



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement n° 101037648 – SOCIO-BEE



Grant Agreement No: 101037648
[H2020-LC-GD-2020-3]

Wearables and droneS fOr City Socio-Environmental Observations and Behavioral Change

Deliverable

D6.3 - Impact assessment & recommendations for stakeholders.R2

Workpackage No.	WP6	Workpackage Title	SOCIO-BEE Law and Ethics: Data Protection and Privacy
Task No.	T6.1	Task(s) Title(s)	Legal Compliance, Assessment and Recommendations (Data Protection and Privacy)
Lead beneficiary	VUB		
Dissemination level	<i>PUBLIC version</i>		
Nature of Deliverable	<i>R</i>		
Delivery date	1 October 2024		
Status	F		
File Name:	SOCIO-BEE Impact assessment & recommendations for stakeholders (D6.3 Public version).pdf		
Project start date, duration	01 October 2021, 36 Months		

Authors List

Leading Author (Editor)				
	<i>Surname</i>	<i>Initials</i>	<i>Beneficiary Name</i>	<i>Contact email</i>
	Fabcic Povse	DFP	VUB	danaja.fabcic.povse@vub.be
Co-authors (in alphabetic order)				
#	<i>Surname</i>	<i>Initials</i>	<i>Beneficiary Name</i>	<i>Contact email</i>
1	Quinn	P	VUB	paul.quinn@vub.be
2	Beloki Marañón	U	UDEUSTO	usue.beloki@deusto.es
3	Lopez Belloso	MLB	UDEUSTO	mlbeloso@deusto.es
4	Segú Odriozola	M	UDEUSTO	msegu@deusto.es

Contributors (in alphabetic order)				
#	<i>Surname</i>	<i>Initials</i>	<i>Beneficiary Name</i>	<i>Contact email</i>
1	Stamati	ES	MRSI	estamati@maroussi.gr
2	Tsiantopoulos	DT	MRSI	dtsiantopoulos@maroussi.gr

Reviewers List

List of Reviewers (in alphabetic order)				
#	<i>Surname</i>	<i>Initials</i>	<i>Beneficiary Name</i>	<i>Contact email</i>
1	Barco	AB	UDEUSTO	a.barco@deusto.es
2	Kotzagianni	MK	MRSI	mkotzagianni@maroussi.gr

List of definitions & abbreviations

Abbreviation	Description
AI	Artificial Intelligence
DPIA	Data Protection Impact Assessment
EASA	European Union Aviation Safety Agency
EHDS	European Health Data Space. Proposal for a Regulation of the European Parliament and of the Council on the European Health Data Space (COM/2022/197 – C9-0167/2022 – 2022/0140)
FAIR	Findable, Accessible, Interoperable, Reusable
FRIA	Fundamental Rights Impact Assessment
GDPR	General Data Protection Regulation
GEP	Gender Equality Plan
GIA	Gender Impact Assessment
HR	Human Rights (equivalent to fundamental rights)
IA	Impact Assessment
KPI	Key Performance Indicator
PET	Privacy Enhancing Technique/Technology
PMR	Project Management Report
SOCIO-BEE	Wearables and droneS fOr City Socio-Environmental Observations and Behavioral ChangE
WP	Work package

Executive Summary

This report is structured as two separate impact assessments; focusing on data protection and privacy, human rights and artificial intelligence in the first part, and on gender equality and inclusivity in the second part.

In the project, legal and ethical work has focused on data protection and privacy, human rights and the use of artificial intelligence under emerging legal frameworks. Following up on the findings of the first impact assessment, contained in the D6.1, we provide a risk-aware roadmap on addressing legal and ethical risks stemming from the second wave of pilots in the local communities. As such, **this deliverable goes beyond the legal requirements of art. 35 of the General Data Protection Regulation (GDPR)**, which requires controllers to carry out a data protection impact assessment when the processing is likely to result in a high risk to the rights and freedoms of natural persons.

The second impact assessment addresses the use of drones, wearables, and citizens' own devices, as well as the continued efforts on a legal, ethical and gender-inclusive environment. Its aim is to inform the community based on the SOCIO-BEE experience on the tackling of legal, ethical and gender aspects and to refine the methodology of such approaches.

Moreover, this report also provides recommendations to future adopters regarding continuous legal and ethical monitoring, as well as recommendations for mitigation measures for protecting citizen scientists' fundamental legal and ethical interests, as well as those aimed at policy-makers. Key recommendations include:

1. Using clear terminology with little to no difficult legal language in all citizen-scientist facing documents, such as Informed Consent Forms.
2. Carrying out an Impact Assessment beyond art. 35 of the GDPR to provide a wider lens through which developers can ethically assess the developed technologies and the involvement of citizen scientists.
3. Adopting technical and organisational measures to foster privacy and data protection.
4. Clarifying the identity of the controller in a citizen science context.
5. Continued ethical assessment of any artificial intelligence (AI) tools.
6. Supporting and promoting human rights to a clean and healthy environment within and outside the context of citizen science projects.
7. Strengthening gender balance in leadership positions and carrying out gender-specific training and capacity building to this end.
8. An intersectional approach to equality and inclusivity.

The results of the impact assessment process will serve to inform **similar future projects** in the field of **citizen science and air pollution monitoring**. We advise the reader to also consult the Data Management Plan, the inclusivity reports of WP6 and the [Knowledge Powerhouse Hub](#).

Table of Contents

List of definitions & abbreviations	3
Executive Summary	4
Table of Contents	5
List of Tables	7
1 Introduction	8
1.1 Purpose of the document.....	8
1.2 Relationship with other deliverables – updates since 1 st release	8
2 Privacy, data protection, artificial intelligence and human rights impact assessment	8
2.1 Motivation	8
2.2 Updates in the legal framework	8
2.2.1 AI Act	8
2.2.2 New drone frameworks.....	9
2.2.3 The European Health Data Space (EHDS).....	9
2.3 Specific remarks.....	9
2.4 Risk response and mitigation	9
2.4.1 Data protection and privacy.....	10
2.4.2 Artificial intelligence.....	15
2.4.3 Human rights.....	19
3 Gender impact assessment.....	21
3.1 Inclusion work between the first and second impact assessment.....	21
3.2 Motivation for the second impact assessment	21
3.3 Results obtained in the second assessment.....	23
4 Conclusions and Recommendations	27
4.1 Privacy, data protection, artificial intelligence and human rights recommendations	27
4.1.1 Recommendations to policy-makers.....	28
4.1.2 Recommendations to future adopters.....	28
4.2 Gender equality recommendations.....	30
4.2.1 Recommendations to policy-makers.....	31
4.2.2 Recommendations to future adopters.....	32
4.2.3 Recommendations for Future Citizen Science Projects	33
4.3 Ethical Use of Artificial Intelligence	33
References	35

Annex I - Questionnaires.....	36
1 Data Protection Impact Assessment.....	39
1.1 Requirements related to Data Protection.....	39
1.1.1 Scope of processing.....	39
1.1.2 Nature, purposes and context of data processing.....	40
1.1.3 Data security.....	41
1.1.4 Identification of risks and mitigation measures.....	41
1.1.5 Processing the data of vulnerable groups.....	42
1.2 Privacy.....	43
1.2.1 Privacy requirements.....	43
1.2.2 Use of drones.....	43
1.2.3 Use of sensors, wearables and other IoT devices.....	43
1.2.4 Use of citizens' own devices.....	44
2 Artificial Intelligence Impact Assessment.....	44
2.1 Human rights context.....	44
2.1.1 Identifying potential Human Rights and impacts.....	44
2.1.1.1 Human dignity.....	44
2.1.1.2 Human Freedom and Autonomy.....	45
2.1.2 Right to psychological and physical safety.....	45
2.1.3 Non-discrimination.....	45
2.1.4 Personal data protection and privacy.....	45
2.1.5 Protection of children.....	46
2.1.6 Freedom of expression and information.....	46
2.2 Controls in place.....	46
3 Human Rights Impact Assessment.....	47
3.1 Principles.....	47
3.1.1 Participation.....	47
3.1.2 Accountability.....	47
3.1.3 Non-discrimination and equality.....	48
3.1.4 Empowerment.....	48
3.1.5 Legality.....	49
4 Gender Impact Assessment.....	50
4.1 Structure and rationale of questionnaire.....	50

4.3	Equal opportunities for women and men in research	51
4.4	Gender in research content.....	52
4.4.1	Research ideas phase	52
4.4.2	Proposal phase	52
4.4.3	Research phase.....	52
4.4.4	Dissemination phase	52
4.5	Gender and Intersectionality:.....	53
4.6	Citizen (scientists) involvement.....	53
4.7	Multistakeholder involvement	53

List of Tables

Table 1: Risk response related to privacy and the protection of personal data (PDP).....	10
Table 2: Risk response related to the use of artificial intelligence (AI)	15
Table 3: Risk response related to human rights (HR)	19

1 Introduction

1.1 Purpose of the document

Continuing the work from the first impact assessment (IA), this report maps the consortium's responses to the risks arising from project research to privacy and data protection, risks related to the use of artificial intelligence, the impact on human rights and gender equality. It is based on consortium responses to the questionnaires released in the Annex, as well as feedback received from the consortium partners on the use of questionnaires within the project, received at the second law and ethics workshop in Brussels on October 9-10 2023.

This report has a threefold purpose:

1. To gather data on the impact of SOCIO-BEE on legal, ethical, and gender equality aspects.
2. Provide an impact assessment of the second wave of pilots.
3. Provide layered recommendations for the stakeholders based on the project experience.

1.2 Relationship with other deliverables – updates since 1st release

The work in this report builds upon the other WP6 deliverables:

- D6.1 Impact assessment model
- D6.2 1st Report on Impact Assessment
- D6.6 and D6.7 Framework for developing social inclusion participation in citizen engagement and behavioural change platforms

Moreover, it continues the work of other legal, ethical and gender equality work – D3.1 Report on Legal and Regulatory Requirements; D1.5,6,7 Data Management Plans (all three versions).

This is the successor of D6.2 and presents the updates and insight reached during the period M21-M26.

2 Privacy, data protection, artificial intelligence and human rights impact assessment

2.1 Motivation

The second wave of pilots in SOCIO-BEE, like the first wave, raises questions about the use of technologies and the involvement of citizen scientists, as well as the wider societal interests of such projects. Moreover, unlike in the first wave, the second wave introduced some changes, such as the use of wearable technologies provided by a non-affiliated third party, the use of drones to take air quality measures, and involved children in some municipalities.

2.2 Updates in the legal framework

2.2.1 AI Act

As analysed in the D6.5, in May 2024 the new EU AI Act was adopted. While the Act is not yet in force nor did it apply to the work carried out in SOCIO-BEE, we advise the reader to consult the referenced deliverable to gauge its eventual applicability to other citizen science and air pollution projects. More

specifically, we would like to direct their attention to the provisions about the definition of an AI system, the level of risk posed by specific types of AI systems and the associated obligations and requirements for developers, adopters and users.

