as individual researchers and management staff are responsible for following good research practices, including the reporting of any misconduct that may be detected. The authors reiterate that if at any time concerns should arise in relation to any kind of misconduct or possible violation of research integrity, the concerned party should contact the R4C Ethics Manager and R4C Coordinator right away to further investigate and seek resolution to the matter.

In addition to the checklists presented within the *Ethics Plan* text, Annexes 1 and 2 illustrate checklists developed specifically for the R4C project related to the preparation of stakeholder Activities and general assessment of research and innovation activities, respectively. Annex 3 further introduces the informed consent process and document templates to be used in R4C project activities. All the documents presented herein via annexes are available to all R4C project participants through the Regions4Climate Teams shared working space.

[16] Horizon 2020 project Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI. https://cordis.europa.eu/project/id/824671

5. ANNEX 1. Checklist for the Preparation of Stakeholder Activities

Regions 4Climate

CHECKLIST FOR THE PREPARATION OF STAKEHOLDER ACTIVITIES IN R4C

This checklist was created to help the R4C consortium partners conduct case studies and involve stakeholders ethically. In case of any further ethical questions, see D1.2 Ethics Plan, the D1.3-5 Project Data Management Plan, or contact the R4C Ethics Manager.

INFORMED CONSENT I have ensured that all participants understand the research aims, the risks and benefits, and their rights to withdraw from the study at any time. I have also obtained written informed consent from all participants before the start of their involvement.	**YES ☐ NO ☐ I don't know ☐**
SENSITIVE DATA I have avoided the collection of sensitive data (health data, ethnic origin, political opinion, religious beliefs, sexual orientation) at all costs. In case sensitive data collection is needed, it will be restricted to necessary and justifiable reason and amount. I have also considered the GDPR (General Data Protection Regulation) requirements when preparing the studies. For further information, see also D1.3-5 Project Data Management Plan.	**YES ☐ NO ☐ I don't know ☐**
DATA PROTECTION I have ensured that the access of personal and sensitive data will be limited through sufficient data protection practices, such as password and multi-factor authentication only to those people who need to have access to the data. All data repositories used are professionally maintained, considering information security requirements. For further information, see also D1.3-5 Project Data Management Plan. (Note, first version due M6)	**YES ☐ NO ☐ I don't know ☐**
DIVERSE AND FAIR REPRESENTATION OF RESEARCH PARTICIPANTS When conducting participatory research, I have ensured diverse and fair representation of stakeholders in a way that they can provide contributions in an equitable manner.	**YES ☐ NO ☐ I don't know ☐**

Funded by the European Union

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Regions 4Climate

CHECKLIST FOR THE PREPARATION OF STAKEHOLDER ACTIVITIES IN R4C

This checklist was created to help the R4C consortium partners conduct case studies and involve stakeholders ethically. In case of any further ethical questions, see D1.2 Ethics Plan, the D1.3-5 Project Data Management Plan, or contact the R4C ethics team.

RESPECT In engagement and communication activities, I have shown respect for different beliefs, values, and cultural practices of consortium members, stakeholders, research participants, and citizens.	**YES ☐ NO ☐ I don't know ☐**
INCLUSIVE LANGUAGE I have ensured that inclusive language has been used both in internal and external communications and have made necessary adaptations to ensure its usage in different European languages used in R4C.	**YES ☐ NO ☐ I don't know ☐**
VULNERABLE GROUPS If my research practices include vulnerable groups (elderly people, Indigenous People, ethnic minorities), I have taken necessary steps to ensure no harm and further stigmatization is caused to them through the research.	**YES ☐ NO ☐ I don't know ☐**
AVOIDING LOCAL TENSIONS AND PITFALLS I have considered local and regional power dynamics, as well as possible tensions that may exist between different stakeholders, and planned my engagement activities to ensure all relevant perspectives and voices are included.	**YES ☐ NO ☐ I don't know ☐**
INCIDENTAL FINDINGS POLICY I have instructions and contact information readily available to provide support or assistance to research participants who may require it in the event of incidental findings	**YES ☐ NO ☐ I don't know ☐**
ARTIFICIAL INTELLIGENCE I have contacted the R4C Ethics manager and/or Ethics board to clarify my questions and concerns related to the usage of AI tools in participatory research.	**YES ☐ NO ☐ I don't know ☐**

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R4C Ethics Manager
veikko.ikonen@vtt.fi