2.2.2 New drone frameworks

New frameworks applicable to using drones in the EU airspace have likewise been analysed in the D6.5, specifically the Communication on countering potential threats posed by drones, [1] and the EASA regulatory requirements.¹

2.2.3 The European Health Data Space (EHDS)

The EHDS is only tangentially related to citizen science projects such as SOCIO-BEE. Namely, the EHDS applies to use and re-use of electronic health data (which may or may not overlap with the notion of personal data under the GDPR), and the conditions for the access of such data. This means that it does not apply to SOCIO-BEE as such, though is very topical for the wider perspective – air pollution is one of today's silent killers, leading to up to 8 million deaths per year.² Hence, the information contained in the health systems organised under the EHDS rules, may be relevant to researchers, policy-makers and other stakeholders in the wider health community.

2.3 Specific remarks

Under the AI Act, covered entities will be required to carry out a fundamental rights impact assessment (FRIA) insofar they are dealing with a high-risk AI system in order to mitigate any relevant risks. Despite this future provision, our methodology in the AI-IA section of this report remains the same, for the following reasons:

1. The AI Act does not apply to the work in SOCIO-BEE due to the latter's not being covered under the AI system definition,
2. Insofar such a system was developed in a citizen science project context, it would have been unlikely that it would have been considered a high-risk system.

Nevertheless, future adopters and producers of similar projects should continually monitor the eventual applicability of the AI Act and the possible requirement of carrying out a FRIA.

2.4 Risk response and mitigation

In this subsection, we document the impact assessment. Each table covers a specific set of risks relating to privacy and data protection, the use of AI, and the impact on human rights, following the methodology described above.

In terms of methodology, we followed the approach set in D6.1 and learning from the feedback received on D6.2, we have refined the questionnaires to be able to obtain a comprehensive picture of the pilot experience, which in turn will inform future adopters and similar projects. To this end, our approach does not focus on compliance but instead lessons learned and recommendations generated. As a result, the below tables (cf. Table 1: Risk response related to privacy and the protection of personal data (PDP), Table 2: Risk response related to the use of artificial intelligence (AI), and Table 3: Risk response related to human rights (HR)) do not represent an evaluation of the project actions

¹ <https://www.easa.europa.eu/en/document-library/general-publications/remote-identification-will-become-mandatory-drones-across>

² <https://www.cleanairfund.org/news-item/deaths-air-pollution-data-hope/> cites 4.2 million [deaths] from outdoor air pollution, and 3.8 million from indoor air pollution from burning wood and charcoal.

taken during the piloting phase, as that would have been inconsistent with the timing of this report in the final month of the project. Instead, they represent a risk-based approach to scenarios likely or possible to occur after the end of the project, either in a future adoption scenario, or in a future citizen science project. The future risks are evaluated based on SOCIO-BEE experience and informed by the same legal and ethical approach in other European technology and development projects. Nevertheless, as it is impossible to predict all the future uses and use cases of the results of SOCIO-BEE, these findings need to be understood in the context of such future use cases.

2.4.1 Data protection and privacy

Table 1: Risk response related to privacy and the protection of personal data (PDP)

RISKS RELATED TO PRIVACY AND THE PROTECTION OF PERSONAL DATA					
Risk ID	Description	Probability of occurrence	Impact	Risk response plan	Additional remarks
DATA PROTECTION REQUIREMENTS					
PDP.1	Lack of informed consent in the sense of art. 6(1) and 7 of the GDPR	Possible	Severe	Consent forms and information sheets of WP6 provide relevant information to participants and can be amended as relevant for future use.	Informed consent can be obtained electronically or physically, whichever is the more convenient, accessible and inclusive manner.
PDP.2	Purpose of data processing is not clearly defined	Possible	Severe	The purposes of data processing are described inter alia in project documentation such as the Data Management Plan, the technical work packages, the privacy notice of the ACADE-ME app, as well as the informed consent forms and information sheets presented to the participants. All information can be adjusted as relevant to account for any changes carried out.	
PDP.3	Processing of data not necessary, adequate or relevant for the purpose	Possible	Significant	Data are gathered through testing pipelines to keep them collected to the minimum.	

PDP.4	Inappropriate use of privacy enhancing technologies (PETs)	Possible	Significant	Measures such as data protection by design and by default, including restricting the data transfers to non-personal or depersonalised data only, using obfuscation and data access management measures.	Another consideration is to use only certified vendors who have implemented appropriate technical and organisational measures aimed at data protection, following national certification schemes (cf. Chapter IV, Section 5 of the GDPR).
PDP.5	Insufficient security of data processing, transfer and storage	Possible	Severe	The resulting SOCIO-BEE tools involve protective measures such as authentication when accessing the web app and the mobile app, hashing of personal data, secure access to the server, and encryption (pseudonymization) of personal data collected.	
PDP.6	The roles and responsibilities of partners are not clearly defined	Remote	Severe	Joint controllership arrangement has been signed by all partners involved in the pilots. The agreement inter alia stipulates that all signatories are acting as controllers, their respective responsibilities and the contact point for the exercise of data subject rights.	Even though the arrangement may not apply to the use-cases in which SOCIO-BEE tools will be used after the project, the adopters can follow the same criteria to designate controllers and processors.
PDP.7	Access to data by unauthorized subjects	Possible	Severe	Technical and organisational measures, such as security measures described in PDP4 and PDP5, as well as restricting access to data on a need-to-know	

				basis (technical staff), using data access management procedures and strong encryption techniques.	
PDP.8	Limited exercise of data subjects' rights	Possible	Significant	A contact point (project coordinator) has been designated and their contact details communicated to the data subjects by means of informed consent procedures as well as the privacy notice in the app.	
PDP.9	Processing personal data of vulnerable subjects such as children and the elderly	Remote	Significant	Use of inclusive, age- and skill-appropriate language in materials and documentation. Using privacy-enhancing techniques and adopting measures aimed at ensuring data minimisation in practice. Providing support such as helplines and assisting with specific privacy settings in the app.	No specific data protection regime exists for the older populations, especially for those who lack digital skills, so mitigation measures should be applied. [3]
PDP.10	Third parties processing personal data obtained from the project that was made available under FAIR principles and Open Science obligations	Possible	Severe	Strategies defined in the DMP and the licensing (as part of IPR management) aim to curtail the likelihood of personal data being used outside the consortium, as only the data that meet the requirements should be made publicly available.	While the project consortium cannot stop these practices, users of data repositories still need to comply with Terms of Use and other agreements, such as licensing when using the provided open data.
PRIVACY REQUIREMENTS					
PDP.11	Affecting privacy of citizen scientists	Probable	Significant	The consortium is adopting the following counter measures:	

				<p>On the legal side, the project gathers legal requirements, including on fundamental rights such as privacy; the consortium also carries out continuous legal monitoring. Moreover, a privacy notice (following the notice-and-consent concept) has been drawn up.</p> <p>On the technical and user sides, security measures have been adopted as well as privacy-enhancing techniques. Moreover, as the project focuses on environmental data, no cameras or other monitoring devices will be deployed.</p>	
PDP.12	The impact on privacy is disproportionate or unnecessary, in terms of data storage periods, right of access, proportionality in the light of the goal or the objective	Possible	Severe	Deletion procedures, leading to destruction of data after the end of the project and/or expiry of the relevant statutory periods.	National or sub-national legislation may require controllers to abide by specific storage periods e.g. for archiving or security reasons of public health.
PDP.13	Affecting privacy of third parties	Possible	Significant /Severe	<p>Technical measures – placement of the sensors, not flying drones, limits on access to data.</p> <p>Instructing drone pilots to not take video.</p>	To ensure legality, the controllers can rely on legitimate interests of the controller(s), or other legal bases as applicable (e.g. legal or contractual obligations)

DRONES					
PDP.14	Drones violate private lives of citizen scientists	Remote	Severe	Pilot-specific use of drones only, under the control of project personnel rather than citizen scientists. Instructing drone pilots to not take video.	
PDP.15	Drones violate private lives of other people	Remote	Severe	id.	
PDP.16	Surveillance in public spaces	Remote	Severe	Due to limited use of drones, this is an unlikely scenario. The drones will be flown above buildings with cameras, with the aim of providing better quality results from the sensors, without storing the recordings.	
PDP.17	Surveillance in private spaces	Remote	Severe	Drones will not be used in private spaces (air space only, which is public).	
WEARABLES, SENSORS AND OTHER INTERNET OF THINGS DEVICES					
PDP.18	Impact on citizen scientists' and third parties' privacy	Probable	Significant	Using mitigation measures, such as to apply robust anonymization techniques to data and regularly assess the risk of de-anonymization so that access to the data should be strictly controlled and monitored. Moreover, removing a direct link between the devices and the identifiable information of the volunteers.	The use of wearables/sensors is aimed at only collecting environmental data.

CITIZENS' DEVICES					
PDP.19	Impact on citizen scientists' privacy			<p>The app is designed to be used on smartphones, which in themselves can and do have a large impact on users' privacy. However, throughout the project, several strategies have been adopted aiming at protecting the citizen scientists, such as the notice-and-consent form, EULA, and various project ethics documentation.</p> <p>Moreover, citizens have been guided to the Knowledge Powerhouse for further guidance on this.</p>	<p>Both the citizen-facing forms as well as any relevant documentation can easily be adjusted by adopters. The contents of the knowledge powerhouse will remain accessible to the citizens even after the end of the project.</p>
		Probable	Significant		

2.4.2 Artificial intelligence

Table 2: Risk response related to the use of artificial intelligence (AI)

RISKS RELATED TO THE USE OF ARTIFICIAL INTELLIGENCE					
Risk ID	Description	Probability of occurrence	Impact	Risk response plan	Additional remarks
HUMAN RIGHTS					
AI.1	The use of AI in SOCIO-BEE has a negative impact on human rights			<p>In SOCIO-BEE, the use of AI is limited to processing data to build profiles. As discussed at the workshop held in Brussels on October 9-10 2023, the impact of the AI may in fact be positive, in terms of raising awareness and bringing behaviour change to citizens.</p>	<p>Nevertheless, as the technology behind AI in environmental monitoring continues to evolve, we invite the adopters to consider carrying out further impact assessments, which can be guided by our methodology.</p>
		Probable	Significant		

AI.2	The collection of personal or non-personal data in SOCIO-BEE has a negative impact on human rights	Probable	Significant/ Severe	Id.	
AI.3	The use of AI in SOCIO-BEE has a negative impact on human dignity	Remote	Low	Since the goal of the project is to raise awareness and encourage air quality monitoring, it is unlikely to have a negative impact on human dignity.	
AI.4	The use of AI in SOCIO-BEE has a negative impact on human freedom and autonomy	Remote	Significant/ Severe	The use of AI does not entail limiting options or behaviours, as it is only used for gathering and analysing data.	
AI.5	The use of AI in SOCIO-BEE has a negative impact on psychological and physical safety	Possible	Significant/ Severe	Widespread climate anxiety about climate crisis, especially among the younger generations. However, SOCIO-BEE can help mitigate by providing information about sensor measurements and a sense of empowerment to the informed citizen scientist.	
AI.6	The use of AI in SOCIO-BEE leads to discrimination [3]	Possible	Significant/ Severe	Anti-discrimination and inclusivity measures have been defined in the Inclusivity Toolkit (T6.3), which will remain available to the public after the end of the project.	

AI.7	The use of AI in SOCIO-BEE has a negative impact on personal data protection and privacy	Possible	Significant/ Severe	Inter alia addressed in the privacy and data protection section of this impact assessment.	
AI.8	The use of AI in SOCIO-BEE has a negative impact on children	Remote	Significant/ Severe	Children are exposed to minimal use of AI, which makes the risks to their rights and interests minimal.	
AI.9	The use of AI in SOCIO-BEE has a negative impact on freedom of expression and information	Remote	Significant/ Severe	The SOCIO-BEE project does not envision building a social network or platform and thus has no realistic impact on the two freedoms. To the contrary, information about air quality monitoring which can be compared to official measurements, which would enhance the freedom of expression and information. Moreover, the Knowledge Powerhouse envisions a citizen scientist informed and empowered about their legal options.	The Knowledge Powerhouse will remain accessible to the general public after the end of the project via the website.
IMPLEMENTING CONTROLS					
AI.10	Lacking policies and protocols to address the negative impacts	Possible	Severe	Due to minimal use of AI, the policies adopted have been tailored to address very specific	

				situations, such as quality assurance and data minimisation techniques.	
STAKEHOLDER ENGAGEMENT					
AI.11	Groups and individuals likely to be impacted by the AI in SOCIO-BEE are not sufficiently involved in the technology process	Remote	Significant	Project outreach will involve creating standards and guidelines to the duty bearers through constant communication with other projects and within the network. Moreover, the project actively involves the local authorities (user partners) and technology developers in the project, following also inclusive participation processes.	
AI.12	Lack of due diligence	Possible	Significant/severe	The consortium has adopted this impact assessment to demonstrate its due diligence and firm commitment to the respect of applicable legal and ethical principles. Moreover, continuous legal developments such as the adoption of the AI Act (which, however, does not apply to SOCIO-BEE) have been taken into account and described in	

				various project deliverables.	
--	--	--	--	-------------------------------	--

2.4.3 Human rights

Table 3: Risk response related to human rights (HR)

RISKS RELATED TO HUMAN RIGHTS					
Risk ID	Description	Probability of occurrence	Impact	Risk response plan	Additional remarks
PARTICIPATION					
HR.1	Non-involvement in SOCIO-BEE of groups and individuals whose rights are affected in the technology process	Remote	Severe	Creating standards and guidelines to the duty bearers through constant communication within the network. Moreover, following inclusive participation processes.	This risk is addressed in the same manner as the risk AI.11. This is due to similarity of the risks and their sources, as well as the limited overlap of the two different impact assessments.
HR.2	Lack of accessibility	Possible	Low/significant	Accessibility might be an issue if the groups involved do not have the relevant digital skills to operate their devices. However, this can be countered by giving questionnaires and/or interviews with group representatives.	

ACCOUNTABILITY					
HR.3	Duty bearers are unaware of their duties, or do not meet them	Possible	Significant	Interdisciplinary workshops and ad-hoc and ongoing legal advice has been provided.	
HR.4	The impact on human rights is not measured, evaluated or known	Possible	Significant	The purpose of the HR impact assessment is to monitor the impact of the action.	
NON-DISCRIMINATION AND EQUALITY					
HR.5	SOCIO-BEE has a negative impact on a protected characteristic or a marginalised group	Possible	Significant	More information can be found in the Gender Impact Assessment and Inclusivity Toolkits.	The Inclusivity Toolkit will remain available to the general public after the end of the project via the website.
HR.6	Lack of universal accessibility and/or reasonable accommodations leads to discrimination or inequality	Possible	Significant	Id.	
EMPOWERMENT					
HR.7	SOCIO-BEE does not lead to empowerment of an individual	Remote	Low	The idea of SOCIO-BEE is to empower individuals by providing them with means of monitoring air quality with their own devices.	
HR.8	Individuals do not know how to become empowered or are not aware of SOCIO-BEE	Remote	Low	The consortium uses dedicated communication channels to notify and reach	

				out to individuals.	
LEGALITY					
HR.9	The deployment of technology does not fully take the impact on human rights into account	Possible	Significant	Measures are taken on the legal side by inter alia conducting this impact assessment, continuous legal and ethical monitoring of the project, and dedicated detailed workshops.	

3 Gender impact assessment

3.1 Inclusion work between the first and second impact assessment

After the delivery of the first gender analysis, the need to provide concrete training on the importance of integrating the gender dimension in research was detected. An action plan was proposed to the coordinators to carry out different training actions, and finally a seminar was held in April 2024. This seminar focused on explaining the eligibility requirement of equality plans and the dimensions that GEPS should address and why.

3.2 Motivation for the second impact assessment

The motivation for conducting a second Gender Impact Assessment (GIA) for the SOCIO-BEE project is rooted in the findings and recommendations of the first impact assessment, which underscored the necessity for a more comprehensive and iterative approach to understanding and addressing gender-related challenges and opportunities in the project. The first GIA highlighted several critical areas where gender dynamics intersect with other social categories—such as race, age, disability, and socio-economic status—potentially affecting participation, access, and benefits within the project. Given the multi-faceted nature of these intersections and the evolving context of the project, a second GIA is deemed essential to ensure that the project remains inclusive and equitable.

Key Findings from the First Assessment

The first impact assessment conducted in July 2023 identified several gaps and challenges related to gender equality and inclusivity within the SOCIO-BEE project. The assessment revealed that while initial efforts had been made to promote gender equality, significant areas for improvement remained, particularly concerning the involvement of diverse stakeholders, the representation of women in decision-making roles, and the integration of gender analysis into the project's research and innovation content.

Underrepresentation of Women in Key Roles:

The first GIA found that only 28% of the key personnel identified in the SOCIO-BEE project team were women. This underrepresentation of women at various levels of the project—especially in supervisory and managerial positions—suggests a need for targeted actions to promote gender balance and support women's leadership within the consortium.

Lack of Gender-Specific Knowledge and Training:

Although the project has undertaken gender-specific initiatives, such as internal training sessions on sex, gender, and intersectional analysis, the first assessment noted a need for continuous and more in-depth capacity-building activities. These activities are crucial to foster a common understanding among all project participants and to challenge unconscious biases and stereotypes that may affect the project's outcomes.

Limited Consideration of Intersectionality:

The first impact assessment also pointed out that while gender issues were considered, there was limited integration of an intersectional approach. Given the project's aim to develop gender-responsive citizen science initiatives and recommendations, it is crucial to understand how gender intersects with other social factors to create more tailored and inclusive strategies.

Challenges in Data Collection and Analysis:

Another key finding was the need for gender-disaggregated data collection and analysis. The first GIA highlighted that collecting such data alongside air quality measurements (e.g., who collects data, who wears the wearables, and who manages the drones) is vital for understanding the gendered impacts of the project's activities and ensuring that technology development is accessible and beneficial to all genders.

Justification for the Second Impact Assessment

Based on the findings of the first GIA, the second impact assessment is motivated by several factors:

- The second GIA will provide an opportunity to address the gaps identified in the first assessment, such as the underrepresentation of women in key roles and the need for more comprehensive gender and intersectional training. It will allow the consortium to evaluate the effectiveness of implemented measures and to refine strategies to ensure a more inclusive approach moving forward.
- As the SOCIO-BEE project progressed, the context and scope of its activities may evolve, requiring a reassessment of gender impacts. The second GIA helped ensure that the project remains responsive to these changes and continues to align with the EU's gender mainstreaming requirements and Horizon Europe's expectations for gender equality.
- By incorporating lessons from the first assessment, the second GIA further developed methodologies for collecting and analysing gender-disaggregated data. This will enhance the quality and utility of the data collected, ensuring it is robust enough to inform gender-responsive strategies and policies.
- The second impact assessment placed a stronger emphasis on involving diverse stakeholders, including women's organizations, community groups, and gender equality experts. This inclusive approach helped to ensure that the project design, implementation, and interpretation of results adequately reflect the needs and concerns of different genders.

- A second GIA was crucial for the continuous monitoring of gender dynamics within the project. It allowed for the evaluation of progress, the identification of emerging issues relevant for future projects, and the implementation of corrective measures where necessary. This iterative process aligned with the principles of gender mainstreaming and ensures that the project contributes to gender equality more effectively.

3.3 Results obtained in the second assessment

The Gender Impact Assessment (GIA) of the SOCIO-BEE project revealed several findings concerning the integration of gender dimensions in both the research content and dissemination strategies. This reassessment focused on evaluating the effectiveness of the current measures and identifying areas for improvement to ensure the project aligns with EU standards on gender equality in research and innovation.

3.3.1. Gender Dimension in Research

The SOCIO-BEE project attempted to integrate gender considerations throughout its research activities; however, the GIA identifies areas where further attention is needed to fully incorporate a gender perspective across all phases of research.

A) Research Ideas and Proposal Phase

Relevance of Gender to Research Topic: While some partners acknowledge the relevance of gender to the research topic, there were inconsistencies in the approach. For example, not all consortium members have reviewed literature on gender differences relevant to the research field, which can lead to gaps in understanding the potential gender-specific impacts of the research outcomes. This relevance was acknowledged and stressed by D.6.7, but better integration on the research results would have been expected.

Methodology for Gender-Differentiated Data Collection: The project has committed to ensuring that sex/gender-differentiated data will be collected and analysed throughout the research cycle. Some partners, such as MRSI, have explicitly included provisions for this in their methodology. However, the GIA indicates that this is not uniformly applied across all partners. For instance, certain teams have not clearly outlined how they would ensure the inclusion of a diverse team to analyse data, potentially leading to biases in data interpretation. Future projects should take into account SOCIOBEE experience when gathering diverse teams. The [SOCIOBEE toolkit for inclusion](#) can be an added value for future Citizen science projects

B) Research Phase

Design of Research Tools to Identify Gender Differences: The research tools, including questionnaires and surveys, are designed to unravel potentially relevant sex and/or gender differences. For example, the questionnaires specifically include inquiries about participants' sex/gender, which is then correlated with indicators of user satisfaction, acceptance, and other variables. This approach ensured that gender-specific insights are generated. However, the GIA suggested that further refinement is needed to capture the nuances of gender identities beyond the binary framework and to consider intersectional aspects, such as how gender intersects with race, class, and disability.