6. ANNEX 2. Ethics Checklist for Research and Innovation Activities

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ETHICS CHECKLIST FOR R4C RESEARCH AND INNOVATION ACTIONS

EVALUATING THE CONTRIBUTIONS TO INVOLVEMENT OF HUMANS IN RESEARCH ETHICS

All necessary mentioned precautions have been taken to ensure the rights of participants. **YES ☐ NO ☐ I don't know ☐**

Informed consent forms have been distributed **YES ☐ NO ☐ I don't know ☐**

- in a language and terms participants can fully understand
- which describe the aims, methods and implications, any risks
- state that participation is voluntary
- state how personal data will be collected and handled
- if applicable, the informed consent forms have been prepared specifically for vulnerable groups and will be collected from the responsible parties (e.g., parents, legal representatives).

If the research activity involves humans representing vulnerable groups, special attention has been paid to the protection of their rights. **YES ☐ NO ☐ I don't know ☐**

Participants involved in research activities have been selected acknowledging the representation of different stakeholder groups and gender balance. **YES ☐ NO ☐ I don't know ☐**

If applicable, the information sheets and informed consent forms have been prepared and adjusted for the research activity and will be collected from research participants. **YES ☐ NO ☐ I don't know ☐**

EVALUATING THE CONTRIBUTIONS TO PERSONAL DATA PROTECTION ETHICS

Necessary informed consent procedures have been conducted and the necessary permissions have been obtained. **YES ☐ NO ☐ I don't know ☐**

The intended use of personal data in the activity has a legal basis and collection and processing procedures have been conducted in accordance with national and EU legislation. **YES ☐ NO ☐ I don't know ☐**

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The collection of this data has been justified as necessary to fulfil the research task and this justification is clearly outlined in the project's data management plan.	**YES ☐ NO ☐ I don't know ☐**
The approaches for collection, processing and storage of these data have been documented in the data management plan.	**YES ☐ NO ☐ I don't know ☐**
The requirements to ensure the privacy of participants have been adopted (e.g., anonymisation or pseudonymisation of personal data).	**YES ☐ NO ☐ I don't know ☐**
If applicable, justification of the reasons not to anonymise/pseudonymise personal data has been documented.	**YES ☐ NO ☐ I don't know ☐**
Ethics risks related to data processing have been identified and processed.	**YES ☐ NO ☐ I don't know ☐**

EVALUATING THE CONTRIBUTIONS TO ENVIRONMENT, HEALTH AND SAFETY ETHICS

Do No Significant Harm principle has been considered including identification of activities. • that lead to significant GHG emissions • that lead to an increased adverse impact of the current climate and the expected future climate, on the activity itself or on people, nature or assets • that are detrimental to the good status or good ecological potential of bodies of water, including surface water and groundwater, or to the good environmental status of marine waters • that lead to significant inefficiencies in the use of materials or in the use of natural resources (e.g., non-renewable energy sources, raw materials, water, land), including in terms of durability, reparability, upgradability, reusability or recyclability of products; or, a significant increase in the generation, incineration or disposal of waste. • that lead to a significant increase in the emissions of pollutants to air, water or land as compared with the situation before the activity started. • that are significantly detrimental to the good condition and resilience of ecosystems, or detrimental to the conservation status of habitats and species.	**YES ☐ NO ☐ I don't know ☐**

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The precautionary principle has been applied to limit negative effects on environment, health and safety.	**YES ☐ NO ☐ I don't know ☐**
All the required environmental impact assessments (EIA) have been conducted during the project planning procedures.	**YES ☐ NO ☐ I don't know ☐**
Aspects possibly leading to green gentrification have been considered during the project planning and execution procedures.	**YES ☐ NO ☐ I don't know ☐**

EVALUATING THE CONTRIBUTIONS TO AI ETHICS

The participants have been informed about their interaction with AI.	**YES ☐ NO ☐ I don't know ☐**
Risk assessment of using AI systems has been documented.	**YES ☐ NO ☐ I don't know ☐**
Explanation of ethics risks and their mitigation measures has been documented.	**YES ☐ NO ☐ I don't know ☐**
Potential negative social and/or environmental impacts have been assessed.	**YES ☐ NO ☐ I don't know ☐**

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7. ANNEX 3. Informed Consent Process and Document Templates

To collect consent to participate in Regions4Climate research a general template has been created. This template is intended to be used when a participant is consenting to his/her own participation in the research. The participant should not be in any vulnerable position or a minor. In case vulnerable participants or minors would be requested to participate in the research, the Regions4climate Ethics Board and Data Manager need to be consulted to ensure the proper and ethical implementation of the research. This template should also not to be used for any medical or clinical research actions (Medical Research Act 488/1999).