Inclusive Language and Gender Balance in Research Groups: The GIA confirms that inclusive language has been consistently used in research tools and materials. The project also strives to maintain gender-balanced groups of volunteer citizen scientists, although this has not always been achieved due to the

composition of existing groups, such as school classes that participate in the pilot projects. Ensuring diversity in research groups is crucial for obtaining a comprehensive understanding of gendered experiences and perspectives, and, as previously noted, the [Sociobee toolkit](#) can help future projects to do so

Analysis and Presentation of Gender-Differentiated Data: The GIA revealed that while some partners have committed to presenting gender-disaggregated data in their analyses, there is a lack of uniformity in how this data is interpreted and disseminated. The progress management reports (PMRs) contain details on gender equality aspects, but the depth and scope of the analysis on gender differences vary.

C) Gender Dimension in Dissemination

The dissemination phase of the SOCIO-BEE project involves sharing research findings and engaging stakeholders, including gender-focused entities. The GIA evaluated how well gender considerations are integrated into these activities.

Inclusion of Gender-Focused Entities

Targeted Dissemination Efforts: The project's dissemination strategy included provisions to address gender-focused entities, such as institutions, departments, and journals that concentrate on gender issues. For instance, the MRSI partner has actively engaged with the Municipal Equality Committee, demonstrating a commitment to involving gender-focused stakeholders. However, the GIA identifies that this effort is not consistently mirrored across all consortium partners, suggesting a need for a more coordinated approach to gender-focused dissemination. The Framework for inclusion designed also under WP6 could help future projects to have a more coordinated approach to gender-focused dissemination.

Balanced Gender Representation in Events

Gender Balance Among Participants and Speakers: The GIA indicated efforts to achieve a balanced gender representation among participants and speakers at workshops, conferences, and other events. However, achieving perfect balance remains challenging. The project team was committed to promoting inclusivity and diversity, as evidenced by participation at the ECSA conference, where three women and one man represented the SOCIO-BEE team. Continued focus on gender balance in dissemination activities ensured diverse perspectives and enhance the inclusivity of discussions.

Gender-Specific Publications and Events

Currently, there is no specific plan for publications or events focused solely on gender-related findings. Some partners, such as MRSI, express concerns about emphasizing differences between sexes and instead aim to promote inclusivity and equality through broader dissemination strategies. Nonetheless, specific publications on gender-related findings could have provided valuable insights and contribute to the literature on gender in citizen science and technology. The Deusto team working on inclusion is working on a publication that will be released after the end of the project and will discuss this and summarise the lessons learnt.

Lessons Learned and Insights for Future Citizen Science Projects The second Gender Impact Assessment (GIA) of the SOCIO-BEE project has provided critical insights into gender-related challenges and highlighted areas where improvements are needed to foster greater inclusion and equality in citizen science projects. These lessons offer valuable guidance for similar initiatives seeking

to align with EU standards on gender equality in research and innovation while maximising their societal impact. They highlight the critical importance of addressing gender imbalance, ensuring consistent gender-specific training, integrating intersectional approaches, and standardising data practices in citizen science projects. These insights guide future initiatives to embed gender equality at every stage of their design and implementation. By prioritising inclusion and equity, citizen science projects can foster more impactful, representative, and sustainable outcomes that benefit diverse communities. Main take-away messages are summarised below:

1. Addressing Gender Imbalance in Leadership and Key Roles

One of the key findings of the GIA was the significant underrepresentation of women in supervisory and managerial positions, with only 28% of key personnel being female. This imbalance demonstrates the need for intentional and targeted efforts to ensure gender diversity in decision-making processes. Future projects should prioritise gender-inclusive recruitment strategies and foster leadership pathways for women to ensure diverse perspectives are represented at all levels. Enhancing gender balance in leadership not only promotes equity but also strengthens decision-making through varied viewpoints.

2. Ensuring Consistent Gender-Specific Training

The GIA revealed inconsistencies in the provision of gender-specific training across consortium partners. While some partners implemented initiatives to build gender awareness, others lacked continuous and structured capacity-building activities. For future citizen science projects, standardised and mandatory gender-specific training is crucial to ensure a uniform understanding of gender issues across all participants. These training sessions should include intersectional approaches to address unconscious biases, enhance inclusivity, and empower teams to integrate gender perspectives effectively into their work. Examples and existing online training as well as a list of key stakeholders providing gender specific training is listed in the [Inclusion Toolkit](#).

3. Integrating Intersectionality into Project Design

A critical lesson from SOCIO-BEE is the importance of addressing intersectionality—the ways in which gender interacts with other social categories, such as race, class, disability, and age. The limited integration of intersectional approaches in project activities risks creating solutions that fail to address the needs of marginalized groups comprehensively. Future projects must prioritize intersectional frameworks from the outset, ensuring that strategies are inclusive and reflective of diverse lived experiences. This approach will enable the development of solutions that are equitable and impactful for all participants.

4. Standardizing Gender-Disaggregated Data Collection and Analysis

The variability in the collection, analysis, and presentation of gender-disaggregated data was identified as a key challenge in SOCIO-BEE. Without a standardized methodology, the risk of bias increases, potentially undermining the validity and reliability of findings. Future citizen science projects must adopt clear and consistent guidelines for collecting and analysing gender-disaggregated data. By ensuring comparability and rigor across different pilots or project phases, research outcomes will better capture gendered impacts and inform evidence-based strategies for inclusion.

5. Strengthening Gender-Focused Dissemination Strategies

While SOCIO-BEE made efforts to engage gender-focused entities in dissemination activities, these efforts were not consistently applied across all partners. This highlights the need for more targeted dissemination strategies to ensure that gender-related findings are effectively shared with relevant stakeholders, including gender equality organizations, policymakers, and the broader research community. Future projects should actively plan for gender-focused publications, events, and outreach efforts to amplify their contributions to gender equality and ensure their findings inform policy and practice.

6. Operationalizing Gender Equality Plans (GEPs)

The findings from SOCIO-BEE underscore the importance of Gender Equality Plans (GEPs) as more than a formal requirement—they must be operationalized as an integrated aspect of research and innovation projects. Maintaining GEPs as an eligibility criterion in EU-funded research ensures accountability and promotes systematic progress toward gender equality. Future projects should develop robust GEPs that include clear targets, measurable outcomes, and continuous monitoring to drive meaningful . For guidance on how to develop inclusive GEPs, a [comprehensive guidance document](#) has been created to assist organizations in meeting the Horizon Europe Gender Equality Plan (GEP) eligibility criterion. This document outlines each mandatory 'building block' and recommended thematic area, providing clear explanations of what these requirements entail in practice when developing, implementing, or assessing the equivalence of existing GEPs or policies. It offers concrete, practical examples and draws on established materials, best practices, and diverse resources that support gender equality in research and innovation at both national and institutional levels. Summary of the outcomes

The main risks identified in the IA are the risks that scored high in both likelihood and impact, or are likely to present a challenge in their own right.

Relating to data protection and privacy:

1. Lack of informed consent in the sense of art. 6(1) and 7 of the GDPR
2. Purpose of data processing is not clearly defined
3. Processing personal data outside the scope of the purpose it was collected for
4. Insufficient security of data processing, transfer and storage
5. Access to data by unauthorized subjects
6. Third parties processing personal data obtained from the project that was made available under FAIR principles and Open Science obligations
7. Affecting privacy of citizen scientists, in a disproportionate or unnecessary manner, especially regarding data storage periods, right of access, and proportionality in the light of the goal or the objective
8. Affecting privacy of third parties
9. Impact on citizen scientists' and third parties' privacy due to the use of wearables, sensors and other IoT devices, especially when provided by third parties, or the use of their own devices.
10. Impact on citizen scientists' privacy due to the use of drones (n.b. this risk was considered remote in the second wave of SOCIO-BEE pilots due to its particularly limited use, but may present a more possible scenario, depending on its future adopters' preferences). This risk was not an outcome in the first impact assessment.

Relating to the use of AI:

1. The use of AI in SOCIO-BEE has a negative impact on human rights
2. The collection of personal or non-personal data in SOCIO-BEE has a negative impact on human rights
3. The use of AI in SOCIO-BEE has a negative impact on personal data protection and privacy
4. Lacking policies and protocols to address the negative impacts

As noted in the previous impact assessment, the use of artificial intelligence poses the biggest challenge for a legal and ethical analysis due to the contextuality of the technology and the uncertain legal frameworks. The AI Act's non-applicability to projects such as SOCIO-BEE does not bring any clarity in terms of legal requirements whatsoever. As in the previous IA report, we remain in favour of *overestimating* any resulting risks in order to fully protect the interests of citizen scientists and third parties.

Relating to the impact on human rights:

1. Duty bearers are unaware of their human rights obligations, or do not meet them
2. SOCIO-BEE has a negative impact on a protected characteristic or a marginalised group
3. The deployment of technology does not fully take the impact on human rights into account

Relating to gender:

1. Significant underrepresentation of women in key roles
2. A lack of uniformity in the provision of gender-specific training without initiatives to enhance gender-specific knowledge and understanding, and continuous or in-depth capacity-building activities
3. Limited integration of the intersectional approach
4. Inconsistent collection, analysis, and presentation of gender-disaggregated data

4 Conclusions and Recommendations

4.1 Privacy, data protection, artificial intelligence and human rights recommendations

In this section, we provide guidance to future adopters and policy-makers based on lessons learned in SOCIO-BEE.

Disclaimer: the recommendations herein may not cover all use-cases present in a post-project scenario, as that is impossible to determine. Citizen science and air pollution monitoring projects can be deployed in many different scenarios, depending on the subgroup of citizens involved (demographic, skill-based, interest-based etc.), the specific type of technologies used on top of the ones developed in SOCIO-BEE, in one or several different countries at once, or perhaps using only specific SOCIO-BEE products only. The specific manner of use may prompt the application of other legal frameworks on local, national or European level.

Whatever the use-case in question, we advise the adopters to keep up legal and ethical monitoring, for which the SOCIO-BEE impact assessment templates can be used. We also encourage future adopters to use SOCIO-BEE products in a manner that supports the citizen scientists' autonomy and wellbeing, aiming at achieving the right to health and the right to clean air for all; and to refrain from using them in an exclusionary or unethical manner for any reason whatsoever.

4.1.1 Recommendations to policy-makers

These recommendations are designed to help policy-makers develop robust, inclusive, and enforceable policies that protect both the environment and the rights of individuals involved in citizen science projects.

1. Clarify data protection roles

Clearly define the roles and responsibilities in a citizen science scenario to ensure accountability in line with art. 24 of the GDPR, which states that the controller shall implement appropriate technical and organisational measures to ensure and to be able to demonstrate that processing is performed in accordance with this Regulation. Considering the unclear identity of controller(s) in citizen science context, we ask the policy-makers to clarify this issue, by e.g., issuing a set of criteria or requirements an entity should meet to be considered a controller. This would in turn ensure that citizen scientists have a clear point of contact for exercising their data subject rights.

2. Develop and implement binding frameworks that ensure the right to clean air

Build on existing right to health frameworks and consider the emerging case law to strengthen human rights protections. Inter alia, this involves cases such as *ClientEarth v. UK Secretary of State for Environment, Food and Rural Affairs* (2018), which highlight inadequacies in air quality regulations and the need for stricter enforcement of existing standards. Additionally, the Ambient Air Quality Directive (2008/50/EC) sets limits on air pollutants, reinforcing the obligation of member states to ensure air quality that protects public health. The European Court of Justice has also ruled in cases such as *C-404/13* (2014), emphasizing the importance of complying with these standards. By building on established health frameworks, policy makers can enhance human rights protections, ensuring that individuals not only have access to a healthy environment but also that their rights are actively defended against governmental inaction.

3. Provide consent guidelines in citizen science

Focus on making these guidelines readable and accessible, particularly for vulnerable groups such as children, the elderly, individuals with lower digital skills, and other relevant groups. We ask the policy-makers to clarify whether, and in which circumstances, the Accessibility Act (Directive (EU) 2019/882) applies to citizen science projects.

4.1.2 Recommendations to future adopters

The following recommendations outline key measures to ensure the protection of personal data, privacy, ethical use of artificial intelligence and human rights within these contexts.

1. Clear and informed consent procedures

Ensure that consent procedures are informative, easy to understand, and use clear language tailored to the specific use case. Adapt existing consent forms and information sheets, such as those provided by SOCIO-BEE, to be relevant and accessible to the target audience.

2. Technical and Organisational Measures for Data Protection

Following the approach taken in the SOCIO-BEE development process, we recommend a **by-design approach**, including adopting technical and organisational measures, to ensure comprehensive understanding and compliance.

a. Technical measures:

- Implement a privacy-by-design approach in all data management practices to comply with the data minimisation principle. This includes ethical data management, minimizing the amount of data collected to what is strictly necessary, and clearly defining roles and responsibilities related to data handling.
- Conduct a Data Protection Impact Assessment (DPIA) under art. 35 of the GDPR, even in cases where it is not explicitly required, to proactively identify and mitigate potential privacy risks.
- Ensure that all personal data collected is stored securely, with strict access controls to prevent unauthorized third-party access.

b. Organizational measures:

- When integrating additional technologies not developed by the project adopter, such as drones or wearables, specific organizational measures should be implemented:
- Regarding drones: instruct drone pilots to avoid capturing videos or photos that could infringe on individuals' privacy.
- Regarding wearables: fully brief citizen scientists on their privacy options when using wearable technologies, ensuring they understand how their data is being collected and used especially when the technologies are provided by third parties.
- Provide clear guidelines to pilots and citizen scientists to avoid collecting data in private spaces or in any other ways that could encroach on others' privacy rights, including by taking photo and video materials, or taking measurements in private spaces.

3. Ethical use of artificial intelligence (AI)

First, continue the ethics assessment of AI tools. Assess whether the tools used in the project qualify as AI systems, by providing a clear definition during the adoption process. While the applicability of the AI Act may currently be limited within existing citizen science projects, it is crucial to consider its potential future applications.

Secondly, carry out stakeholder consultations. In the creation or deployment of AI within citizen science, consult with the public and involve a diverse range of stakeholders. This ensures that the technology is widely accepted, does not pose unforeseen risks, and does not contribute to further exclusion.

Finally, use only high-quality data in an AI system to avoid the "garbage in, garbage out" scenario, where poor data quality could result in meaningless or misleading outcomes.

4. Supporting and promoting human rights

Foster stakeholder awareness through dialogue and stakeholder consultations to ensure that all involved entities, including duty bearers, are aware of their human rights obligations. Similarly, ensure that citizen scientists are informed about their rights and responsibilities, possibly through targeted campaigns or project-specific notices, such as in-app messages.

Continue monitoring the impact on vulnerable groups by assessing any disproportionate impacts of the project on vulnerable or disadvantaged groups. For instance, avoid limiting air quality monitoring to affluent neighbourhoods, which could create data gaps and perpetuate inequalities.

5. Other recommendations

Regarding the use of FAIR and Open Data. Use FAIR (Findable, Accessible, Interoperable, Reusable) and open data according to relevant licenses, ensuring adherence to the principles of scientific integrity. The information on the data gathered within the SOCIO-BEE project can be found in the Data Management Plans.

Engaging Policy-Makers. One of the destined usages of the data collected in SOCIO-BEE is to inform (especially local) policy-makers to help them make the optimal policy decisions. We encourage the future adopters to provide only high-quality and ethically obtained data to inform decision-making processes when engaging with policymakers.

Finally, we recommend maintaining a continuous review of the legal and ethical implications of the project through impact assessments or similar tools, in order to foster a responsible and ethical approach to citizen science and technology use, ensuring that human rights are respected and upheld throughout the project lifecycle.

4.2 Gender equality recommendations

Gender is a relevant factor for entities participating in citizen science projects for several reasons that align with the goals of inclusivity, representativity, and equity in scientific research and community engagement. Here are key points to consider for future participants in citizen science projects:

Citizen science projects aim to engage a diverse range of participants to ensure that various perspectives and experiences are represented in scientific inquiry. Gender diversity is essential in achieving this goal, as it allows for a more comprehensive understanding of phenomena being studied, considering different lived experiences, needs, and knowledge that different genders may bring.

Besides, gender can influence the way data is collected, interpreted, and understood. For instance, projects focused on health, environment, or social sciences might yield biased results if one gender is overrepresented, as it has been shown during the pandemic. Ensuring gender diversity among participants helps mitigate these biases and leads to more accurate, reliable, and generalizable findings.

Moreover, certain genders, particularly women and non-binary individuals, have been underrepresented in science. Engaging a diverse gender spectrum in citizen science projects helps promote equity, providing opportunities for all genders to contribute to and benefit from scientific research. This inclusion can challenge existing stereotypes and encourage more diverse participation in professional scientific communities.

Citizen science projects often rely on community participation and trust. Demonstrating a commitment to gender inclusivity can build stronger relationships with communities, showing respect for their diversity and ensuring that all voices are heard. This inclusivity can lead to higher engagement rates and more sustained participation. On the contrary, some citizen science projects might focus on issues that disproportionately affect certain genders, such as reproductive health, gender-based violence, or occupational hazards. Gender-relevant participation ensures these projects are better aligned with the lived realities of those most impacted and can lead to more effective interventions and policy recommendations.

Finally, gender diversity brings a variety of skills, perspectives, and problem-solving approaches that can enhance the creativity and effectiveness of a project. Different genders may have distinct ways of

understanding issues and proposing solutions, which can enrich the collaborative process and lead to more innovative outcomes.

4.2.1 Recommendations to policy-makers

To effectively address aforementioned risks, policy makers at the EU and national levels should consider the following recommendations:

1. Strengthen Gender Balance in Research Teams and Leadership Roles

To achieve the goal of a balanced rate of men and women in research teams and leading roles, policy makers should establish clear and enforceable targets for gender balance across all R&I projects funded under Horizon Europe. This should include specific targets for gender balance at all levels of the project hierarchy, including senior management, supervisory, and decision-making positions. Institutions failing to meet these targets should provide justifications and action plans to address the imbalance. Incentives, such as additional funding or ranking advantages, could be provided to projects that demonstrate strong gender balance in leadership roles.

Gender balance among researchers is currently a ranking criterion for proposals with the same evaluation scores under Horizon Europe. To further strengthen this measure, policy makers should consider making gender balance a mandatory criterion in the evaluation process, not just a ranking tie-breaker. This approach will compel institutions to prioritize gender balance in their teams.

2. Ensure Comprehensive Gender-Specific Training and Capacity Building

Policy makers should mandate a standardized gender equality training module that all research teams must complete. This training should cover topics such as unconscious bias, intersectionality, gender-sensitive research methodologies, and inclusive practices. The training should be compulsory at the beginning of each project and should include follow-up sessions to ensure continued learning and engagement. It would be advisable to take into account that there is already a network of projects financed with money from the previous programmes that have implemented equality plans and generated a lot of training material, and there are also numerous toolkits and repositories that can be useful, so it would be advisable to be able to take advantage of all the knowledge generated.

Institutions are required to allocate dedicated resources for gender equality in GEPs. It would be advisable to include continuous gender-specific training and capacity building also as mandatory requirement. This could include funding for workshops, mentoring programs, and the engagement of gender experts to support research teams. Providing these resources will help ensure that gender equality is not just a checkbox exercise but an integral part of the project's culture and practice.

3. Promote Intersectional Approaches in Research and Innovation

In HEurope addressing how gender equality is integrated in the research proposal is required. Policy makers should require also all R&I projects to integrate an intersectional gender analysis in their research proposals. This analysis should examine how gender intersects with other social categories such as race, class, disability, age, and sexual orientation to impact research outcomes and participation. The requirement should be supported by guidelines and toolkits, such as the EU's 'Gendered Innovations 2' report, to help researchers understand and apply intersectional approaches.

To support institutions in applying intersectional approaches, policy makers should develop comprehensive guidelines and best practices that outline how to incorporate intersectionality into research design, data collection, analysis, and dissemination as this is still one of the main challenges.

These guidelines should include case studies and examples from various scientific fields to illustrate the value of intersectional analysis.

4. Standardize Gender-Disaggregated Data Collection and Analysis

As part of the Horizon Europe eligibility criteria, GEPs must include data collection and monitoring on sex and gender-disaggregated data. Policy makers should expand these requirements to include specific metrics and indicators related to gender and intersectional impacts, which should be reported annually. This will help institutions track progress and identify areas for improvement.

5. Enhance Gender-Focused Dissemination Strategies

Policy makers should create guidelines that require R&I projects to develop targeted dissemination plans focusing on gender-related findings. These plans should specify how research results will be shared with gender-focused entities, such as women's organizations, academic journals dedicated to gender studies, and conferences on gender equality. This will help to amplify the impact of gender-related research and contribute to the broader discourse on gender equality in science and technology.

To promote diverse perspectives in dissemination activities, policy makers should require projects to achieve balanced gender representation among participants and speakers in workshops, conferences, and public engagement events. Projects should be encouraged to engage with a wide range of stakeholders, including underrepresented groups and gender equality experts, to ensure that dissemination activities are inclusive and reflective of diverse experiences.

6. Foster a Culture of Continuous Monitoring and Iterative Improvement

Policy makers should mandate continuous monitoring of gender equality measures in R&I projects through regular reviews and impact assessments. This could involve establishing a Gender and Equality Monitoring Committee within each project to provide oversight and ensure that gender equality measures are effectively implemented.

To promote a culture of continuous improvement, policy makers should encourage projects to establish feedback mechanisms that allow team members, stakeholders, and citizen scientists to provide input on gender-related issues. This feedback should be used to refine and adjust gender strategies and practices throughout the project lifecycle.