It should be noted that this template needs to be tailored to match individual research actions. This template should be completed in parallel with defining the research plan. Both the Deliverable 1.2 *Ethics Plan* and the Regions4Climate *Project Data Management Plan* and its periodic updates (Deliverables 1.3-1.5) should be reviewed during the planning phase. If support is needed either for questions related to the ethical or data issues, the Ethics Manager or Data Manager of the project should be consulted.

Each tailored consent form for various research actions needs to be stored both in the research definition dataset folders and in the project's Ethics Board Teams folder before the research action starts. The Ethics Board (via the Ethics Manager) and the R4C Data Manager should be informed of new research requiring consent so that the action can be recorded in the project's Data Management Plan. Each filled consent form needs to be stored in a secure location because the forms contain personal information.

The informed consent template will be also included in the *Project Data Management Plan* (Deliverable 1.3) and its periodic updates (Deliverables 1.4 and 1.5), and possible updates to the consent template will be reflected in these documents.

The following pages present the Regions4Climate project's general informed consent template. This document is available in the project's Teams folder under the T1.3 Ethics Management & RRI section.

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Declaration of Consent

for participation in research and

processing of personal data

Place: _____

Date: _____

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Purpose of this consent form

This declaration of consent is used in the European Union funded Regions4Climate project (short name R4C). Purpose of this document is to inform the participant, you, about the project and the research, which you will be participating. With this declaration of consent, you agree with the collection, processing, and publishing of personal data for the Regions4Climate project. It will be the legal basis that allows the R4C project team to handle the data.

Performing institute(s)

Performing institute(s) is/are: _____

_____

Contact person(s) / interviewer(s): _____

_____

Contact information (email/telephone): _____

Project overview

European communities face an urgent need to catalyse societal transformation towards increased social, economic and ecological resilience to both realised and foreseen impacts of climate change. Unsustainable practices and use of resources, combined with greater frequency of extreme weather events, have culminated in increased risks to the livelihoods of individuals and communities in the EU. The EU's Mission on Adaptation to Climate Change was initiated in September 2021 to accelerate European adaptation to the changing global climate and the transition to a more climate resilient European society. The mission aims at supporting at least 150 regions and communities in Europe towards climate resilience by 2030. Partnership and collaboration are essential in overcoming the current political, economic, and social barriers for appropriate climate change adaptation. Peer-to-peer learning, social innovation, and cross-border knowledge sharing are the key to breaking down these barriers, as well as the technological and environmental obstacles that must be overcome.

The Regions4Climate project brings together 44 partners from 13 different European countries to demonstrate innovations that enhance societal resilience to the impacts of climate change, in line with the Paris Agreement and the EU Green Deal. Based on cross-sectoral strategies created by and for people, the project partners will collaboratively develop and implement novel social, technological, digital, business, governance, and environmental solutions to reinforce adaptive capacity and minimise vulnerability to climate impacts. The European Commission awarded the Regions4Climate project 24,522,103€ to undertake innovative climate resilience actions for a period of 5 years beginning in January 2023. Regions4Climate is funded under the call topic "Large scale demonstrators of climate resilience creating cross-border value" of the Horizon Europe Mission on Climate Adaptation research and innovation programme, under grant agreement no. 101093873. More information about the project can be found from the project's website: https://www.regions4climate.eu/

Regions 4Climate

Participation in the research

1. Request for participation

You are requested to participate in a Regions4Climate project's research, which is outlined more detailed in this chapter. You can also ask further information from the contact persons mentioned above in this document.

2. Data to be collected

In this research we collect the following data: _____

3. Methods for data collection

Data is collected by using the following method(s): _____

4. Selection and/or exclusion criteria

Participation in this research requires that you have/do not have _____

[describe possible selection or exclusion criteria] _____

5. Voluntariness

Your participation in this research is voluntary. You may decline from participation or interrupt your participation at any phase of the research without having a specific reason and without having to explain your reason for this. You may skip any question you feel uncomfortable answering.