4.2.2 Recommendations to future adopters

Given that the project is in its final phase, it is difficult to establish risk mitigation measures in the medium to long term. However, it is also worth noting that the issues identified in SOCIOBEE are constraints and challenges that are shared with the vast majority of research projects. It is for this reason that mitigation strategies need to be framed in more structural measures and driven by research funding agents and national stakeholders (Ministries, quality agencies etc.) in a way that redirects the issues identified above. It is for this reason that the recommendations presented for these actors in the following section are particularly relevant.

From the lessons learnt in SOCIO-BEE, we could suggest the following key actions:

- Ensure gender balance in leadership roles: Actively promote the inclusion of women in supervisory and decision-making positions to foster diverse perspectives in project governance.

- Implement mandatory gender-specific training: Provide continuous and uniform gender-awareness training for all participants and consortium members to enhance understanding of gender issues throughout the project lifecycle.
- Adopt an intersectional approach: Integrate intersectionality into project design and analysis to ensure that strategies address the intersecting effects of gender, race, class, disability, and other social categories.
- Standardize the collection of gender-disaggregated data: Develop clear guidelines for consistently collecting, analysing, and reporting gender-disaggregated data across all project partners to avoid bias and improve the validity of findings.
- Include gender-focused dissemination strategies: Ensure targeted outreach and dissemination of gender-related findings to relevant stakeholders and the broader research community, emphasizing the impact on gender equality.
- Foster inclusive participation: Encourage diverse participation by considering the unique needs of women and underrepresented groups in project activities, including flexible participation options.
- Evaluate project impact on gender equality: Regularly assess the project's contributions to promoting gender equality and make adjustments as needed to improve inclusivity and representation.
- Collaborate with gender experts: Partner with organizations and experts specializing in gender equality to guide the project's approach and ensure it aligns with best practices. Please, take into account that this shouldn't be a "ticking the box" exercise, and on the contrary, it should show a commitment towards Gender Equality.
- Incorporate gender in project goals and outcomes: Clearly define gender equality as a key objective of the project, with measurable outcomes related to gender balance and inclusivity.

4.2.3 Recommendations for Future Citizen Science Projects

Privacy and Data Protection

This deliverable emphasizes the importance of robust privacy and data protection measures in citizen science projects. Central to this is the simplification of consent procedures to ensure they are accessible to all participants, particularly vulnerable groups such as children and individuals with limited digital skills. Consent forms must be designed to provide clear and transparent information about data collection and usage, tailored to the specific contexts of the project.

A key principle highlighted is data minimization—only collecting data that is strictly necessary for achieving the project's objectives. Ensuring compliance with this principle reduces the risk of unnecessary intrusion into participants' privacy. Security measures, such as encryption and pseudonymization, are critical for safeguarding personal data throughout its lifecycle, including collection, storage, and transfer. Additionally, the report underscores the need for clearly defined roles and responsibilities for data controllers and processors, ensuring adherence to the General Data Protection Regulation (GDPR) and accountability in managing data.

4.3 Ethical Use of Artificial Intelligence

The use of artificial intelligence (AI) in SOCIO-BEE introduced both opportunities and challenges, as reflected in the recommendations. The deliverable highlights the need for comprehensive ethical assessments of AI tools to address potential risks related to human rights, privacy, and inclusivity.

These assessments are essential to evaluate the impact of AI on project outcomes and participant experiences.

Stakeholder engagement is a critical component of ethical AI use. Actively involving diverse groups ensures that AI systems are designed and implemented in ways that are equitable and free from biases. Moreover, the importance of using high-quality, representative datasets is emphasized to avoid generating unreliable or misleading results. The report calls for adopting transparent practices that uphold ethical standards and ensure AI applications are both beneficial and fair.

Human Rights

The report highlights the centrality of human rights in citizen science projects. Ensuring non-discrimination and inclusivity is paramount, requiring project designs that actively remove barriers to participation for marginalized groups. Tailoring project activities to address the specific needs of diverse participants ensures equitable access and representation.

Empowering participants through accessible communication and engagement strategies is another key recommendation. By providing citizen scientists with the tools and knowledge necessary for meaningful contributions, projects can foster a sense of ownership and agency among participants. Furthermore, accountability mechanisms are crucial for upholding human rights commitments, with clear frameworks in place to monitor and enforce these obligations throughout the project's duration.

Gender Equality and Inclusion

Gender equality remains a critical focus, and the deliverable provides actionable insights to enhance inclusivity. Integrating intersectionality into project design and implementation is emphasized, recognizing how gender intersects with other social categories, such as race, disability, and age. This approach ensures that strategies address the multifaceted nature of inequality.

Mandatory gender-specific training is recommended for all project partners to build awareness and understanding of gender dynamics. Such training supports the development of inclusive practices and fosters equitable participation. Collecting and analyzing gender-disaggregated data is highlighted as essential for uncovering gender-specific impacts and guiding evidence-based strategies. The deliverable also stresses the importance of targeted dissemination efforts that amplify gender-related findings and engage stakeholders focused on promoting equality.

Operational Excellence and Sustainability

The SOCIO-BEE experience underscores the value of continuous monitoring and iterative impact assessments. These practices allow projects to reflect on their methodologies and adapt to emerging challenges. Building lasting networks and communities of practice is also highlighted as a way to sustain citizen engagement and amplify project impacts beyond its immediate lifecycle.

Open data standards, such as the FAIR principles (Findable, Accessible, Interoperable, Reusable), are advocated to ensure transparency and accessibility while maintaining strict adherence to privacy and ethical guidelines. The deliverable recommends embedding citizen science initiatives within institutional strategies to secure resources and promote long-term sustainability.

Policy and Institutional Support

The recommendations call for aligning project outcomes with broader policy frameworks, such as the right to a clean and healthy environment and gender equality mandates. Institutional backing is crucial for embedding citizen science within organizational strategies, ensuring the necessary resources and support for long-term success. The deliverable also emphasizes the need for engagement with policymakers to create supportive environments for citizen science initiatives.

References

- [1] Communication from the Commission to the Council and the European Parliament COM(2023) 659 final on countering potential threats posed by drones <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023DC0659>
- [2] Danaja Fabric Povse, 'Challenges of Remote Patient Care Technologies under the General Data Protection Regulation: Preliminary Results of the TeNDER Project' in I Glenn Cohen and others (eds), Digital health care outside of traditional clinical settings (Cambridge University Press 2024) <<https://petrieflom.law.harvard.edu/events/details/2022-petrie-flom-center-annual-conference>>.
- [3] ICO (2017). 'Big data, artificial intelligence, machine learning and data protection' and FRA (2011). 'Handbook on European non-discrimination law', [Online] Available: <https://fra.europa.eu/en/publication/2011/handbook-european-non-discrimination-law-2011-edition>.

Annex I - Questionnaires

Dear SOCIO-BEE partner,

The present questionnaire is part of WP6, T6.2 Legal Compliance, Assessment and Recommendations (Data Protection and Privacy), and more specifically, the SOCIO-BEE D6.3 2nd Impact Assessment and Recommendations to Stakeholders.

This questionnaire aims to collect information from the partners and, on that basis, to provide SOCIO-BEE stakeholder community with recommendations and suggestions. Depending on the type of impact assessment, the questionnaires will be applicable to all or some SOCIO-BEE partners.

The answers to this impact assessment questionnaire are necessary for us to anticipate the risks and adopt a mitigation strategy for the further development of the technologies, the participation of citizen scientists and vulnerable groups in the project and running pilots. This questionnaire aims to get a clear overview of the overall intended functioning of the SOCIO-BEE platform, the use of drones, AI and wearables, the particularities of citizen science research, and the project as a whole. The impact assessment will also be carried out in conjunction with the second wave of the pilots.

This process will ensure that the technologies used in SOCIO-BEE, as well as the participation of citizen scientists and vulnerable groups, and any new aspects thereof, will be tested against the relevant legal, ethical and gender concerns, through the implementation of the impact assessment outcomes by all partners, that it will be compliant with relevant laws and best practices.

The outcomes will be documented in the D6.3, 2nd Report on Impact Assessment and Recommendations for stakeholders, due in M36.

Instructions for completion

- Please read the below instructions carefully prior to completing the questionnaire.
- Please fill in this questionnaire regarding your organisation's contribution to the project in the light of the second wave of the pilots.
- Where a question is accompanied by instructions, please read them carefully. The instruction will provide you with guidance on what information is sought, explain certain terms or refer you to where further guidance can be found. Should a question remain unclear, please reach out to VUB for assistance.
- Please answer each question in as much detail as possible and try to answer each question in plain language. This will allow VUB and DEUSTO to avoid having to reach out to seek clarifications. In the event a certain question cannot be answered because 1) an aspect is still under development, please indicate this clearly and provide, where possible, a brief description of the intended approach or options that are being considered 2) it is not applicable, then you may write that stating why this is not applicable.
- If necessary, please check with your Data Protection Officer, regarding any questions about personal data being processed. If applicable, also mention any relevant Codes of Conduct or certifications.
- If the type of activity referred to in the question does not apply to your organisation's role in the project, please state that it is not applicable (N/A).
- Please answer the questions in connection to the specific component(s) that you are developing, contributing to, using or testing, or, where possible and appropriate, in relation to SOCIO-BEE as a whole. If you are answering in connection to SOCIO-BEE as whole or multiple components, please indicate this clearly and, where possible, separate your answer per component.
- We will review the answers and contact you as soon as possible in case if there any additional information or clarification needs to be provided.
- Please fill out the questionnaire as soon as possible, but no later than March 8 2024, and share them with VUB and DEUSTO, as indicated in the email.

Structure of questionnaire

This questionnaire has 3 sections divided in accordance with the different impact assessments.

- The first section is devoted to the Data Protection Impact Assessment
- The second section is devoted to the Artificial Intelligence Impact Assessment
- The final section is devoted to the Gender Impact Assessment

If your organization is involved in several sections, please fill in all the relevant sections.

All the partners should also fill in the table below.

Name of respondent(s):	
Name of consortium partner:	
Email contact:	
Role in the project (e.g., user, developer, service provider...):	
Name of the tool/solution/method/mechanism/system to be developed:	
Description of the tool/solution/method/mechanism/system to be developed:	
What role will this tool/solution/method/mechanism/system play in relation to other tool/solution/method/mechanism/system (to be developed) in the project?:	

1 Data Protection Impact Assessment

1.1 Requirements related to Data Protection

1.1.1 Scope of processing

Question 1: What is the nature of the data that will be collected? Are the partners able to identify a natural person based on the collected data (as such or combined with other data)?

Reason: Data which relate to an identified or identifiable natural person are personal data. In that case, data protection law becomes applicable.

Input:

Question 2: Will any personal data be collected during the project? If so, please describe the type of data

Where possible, please separate this with respect to the relevant technologies and other data collecting methods (e.g. xx data is collected with xx sensor, xx component will process xx data). The categories below are provided as an example. The categories below are provided for orientation and are not necessarily needed for the purposes of the project. Please specify those relevant to your activities.

1. Identification data (e.g. name, last name, data of birth, age, gender, email, phone)
2. Personal features
3. Financial data
4. Physical, physiological or behavioural characteristics of a natural person, allowing or confirming their unique identification (please specify)
5. Genetic data
6. Biometric data
7. Other information regarding health, incl. mental health
8. Habits
9. Family composition
10. Hobbies and interests
11. Consumption patterns
12. Residence or home address
13. Education
14. Occupation and employment
15. Social security number
16. Racial or ethnic background
17. Philosophical or spiritual orientation
18. Information on sexual preferences
19. Political orientation or opinion
20. Membership of trade union or affiliation
21. Other memberships
22. Video footage
23. Other, namely:

Input:

Question 3: If the processing operation includes the processing of personal data, will you process special categories of personal data (“sensitive data”)?

Reason: Special categories of data, such as e.g. health data, political opinion, ethnicity etc fall under the scope of stricter rules as their processing may result in a higher risk to the rights and freedoms of the data subjects. For instance, it may lead to discrimination against them.

Input:

Question 4: Whose personal data is being processed?

Please describe the data subjects, i.e. the (groups of) individuals whose personal data will be collected and processed.

Input:

Question 5: What Privacy Enhancing Technologies (PETs) are used and if so, how? What Data Protection by Design and by Default techniques are implemented [art.25 GDPR]?

Reason: The data controllers must have in place a system of ICT measures which eliminate or minimise personal data, thereby preventing unnecessary or unauthorised processing, for instance, encryption or anonymisation.

Input:

Question 6: If processing of personal data occurs, is the access to the personal data restricted? What are the rules of access (with special attention to its conditions, mode, and limits) [art.5 GDPR]?

Reason: The details of processing operations should be clarified and documented (via, e.g. logs, permissions).

Input:

1.1.2 Nature, purposes and context of data processing

Question 7: Please describe the data processing, with special attention to the method and the tools (e.g. cloud computing solution) to be used. Be specific about the source of the data (from data subjects, other partners/sources) and the ways you will collect (sensors/ video recordings/ software/ questionnaires/ other means), use, store (e.g. office servers, cloud, third parties) and delete them [art.35 GDPR].

Reason: The systematic description of the envisaged data processing operation is a minimum requirement for a DPIA and a crucial element for any further analysis.

Input:

Question 8: Where the processing is based on consent, will it be possible to demonstrate that the data subject has consented to the processing of his or her personal data [art.7 GDPR]? how do you guarantee that the consent is informed, specific and freely given?

Reason: This condition is of utmost importance for the accountability of the data controller as well as the assessment of whether consent was given under the necessary conditions (freely given, specific, informed).

Input:

Question 9: If processing personal data, what is the purpose of that? What are the expected benefits of the processing for you, as a data controller, and more broadly? [art.5 GDPR]

Reason: The processing of personal data shall be conducted for fulfilling specified purposes.

Input:

Question 10: What is the nature of your relationship with the individuals whose personal data will be collected? Would they have a reasonable expectation that their data are used this way?

Reason: In order for some legal grounds to be applicable and the data subjects to be able to enforce their rights and freedoms fully, it is important that the data subjects have a reasonable expectation that their data are processed

Input:

1.1.3 Data security

Question 11: What security measures do you implement in order to ensure data security and integrity [art. 32 GDPR]?

Reason: Appropriate technical and organisational measures should be put in place to guarantee a suitable level of security. This includes measures for secure storage, transfer and access to the personal data as well as precautions against cyberattacks and unauthorised access

Input:

Question 12: Is the processing activity novel in any way? Are there prior concerns over this type of processing or any known security flaws?

Reason: Compliance of a novel processing activity may be challenging. Therefore, assessing a technological application in its infancy may require the input of external experts

Input:

Question 13: How do you document your processing operations? Who has access to this documentation and up to what extent?

Reason: Record-keeping and appropriate documentation may improve the process for the identification of risks both for the controller and the supervisory authority. However, unauthorised access to this documentation may pose security risks

Input:

Question 14: Have you adopted or will you adopt procedures for dealing with data breaches and notification of breaches to the national supervisory authority or to the affected individuals, if applicable [art.33-34 GDPR]?

Reason: The data controller is responsible, for reasons of transparency and accountability, to establish communication and notification procedures of a data breach, depending on its scale. Please specify any technical measures (e.g. specific email address for requests, software or in-built secure system allowing data subjects to access their own personal data in a transparent way) and organisational measures (e.g. who will provide information to the data subjects) that will be put in place?

Input:

Question 15: If processing personal data, how will the collected data meet the requirements of data quality (accuracy, integrity, up-to-date) and data minimisation (adequacy, relevance and storage limitation)? How do you ensure that data will remain accurate when disclosing it to third parties? [art.5 GDPR]

Reason: The processed data should be relevant and accurate. SOCIO-BEE should only collect those types of personal data which are necessary to reach the goal of the processing; furthermore, the processed data must be accurate and kept up to date.

Input:

1.1.4 Identification of risks and mitigation measures

Question 16: Describe the sources of potential risk and the nature of the potential impact on individuals

Reason: Proper documentation of potential risks can help better understand and assess the impact on individuals and integrate proactive mitigation measures into the project plan.

Source:
The likelihood of harm: remote, possible or probable
The severity of harm: minimal, significant or severe
The overall risk: low, medium or high

Question 17: Identify envisaged measures to reduce or eliminate the risks depicted as medium or high in the previous question.

Reason: Proper documentation of the additional measures can help the data controller identify whether there is a need to seek the advice of the DPO or consult with the supervisory authority (accepted residual risk).

Risk (Illegitimate access to data; Unwanted change of data; Disappearance of data):

Options to reduce or eliminate risk:

Effect on risk: eliminated, reduced or accepted

Residual risk: low, medium or high

Measures: approved or not approved

Question 18: In line with the research ethics and the principles of fair and transparent data processing, should SOCIO BEE researchers consider rendering the datasets available for future research, they should obtain the additional, explicit consent of the data subjects (and their legal guardians) to the secondary use of the data. Data subjects must be explicitly given the opportunity to opt-out from such further processing. What measures will your organisation or company take to meet these conditions?

Input:

1.1.5 Processing the data of vulnerable groups

Question 19: Regarding the processing of personal data of children and elderly persons, all actions concerning them should take their best interests into primary account. This means that if you process their personal data, then you should think about the need to provide the specific protection from the outset and design your processing, products and systems with this in mind. It is usually easier to incorporate child/elderly friendly design into a system or product as part of your initial design brief than to try and add it in later. Such specific protection should, in particular, apply to the use of personal data to create personality or user profiles.

If you process personal data of children or elderly people, do you have any specific measures in place that take their best interest into primary account as stated above?

Input:

Question 20: As with children, when processing personal data of elderly and disabled people, specific attention should also be paid to their protection. Considering the previous question, if you process personal data of elderly and disabled people, have you taken any specific measures? If so, which?

Input:

1.2 Privacy

1.2.1 Privacy requirements

Question 21: Is the impact on the privacy of individuals adequate and necessary to achieve the purpose of SOCIO-BEE? Or are there less invasive solutions which can be used to achieve the same purpose effectively?

This relates to the necessity of the use of certain technologies.

Input:

Question 22: In relation to limiting the potential intrusion of privacy, will the access to personal data be restricted? What are the rules of access?

Input:

Question 23: Is unused data deleted automatically? If so, when and how often does this occur?

Regular deletion of data reduces the privacy risks as a result of malevolent action of others (e.g. that someone would be able to access and steal data).

Input:

Question 24: Is there a risk that the technology (either the system itself or technologies used for data gathering) will pick up activity from others than those testing or using the SOCIO-BEE system? If so, how is this addressed?

Input:

1.2.2 Use of drones

Question 25: Is there a risk that the use of drones will impact individuals' privacy? If yes, how? Whose privacy is impacted? Please describe groups or individuals whose privacy could be at stake.

Input:

Question 26: If drones are used in public spaces, could their use lead to invasive monitoring and/or surveillance? If yes, what steps do you plan to take to limit the monitoring and/or surveillance?

Input:

Question 27: If drones are used in private spaces, could their use lead to invasive monitoring and/or surveillance? If yes, what steps do you plan to take to limit the monitoring and/or surveillance?

Input:

1.2.3 Use of sensors, wearables and other IoT devices

Question 28: Is there a risk that the use of IoT devices such as wearables and sensors will impact individuals' privacy? If yes, how? Whose privacy is impacted? Please describe groups or individuals whose privacy could be at stake.

Input:

1.2.4 Use of citizens' own devices

Question 29: Is there a risk that the use of citizens' own devices, such as smartphones, could impact citizens' privacy? If yes, how?

Input:

Question 30: If the answer to the previous question is yes, whose privacy is impacted? Please describe groups or individuals whose privacy could be at stake.

Input:

Question 31: What kind of mitigation measures do you plan to take to minimise the impact on citizens' privacy when their own devices are used?

Input:

2 Artificial Intelligence Impact Assessment

2.1 Human rights context

2.1.1 Identifying potential Human Rights and impacts

Question 1: Fundamental right: Is the algorithm/AI system you are developing likely to have an impact on any of the following:

- Social and economic fundamental rights such as the right to health, the right not to live in poverty ...
- Freedoms such as autonomy, freedom of speech, freedom of assembly, freedom of conscience ...
- Equality rights and non-discrimination
- Procedural rights

Input:

Question 2: Is there any specific national legislation applicable to the fundamental right in question that should be taken into account?

See the D3.1 Report on Legal and Regulatory Requirements

Input:

2.1.1.1 Human dignity

Question 3: How, if at all, could this system prompt confusion or uncertainty in rights-holders about whether they are interacting with an AI system rather than a human being?

Input:

Question 4: How, if at all, could this system expose rightsholders to humiliation (i.e put them in a state of helplessness or insignificance; deprive them of a sense of individual identity)?

Input:

Question 5: How, if at all, could the system expose rightsholders to instrumentalization or objectification (treating them solely as exchangeable, as statistical aggregates, as means to ends, or as objects to be freely manipulated or steered)?

Input:

Question 6: In what other ways, if any, could the use of this system adversely impact the dignity of affected rights-holders?

Input:

2.1.1.2 Human Freedom and Autonomy

Question 7: How, if at all, could the system adversely affect or hinder the abilities of rights-holders to make free, independent, and well-informed decisions about their lives or about the system's outputs?

Input:

Question 8: How, if at all, could the deployment of the system result in the arbitrary deprivation of rights-holders' physical freedom or personal security, or the denial of their freedoms of expression, thought, conscience, or assembly

Input:

Question 9: In what other ways, if any, could the use of this system adversely impact the freedom or autonomy of affected rights-holders?

Input:

2.1.2 Right to psychological and physical safety

Question 10: - Does the AI system have adequate data security and cybersecurity measures in place?

Input:

2.1.3 Non-discrimination

Does the AI system potentially negatively discriminate against people on the basis of any of the following grounds (non-exhaustively): sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation?