6. Potential harm, risk, and inconvenience

[Describe potential harm, risk and inconvenience that the research may cause, if applicable] _____

7. Compensation in the research

Your participation in the research is not financially compensated.

8. Informing about research results

[Describe if the participant will be provided information about their research results or in general about results of the research] _____

[Describe what type of results are expected, such as scientific publications/ thesis/ presentations/ results for use in practice/ commercial exploitation.] _____

9. Personal data and privacy

Your responses and contributions being recorded on paper/audio/photographs/video, and subsequently entered to a computer database, to which only the necessary Regions4Climate project Consortium working with research will have access.

The information from your participation will be anonymized, and you authorize its publication in the various means of dissemination within the project (e.g. website, newsletter, apps, etc.).

You consent to the processing of your personal data, made available within the scope of this project, for the purposes described above in this declaration of consent within the scope of the Regions4Climate project.

At the conclusion of this study, the researchers may publish their findings. Information will be presented in summary format and you will not be identified in any publications or presentations.

*[In this section, explain in detail the specific procedures that will be used to protect the study records and subjects' identity. Include a statement describing how electronic files and data will be secured, maintained, and disposed of]*_____

☐ Yes	☐ No	I confirm that I have read and understood the information sheet and attached privacy notice. I confirm that I fulfil the selection criteria and/or do not have any exclusion criteria mentioned in the information sheet.] I have had the possibility to consider all information and ask questions and I have received satisfying answers to my questions.
☐ Yes	☐ No	I hereby consent to participate in the research. I have the right to interrupt my participation or leave out from any phase of the research and withdraw my consent at any time without any specific reason and without having to explain the reason.
☐ Yes	☐ No	I hereby consent to processing of [*add if applicable: special categories of*] personal data in the research. I have the right to withdraw my consent at any time without any specific reason and without having to explain the reason.
☐ Yes	☐ No	I hereby consent that I can be quoted in publications of the project provided that my identity is not mentioned.
☐ Yes	☐ No	I hereby consent that my photos/ videos may be published at the research project's publications, at website and other web platforms. [*keep this, if applicable*]
☐ Yes	☐ No	I hereby consent that my photos/ videos may be published in social media platforms and/or in commercial and marketing purposes of the consortium members. [*keep this, if applicable*]

_____ _____

Date Place

_____ _____

First name, last name of the research participant Signature

_____ _____

First name, last name of a Project team member Signature

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Regions4Climate Fact Sheet: What is Green Colonialism?

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Green Colonialism

1.1 Introduction

Although the Regions4Climate (R4C) project will take place exclusively within Europe, some discussion about green colonialism is of interest in the context of the engagement of citizens and broader empowerment concept to be developed during the project. Similar issues and the vulnerabilities associated with green colonialism and indigenous groups in interactions between the Global North and Global South may also be relevant when collaborating with regional European communities and other minority groups in the R4C project. Here we present short introduction to the topic and some general recommendations how to prevent green colonialism in research and innovation processes.

1.2 Colonialism in Science and Innovation

In both academic and popular discourse, colonialism has long been understood as the conquering and exploitation of overseas regions from the 15th to early 20th century, conducted by European states (Cooper, 2005). However, colonialism is a much wider and more complex phenomenon that remains relevant in the modern context, highlighted by contemporary challenges stemming from climate change.

Ania Loomba (1998) defines colonialism as the conquering of lands and resources of other people, the utilization of their labour, and as efforts to modify their societies and cultures to suit the interests and worldviews of the conquerors. Colonial projects have been undertaken not only by states, but also by private trading companies, independent adventurers, and by Western scientists (Porsanger, 2004). Colonialism is also linked to the centre-periphery theory, where the centre or Global North is associated with power, hegemony, and progress, and the periphery or Global South associated with backwardness, exploitation, and stagnation (Hauthal & Toivanen, 2021; Said, 1979).

Whilst often used as a lens to study the asymmetrical relationship between the Global North and the Global South, colonialism and the centre-periphery theory also are applicable national contexts, where the asymmetrical centre-periphery relationship can manifest itself in a capital-province pattern; for example, Paris is often seen in opposition to rural France (Hauthal & Toivanen, 2021). Colonialism also entails creating oppressive hierarchies, where some groups of people and worldviews are considered superior to others (Spivak, 1988; Tuhiwai Smith, 1999). This is often made visible in the negative, stereotypical, stigmatising, and nostalgising ways metropolitan capitals view rural providences, or how certain country see their neighbouring countries or regions (Nyman, 2015; Peeren, Stuit & Van Weyenber, 2016). Within Europe, colonialism and the creation of oppressive hierarchies may also be evident in the marginalisation of indigenous communities and minority cultural groups.

1.3 Colonialism and Climate Change

Colonialism is also visible in the most recent environmental and climate change discussions, and the concept of colonialism is considered a highly relevant ethical question for those involved in research and innovation in the field. In 2022, for the first time the Intergovernmental Panel on Climate Change (IPCC) included the term 'colonialism' in its assessment report on the impact of climate change. According to the report, the impacts of climate change have been exacerbated by colonialism. Specifically, both past and present forms of colonialism have contributed to enhancing the susceptibility of certain regions and populations to suffer from the consequences of climate change. The report points out to two on-going challenges for climate adaptation and resilience which are linked to colonialism, first that "Colonialism can inhibit the development of robust climate adaptation strategies, and exacerbate climate risks […]" (IPCC, 2022, p. 2332).; and particularly, in regards to Indigenous Peoples "The legacy of colonialism and historical patterns of development will continue to shape the adaptation responses and resiliency […]" (IPCC, 2022, p.1980).

At first glance, it might seem like just another term has been added to the extensive pool of terms and concepts used in the report. However, its importance lies on recognising the linkage of climate change to acts of colonisation. As explained by Mercer (2022), it is about "recognising that historic injustices are not consigned to history: their legacies are alive in the present". Ultimately, the effects of climate change can only be thoroughly addressed in research and innovation actions, and climate resilience can only be built with the acknowledgement of colonial legacies and the unequal distribution of climate change burden in different population groups.

Although it might seem that colonialism in science, and specifically climate research is an issue to be dealt at a higher level by policy makers, funders and research institutions, consortium members of a project like R4C can take significant steps towards decolonialization of science and its practices. **Figure 1**, below, can instigate some reflection as it illustrates examples of good practices to be considered when engaging with local communities, the involvement of experts, and the planning and implementation of dissemination and communication activities.

In recent years, scholars have drawn attention to the coloniality of technological industry-driven energy transition and the connection between climate discourses and colonial structures. This point of view has been highlighted by scholars such as Bertinat and Argento (2022), Dorn (2011 and 2022) and Svampa (2022) and has also been increasingly discussed in activist and science-activist-oriented journals and conference presentations. This type of colonialism is commonly referred to as *green colonialism* (also known as *eco-colonialism*, *environmental colonialism*, and *climate colonialism*).

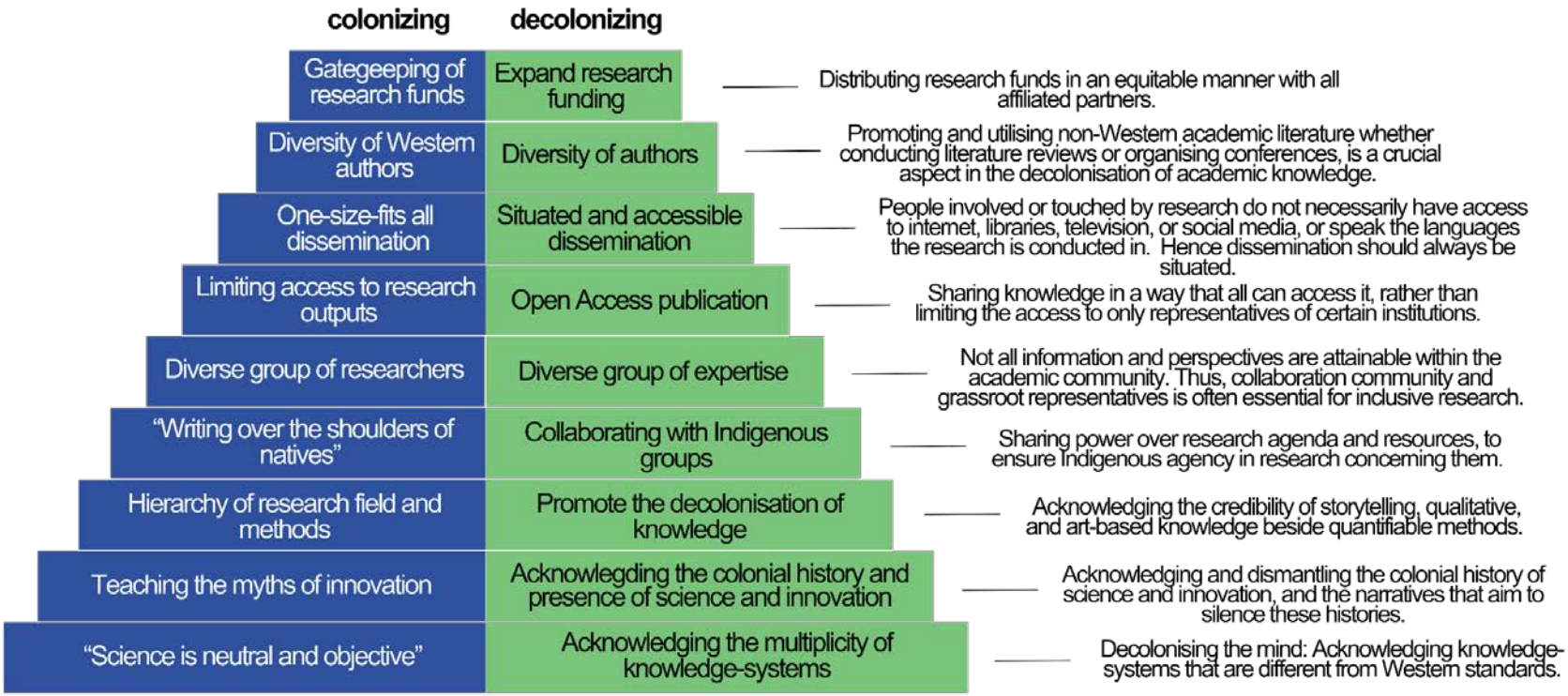

Figure 1. Pyramid of colonization vs. Pyramid of decolonization. Consider the differences in these steps to ensure your research team and projects contribute to the decolonisation of scientific practices. Adapted from the literary works of Kovach (2020), Lassiter (2005), Martini (2017), Porsanger (2004) Simmons (2015), Spivak (1988), Tarvainen (2022), Trisos et al. (2021), Tuhiwai Smith (1999), and West (2018), and the Ethical Guidelines to research from the Aboriginal and Strait Islander Peoples and Communities (AIATSIS, 2020), the Māori people (HRC, 2010), and the Swedish Sámi Parliament (Sámiid Riikkasearvi, 2019)

1.4 Outsourcing Environmental Costs

While green colonialism can take many forms in different settings, broadly it is understood to occur when central regions (Global North, capital/metropolitan) outsource their environmental costs to peripheral regions (Global South, rural/province) to reach high standards of living, and/or to meet the climate sustainability goals (Claar, 2022; Dorn, 2022; Normann; 2021). Green colonialism can manifest itself through predatory extraction of resources, outsourcing emissions, and environmental costs, imposing of sustainability frameworks and goals, and sacrificing the environmental, economic, and social needs of others. Therefore, it is crucial for research and innovation projects such as R4C aiming for just transition, to reflect on risks and prevention mechanisms related to green colonialism.

According to Dorn (2022), the term "green colonialism" is closely related to the concept of "green extractivism", which aims to convey the message that the energy transition continues to rely on the commodification of nature, the shifting of environmental costs and risks onto marginalized communities. In their recent study, Biczkowski et al. (2022) suggest the European Common Agricultural Policy (CAP) has initiated a land-grabbing movement referred to as “suitcase farming”, where rural land is appropriated to urban ownership to collect the CAP support. According to Biczkowski et al., this movement has colonial tendencies within Poland, and has caused further marginalization in rural areas. Thus, although an innovation can be successful in tackling climate sustainability goals in one context (geographical, economic, social), it can have colonial tendencies in and negative implications for local communities in other contexts.

Green or climate colonialism is also linked with how climate change impacts different regions, as it can aggravate the ability of vulnerable regions to adapt to climate change. An example of this are wind farms established in the Norwegian and Finnish Sápmi, the traditional land of the indigenous Sámi people and a region already vulnerable to the implications of climate change. Although framed as “climate mitigation strategies”, wind farms in the Sápmi violate the human rights of the Sámi people, as they involve exploitation of their traditional land (the Sápmi), endanger sustainable life systems, and hamper the region’s ability to respond to climate change (Normann, 2021, p. 78). Reindeer find their food from nature, and thus reindeer herding acquires broad and diverse grazing areas for it to function in an ecologically, socially, financially, and culturally sustainable manner (Reindeer Herders' Association, 2014). However, unstable winters resulting from climate change have hampered the ability of reindeer to find their food from nature, and wind farms place further pressure on reindeer grazing, as the reindeer avoid going near the wind farms (Normann, 2022; Seipiharju, 2020; Zilliacus, 2022).

Colonial innovations, research, and attitudes are often linked with lack of knowledge, and in particular lack of diverse knowledge and expertise. Such was the case with wind farms established in Sápmi: the Sámi communities were not heard when planning and establishing wind farms in Sápmi. Rather, Finnish, and Norwegian states have seen the Sápmi as scarcely populated wasteland, whilst the Sámi argue it has been actively and sustainably used by the for reindeer herding for centuries (Normann, 2021; Seipiharju, 2020; Zilliacus, 2022). Central standard-setting and prioritization of sustainability goals is commonly visible in national urban-rural contexts, where the environmental, social, and economic needs of rural communities are often overlooked, dismissed, and sacrificed to reach the goals of central governments.

1.5 Good Practices to Prevent Green Colonialism

Including vulnerable groups and local communities in decision-making, acknowledging diverse perspectives on climate resilience and adaptation, and considering the socio-economic impacts of climate mitigation innovations are crucial steps to take in R4C. **Figure 2** illustrates examples of good practices to be considered to prevent green colonialism in R4C.

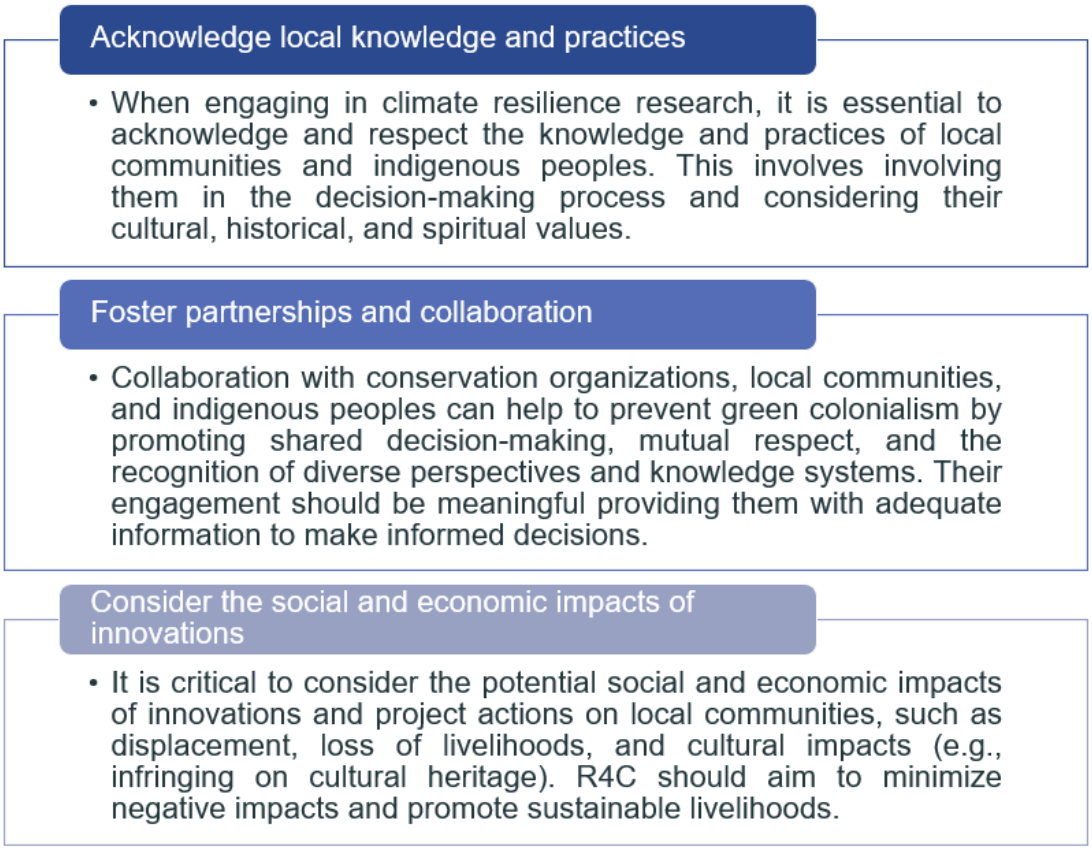

Figure 2. Responsible practices for preventing green colonialism in research and innovation processes.

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Regions4Climate Fact Sheet: What is Green Gentrification?

Regions 4Climate

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Green Gentrification

1.1 Introduction

In rural and coastal areas, economic development can take the form of land grabbing and resource extraction justified by environmental conservation and climate adaptation methods. This can lead to the displacement of local communities who rely on the land for their livelihoods and cultural practices, in addition to potential loss of biodiversity and ecosystem services, as monoculture plantations or protected areas often prioritize the needs of global markets or tourists over the needs of local communities. In the name of environmental sustainability and green transition, vulnerable low-income communities can endure loss of property rights and displacement to urban peripheries (Safransky, 2014).

Greening or re-naturing environments highly influenced by human activities is an important part of development aimed at creating a healthier, greener and more sustainable built environment. Natural areas or green and blue spaces within highly developed landscapes can offer a variety of benefits including flood management and heat mitigation, and provide spaces for social interactions, activities and events that promote social cohesion. However, uneven access and distribution of green and blue spaces between socioeconomic groups with respect to race, income or social class has been documented (Busà et al., 2021). Green gentrification has received significant attention for creating social inequalities with respect to the availability of and access to benefits offered by urban green and blue spaces (Anguelovski et al., 2022). Marginalised residents were noted to perceive urban green areas as less safe and as not promoting a sense of belonging (Jelks et al., 2021).

1.2 Green Interventions and Gentrification

Various types of green interventions (e.g., parks, recreational spaces, community gardens) can be associated with gentrification to a various degree (Anguelovski et al., 2022; Triguero-Mas et al., 2022). However, the creation of green/blue spaces alone does not necessarily drive gentrification, so it is important to also consider other factors, such as proximity to city centre or presence of already gentrifying neighbourhoods (Triguero-Mas et al., 2022). Considering the drivers of gentrification, the presence of new or renewed green spaces, including urban parks and street greening as well as environmental remediation, has been associated with housing market dynamics and real estate growth (Busà et al., 2021; Jelks et al., 2021). Other gentrification drivers can include new residential development or new transit infrastructure (Anguelovski et al., 2022). These combined with urban greening can amplify the inequalities. In a recent study, Anguelovski et al. (2022) found that the majority of cities investigated experienced short- to long-term green gentrification for at least one or more decades since the 1990s.

The multidimensionality of justice challenges (Haase et al., 2022) includes epistemic injustice, which is related to knowledge injustice demonstrated by excluding an individual or a group either based on their identity or different knowledge/language used to describe their experiences (Mabon et al., 2022). Thus, when planning nature-based or

green interventions, it is important to ask who benefits from the development and who is burdened and/or displaced by it (Grabowski et al., 2022). Another important consideration is whose knowledge is recognised as being significant for developing adaptation interventions (Haase et al., 2022).

1.3 Measures to Address Green Gentrification

Measures to address green gentrification are many, and some examples include tax reduction, inclusion of social housing in the district development, incorporation of social impacts in greening policies, inclusion of local stakeholders in the UGS design, including means of tenant protection, changing property ownership to maintain housing affordability, infrastructure planning to address diverse communities, participatory budgeting, greater functionality of UGS, deliberate inclusion of diverse actors, and accounting for different ways of incorporating local knowledge (Busà et al., 2021; Anguelovski et al., 2022; Grabowski et al., 2022; Haase et al., 2022; Mabon et al., 2022).

Inequalities define the socio-ecological context, and the presence of structural social injustice leads to uneven exposure of marginalised communities to hazards. To address this, environmental justice should be considered when shaping urban greening and nature-based solution (NBS) policy and practice (Grabowski et al., 2022). Similar attention should be paid to including justice and just distribution of NBS benefits in the final evaluation of impacts (Mabon et al., 2022). Urban and regional planners and decision-makers should pay attention to micro-processes of the green gentrification phenomenon intersecting with other economic, social and political factors (Sax et al., 2022). Design of inclusive and socially sustainable green interventions should not prioritise quantity over quality of green space or nature distribution (Wijsman & Berbes-Blazquez, 2022).

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