Question 11: Have you put in place processes to test and monitor for potential negative discrimination (bias) during the development, deployment and use phases of the AI system?

Input:

Question 12: Have you put in place processes to address and rectify for potential negative discrimination (bias) in the AI system?

Input:

2.1.4 Personal data protection and privacy

Question 13: Can the AI system be used for monitoring and surveillance purposes? If yes, is this monitoring continuous or can the user stop it?

Input:

Question 14: Have you put in place processes to assess in detail the need for a data protection impact assessment, including an assessment of the necessity and proportionality of the processing operations in relation to their purpose, with respect to the development, deployment and use phases of the AI system?

Input:

Question 15: Have you put in place measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of personal data with respect to the development, deployment and use phases of the AI system?

Input:

2.1.5 Protection of children

Does the AI system respect the rights of the child, for example with respect to child protection and taking the child's best interests into account?

Question 16: Have you put in place processes to address and rectify for potential harm to children by the AI system?

Input:

Question 17: Have you put in place processes to test and monitor for potential harm to children during the development, deployment and use phases of the AI system?

Input:

2.1.6 Freedom of expression and information

Question 18: Have you put in place processes to test and monitor for potential infringement on freedom of expression and information, and/or freedom of assembly and association, during the development, deployment and use phases of the AI system?

Input:

Question 19: Have you put in place processes to address and rectify for potential infringement on freedom of expression and information, and/or freedom of assembly and association, in the AI system?

Input:

Question 20: Is the AI system able to transmit content to the user?

Input:

Question 21: Which kind of relationships is the AI system able to create with the user?

Input:

Question 22: Does AI system share any value-oriented messages with the user? If yes, what kind of values are communicated? Are these values customisable by users (including parents) or on the basis of user interaction? If so, what range of alternative value sets is provided? Are these values the result of work by a design team characterised by diversity?

Input:

2.2 Controls in place

Question 23: What policies and procedures are in place to assess the potential impact on human rights?

Input:

Question 24: Has an impact assessment already been carried out, developed and implemented in relation to specific issues or some features of the product/service?

Input:

3 Human Rights Impact Assessment

3.1 Principles

3.1.1 Participation

Question 1: How does your organisation in SOCIO-BEE ensure that people whose rights are affected have an influence on and participate in the development of these activities? How do those people feel that their opinions are listened to, even if a contrary decision is made?

Input:

Question 2: Is there a policy for participation in these activities? How is that policy employed across all activities? What mechanism do you have for determining how participation will be considered in each piece of work?

Input:

Question 3: Does your organisation in SOCIO-BEE take into account representation: 1) Geographically 2) Across all protected characteristics 3) From seldom heard groups?

Input:

Question 4: How does your organisation in SOCIO-BEE seek to overcome barriers to participation for these groups?

Input:

Question 5: How does your organisation in SOCIO-BEE ensure information is presented in a format which rights holders are able to understand? For example, Easy Read, Plain English, BSL or other formats may be required.

Input:

Question 6: How does your organisation in SOCIO-BEE involve the relevant duty bearers (people and organisations with human rights obligations) in each activity?

Input:

3.1.2 Accountability

Question 7: Can your organisation in SOCIO-BEE identify duty bearers (people and organisations with human rights obligations) in each activity?

Input:

Question 8: How does your organisation SOCIO-BEE use/create mechanisms to hold those duty bearers to account?

Input:

Question 9: How does your organisation SOCIO-BEE identify the most important capacity gaps in duty bearers to meet their obligations?

Input:

Question 10: How does your organisation monitor and evaluate the impact of SOCIO- BEE on human rights outcomes over time?

Input:

3.1.3 Non-discrimination and equality

Question 11: How does your organisation in SOCIO-BEE identify the impact of activities on protected characteristics (age, disability, gender reassignment, race, religion or belief, sex, sexual orientation, marriage and civil partnership, and pregnancy and maternity), and other marginalized groups?

Input:

Question 12: How are their needs taken into account, both in participation (see above) and in ensuring their issues are reflected throughout the work?

Input:

Question 13: How does your organisation in SOCIO-BEE address issues of universal accessibility (making things accessible for all groups of people) and reasonable accommodation (making adjustments so that things are accessible to a particular individual)?

Input:

Question 14: How does SOCIO-BEE check and ensure the accessibility of SOCIO-BEE's own materials for groups with particular needs

Input:

3.1.4 Empowerment

Question 15: How does implementation of activities contribute towards building the capacity of rights holders (people whose rights are affected) to claim their rights (e.g. ability to access information, organise, advocate policy change and get access to justice etc?)

Input:

Question 16: How do people know about how they can participate in SOCIO-BEE's work? How available is this information?

Input:

Question 17: How does your organisation in SOCIO-BEE empower people to know and claim their rights? What information would be provided to rights holders about their human rights?

Input:

Question 18: How does your organisation in SOCIO-BEE identify the most important capacity gaps in each activity that constrain rights holders from claiming their rights?

Input:

3.1.5 Legality

Question 19: What human rights are affected by your organisation in SOCIO-BEE activities?

Input:

Question 20: How does your organisation in SOCIO-BEE ensure that furthering these rights is the aim of the activity?

Input:

Question 21 How does your organisation in SOCIO-BEE use relevant human rights standards and recommendations of regional and international human rights mechanisms to inform each activity?

Input:

Question 22: How is implementation tied to those priorities?

Input:

Question 23: How does your organisation in SOCIO-BEE's work address the full range of civil, political, economic, social, and cultural rights?

Input:

4 Gender Impact Assessment

4.1 Structure and rationale of questionnaire

Gender equality is a foundational principle of European Union (EU) law that extends to all realms of social existence. The EU employs a comprehensive approach to promote gender equality, combining targeted initiatives with the practice of gender mainstreaming.

A Gender Impact Assessment (GIA) is a valuable tool for assessing the potential effects of a project or policy on gender equality. In the case of a Citizen Science project, a GIA can help identify how gender intersects with other social categories (such as race, class, disability, etc.) and understand the potential implications for participation, access, and benefits.

By conducting a GIA, the project can ensure inclusivity, address potential gender disparities, and maximize the positive impact on diverse communities. Gender impact assessment serves as the primary tool for governmental entities to implement gender mainstreaming effectively. It is an essential component of Indicator 3 on Gender Mainstreaming, introduced by the Finnish Presidency of the Council of the European Union in 2006. This indicator outlines the criteria for measuring Member States' progress in terms of institutional mechanisms and gender mainstreaming. Gender impact assessment, conducted as an early-stage approach during policy development, plays a crucial role in integrating a gender analysis at the initial "define" stage of the policy cycle. Its purpose is to bring about substantial impacts not only in policy design but also in the planning phase, ensuring equitable outcomes are adequately addressed. (EIGE 2017)

The survey is structured as follows:

1. Socio-demographic information
2. Equal opportunities for women and men in research
3. Gender in research content
 - a. Definition of Research project
 - b. Gender relevance
 - c. Gender sensitive analysis.
4. Gender and Intersectionality:
5. Citizen (scientist) involvement
6. Multi stakeholders' involvement
7. Performance of a GIA

4.2 Socio demographic information

Name of respondent(s):	
Consortium Partner(s):	
Gender	
Age	12-18
	19-40
	41-65
	66-100
Nationality	
Work package:	
Title of the task:	
Task description:	
Name of the tool/solution/method/mechanism/system to be developed:	
Description of the tool/solution/method/mechanism/system to be developed:	
What role will this tool/solution/method/mechanism/system play in relation to other tool/solution/method/mechanism/system (to be developed) in the 'project'?	
Email contact:	

4.3 Equal opportunities for women and men in research

Question 1: Is there a gender balance in the project consortium and team, at all levels and in decision-making positions?

Input:

Question 2: Do working conditions allow all members of staff to combine work and family life in a satisfactory manner?

Input:

Question 3: Does your institution foresee any measure to ensure the right to disconnect?

Input:

Question 4: Are there mechanisms in place to promote gender equality, e.g. workforce statistics? (Bear in mind that Horizon Europe Gender Equality Plans building blocks are: 1) publication of a formal document (diversity/equality plan) on the institution's website, 2) to have dedicated resources on equality within the organization, 3) to collect and monitor sex and gender disaggregated data, and 4) to have an internal capacity building program on equality and diversity.)

Input:

4.4 Gender in research content

4.4.1 Research ideas phase

Question 5: If the research involves humans as research objects, how has the relevance of gender to the research topic been analysed?

Input:

Question 6: Have you reviewed literature and other sources relating to gender differences in the research field?

Input:

4.4.2 Proposal phase

Question 7: Does the methodology ensure that (possible) gender differences will be investigated: that sex/gender differentiated data will be collected and analysed throughout the research cycle and will be part of the final publication?

Input:

Question 8: Does the methodology ensure that a diverse team will analysed the data gathered throughout the research cycle and that diversity will be ensured of the final publication?

Input:

Question 9: Have possibly differentiated outcomes and impacts of the research on women and men or other gender identities been considered?

Input:

4.4.3 Research phase

Question 10: Are questionnaires, surveys, focus groups, etc. designed to unravel potentially relevant sex and/or gender differences in your data?

Input:

Question 11: Is inclusive language used in these tools??

Input:

Question 12: Are the groups involved in the project (e.g. samples, testing groups) gender-balanced? Is data analysed according to the sex variable? Are other relevant variables analysed with respect to sex and other discrimination axes?

Input:

4.4.4 Dissemination phase

Question 13: Do analyses present statistics, tables, figures and descriptions that focus on the relevant gender differences that came up in the course of the project?

Input:

Question 14: Are institutions, departments and journals that focus on gender included among the target groups for dissemination, along with mainstream research magazines?

Input:

Question 15: Have you considered a specific publication or event on gender-related findings?

Input:

4.5 Gender and Intersectionality:

Question 16: Are the people who are targeted and impacted by project included in the decision-making?

Input:

Question 17: Do you think that people of different genders access this project at the same rate?

Input:

Question 18: Do you think that everyone who accesses this project has the same needs from it?

Input:

Question 19: What additional needs might there be for people with disabilities, or from different cultural identities, ages, gender identities, sexual orientations or religions?

Input:

4.6 Citizen (scientists) involvement

Question 20: How will the consortium ensure that citizen scientists that will be involved in the deliberative processes represent gender diverse interests?

Input:

Question 21: Will sex/gender and other differences be explicitly addressed in the discussions and during possible workshops, conferences, ...?

Input:

Question 22: Will the consortium achieve a balanced gender representation among the participants and speakers in workshops, conferences, ...?

Input:

4.7 Multistakeholder involvement

Question 23: How will SOCIO-BEE verify that the mechanisms set up for dialogue and debate have not built-in gender biases?

Input:

Question 24: How will SOCIO-BEE seek and ensure a gender diverse participation in the dialogues?

Input:

Question 25: Will there be criteria and indicators in place to monitor the respective stakeholders' participation in and contributions to the dialogue?

Input: