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Wearables and droneS fOr CIty Socio-Environmental Observations and Behavioral ChangE

Deliverable

D6.6 - Framework for developing social inclusion participation in Citizen Engagement & behavioural change.R1

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List of definitions & abbreviations

Abbreviation	Description
AQ	Air Quality
AcadeMe	AcadeMe – online repository of toolkit materials to be used by all relevant stakeholders in SOCIO-BEE
B	Bee
BR	Bear
BK	BeeKeeper organisation
CO	Citizen Observatory
CS	Citizen Science
EU	European Union
GA	Grant Agreement
QB	Queen Bee
Q&A	Questions and Answers
SwafS	Science with and for Society
WP	Work Package
WSN	Wearable Sensor Node. The air pollution measurement device developed by Bettair.

Executive Summary

This document provides the guidelines and describes the use of a tool that ensures that the processes and outcomes of a citizen science project are socially inclusive from an intersectional perspective.

Inclusion and gender equality respond not only to a pedagogical issue that offers opportunities for all citizens to participate in scientific creation processes, but also to a representativeness issue that guarantees the validity and legitimacy of the collected data. The intention of incorporating an inclusive and gender perspective into this project is mostly related to social justice and the democratization of science, which considers that both scientific questions and the impact of the scientific results should benefit all citizens, including the most vulnerable individuals and groups. This perspective becomes particularly relevant in environmental projects; as environmental benefits must be equitable in order to be considered sustainable.

Although some classifications describe levels of participation in citizen science based on the control that citizen scientists have over each stage of the research process, and being aware that the ideal scenario consists of maximum participation, the dynamics of the SOCIO-BEE project combine different typologies based on the roles of citizen scientists that the project foresees. The scalable nature of the project constitutes an advantage for its inclusivity, as it facilitates multiple points of entry and engagement. The key is to avoid keeping the most vulnerable individuals in lower roles.

The factors that generally deserve special consideration regarding inclusivity in this citizen science project are:

- Diverse participation of individuals, groups, and associations.

- Representation, disaggregation, and traceability of data, always respecting the principle of confidentiality and the control of the provided data.

- Accessibility of physical, virtual, and relational tools used in the project.

- Creation of safe environments, understood as physical or digital spaces in which all activities and relationships aim to promote the well-being of individuals.

All these factors must be ensured during the phases of citizen science: definition of the citizen project; definition of the project and the project team; development phase; live phase; analysis and reporting phase (Tweddle et al., 2012).

In general terms, the first obstacle related to inclusivity is the still unfamiliarity and/or persistent resistance to its incorporation in citizen science processes, especially in the technology field, and the consequent absence of materials and tools.

Two strategies have been adopted to overcome these obstacles.

a) In SOCIO-BEE, to move forward to the beginning of the project the inclusion-related activities initially planned for M22. The decision was to incorporate the inclusion perspective into the process through early collaboration. That would make the process as inclusive as possible from the beginning. The initial actions have involved raising awareness among all the parties involved based on two premises. The first premise is that anything that does not include contributes to exclusion and increases the gap between included and excluded individuals and groups. The second premise is that the goal is not so much to achieve perfection in terms of full incorporation, but rather to always be guided by the principles of equity and inclusivity in all the steps and decisions we take.

b) The approach devised by the team to help actors of any citizen science projects incorporate the criterion of inclusiveness, has been the development and implementation of a tool that ensures reflection on inclusivity and allows anticipating inclusiveness in relevant decision-making at each stage.

Initially, the designed tool consisted of an Excel checklist for self-positioning (yes/not/not sure) on 47 items, structured into 3 levels of progress (initial, intermediate, and expert). The tool was presented and validated with different stakeholders. From the tool, a "deck" board game emerged, and based on feedback from the various stakeholders, a structural revision of the tool itself was conducted, transforming it into an online questionnaire in the form of a 5-point Likert scale agreement scale. The questionnaire consists of 21 items grouped into 4 blocks and a space in each item for qualitative responses. It incorporates rubrics to guide participants in their answers. It also includes a section explaining the relevance and importance of the items, complementary information, theoretical support, and guidelines for using it in different project phases. The tool provides respondents with a score and recommendations.

The tool yields the following preliminary results: exclusion keys have been identified and better scores have obtained in representativeness and participation, and safe environment blocks compared to data collection and analysis, and accessibility. These results are justified by a greater sense of control over inclusivity when it comes to acting upon individual behaviours, compared to the control over gadgets, data, and devices. On the basis of these preliminary results, the last section of this document makes a general assessment of the project's inclusiveness and provides a serie of recommendations for continuous improvement from this perspective.

The gender perspective receives special consideration within the inclusivity of the project. SOCIO-BEE has performed a public bet on gender inclusion and diversity (Task 6.3) and have allocated tasks and resources to ensure that gender equality is mainstreamed in the design of the SOCIO-BEE model (WP2), in the recruitment of participants and in the pilot actions (WP5). The gender perspective has also been included in the toolkit. Moreover, the SOCIO-BEE Gender Focal Point will make sure that all the criteria are fulfilled.

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1. Introduction

1.1 Purpose of the document

The aim of these guidelines is to provide a social science vision that will help the citizens involved in the SOCIO-BEE project, and especially the people in charge of the design, coordination and implementation of the more technical activities, to ensure that the processes and results of this project are socially inclusive from an intersectional perspective.

The commitment of the 2030 Agenda to ensure that no individual or group is excluded from its benefits, as encapsulated in the principle of "Leave no one behind," finds its roots in the fundamental principles enshrined within the United Nations Charter and the Universal Declaration of Human Rights. These foundational documents, recognized globally, emphasize the principles of equality and non-discrimination (Renner et al., 2018, Montanari, 2021) In this way, these guidelines respond to Task 6.3, which seeks to ensure the development of a strategy for equal, inclusive, diverse and non-discriminatory citizen participation in the SOCIO-BEE platform. To this end, this guide seeks to examine the parameters and intersectional factors that impede and/or create barriers to balanced citizen participation in citizen science initiatives and to examine their relationship to potential problems with the SOCIO-BEE co-creation approach.

Thus, three key elements have been included in this document to ensure both socially inclusive project processes and outcomes. For a more effective and simpler implementation for the different actors involved in the process, as well as the scalability of this work in other citizen science projects, a "checklist" approach has been chosen to allow for a self-examination of the participating people and entities.

This self-examination methodology will be combined with the participant observation of the team leading this task in UDEUSTO in related tasks in the different WPs, especially WP2 and WP5, in order to ensure the design, implementation and development of tools (WP2, Task 3.2, Task 3.3, WP4) and the horizontal validation of the effectiveness of the implemented solutions (Task 5.6).

The deliverable corresponding to this task was foreseen according to the AG for M22, but it has been understood that the document and the process of design, implementation and validation of the tools would be enriched from an early collaboration.

In order to facilitate the understanding of concepts fundamental to this work, we have included a glossary[1] (Section 5) that provides basic definitions of concepts fundamental to ensuring the inclusiveness of the hive and the project.

1.2 Relationship with other deliverables

This deliverable builds heavily on those previously finished as part of WP2. D2.1 - Profiling instruments for CS Bees and Bears identification - 1st release, defined a set of key characteristics from the Hives as spaces where different stakeholders (Bees and Bears) will work together on implementing citizen science activities. Furthermore, this deliverable also provides a detailed overview of the different Bees and their roles within the project. D2.3 - Target user behaviours and determinants for citizen science driven green behaviour - 1st release, provides an overview of existing strategies of engagement in citizen science with a focus on recruitment, support, communication, evaluation and project organisation. D2.3 also relates

[1] Live Glossary for legal and ethical issues for D1.5 & D3.1.

these to the aims of SOCIO-BEE and defines a set of guidelines for the development of the building blocks of the engagement toolkit together with recommendations on how these could be adapted to SOCIO-BEE also. It captures D2.5 - SOCIO-BEE methodology for ecosystem and Hive creation - 1st release proposes a methodology to engage Bears and empower BeeKeepers as the crucial players in the creation and maintenance of citizen science Hives. And finally, it builds on the expert feedback from D2.7, to take into account the recommendations from the external experts to use these as guiding principles for this next step in the toolkit build-up.

Due to it's relevance in monitoring engagement and pilot activities, the deliverable is complementary to D5.10 'Execution and monitoring of pilots – 1st iteration' in assessing engagement and inclusiveness metrics of the pilot's execution.

Furthermore, this deliverable is intimately related to deliverables D2.4 and D2.6 which are foreseen for M22 as well and which address the behavioural patterns and methodological coherence of SOCIO-BEE, which cannot be understood without inclusion and equality.

Finally, it also connects with other deliverables under WP6, specifically 6.2.1 First report on impact assessment. This impact assessment carries out an assessment, in order to assess the risks to citizens' fundamental rights and freedoms that might occur during the project research activities and beyond. An impact assessment contributes to human rights protection in advance in the light of the provisions of the EU law on data protection and privacy and other relevant societal issues such as gender equality, inclusion and diversity.

2. Framework for developing social inclusion participation in citizen engagement and behavioural change platforms

2.1 Why is inclusion & gender equality relevant for citizen science?

Citizen Science processes involve a democratisation of science through the inclusion of participants from different groups, statuses, ages and genders Dickel & Franzen, (2015). As stated by Paleco eta al.(Paleco eta al. 2021), for citizen science to be inclusive, it must involve people from these diverse groups. However, this inclusion is not always easy. Thus, , Pandya et al (20122012) point out that these citizen science processes often do not reflect and include all demographic profiles. This ethno-demographic disproportion is also repeated in analyses of citizen science projects in the field of biodiversity (Theobald et al. 2015; Burgess et al. 2017) or ornithology (Edwards et al. ,2018) while in a study conducted by OPAL, people with disabilities were the least represented. In an area closely related to SOCIO-BEE's goal, environmental volunteering, Ockender states that low-income people, people with disabilities and people of colour are generally underrepresented.

In order to reverse this disparity in the representativeness and involvement of different groups, it is necessary to understand the cultural, social, economic and natural barriers that currently hinder participation and to commit to inclusive approaches designs (Spiers et.al., 2019; Paleco, 2021). Also Cooper et al (2021) bet on this broadening of participation in, and enlarging the number of beneficiaries of, citizen science by diversifying the perspectives of participants (Campos et.al, 2021; Van Bouwel, 2023) and their sectors of origin (governmental, CSO, academia, companies, etc) but also those unaffiliated with institutions. In addition, this project makes a clear commitment to our community and our hive to have an intersectional approach, our adherence to the European strategy for gender equality (2025) by implementing specific actions to ensure the inclusiveness of women and members of the LGTBIQ+

collective, and promoting the mainstreaming of the gender perspective in the different moments of citizen science.

However, to ensure this inclusive approach, we need not only to diversify the participation of citizen science actors by ensuring the representativeness of the hive, but we must also ensure that the data collected (honey) and the tools used are accessible to all subjects and encourage and facilitate their participation. As Moustard et al. (.(2021) state, in order for us to contribute to the solution of environmental problems, we must collect diverse data but also ensure interdisciplinary and inclusive collaboration in their analysis and encourage the interaction of different groups through tools that are accessible and understandable. That is why, in section X of this guide, we dedicate a space to reflect on the typology and characteristics of the data to be collected, as well as the tools and technological solutions to be used during the process.

Finally, we cannot address non-discrimination, inclusion and diversity without determining the extent to which our project and our community (hive) will ensure that all participating actors do so in a safe, free and consensual manner and are aware of what their participation entails. In this sense, much progress has already been made in citizen science projects and specifically, there are already several protocols[2], so our purpose has been to review some of these existing protocols and procedures to incorporate them into our operation, incorporating lessons learned and knowledge generated by similar projects such as You Count.

2.2 Community participation & representativeness

Citizen science aims to involve the community in the science processes it creates. To this end, it is essential to take into account the different perspectives, interests and values of the people who are part of that community in its creation. While representation need not be a direct replica of the composition of a population, participation in citizen science needs to reflect as much as possible the characteristics and sensitivities that are part of a diverse society (Pandya, 2012; Paleco, 2021). This is both for reasons of legitimacy and for reasons of influence. First, inclusive citizen science, to the extent that it incorporates the contributions of people and groups with different perspectives (Doyle & Timonen, 2010), benefits from a greater number and diversity of data and sources, and its scientific results are more consistent. The methodology of citizen science research promotes critical thinking by fostering active participation, questioning and challenging preconceived ideas, data analysis and problem-solving, as well as collaboration and effective communication (Rollan, 2022). Indeed, people are experts on their own lives and bring a unique perspective on the values and priorities of the communities in which they live (Holroyd-Leduc et al., 2016). Not least from a social justice perspective, incorporating the whole community ensures that the benefits of scientific processes have an impact on all people, not just the most privileged groups (Gupta et al., 2012; Yamineva, 2017; Mahajan et. Al., 2020). The scientific progress generated by the different processes must contribute to all citizens' wellbeing, interests, concerns, and needs. Added to this, is the very pedagogical purpose of citizen science, which offers people the possibility to understand and engage in the process of generating science. To this end, Pandya (2021) presents a framework for aligning citizen science processes with community priorities and contributing to social inclusion. The framework incorporates five actions for the development and implementation of citizen science projects:

[2] In the context of this project, various constructions have been built created: research ethics protocol for citizen scientists to provide a possible answer to this existing ethical gap in good research practice. and procedures to ensure safe and inclusive environments)

(1) aligning research and education with community priorities,

(2) planning for co-management of the project,

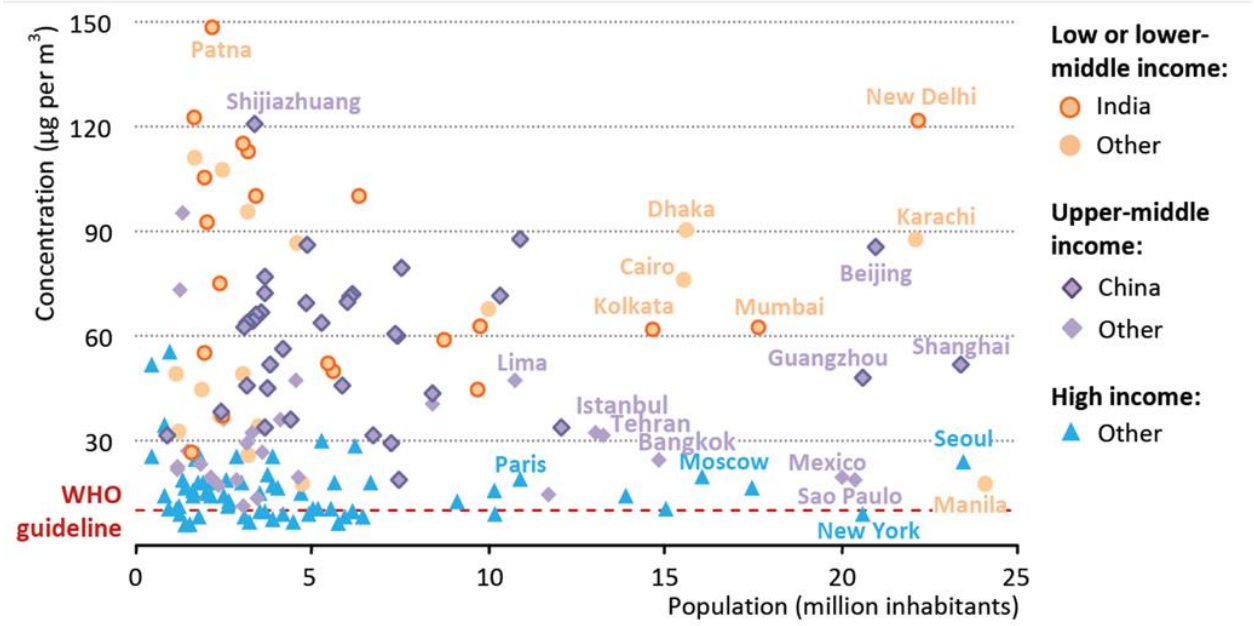
(3) engaging the community at every step,

(4) incorporating multiple kinds of knowledge, and

(5) disseminating results from the work widely (outside of scientific publication)

(Pandya, 2012; Paleco, 2021).

The ideal of achieving a majority reach of scientific results becomes even more relevant in environmental projects because, as Soleri points out, a lack of consideration of human diversity and different social situations and experiences can result in a disproportionate impact of, for example, environmental pollution on underrepresented populations (Soleri et. al., 2016).



Source: Borrego et al. (2018)

Figure 1 Average Annual outdoor PM2.5 concentrations in selected urban areas

Recognising the need for diversity, the early stages of inclusive citizen science processes should incorporate an ethnographic approach to the composition of the community itself, in order to understand its characteristics, values and interests (Paleco, 2021).

2.2.1 Do we know enough about the characteristics of the people affected by the object of study? For whom is the outcome of the project relevant?

Although citizen science projects, responding to the principles that guide them, make efforts to identify and incorporate multi-sectoral leaders and agents (as spokespersons for the interests and values of the community in which they are created) in their processes, it is common that in this identification, which usually takes place in the initial stages of project design, some groups are considered difficult to reach or involve and are excluded (Pantic, 2021). This contradicts the ideas of representativeness and inclusiveness. The community must be incorporated from the beginning of the process according to its

own capacities and this implies that reasonable efforts are made to ensure equal opportunities with the participation of as many groups as possible (Yale Center for Clinical Investigation, 2009). Otherwise, it will only contribute to the reproduction of segregating practices (Bela et. al, 2016).

To overcome this risk of exclusion, it is proposed to reframe the situation in positive terms and, instead of rejecting certain groups a priori, we can promote reflection on why we consider them in such a way and identify the obstacles that we would have to overcome for their sustainable incorporation into the project. This reframing helps strategic planning and anticipation of the resources that will be needed to make the process inclusive from the outset (Pantic, 2021).

Indeed, if the project is accessible to those "on the margins"; then the project will be accessible to all people (Cooper et. al., 2021). Therefore, it is necessary to reflect about:

-People that is not part of the community

-potential benefit for these groups benefit from our project action/results

-Social justice implication or leaving these groups behind

-Existing stereotypes and prejudices in our selection of participants

-Resources constraints related to their exclusion

This approach does not imply renouncing key actors in a community (e.g. representatives of associations) who have experience in citizen science or people with social and communication skills (Dardier et.al, 2021) as they are often the ones who are most involved, who contribute to the motivation of others and who facilitate networking. However, in order to avoid the risk that the same actors and groups are represented in all citizen processes and others are not convened, an effort should be made to incorporate new forms of participation and recruitment (Woods et al., 2021). (Woods et. al., 2021). Inclusive forms of recruitment include, for example, the organisation of open events, recruitment through flyers (Elwood, 2016), word of mouth (Mahajan, 2020), recourse to events already scheduled for this or other purposes (Duddigan, 2020) and also the possibilities offered by online participation, through websites, which contribute to both decentralisation and the incorporation of local groups (Soleri et. et. al., 2016).) This implies that, in general terms, representativeness requires a research methodology and the use of mechanisms that are broad, flexible and inclusive enough to accommodate the contribution of people from all walks of life. (Yale Center for Clinical Investigation, 2009). It is likely that the most vulnerable populations have or may have a desire to participate, but it is also likely that they do not know how to do so (Holroyd-Leduc et al, 2016). Despite most citizen science projects state their ambition to be inclusive, recent research by Paleco et al. (2021) shows a series of trends that indicate vulnerable groups and minority groups in society tend to be under-represented.

But, who are vulnerable groups? There is already work done in other projects such as Panelfit3 to identify vulnerable groups:

[3] Some of these data is sensitive and will require additional protection and checks in the project so that 1) vulnerable groups are protected 2) no stigmatization occurs as a result of possible data analysis techniques. With WP6 VUB-LSTS will perform several types of “impact assessments” including
normally a vulnerability / gender assessment

age-related issues: both young people4 (Makuch & Aczel,2020, Constant & Hughes, 2023)health-related issues: including disabilities, temporary illnesses to long-term conditions

social issues: these might be related to poverty and low-incomes, unemployment, limited education, homelessness or others

sexuality, which makes people vulnerable in many contexts

ethnicity, with many minority groups still facing discrimination in Europe.

Panelfit Report 2020

In addition, both recruitment and participation channels should be accessible to all individuals and groups (Katapally et.al., 20182018), both in terms of cost, use and language, so that they are equitable.

One of the aspects that needs more attention due to its scarce presence in the literature to date is the issue of including gender equality and non-binary approaches in the selection criteria of the sample of project participants. Although some organisations such as ECSA have started working on tools and principles (ECSA 2015) and improving the representativeness of women in the leadership of citizen science projects (Tympas et.al.,Tympas et.al., 2019) there are still few references to gender mainstreaming in these projects.

Some projects such as Spotteron,5, a tool for working on citizen science projects and monitoring volunteers, are already working on the development of Gender Equality Plans, following in the footsteps of EU-funded projects. Indeed, the policy actions put in place by the EU to mainstream gender in research have had an undeniable impact (Kantola & Lombardo, 2018) and the recently introduced eligibility requirement in the Horizon Europe programme6 is going to be a qualitative leap in the consideration of the gender perspective in research. The EU establishes a series of requirements for these equality plans to be considered effective: publicity, allocation of resources, disaggregation of data and training. These four requirements are accompanied by a series of thematic axes suggested by the EC so that the equality plans really mean a quantitative leap in the structural change of the institutions: work-life balance and organisational culture; gender balance in leadership and decision-making; gender equality in recruitment and career progression; integration of the gender dimension into research and teaching content; and measures against gender-based violence including sexual harassment.

Building on these principles and in the European Strategy for Gender Equality, SOCIO-BEE has performed a public bet on gender inclusion and diversity (Task 6.3) and have allocated tasks and resources to ensure that gender equality is mainstreamed in the design of the SOCIO-BEE model (WP2), in the recruitment of participants and in the pilot actions (WP5). Moreover, the SOCIO-BEE Gender Focal Point, will make sure that all these criteria are fulfilled and will be the contact point if training on gender equality and diversity is needed.

Inclusive participation requires that participants are able to perceive the real impact of their actions in the project. Real inclusion within citizen science is more likely to occur if issues are framed around

[4] Examines the benefits and challenges of engaging children and young people in environmental citizen science

[5] https://www.spotteron.net/ https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/democracy-and-rights/gender-equality-research-and-innovation_en#gender-equality-plans-as-an-eligibility-criterion-in-horizon-europe

[6]

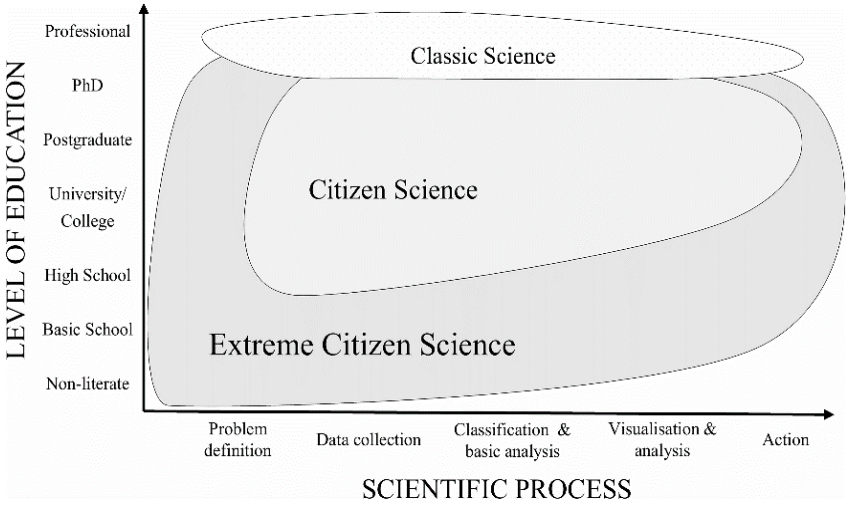
participants' values, focusing on local and tangible concerns, and if individuals believe their actions have impact (Paleco, 2021).

When collecting data, the people involved must have sufficient support to be able to know and compare the progress they are making. To this end, it is useful to provide participants with opportunities to share their considerations, to make themselves and their actions available and to offer them continuous contact, as well as to give them feedback on how the use of the tools is going among other participants (Barrie, 20192019). It is also useful to share progress on outcomes at the outstand to check that participants feel that their actions are having an impact (Woods et. al. 2021).

One of the virtues of the SOCIO-BEE project is its scalable nature, which in terms of inclusion is, in principle, an advantage. The ladder consists of a variety of forms of interaction that allow for the participation of different types of audiences, depending on their interests and capacities. This ensures multiple entry points and varied ways of participating with varying degrees of interest, willingness and commitment (Paleco, 2021). However, the existence of different levels should not be an excuse to keep the most vulnerable or less well-resourced people at the lowest levels, without the possibility of changing their role.

2.3 Inclusive Data & data analysis

As mentioned above, solving environmental problems such as improving air quality requires scientific data collection and analysis by interdisciplinary teams. Moustard et al. 2021). However, recent works affirm that in order to foster a meaningful participation of the diverse groups in the citizen science, their involvement is needed not only in the data gathering, but also in the design of the project (Parrish et.al, 2019)) in the analysis of the data, and in acting on the results, (Ehrlich and Ehrlich, 2013; Daguitan et al., 2019).



Source: Moustard, Fabien, et al. "Using Sapelli in the field: Methods and data for an inclusive citizen science." Frontiers in Ecology and Evolution 9 (2021), p. 4

Figure 2 Extreme Citizen Science

According to the classification made by Haklay (2013), there are 3 types or levels of participation in citizen science: Long-running citizen Science, Citizen cyber science and Community Science. However Moustard et all refer to 4 different categories: crowdsourcing science (Howe, 2006), understood as citizen science in which citizens are used as "sensors" and whose intervention is limited to data gathering; “distributed intelligence”, where cognitive skills of citizens are required and they do not only collect data, but also

analyse them; third, “participatory Science” refers to the process where citizens do not only gather data and analyse data, but also contribute to a problem definition, although the process is led by scientist, who control the development of the protocol, and do most of the analysis; finally, the fourth level is what they call “Extreme Citizen Science and relates to process where the citizens themselves take the lead on all stages of the scientific process, and professionals act as support when needed.

Although in our case, the dynamics of the hive does not fully correspond to any of these typologies, but combines several of them through the different roles (queen bees, worker bees...) we agree with these authors that data sovereignty in these processes should minimise the risk that the collection and analysis of data may pose to the participants, especially when data managers handle information from or collected by vulnerable groups. Therefore, we share the concern of ensuring that participants from the vulnerable groups and other local communities with whom we collaborate retain full control of the data that they facilitate collecting. Data ownership in general in the EU has been a hot topic, but especially also in citizen science; there are a few debates going on about how to tackle this question Possible source: A framework for addressing ethical issues in citizen science - ScienceDirect

Something SOCIO-BEE should take into account when collecting personal data from children (apart from the ethical issues) Processing of personal data with children may be more difficult in general due to:

Required informed consent by legal guardian depending of age threshold of member state (between 13 and 16 years in EU from GDPR) Assent of the child depending if child can give no consent by law Spain and Italy : 14 and above from consent personal data, Greece: 15 and above.

Accordingly, WP6 has ensured a proper Data Protection strategy and revised all the informed consents (a template has been created. in connection with D1.5; Information sheet and Informed consent)

handled by the partners to make sure that each participants understand the nature of the data they are gathering and the impact that it might have. This way, participants are placed at the centre of the process

Putting people at the centre means that the whole system/platform designed to operate our hive must be accessible and understandable for all participants. This issue of interface accessibility is particularly important as the process will involve older people (Ancona Pilot) and that is why we are building on universal design (Ginnerup, 2010)

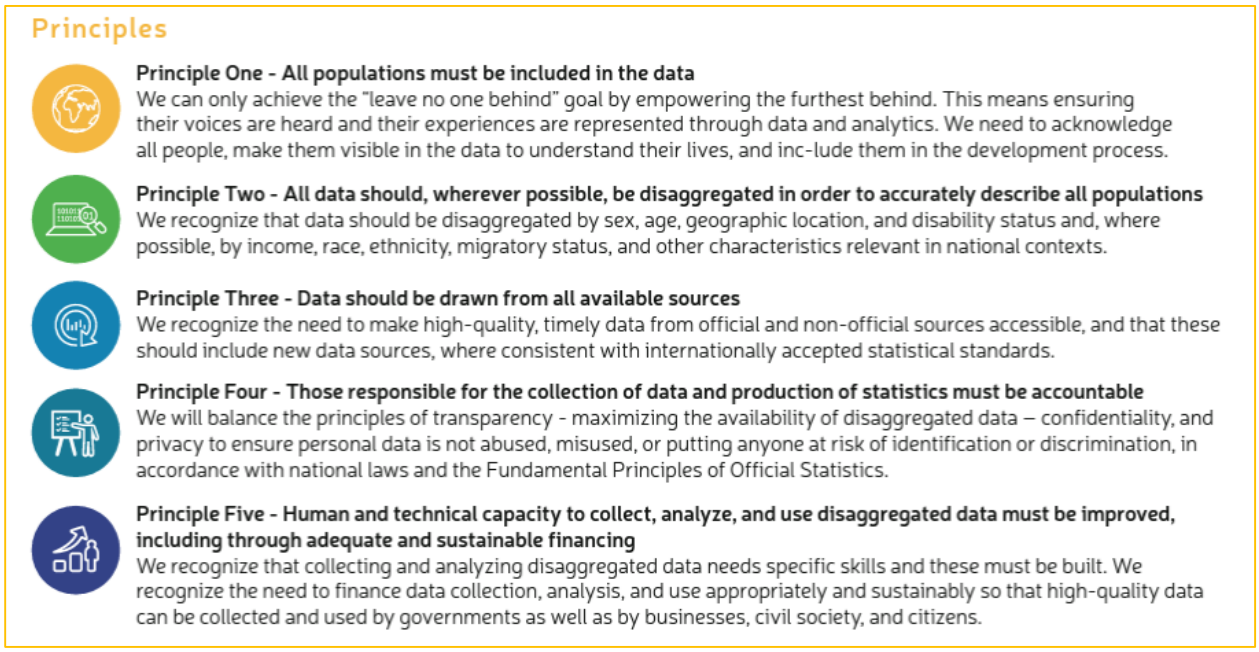
Universal Design is a strategy aimed at the development of environments, products, information and communication technologies and services that are accessible to all and usable by all "Universal Design" means the design of products, environments, programmes and services so that they can be used by all people, to the greatest extent possible, without the need for adaptation or specialised design. Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where necessary. (Convention on the Rights of Persons with Disabilities 2006, Article 2)

Universal design principles (Ginnerup, 2010)

- Equitable use: marketable and useful for people with a range of disabilities.
- Flexibility of use: adaptable to a wide range of individual preferences and abilities.
- Simple and intuitive to use: easy to understand regardless of the user's experience or knowledge, language proficiency or level of concentration at the time.
- Perceptible information: conveys the necessary information to the user effectively, regardless of environmental conditions or the user's sensory capabilities.

- Tolerance of error: minimises the risk and adverse consequences of accidental or unintended actions.
- Limited physical effort: can be used effectively and comfortably and with a minimum degree of fatigue.
- Size and space: appropriate for approach and access, handling and use, regardless of the user's body proportions, posture or level of mobility.

In addition to the design of the technology and activities themselves, the context and timing are also relevant. For example, data collection should be able to be applied as part of the routines and in the environments that are part of the daily lives of the participants, trying to disrupt daily life as little as possible (Barrie, 2019) and ensuring that participation in the process does not involve additional efforts that may lead to abandonment and consequent exclusion in practice. Furthermore, the use of support measures should not be ruled out, including participation through third parties (e.g. personal assistants, facilitators, trusted persons...) that can contribute to ensuring the full inclusion and participation of the person with functional difficulties (Soleri et. et. al, 2016; Holroyd-Leduc et al, 2016).



Source: https://www.data4sdgs.org/

Figure 3 Principles for inclusive data

A good strategy is to use mixed methods that allow not only the collection of data related to the object of study, but also elements of the physical and social context (Tiago, 2017), subjective and qualitative insights useful for data triangulation and constant real-time interaction with other researchers (Katapally, 2018).

In any case, inclusivity in participation implies creating the necessary conditions not only for people to take part in the process using the right tools, but also for them to appreciate the results of their contributions.

Characteristics of inclusive data

Citizen science processes have recently been seen as an opportunity to diversify data and fill gender data gaps(Kimura & Marks, 2021) . According to Claudia Wells, Director of Data Use[7], inclusive data are those collected for all people, regardless of their location, ethnicity, gender or age . This institution also higlights the importance of intersectionality of data, and intersectional analysis of data (Wells cf.). In order to respond to this inclusive logic, the data collected from SOCIO-BEE participants must have the following characteristics

1. Disaggregated
2. Representative
3. Traceable

2.4 Secure Spaces & Inclusive participation

2.4.1 What is a safe environment?

We understand safe environment as any physical or digital space (Gibson, 2019) in which any of the activities that are developed and the relationships that are established are aimed at promoting the well-being of the person, promoting the culture of Good Treatment, guaranteeing respect among all, asserting the rights of each person and collaborating in the personal growth of each individual. Involving all key agents, including external institutions. (Deusto, 2022).

To address the issue of safe environments in citizen science projects we can build on what has already been advanced by large citizen science associations, such as ECSA, but we can also enrich the approach with contributions that have been made from corporate safe environments.

ECSA has a working group[8] aimed at developing safe environment policies and codes of conduct that guarantee equal and enjoyable participation for all participants (ECSA 2021). In this working group they have reflected on and established some of the basic issues to ensure that all participants feel safe, comfortable and not discriminated against or intimidated. They set as boundaries the attitudes they consider harassment (ECSA 2021) but do not provide tools to determine whether the events organised and the various interactions are being organised according to these policies and principles.

It is for this reason that we have turned to the literature on safe environments in organisations to try to propose tools that help to check and ensure an equal, non-discriminatory and harassment-free organisation. According to the World Health Organisation (WHO), a healthy company is one in which "workers and senior staff work together to implement a process of continuous improvement to protect and promote the health, safety and well-being of all workers and the sustainability of the workplace". In this sense, Good Treatment is understood as a form of relationship. It is the possibility of approaching the other person with empathy, understanding, respect, tolerance, in order to guarantee legal and social equality, based on a habit and life choice and not on an obligation or social norm. The starting point of good treatment consists of responding correctly to the needs of care, protection, education, respect, empathy and affective bonding. Understood in this way, good treatment includes all styles of relationships and behaviours that promote well-being and ensure a good quality of life. Thus, it is about providing a space for harassment-free interaction for all people, regardless of gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race or religion. (ECSA, 2021).

1. [7] devinit.org-

[8] https://ecsa.citizen-science.net/working-groups/empowerment-inclusiveness-equity/

Following the Safe Environment Manual of the Society of Jesus (2022), this free interaction is built from a rights-based approach and based on responding to the real needs of the people who participate in it, assuming attention to diversity in all its dimensions, as could be :

- Creating welcoming, respectful and safe environments, both physical and virtual.
- Promoting good treatment among all people
- Attending to, protecting and caring for any person in a situation of vulnerability

2.4.2 Causes of an unsafe environment

According to the International Labour Organization, violence and harassment in the world of work can be induced by a range of individual, social and work-related factors (including psychosocial hazards, workplace culture, particular work situations, among others). Some of the psychosocial hazards that may contribute to the risk of workplace violence and harassment include the following (ILO, 2019:4)

- Job demands (e.g. when tasks do not match the worker's knowledge and skills);
- task control (e.g. when workers have little or no say in how their work is carried out);
- Task design (e.g. when the tasks performed by workers are repetitive or monotonous).
- Clarity of roles (e.g. when workers' responsibilities, roles and authority are unclear).
- Workplace relationships (e.g. undue or inappropriate criticism, exclusion at work, lack of support from supervisors and co-workers, and lack of feedback and communication;
- Leadership styles (e.g. autocratic leadership style, which involves limited participation of workers in decision-making, or laissez-faire leadership style, which is characterised by inadequate or non-existent supervision of workers)
- Organisational justice (e.g. lack of or inconsistent application of workplace policies and procedures, including career development and recruitment procedures, and unfairness in decision-making).
- management of organisational change (e.g. restructuring/downsizing; changes in technology used, work methods and/or work organisation; and outsourcing); and
- And the physical work environment (e.g. design and maintenance of work equipment and facilities).

2.4.3 Safe environments to avoid inappropriate practices

Always report any inappropriate practices that are appreciative as well as any type of abusive or harassing behaviour, such as (PIXELLES, 2021; ECSA 2021):

- Offensive, derogatory, derogatory, threatening, aggressive or silencing verbal or written comments that reinforce social structures of domination related to gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, age and/or religion.
- Sexual imagery in public spaces
- Deliberate intimidation, harassment or stalking;
- Photography or recording without the subject's consent;

- Sustained disruption of chats or other events
- Physical or other inappropriate contact or messages, without consent
- Violence, intimidation, harassment or unwanted following of a person
- Persistent, abusive and unconstructive criticism regarding any project(s) that any participant may
- Project(s) that any participant may display during an event, space or programme
- Persistent micro-aggressions in the form of comments, jokes, material or

  Otherwise
- Harassing photographs or recordings
- Disruption of events, programmes or space functionality
- Unwanted sexual attention
- Sexually degrading images
- Promoting or encouraging any of the above behaviours.

Following the International Labour Organisation (2019), they indicate that violence and harassment can be perpetrated by colleagues (horizontal violence), between supervisors and subordinates (vertical violence), or by clients/consumers/patients (third-party violence).

Following CSI Centre (2020), it should be noted that while harassment can be directed at both men and women, women face more harassment than men and the nature of harassment is harsher, as it focuses on social issues, ranging from body shaming to questioning their professional suitability and qualifications.

In order to build an anti-harassment policy in organisations, there will be a need for objectives, definitions and multiple rules that are generally followed by all members of an organisation, which also means guidance for the staff. In reality, there is no strict formula. The process is flexible and will depend on the needs, resources and preferences of each entity. It is important to define the channel for lodging complaints and to define the authority responsible for receiving them on the basis of the protocols.

2.4.4 Secure environments for online environments

In addition to the creation of Good Deal spaces, and specifically aimed at all those activities that enable remote work, it is also a fundamental requirement to ensure a secure environment, where the person who participates can do so in a safe and secure way and where they can be certified. To help you achieve this goal, here are two user guides that can be of great help when it comes to securing your workstation and that of your entire company.

What elements should a secure remote access have? (Instel ,2020)

- Protect the privacy of individuals, as well as confidentiality, as far as possible and as appropriate, and ensure that these requirements are not misused.
- IPSEC and SSL VPN client. VPN Gateway capabilities for both IPSEC and SSL tunnelling.
- Two-factor authentication. Remote access means opening a door to our company. Access should never be allowed without reliable authentication. Therefore, in addition to using your username and password, a second factor can be added to the authentication process through a physical token or an app that confirms the identity of the users.

- Content Protection. Remote access should be scanned for threats, malware, etc. whether it is done from a mobile device, a VPN gateway or even in the cloud. The model to follow will depend on the needs of the entity and the user's profile. It is therefore necessary to establish and apply the same browsing and security policies as when the employee is in the office.
- Advanced endpoint. Allows complete visibility of what is being executed and allows automatic action to be taken in the event of a problem.
- Encryption. All information circulating on the corporate network that is critical should be encrypted. It is advisable to have a solution that allows all communications to be encrypted and inspected with the most secure mechanisms available.
- SSL and L7 inspection It is important that all traffic can be inspected (including HTTPs) and that an Intrusion Prevention System (IPS), application control and antivirus are applied to all traffic. In addition, this control must be done before data enters the corporate network to prevent malware from entering.

Online interventions, the moderator is the key

Many online meeting and discussion spaces have some form of moderation policy and/or structure to address the needs of users. Like other face-to-face discussion spaces, virtual meetings also require moderators - usually through software and/or a designated person - to determine and enforce ground rules for discussion and appropriate behaviour.

Moderators play a key role in preventing participation that does not respect safe space protocol, in filtering, modifying and deleting comments, or banning disruptive users (Matias, 2016). It is therefore important to establish the powers that are established for moderators and the effects they have on the debate or on spirals of silence.

Standards

The International Labour Organisation (2019), adopts a number of standards to protect the physical and mental health of workers, including, inter alia, the Occupational Safety and Health Convention, 1981 (No. 155) and its Recommendation (No. 164), and the Protocol of 2002 (No. 164), and the Protocol of 2002 (No. 164). 164) and its Protocol of 2002 (P 155); the Occupational Health Services Convention, 1985 (No. 161) and its Recommendation (No. 171); the List of Occupational Diseases Recommendation, 2002 (No. 194); and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) and its Recommendation (No. 197). Although not specifically mentioned in these instruments, violence and harassment constitute a clear occupational safety and health (OSH) risk.

3. Step by step inclusive citizen science

In addition to analysing the extent to which it is necessary to protect and ensure diversity and inclusion in the different aspects that make up citizen science (the representativeness of the community, the data collected and the environment generated), it is necessary to reflect on how we should include this inclusive perspective throughout the entire citizen science process. In order to carry out this analysis, we have based ourselves on the contributions made by gender mainstreaming, which has meant a substantive advance in the incorporation of the gender perspective in public policies and also in research. In order for the process of incorporating inclusive processes to take place in a coherent and systematic

way and not become a mere "ticking the box exercise", it is necessary to reflect on the need and the ways of guaranteeing inclusivity throughout the entire process.

In order to carry out this procedural analysis we have started from the phases of citizen science development identified by Tweddle et al.'s (2012) and will now go on to detail why and how to ensure inclusivity in each of the phases identified by these authors:

Sourcem: Tweddle et al.'s (2012) proposed method for developing, delivering and evaluating a citizen science project

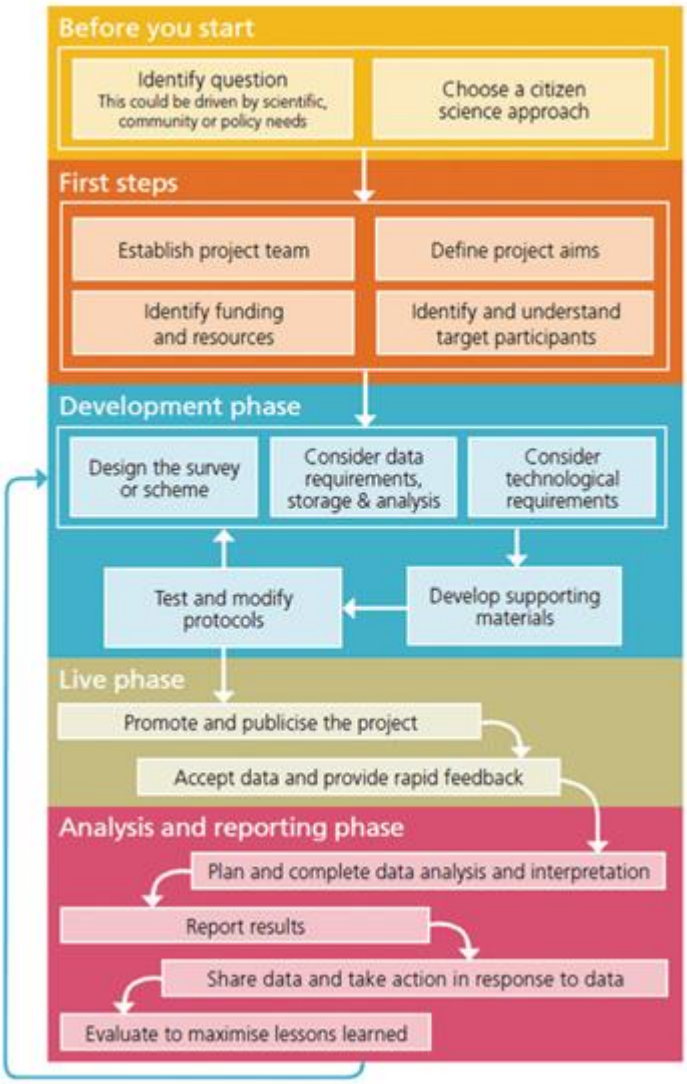


Figure 4 Citizen Science process

1.-Preliminary phase: definition of the citizen science project (before we start)

Before starting any citizen science project, it would be necessary to reflect on its potential impact and repercussions in terms of inclusion and diversity. To this end, it is necessary to reflect on:

-Collectives and groups that will benefit from the research.

-Collectives and groups that will be included from this research

Which dynamics of vulnerability/exclusion can be reinforced or fostered by the citizen science project (focus or theme) -Which dynamics of vulnerability/exclusion can be reinforced or fostered by the citizen science project (focus or theme)

- Which dynamics of vulnerability/exclusion can be reinforced or fostered by the citizen science project (typology of citizen science to be implemented - see section 2)

-What opportunities may be missed by not adopting an inclusive approach from the formulation of the problem and the definition of the objectives.

In terms of the data needed to meet the objective of my citizen science project:

-Quality and nature of the data to be collected

-Diversity and disaggregation of the data

Implications for the people whose data will be collected or who will be involved in the process -

2.-Definition of the project and project team

The composition of the team is a fundamental aspect for the definition of the project, since the greater the diversity of the team involved in its definition and subsequent implementation, the greater the richness and ambition of the project. Furthermore, it is necessary to bear in mind that depending on the context in which we want to implement our project or the source of funding we want to access, there will be legal requirements and political guidelines that will have to be met. For example, in Europe, the European Commission has adopted a number of policies that reinforce Europe's commitment to equality, such as:

a gender equality strategy

an anti-racism action plan

a strategic framework on Roma

a strategy on the rights of LGBTIQ people

a strategy on the rights of persons with disabilities

In addition to ensuring diverse participation in the design and composition of the teams, it is necessary to take into account when attributing roles and responsibilities in the project, being aware of the stereotypes surrounding each of the vulnerable collectives or groups in the area where citizen science is to be applied. This should ensure that all groups and groups can access and participate in all structures and phases of the project, as this will contribute to a better identification of the target audience of our project and their needs.

3.- Development phase

In Tweddle et al's methodological guide, this phase includes: designing the citizen science model; designing the tools or questionnaires, data requirements and technical requirements; testing and modifying protocols; and developing supplementary materials.

For this phase, it is essential to reflect on the implications of what we are asking the community to do in the project and the impact this may have on vulnerable groups or groups that are excluded from our scope of action. In this first phase, these authors talk about the design of the models and questionnaires or tools to be used in our citizen science project. It is important that the role of each participant is clear and that the protocols for action are simple, accessible and ensure a respectful and safe environment for all participants. In the case of the development of the model, which is directly related to the theoretical foundation that will support our project, it is necessary to reflect on whether these theoretical approaches influence the exclusion of any specific group, or, in other words, whether they provide knowledge about different groups that enriches the overall contributions of the project.

When designing and developing the project, it is also necessary to start thinking about evaluation, to ensure that we are collecting and systematising elements that we will be able to analyse later on..

In this phase of development, it is essential to reflect on the quantity, typology and quality of data to be collected and/or analysed through citizen science processes. Depending on the type of intervention selected, this reflection will require more or less detail. In any case, it must be ensured that the data obtained are representative, disaggregated and meet the quality standards necessary for the research. Directly related to the quantity and quality of the data, it is also necessary to analyse to what extent the technical means used and offered by the project are accessible to the participants, and what implications their inaccessibility may have for vulnerable groups and for the data to be analysed later (for example,

that certain groups cannot access the technical means and that this results in the impossibility of collecting data or in the data being biased).

4.-Live phase

During the implementation phase of the project, these authors argue that the team should aim for more than just communication of results and dissemination of calls for participation. On the contrary, in order for this phase to work, these authors state that the communication channels to be used, the use of social networks and how the different groups and collectives will be represented in this communication must be planned in advance. It is essential that in the live phase of the project constant attention is paid to the visibility that each of the groups obtains.

From a formal point of view, it is necessary that the language used is inclusive and accessible, avoiding technical terms and jargon that cannot be understood by society as a whole. Furthermore, the use of visualisations and materials that allow accessibility for people with disabilities and for groups with special needs (minors or the elderly) is recommended. At all times, care should be taken to avoid generalisations and stereotypes, as well as those issues that could lead to the perpetuation of stereotypes or hate speech.

In addition to taking care of the formal aspects during the live phase of the project, it is also necessary to pay attention to the periodicity and processes of iteration and feedback to the community and participants. This fluidity in communication and in the relationship between the project team will make it possible to correct possible deviations and problems that arise in the implementation of the project.

From the point of view of the organisation of events and project spaces, in this phase the management and assurance of safe environments and spaces that promote an equal and participative participation of all groups and collectives is of special relevance. For this reason, special attention must be paid in this phase to the organisation of activities and events and to ensuring that the necessary protocols and measures are put in place to prevent situations of abuse and harassment. It will be necessary to ensure that all participants identify and are aware of the people and processes in place and in charge of the protection of participants and that access to these mechanisms is easy and equal for all groups.

Finally, from the data point of view, the live phase of the project should check that the data being contributed to the project from citizen science responds to the needs identified, is representative and of sufficient quality to draw conclusions. If this is not the case, the project must have the appropriate measures in place to reverse this situation and address the shortcomings identified in the data and collection processes.

5.- Analysis and reporting phase

The data collection process should be carried out in a planned manner, as well as its analysis and in a way that ensures that all groups and collectives represented participate in the analysis and interpretation of the data.

In order for this analysis and monitoring to be carried out properly, it is important to define the indicators and questions necessary for a correct evaluation and interpretation of the data from the initial phases (phase 1 and phase 2).

It is also necessary to carefully plan and guarantee a process of feedback and reporting to the entities, actors and groups that have taken part in the project in order to thank and value their contribution to the project's objectives. This feedback and reporting will be carried out using a language and format adapted to the needs of each of the groups.

The ultimate objective of citizen science is to solve or respond to a specific problem, so in this last phase it will be necessary to determine how our project will respond to the objective defined in the initial phases in a way that responds to the needs of all the participating groups, guaranteeing inclusiveness and above all ensuring that no axes of discrimination are produced or fostered within the project

4. Inclusion checklist

4.1 Description of the checklist

The process of developing a tool that captures the aspects outlined so far and provides useful tools for actors and projects working in Citizen Science has not been an easy process.

In order to begin the task of providing a framework for developing social inclusion and participation in citizen science projects, we started by reviewing and analysing previous work in the field (see section 2.1). From an academic point of view, academic interest in the need to incorporate inclusion into Citizen Science analyses has been growing since 2018. While it is true that the majority of articles still come from the social sciences, the relevance of inclusion for the quality of research in other disciplines is increasingly emphasised.

However, there is still resistance to the incorporation of inclusive approaches in citizen science. For this reason, the development of a tool that can help people, actors and projects in any discipline and area of knowledge to incorporate the criterion of inclusiveness into citizen science is particularly important and challenging.

For this reason, when designing the tool, we have followed a process of interaction with different agents that has allowed us to perfect the tool and its usability. This section describes not only the tool itself but also the process of elaboration and contrast to which it has been subjected.

4.1.1 **4.1.1. Checklist structure**

From the beginning of the process of developing this framework and the tool to be developed, the backbone elements of this tool were clear, as they emanated directly from the bibliographical analysis carried out.

These building blocks are:

1. Representativeness- Who are we including/excluding?

   Inclusive representativeness is crucial for citizen science projects because it ensures that a diverse range of perspectives, backgrounds, and experiences are included and valued in scientific research. Citizen science projects involve the participation of members of the public in scientific data collection, analysis, and interpretation. By engaging a wide variety of individuals, these projects can tap into the collective intelligence and expertise of the broader community, leading to more robust and inclusive scientific outcomes. Inclusive participation allows citizen science projects to draw on a diverse range of perspectives and knowledge. Different individuals bring unique experiences and insights, which can contribute to a more comprehensive understanding of the research question at hand. Including people from various backgrounds, cultures, age groups, and geographic locations can lead to innovative solutions and novel discoveries that may otherwise be overlooked. It helps to ensure that the findings and conclusions derived from citizen science projects are valid and reliable. By involving a broader range of participants, citizen science projects can mitigate biases and limitations that may arise from a narrow or homogenous sample.

It allows for data collection across different contexts, enhancing the generalizability and robustness of the results. Citizen science projects often aim to foster community engagement and empowerment. By actively involving a diverse set of individuals, including those traditionally underrepresented in science, these projects can promote inclusivity, social cohesion, and a sense of ownership among participants. Inclusive representation helps build trust between the scientific community and the public, leading to more effective collaborations and sustained involvement in citizen science initiatives. Moreover, is essential for addressing issues of equity and social justice. Historically, certain communities have been marginalized or excluded from scientific research processes. By intentionally including individuals from underrepresented groups, citizen science projects can help to bridge these gaps, amplify diverse voices, and address environmental or societal challenges that disproportionately affect marginalized communities.

2. Data collection analysis-How are we analysing/collecting data?

   Inclusive data gathering and analysis promote a more comprehensive and accurate understanding of scientific phenomena while ensuring equal participation and representation. They help prevent gender bias in scientific research. By involving individuals of all genders, citizen science projects can ensure that diverse perspectives and experiences are considered in data collection and interpretation. This helps overcome potential biases that may arise from a single-gender sample or the omission of gender-related factors in the research process. Gender equality in data gathering and analysis allows citizen science projects to capture a broader range of experiences related to the research topic. Gender can influence people's interactions with and perceptions of the natural environment, which may impact their observations and insights. Including participants of different genders helps uncover unique perspectives, enriches datasets, and leads to more nuanced findings.

3. Accessibility of the tools-Is the methodology/tools that I am using inclusive?

   Ensuring accessibility of tools and methodologies enables broader participation, promotes inclusivity, and enhances the quality and reliability of the scientific outcomes. Accessibility ensures that individuals from diverse backgrounds, including those with disabilities or limited resources, can actively engage in citizen science projects. By removing barriers to participation, such as physical, cognitive, or socioeconomic limitations, more people can contribute their skills, knowledge, and observations to the project. This leads to a more representative and inclusive dataset, which strengthens the scientific validity and reliability of the findings. Accessible tools and methodologies foster equity and inclusion by ensuring that everyone has an equal opportunity to participate in citizen science projects. It prevents the exclusion of individuals who may face challenges related to mobility, communication, or technological access. By intentionally designing tools and methodologies that are accessible to diverse populations, citizen science projects can promote equal participation and address disparities in scientific research. Besides, accessibility plays a crucial role in maintaining scientific rigor and ensuring the quality of data collected in citizen science projects. When tools and methodologies are accessible, participants can follow standardized protocols and guidelines accurately. This consistency enhances the reliability of the data and allows for robust analysis and interpretation. It also enables comparisons across different projects or regions, facilitating broader scientific insights and collaboration. Accessible tools and methodologies accommodate citizen scientists with varying levels of expertise or prior scientific knowledge. Not everyone participating in citizen science projects will have a formal scientific background. By providing user-friendly tools, clear

instructions, and support materials, citizen science projects can empower participants to contribute meaningfully, regardless of their scientific expertise. This promotes lifelong learning, scientific literacy, and the democratization of scientific research.

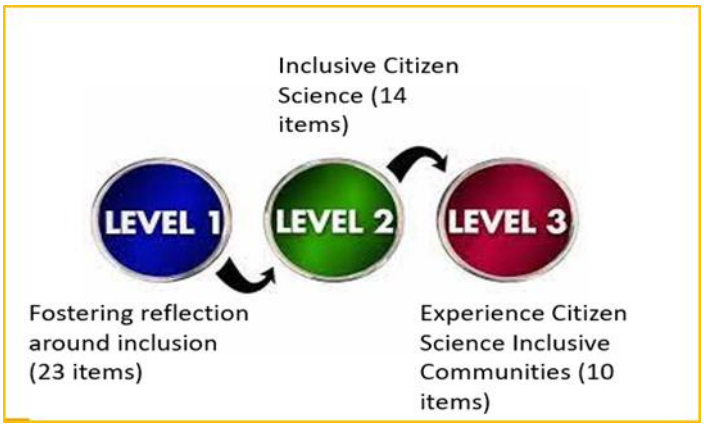


Figure 5 Initial structure of the Checklist

Each of these three levels included questions from the 4 constituent blocks and the possible answers were: yes; no; not sure. The first label comprised 23 items, the second 14 and the third 10 and the traffic light logic was used to make progress visible.

4. Secure spaces-Am I fostering an inclusive environment?

   Ensuring safe and secure environments protects the well-being and privacy of participants, promotes ethical conduct, and maintains trust in the scientific process. The safety and well-being of participants should be a top priority in citizen science projects. Providing a safe environment ensures that participants are not exposed to physical, emotional, or psychological harm during their involvement. This includes addressing potential risks associated with fieldwork, data collection in sensitive areas, or interactions with certain organisms or materials. Safeguarding participant well-being fosters a positive and supportive experience, encouraging continued engagement and preventing negative consequences. Citizen science projects often involve the collection and analysis of personal or sensitive data. Ensuring data privacy and confidentiality is essential to protect the privacy rights of participants. Clear protocols should be in place to handle and store data securely, including measures to anonymize or de-identify personal information. Participants must have confidence that their data will be handled responsibly and used only for the intended scientific purposes.
   Citizen science projects should adhere to ethical guidelines and standards. Participants should be informed about the goals, risks, and potential benefits of the project, and their informed consent should be obtained. Ethical considerations also include respecting cultural protocols, obtaining necessary permits for research activities, and ensuring compliance with applicable laws and regulations. Upholding ethical principles fosters transparency, accountability, and the responsible conduct of research (See Socio-Bee research protocol)
   Citizen science projects that involve fieldwork or interactions with the natural environment should address potential risks and hazards. This includes providing adequate training, safety guidelines, and protective equipment to participants. Conducting risk assessments and implementing appropriate safety measures can minimize the likelihood of accidents or injuries. By proactively managing risks, citizen science projects can create a safer and more secure environment for all involved.

Initially, these 4 building blocks were translated into an Excel checklist structured in three “labels”:

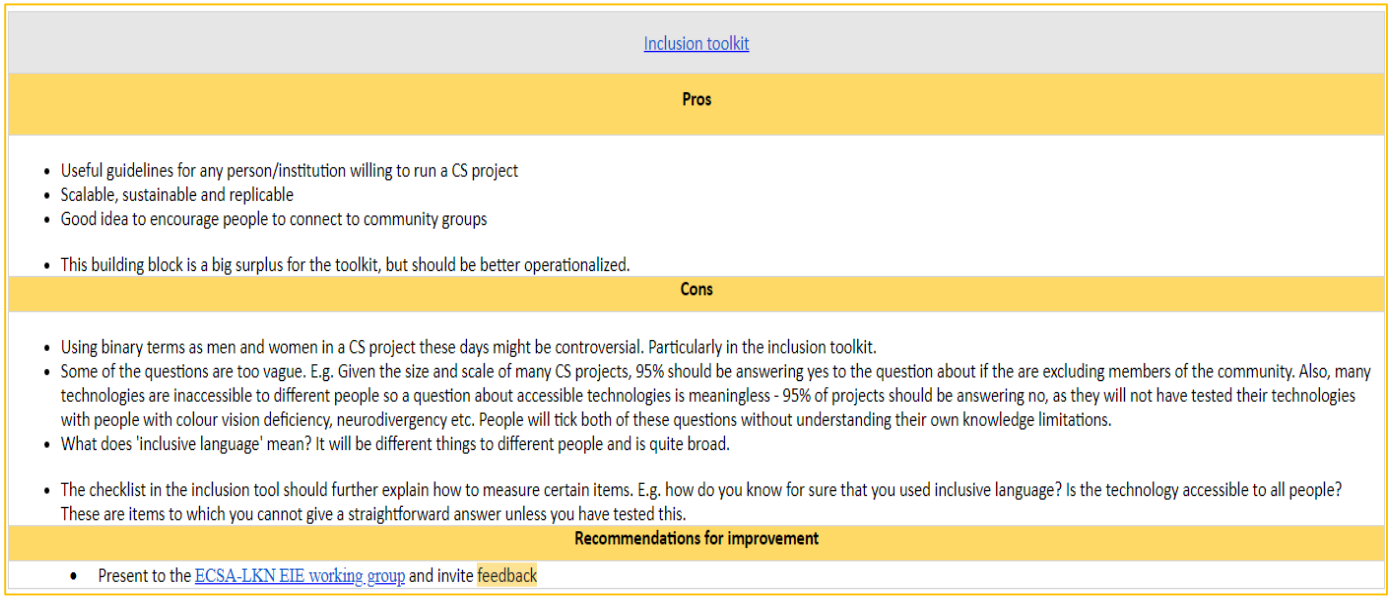
1) Beginners/new comers
2) Intermediate level
3) Inclusion experts

	SOCIO BEE INCLUSION AND NON DISCRIMINATION CHECKLIST			
	Representativeness of the hive			
	ITEM	**YES**	**NO**	**NOT SURE**
Fostering reflection around inclusion (23)	Are we excluding any group of people belonging to the community?			
	Axes of exclusion relevant to the proyect have been identified			
	Would people outside groups and associations have a way to participate in the process?			
	Is there a balance between men and women?			
	Has the role of these women in the project been considered			
	Is inclusive language used?			
	If the project has any impact on the groups involved, are people aware of what this impact might be?			
	Has it been thought how the results will be disseminated to be inclusive way?			
	Are we sure that the criteria established for each of the roles do not incorporate exclusionary axes?			
	Data collection/Data Analysis			
	ITEM	**YES**	**NO**	**NOT SURE**
	Is inclusive language used?			
	Are data disaggregated by participants taking into accout axes of inequality?			
	Have the questions and response categories been simplified as much as possible?			
	Accessibility of the tools			
	ITEM	**YES**	**NO**	**NOT SURE**
	Does the community have access to technology or there is a digital gap relevant for the project ?			
	Is inclusive language used?			
	Are facilitators/support foreseen?			
	Are the technologies being used accessible to all people?			
	Is all the information provided perceptible?			
	Does the tool take into account the size and spacing of letters, icons, images to ensure its use when there is functional diversity?			
	Can the tools and devices be used be carried or used during daily activities?			
	Size and spacing: Are they suitable for approach and access, handling and use, regardless of the user's body proportions, posture or level of mobility?			
	Safety of the spaces			
	ITEM	**YES**	**NO**	**NOT SURE**
	Is inclusive language used?			
	Has an effort been made to create welcoming, respectful and safe environments, both physical and virtual?			
	All actors involved have been made aware that any inappropriate practices as well as any type of abusive or harassing behaviour will be reported?			

Figure 6 Initial draft of the SOCIO-BEE inclusion checklist

This initial development and design phase of the tool lasted until June 2022. The checklist was complemented by a glossary explaining the basic concepts for approaching inclusion and understanding the essential terminology.

At the end of this first phase, a first presentation of the tool was made to the consortium and the advisory board during the second plenary meeting in Berlin (16-17 May 2022). This first approach was well appreciated by the Advisory Board who gave a positive assessment and pointed out some suggestions for improvement:



Inclusion toolkit

Pros

- Useful guidelines for any person/institution willing to run a CS project
- Scalable, sustainable and replicable
- Good idea to encourage people to connect to community groups
- This building block is a big surplus for the toolkit, but should be better operationalized.

Cons

- Using binary terms as men and women in a CS project these days might be controversial. Particularly in the inclusion toolkit.
- Some of the questions are too vague. E.g. Given the size and scale of many CS projects, 95% should be answering yes to the question about if the are excluding members of the community. Also, many technologies are inaccessible to different people so a question about accessible technologies is meaningless - 95% of projects should be answering no, as they will not have tested their technologies with people with colour vision deficiency, neurodivergency etc. People will tick both of these questions without understanding their own knowledge limitations.
- What does 'inclusive language' mean? It will be different things to different people and is quite broad.
- The checklist in the inclusion tool should further explain how to measure certain items. E.g. how do you know for sure that you used inclusive language? Is the technology accessible to all people? These are items to which you cannot give a straightforward answer unless you have tested this.

Recommendations for improvement

- Present to the ECSA-LKN EIE working group and invite feedback

Figure 7 Feedback from the Advisory Board

This first version was also presented at the "Common Identities" conference and at a seminar organised at the University of Deusto with researchers involved in the SOCIO-BEE and Youcount projects (24-11-2022).

Our partners from HKU also revised the toolkit and tried to make it more accessible by transforming the checklist into a “deck” board game.Following the initial structure, they drafted cards that contain checklist´s questions that the stakeholder can put on one of three stacks (yes-no-not sure):

However, the open question and the need of guidance to answer the items remained also when using this version and therefore, the task members decided to upgrade the checklist.

Once these contrasts had been made, the team behind the development of the checklist began a process of revision and re-editing of the checklist to incorporate the comments and suggestions received.

The four building blocks of the checklist remained the same, but structural modifications were made to improve the shortcomings identified. Firstly, a change was made from a question/item with three possible options (yes, no, not sure) to a Likert scale. A Likert scale is a valuable tool for assessing opinions, attitudes, or behaviors by using a rating scale.

It typically consists of a statement or question, accompanied by a series of five or seven answer statements. Respondents are then prompted to select the option that best reflects their sentiment or viewpoint regarding the statement or question.

Figure 8 HKU adaptation of the checklist

By presenting a range of answer choices, Likert scales allow for capturing nuanced levels of agreement or feelings on a particular topic. However, it's important to be aware of potential response bias associated with Likert scales. Respondents may exhibit a tendency to agree or disagree with all statements due to factors such as fatigue or social desirability, or they might have a tendency toward extreme responses or other demand characteristics. It's essential to consider these potential biases when interpreting Likert scale data.

In this particular case, we designed a 5 point agreement scale. The items were revised, and instead of structuring them in three levels, the different gradations were incorporated into 21 revised items comprising all the questions measured in the previous version. Instead of 3 levels, ad hoc feedback was designed for the responses obtained in response to the previous three levels. The structure of the new version is as follows:

Representativeness (8)

Data collection analysis (2)

Accessibility of the tools (8)

Secure spaces (3)

To facilitate the response to the scale, rubrics were defined to guide participants in their answers. In addition, each item includes a section explaining the relevance and importance of the item and its connection to citizen science. In addition, for each item, a section has been included providing complementary information and theoretical support that helps participants to elaborate on each of the

items. In addition, being aware of the phases of citizen science project development, and with the intention that this tool can be useful in all phases and disciplines, an effort has been made to detail how each item is relevant in the different phases of the project.

Thus, the structure of each item is as follows:

ITEM

Scale: Not at all 1 2 3 4 5 Completely

Why is this important?

Rubrics

Need more information

Inspiring Resources

Following the advice from the External AB, we presented this second version of the toolkit at the ECS Collaboration workshop the 2nd May 2023. After a brief presentation of the building blocks and the structure of the checklist, a discussion followed using Miro board. 4 break out rooms were organised, each of the working on some selected items of teach building blocks.

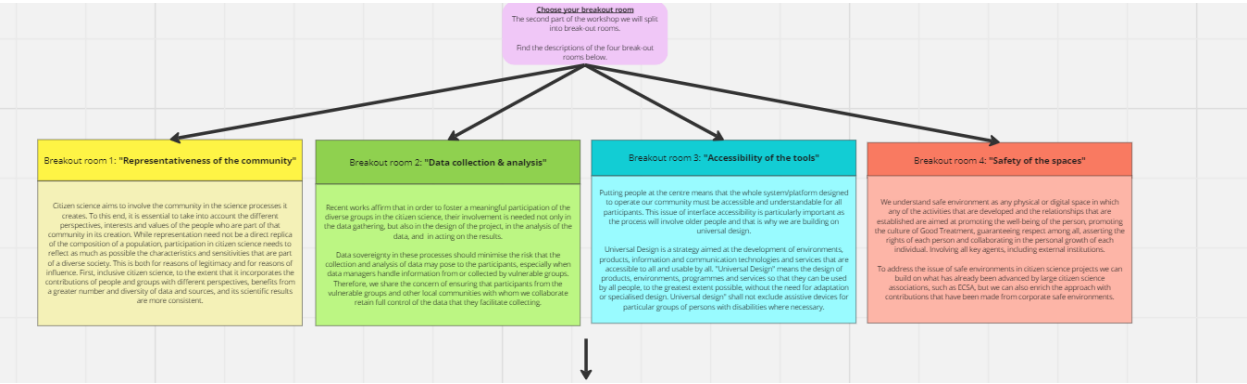


Figure 9 Screenshot from the Miro panel

4.2 How to use the toolkit

Above all, the tool allows reflection on the inclusion that the project is achieving, as well as the exclusionary effects that it may have, with a view to minimizing the latter and ensuring that the project achieves the maximum possible incorporation of diverse citizens.

The optimal way to use the tool is the collaborative reflection of the different instances of the project that precedes the response to each of the items of a Likert scale that specify the factors of inclusion in citizen science, grouped into four blocks: representativeness, data collection/analysis, accessibility and safe spaces.

To encourage this reflection, the tool incorporates, as stated above:

- The justification of the importance of each inclusion factor.

- Explanatory rubrics of the components of each scoring threshold on the scale.

- Information on the keys and topics to reflect and deliberate on in each of the project phases.

- Resources to deepen each inclusion factor

The tool asks the respondent for a numerical self-rating on the Likert scale for each of the items, and a qualitative response for each self-rated item below 4, describing opportunities for improvement.

The levels based on the location on the scale are as follows:

- 1-2,5: LOW
- 2,6-3,9: MEDIUM
- 4-5: HIGH

It can be affirmed that the tool is demanding, as a high level of inclusivity is achieved with a self-assessment of 4 out of 5

Once the respondent sends the on-line form, the levels are determined based on the following thresholds:

Table 1 Feedback thresholds

	Representativeness	**Data collection/analysis**	**Accesibility og the tools**	**Secure Spaces**
LOW	8-20	2-5	8-20	5-13
MEDIUM	21-31	6-7	21-31	14-19
HIGH	32-40	8-10	32-40	20-25

The tool can be used at different points in the project and allows anticipating the incorporation of inclusive criteria in relevant decision-making at each stage.

Currently, the toolkit is available online[9] as a google survey. The link has been distributed to project partners and to the participants in the ECS Collaboration workshop. In the following months, we will liaise with WP 8 to embed the link in the SOCIO-BEE website. We will also work on some complementary resources to disseminate the toolkit and provide some feedback on the process and use.

4.3 Preliminary results

Up to this moment, the tool has been used by 16 agents involved in the project. These preliminary responses yield the following results. In general terms, we can affirm that the entities are aware of the need to include diverse individuals and groups in the citizen science project. The average global score is 3,8/5, which nearly represents a high level of inclusiveness in the project. However, there are slight differences between the four blocks.

The obtained averages are quite high in representativeness (3.9/5) in representativeness and in secure spaces (4/5), whereas respondents rate the project in a medium level in terms of inclusiveness regarding data collection and analysis and accessibility of the tools (3,6/5). The reason of this difference can be deduced from the qualitative comments made to the items. The responding agents consider that they have greater control over inclusivity when it comes to acting upon individuals and/or behaviours. In other words, the representative participation of individuals in the project and the creation of safe conditions for

[9]https://docs.google.com/forms/d/e/1FAIpQLSd0U4Fl5puxTM2I_Df-ZapP2s7O1fVIyB1PZAvKTmglbRa6Kw/viewform?usp=pp_url

participants are perceived as elements that are more feasible to act upon in order to promote inclusion than data collection and analysis and device accessibility. Regarding these latter two blocks, the respondents, while identifying the need for inclusivity, perceive less responsibility and capacity for action.

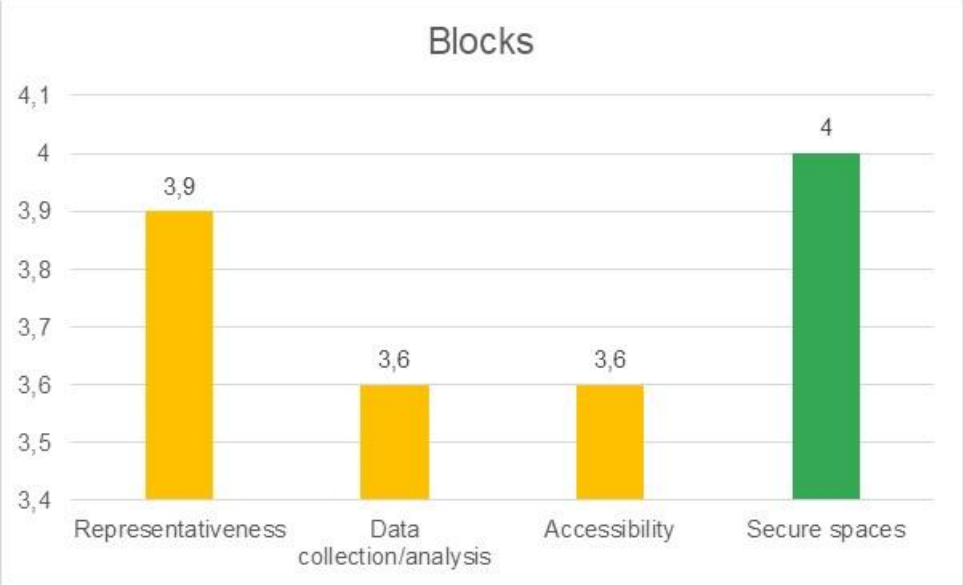


Figure 10 Preliminary results by building blocks

4.3.1 Representativeness of the hive

In the representativeness block three items reach a high level of inclusiveness: the two related to gender equality and one related to the possibility of incorporating people from outside established groups into the project. Respondents seem to be aware of the exclusion axes relevant to the project (3.9/5) and of what the exclusion of groups belonging to the community may imply (3.8). Reflection on how to make the dissemination of results as inclusive as possible is also encouraged (3.9/5). Inclusive language and equity and the awareness of citizen scientists of the results obtained are the factors that require the greatest improvement (3.4/5 and 3.6/5, respectively).

In relation to the general state of inclusiveness, it should be noted that the project is in a first phase, in which it is a matter of testing the devices and applications. In this sense, there is room for improvement in the second phase, in which the project will be implemented "for real". The advantage of having applied the tool from the beginning, is that it has allowed the project to be aware and to adopt measures to prevent deficits that could occur in the second phase. On the other hand, the idea to be conveyed in the meetings on the use of the tool is that it is not a matter of representing in the project what happens in society, in the sense of reproducing it, but of overcoming inequalities and transforming unjust exclusionary tendencies.

These are some of the areas for improvement identified through the use of the tool in the representativeness criterion:

- People or groups that may be excluded: blind people; iPhone users; non-mobile phone users.
- Men-women imbalance: there are difficulties in incorporating skilled women. One of the recommendations provided is for the app to alert about any gender imbalance occurring in the responses, if any.

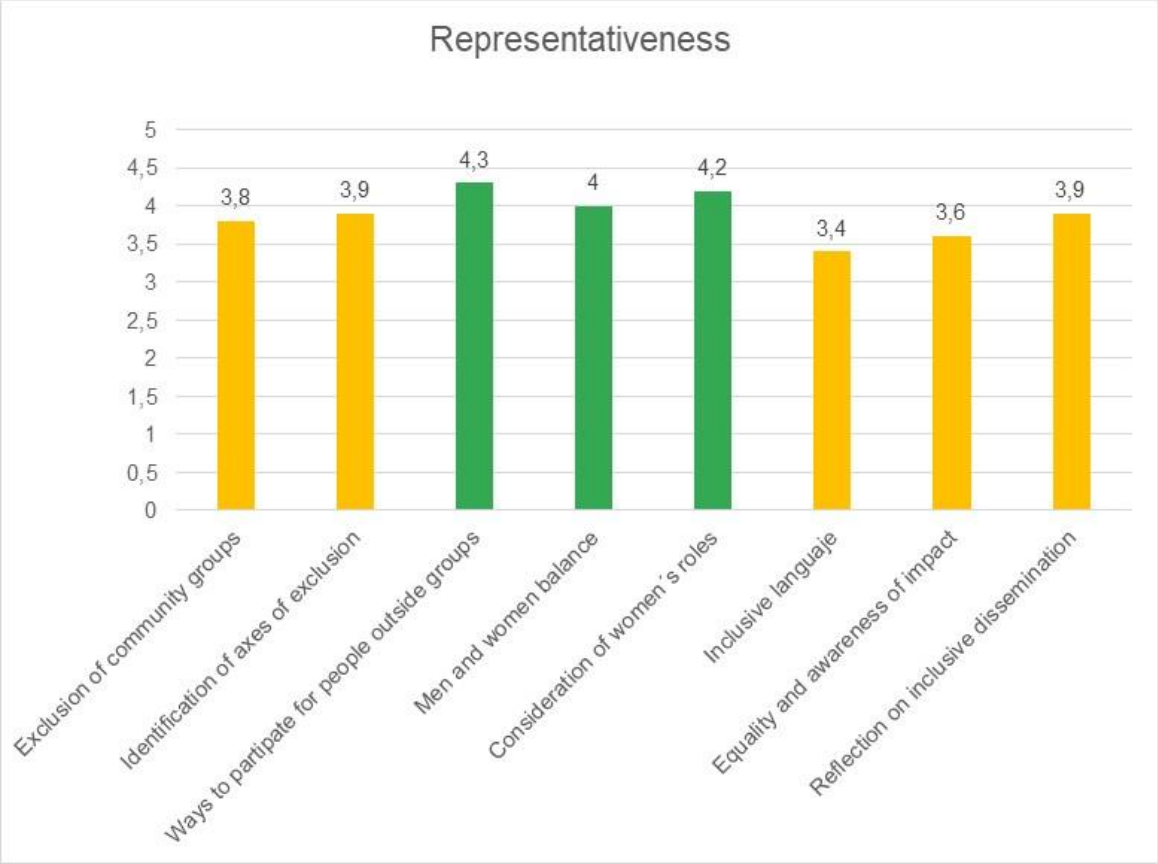


Figure 11 Main findings on Representativeness

- Inclusive language: the participation of different partners with diverse national realities poses a challenge for language inclusivity. It is suggested to follow official norms from different countries and regions, utilize inclusive language guides, or receive training in this area.
- Regarding awareness of the data and results obtained from the project, and the potential inequity associated with them, ways for providing access to citizen scientists to the data being collected is demanded. It is suggested to ask the impacted communities for feedback on their evaluation of the distribution of effects and compare answers with vulnerability data.
- In terms of inclusive dissemination of the results, it is recommended to improve citizen scientists' access to data through the app. In relation to the difficulties in managing feedback that should be requested in light of such information, it is proposed to establish time slots and standardized forms to facilitate it.

4.3.2 **Data collection/analysis**

In this criterion, although questions and responses are acknowledged to have been simplified, an improvement of the app is demanded in relation to greater disaggregation of data according the axes of inequality.

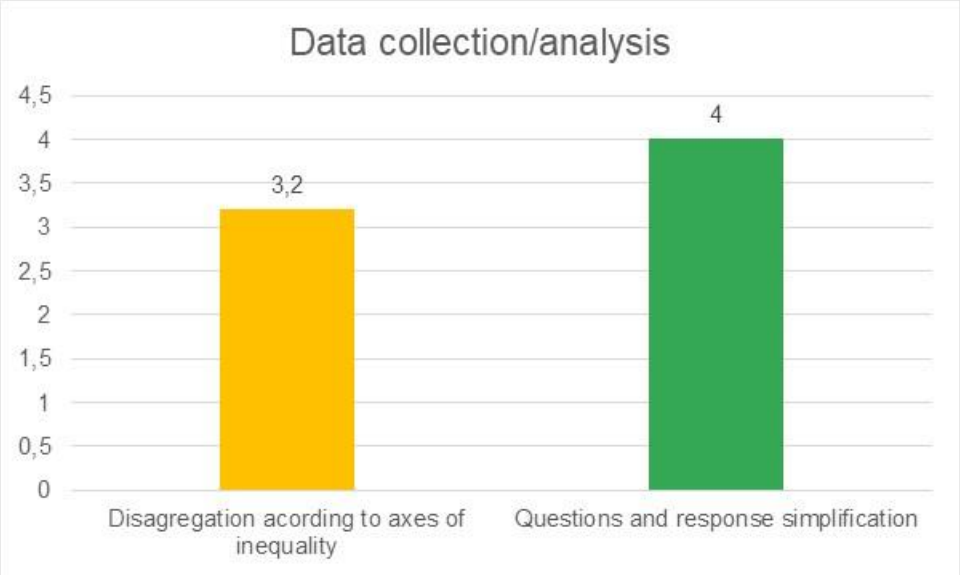


Figure 12Preliminary results on Data Collection

4.3.3 Accessibility of the tools

The accessibility of the tools is the most demanding criterion in terms of exclusion and the most difficult to meet.

Except for one of the items, related to physical and functional access, probably due to the characteristics of the devices themselves (4/5), the rest place the project at a medium level, in this first phase.

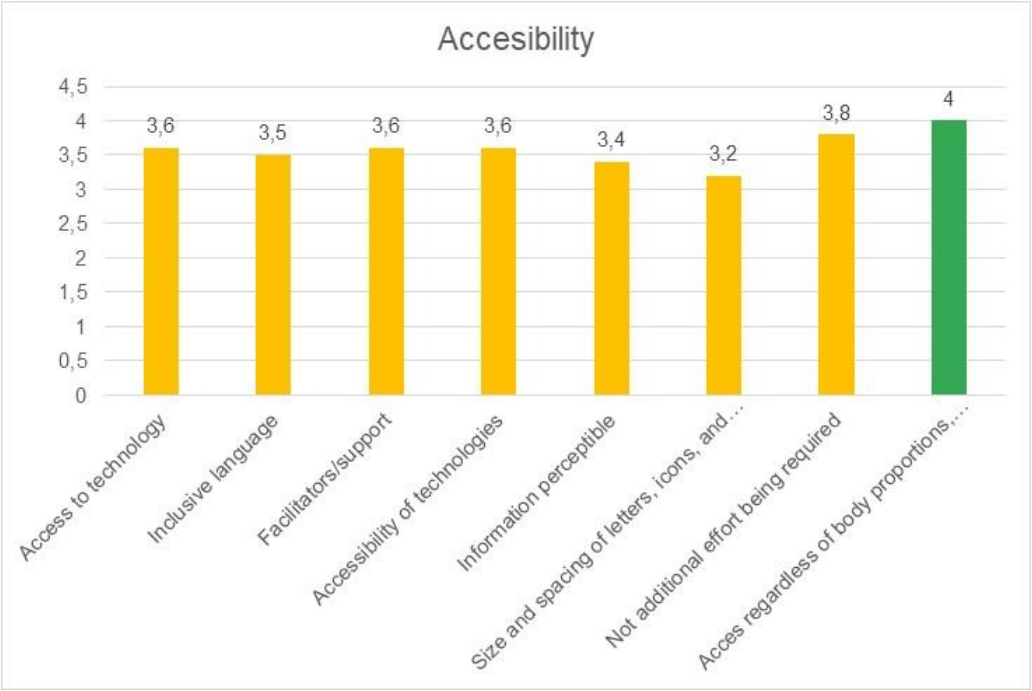


Figure 13 Preliminary results on Accessibility

The inclusion improvement needs identified in this criterion are the following:

- In access to technology, difficulties have been identified in iPhone users, and above all, in people living in remote areas with almost no internet access. It is suggested a non-tech way of participating, that could help a lot in inclusion.
- In the same vein, paper participation would include people who cannot manage with technologies.
- As noted above, language inclusion is a perceived need. In this case, the organization of workshops on language inclusiveness in the project is suggested.
- Another difficulty results from the use of "software from the shelf" that limits the possibilities of visual accessibility of the letters and symbols used.
- Finally, the professionalism required for flying drones has been identified as an obstacle for inclusion due to their dangerousness. On the contrary, we consider that the professional handling the drones can really be considered a support person or representative for the citizen scientist to participate equally in the project.

4.3.4 Secure spaces

This is the block that is perceived as having the greatest possibilities for action in the area of inclusion and that allows the adoption of preventive measures for the on-line meetings that will take place in the following phases.

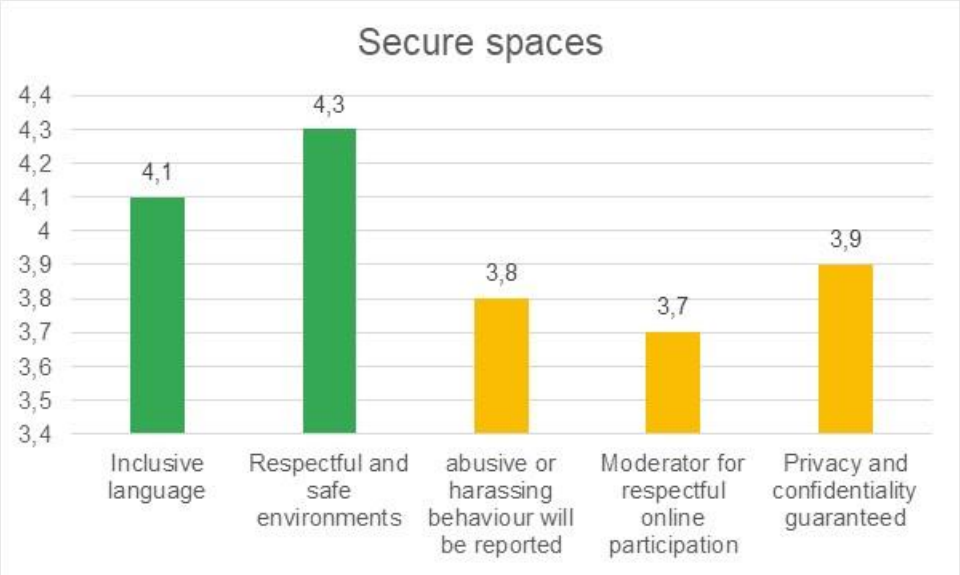


Figure 14 Preliminary Results on Secure spaces

There is confidence in the knowledge and experience of the pilots, to ensure the safety of the people who participate from them, and possibilities are identified for reporting of abusive or harassing behaviour, such as: Information included in the informed consent forms, way of problems reporting added in the App and clear statement of whistleblowing policies.

5. Glossary & useful resources

As we have already mentioned in the first version of the checklist, we include a glossary of terms that are key to the reflections on inclusion and diversity that the checklist wants to promote. Subsequently, in the revised version of the toolkit we complete these definitions with resources and sources of complementary information whose purpose is to help the people who carry out the checklist not only to be able to better complete the scale of the tool itself but also to reflect on the improvement measures. and the actions to take. Here we summarize the theory and the source repository compiled:

Table 2 Glossary and resources

Building block	Related definitions	Available resources	Recommended readings
Representativeness and inclusion in Citizen Science communities	**Exclusion** Exclusion may result from the fact that we do not know the characteristics of the people who form part of the community in which the project is being developed or that, even though we know them, we are consciously excluding some because we think that their social conditions make it difficult for us to reach them or for them to get involved in the project. While representation need not be a direct replica of the composition of a population, participation in citizen science needs to reflect as much as possible the characteristics and sensitivities that are part of a diverse society. Diversity brings a unique perspective on the values and priorities of the communities in which people live (Pandya, 2012; Holroyd-Leduc et al., 2016; Paleco, 2021).	https://www.un.org/esa/socdev/documents/compilation-brochure.pdf https://www.london.gov.uk/sites/default/files/mayors-equality-diversity-inclusion-strategy-easy-read.pdf https://science.nasa.gov/citizenscience https://cdn.earthdata.nasa.gov/conduit/upload/14273/CSDWG-White-Paper.pdf https://vastuullinentiede.fi/en/doing-research/responsible-citizen-science	Eleta, I, et al. 2019. The Promise of Participation and Decision-Making Power in Citizen Science. Citizen Science: Theory and Practice, 4(1): 8, pp. 1–9. DOI: https://doi.org/10.5334/cstp.171

	Social exclusion is a process and a state resulting in a lack of access to full participation in mainstream society. Social inclusion, conversely, is a multi-dimensional process aimed at creating conditions that enable full and active participation of every member of society in all aspects of life, including civic, social, economic, and political activities, as well as participation in decision-making processes. (DESA, 2009).		
	Inclusive society Is a society that over-rides differences of race, gender, class, generation, and geography, and ensures inclusion, equality of opportunity as well as capability of all members of the society to determine an agreed set of social institutions that govern social interaction. (Expert Group Meeting on Promoting Social Integration, Helsinki, July 2008) In an inclusive society, members do not only have the right but actually do take part in the process. What is most significant in creating an inclusive society is the engagement of the individual in the process by which society is managed, ordered and represented. Accommodating people with different backgrounds and working together to build a	https://shaping-inclusive-societies.com/tools/ https://www.sdg16toolkit.org/explore/ https://resources.peopleinneed.net/documents/1018-civicus-social-inclusion-toolkit.pdf	

	common future is a core value of an inclusive society (DESA, 2009). Participation is promoted in the projects through the involvement of civil society groups and organisations, as they represent the interests, needs and concerns of their members. Identification of key actors in the community (e.g. representatives of associations) contributes to the motivation of others and those who facilitate networking, as it is the latter who have experience in citizen science or are people with social and communication skills (as they are often the ones who are most involved). However, the risk is involving the same people or groups in every project, so that the gap with respect to those who never participate is increased. Studies show that people belonging to vulnerable groups experience more barriers that tend to completely prevent participation: living farther away from green space; working unpredictable hours; experiencing reduced access to health care; experiencing internet connectivity issues (Lynch & Miller, 2023)		
	Social Participation This denotes an active involvement in the process, not merely having access to society's activities, but engaging in them, and building and maintaining a social network.	https://science.nasa.gov/citizenscience https://mappingforchange.org.uk/projects/	Dardier, G.; Jabot, F.; Pouliquen, F. (2021) Can Air Quality Citizen-Sensors Turn into Clean Air Ambassadors? Insights from a Qualitative Study. *Int. J. Environ. Res. Public Health*, 18, 10046.

	Participation also creates a sense of responsibility towards others, a community or an institution, and influences decisions or enables individuals to have access to the decision-making processes. Social participation in a project implies an attitude towards the project motivated by and experienced as a member of a group of people or a community (Soleri et. al, 2016). Real inclusion within citizen science is more likely to occur if issues are framed around participants' values, focusing on local and tangible concerns, and if individuals believe their actions have an impact (Paleco, 2021).		https://doi.org/10.3390/ijerph181910046 Holroyd-Leduc, J., Resin, J., Ashley, L., Barwich, D., Elliott, J., Huras, P., et al. (2016). *Giving voice to older adults living with frailty and their family caregivers:* Engagement of older adults living with frailty in research, health care decision making, and in health policy. Research Involvement and Engagement, 2(1), 1-19. https://doi.org/10.1186/s40900-016-0038-7 Woods T., Arias R., Salas Seoane N., Burbano J., Hernández M., Alonso M., Francis L., Capelli L., Schleenstein G., Paz L., Vlachos S. (2021). *DIY guidelines for citizen science projects in odour-conflicted communities.* DOI 10.5281/zenodo.6073972 Lynch, L. and Miller, J., 2023. *Accessibility of Participation in a Pollinator-Focused Community Science Project. Citizen Science: Theory and Practice, 8(1), p.15.*

			DOI: http://doi.org/10.5334/cstp.557 Eleta, I, et al. 2019. The Promise of Participation and Decision-Making Power in Citizen Science. Citizen Science: Theory and Practice, 4(1): 8, pp. 1–9. DOI: https://doi.org/10.5334/cstp.171
	Vulnerability Vulnerability can be considered in two different approaches: The first approach is associated with human rights. There can be vulnerable people who are often subject to material inequality and indirect discrimination. The second approach is linked to the idea of risk, which considers vulnerable people in need of special care and protection due to their greater susceptibility to harm resulting from various threats (Beloki & Mosteiro, 2017).	Data Protection, Vulnerable Groups and Citizen Science: Protecting everyone's rights. Available at: https://www.youtube.com/watch?v=OW2DFweV064	Inclusiveness in citizen science: how can projects help vulnerable groups to participate?. Available at: https://cos4cloud-eosc.eu/blog/inclusiveness-in-citizen-science-how-can-projects-help-vulnerable-groups-to-participate/
	Gender Equality[10]: Gender Equality is related to ensuring equal rights, responsibilities and opportunities for women and men and girls and boys (EIGE	EIGE Gender Equality toolkits EU Gender Equality Strategy Gender in RRII UN Women toolkits	

[10] https://ec.europa.eu/info/about-european-commission/organisational-structure/people-first-modernising-european-commission/people-first-diversity-and-inclusion_es#:~:text=La%20Comisi%C3%B3n%20Europea%20ha,las%20personas%20con%20discapacida

	2016). The Council of Europe defines gender equality as "an equal visibility, empowerment and participation of both sexes in all spheres of public and private life. Gender equality is the opposite of gender inequality, not gender difference, and aims to promote the full participation of women and men in society. It means accepting and valuing equally the differences between women and men and the diverse roles they play in society. Gender equality includes the right to be different. This means taking into account the existing differences among women and men, which are related to class, political opinion, religion, ethnicity, race or sexual orientation. Gender equality means discussing how it is possible to go further, to change the structures in society which contribute to maintaining the unequal power relationships between women and men, and to reach a better balance in the various female and male values and priorities"		
	Gender Balance: "By gender balance, we refer to a situation where both males and females have equal opportunities and access to matters in all the		

	institutions of the society, namely, religion, economy, education, culture, and polity."[11]		
	Gender role Gender Role (also known as a sex role (Levesque, 2011) is a social role encompassing a range of behaviours and attitudes that are generally considered acceptable, appropriate, or desirable for people based on their actual or perceived sex or sexuality (Alters, 2009; Gochman, 2018). As such, gender roles are closely related to how we construct our gender identities and the unequal importance attributed to feminine and masculine values. (Bourdieu, 1999; Connell, 1995; De Beauvoir, 1949; Firestone, 1976; Giddens, 1992; Gil, 2008; Lagarde, 1990; Martínez & Bonilla, 2000; Woolf, 1929).	Deusto guidelines to mainstream gender in research Gear Tool: Gender Equality in Academia and Research YW CHECKLIST FOR GENDER IN RESEARCH GARCIA Toolkit for Integrating Gender-Sensitive Approach into Research and Teaching Topical case studies YW toolkit- Environment Gendered innovations-Environment	
	Inclusive Language "Using gender-inclusive language means speaking and writing in a way that does not discriminate against a particular sex, social gender or gender identity, and does not perpetuate gender stereotypes. Given the key role of language in shaping cultural and social attitudes, using gender-inclusive language is a powerful way to promote	https://www.uni-kassel.de/hochschulverwaltung/index.php?eID=dumpFile&t=f&f=378&token=2c496cdb2d302e879aa4f089ee012938080d2809 WeCount 2019 report, Identity and pronouns — Public Service Commission Pronoun use in email signatures — Public Service Commission	

[11] Omotosho, B.J. (2013). Gender Balance. In: Idowu, S.O., Capaldi, N., Zu, L., Gupta, A.D. (eds) Encyclopedia of Corporate Social Responsibility. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-28036-8_624

	gender equality and eradicate gender bias" (UN)	Age inclusive language Guiding Principles for Using Inclusive Language General Resources Race and Ethnicity Ability Age Gender and Sexual Orientation Socioeconomic Status Framing for Change Oxfam Inclusive Language Guide	
	Axes of inequality Divisions according to which socially valued resources are distributed unequally. Thus, people, according to the social groups to which they belong, will have more or less access to specific resources (money, prestige, contacts, information, etc.). The theorising of intersectionality is closely related to the axes of sex, race and social class, but there is no exhaustive list of axes, nor can we establish a hierarchy among them. Currently, those most worked on in public policies in the European context are the following: • Age / Life cycle • Disability / Functional diversity • Ethnicity/racialization • Origin/migration • Sex / Gender	https://vastuullinentiede.fi/en/authors/heidi-laine https://vastuullinentiede.fi/en/planning/publication-plan-improves-impact-and-makes-author-roles-clear https://vastuullinentiede.fi/en/doing-research/responsible-citizen-science https://citi-sense.eu/	

	• Religion / beliefs • Sexual orientation and gender identity / LGTBI • Social class		
	Intersectionality Analytical tool for studying, understanding and responding to the ways in which gender intersects with other structural axes of inequality such as class, origin, race, age, sexual identity, functional diversity, etc. and how these intersections contribute to shaping unique experiences of oppression and privilege.	OHCHR GUIDANCE NOTE ON INTERSECTIONALITY, RACIAL DISCRIMINATION & PROTECTION OF MINORITIES: https://www.ohchr.org/sites/default/files/documents/issues/minorities/30th-anniversary/2022-09-22/GuidanceNoteonIntersectionality.pdf Intersectional AI Toolkit: https://intersectionalai.miraheze.org/wiki/Intersectional_AI_Toolkit UN PRDP: INTERSECTIONALITY RESOURCE GUIDE AND TOOLKIT An Intersectional Approach to Leave No One Behind: https://www.unwomen.org/sites/default/files/2022-01/Intersectionality-resource-guide-and-toolkit-en.pdf	
	Ethnicity Ethnicity is a term that describes shared culture and national origin. Minority groups are defined by their lack of power. Race is fundamentally a social construct. In addition, a distinction can be made between:	Allf, Bradey & Cooper, Caren (2022) Citizen science volunteers are almost entirely white: https://theconversation.com/citizen-science-volunteers-are-almost-entirely-white-184997	Pateman, R., Dyke, A. and West, S., 2021. The Diversity of Participants in Environmental Citizen Science. Citizen Science: Theory and Practice, 6(1), p.9.DOI: https://doi.org/10.5334/cstp.369

	Indigenous. Peoples are a culturally distinct society and peoples. The UN recognizes the difficulty in defining such a diverse group of people, and instead looks to certain characteristics such as a distinct social, economic and political system and strong links to territories and surrounding natural resources. In some countries, there may be preference for other terms including tribes, first peoples/nations, aboriginals, ethnic groups, adivasi, janajati. Because the term "indigenous" has negative connotations, some people may choose not to reveal or define their origin *Ethnic Minorities*. Ethnicity is considered to be shared characteristics such as culture, language, religion, and traditions, which contribute to a person or group's identity. While a minority group can be understood as any group of people who, because of their physical or cultural characteristics, are singled out from the others in the society in which they live for differential and unequal treatment, and who therefore regard themselves as objects of collective discrimination.		Mahmoudi, D., Hawn, C. L., Henry, E. H., Perkins , D. J., Cooper, C. B., & Wilson, S. M. (2022). Mapping for Whom? Communities of Color and the Citizen Science Gap. ACME: An International Journal for Critical Geographies, 21(4), 372–388. Retrieved from https://acme-journal.org/index.php/acme/article/view/2178
	Empowerment		

	A term coined at the World Women's Conference in Beijing to refer to increasing women's participation in decision-making processes and access to power. Today, this term also has another dimension: an awareness of the power that women individually and collectively hold, which has to do with the recovery of women's own dignity as persons, changing their self-image and beliefs about their rights and capabilities, and challenging feelings of inferiority.Empowerment is always relational and is a process, i.e. it is not a state that is accessed once and for all and forever, but rather a series of changes over time that has no end goal, as no woman ever becomes empowered in any sense of the word, and no woman ever becomes empowered in any sense of the word (Universidad de Deusto, 2021).		
	Equity Equity is not the same as equality. Equality distributes the same benefits to all the people and assumes everyone should be treated the same regardless of needs, experiences, and opportunities. Equity, on the contrary, puts people on an equal footing by recognizing the systemic barriers that continue to oppress traditionally marginalized groups and implementing a fairer distribution of resources. In short, equity recognizes that		

	barriers and privileges mean not everyone comes to the table with the same resources. Equitable projects aim to correct for those imbalances by improving procedures and processes (Pantic, 2021) . **Discrimination** Any distinction, exclusion or preference which produces a detrimental result against a person because of his or her personal or social condition nd which lacks objective and reasonable justification. It can be of three types: direct (differentiated and prejudicial treatment, where the condition is the subject of direct consideration); indirect (an apparently neutral provision, criterion or practice that disproportionately disadvantages persons of a particular personal or social condition) and multiple (intersectionality) (Universidad de Deusto).		
	Diversity Put simply, is the presence of difference. In the context of civic engagement, diversity typically refers to the representation of different identities across traits such as race, gender identity, ethnicity, socioeconomic status, and (dis)ability (among many other characteristics) (Panty, 2021). Hardy and Mawhiney define diversity as “the ways that people are different from one another and how these differences shape various ways of		Pandya, Rajul E. "A framework for engaging diverse communities in citizen science in the US." *Frontiers in Ecology and the Environment* 10.6 (2012): 314-317 .

	living and thinking, different assumptions, values and beliefs". (2002: 58). Diversity can lead to heterogeneity but also to social stratification (vertical differentiation in a hierarchy of status differences); social inequality (social status reinforced through the exercise of social power) and minority group discrimination (Winterdyk & King 1999 in Rosemary, 2005). In its positive sense, diversity is also about people living and working together from different backgrounds, religions, genders, disabilities, and whether they are attracted to people of the same sex or not (Greater London Authority, 2018). Therefore, diversity is diversity is an approach to equality which celebrates differences among people (Universidad de Deusto, 2021)		
	Stereotypes Preconceived social and cultural models or ideas that attribute to women and men a specific and limited set of characteristics on the basis of their sex determine social expectations and are an obstacle to achieving real gender equality.	Laine (2018) Open co-authorship of scientific articles. https://vastuullinentiede.fi/en/publishing/open-co-authorship-scientific-articles	

Data collection/Data Analysis	**Key principles when collecting data:** It is important that data always be disaggregated by sex as a primary, overall classification. For example, when collecting statistics on 'young people' or 'older people', make sure that the target group is disaggregated by sex. In addition to quantitative data on specific characteristics, analysis needs to take into account qualitative data on people's lived experiences. Crucially, it must identify how services are used differently by different people, and what resources should be allocated to address these differences. It is important to use information from a range of sources (e.g. local and sub-national studies or consultations) and combine various data sources (e.g. data from statistical offices, academic works and policy reports) for a comprehensive understanding of on-the-ground realities. When data on race or ethnicity, age, disability or sex are not available, this should be identified as a gap. Activities to improve available data could be part of programmes and local projects. Efforts to improve data could be considered in project objectives and reporting. Gender-specific data on work-life balance contributes to better understanding of how	Disaggregated data: an opportunity to make realities visible Inclusive data to leave no one behind – best practices in data disaggregation and use Inclusive data charter Disaggregation of Race and Ethnicity Group Data https://globalresearchcouncil.org/fileadmin/documents/GRC_Publications/Survey_Report__GRC_Gender-Disaggregated_Data.pdf Juran, S., Zagheni, E., & Castillo, C. (2021). Data disaggregation by socially relevant categories in population censuses: A review of international standards, national practices, and assessment of implications for the measurement of the Sustainable Development Goals. Social Indicators Research. https://doi.org/10.1007/s11205-021-02829-1 King, E., & Palmer, R. (2021). Disaggregating data: Why it matters and what to do about it. IDS Bulletin, 52(2), 1-14. https://doi.org/10.19088/1968-2021.102 Lutas, M. (2021). Data disaggregation by race, ethnicity, and national origin: A guide for human rights advocates, researchers, and	Juran, S., Zagheni, E., & Castillo, C. (2021). Data disaggregation by socially relevant categories in population censuses: A review of international standards, national practices, and assessment of implications for the measurement of the Sustainable Development Goals. Social Indicators Research. https://doi.org/10.1007/s11205-021-02829-1 King, E., & Palmer, R. (2021). Disaggregating data: Why it matters and what to do about it. IDS Bulletin, 52(2), 1-14. https://doi.org/10.19088/1968-2021.102 Lutas, M. (2021). Data disaggregation by race, ethnicity, and national origin: A guide for human rights advocates, researchers, and funders. Human Rights Data Analysis Group. https://doi.org/10.31235/osf.io/p7r5v United Nations. (2017). Leaving no one behind: Data disaggregation for the SDGs. United Nations. https://doi.org/10.18356/55576c68-en

	work and care responsibilities are divided between women and men. Data on employment and time use sheds light on gendered patterns of paid and unpaid work. It is vital to tailor any analysis to the local context, including analysis of local data. This can be achieved by involving national or local gender experts, consulting civil society organisations – especially women's organisations – making use of national research, and triangulating information.	funders. Human Rights Data Analysis Group. https://doi.org/10.31235/osf.io/p7r5v United Nations. (2017). Leaving no one behind: Data disaggregation for the SDGs. United Nations. https://doi.org/10.18356/55576c68-en Wazir, N. (2018). Data disaggregation for gender-responsive development planning: Lessons learned from Asia and the Pacific. Journal of International Development, 30(6), 1016-1034. https://doi.org/10.1002/jid.3388 World Bank. (2018). Data disaggregation for inclusive development: A guide for practitioners. World Bank. https://doi.org/10.1596/978-1-4648-1332-3	Wazir, N. (2018). Data disaggregation for gender-responsive development planning: Lessons learned from Asia and the Pacific. Journal of International Development, 30(6), 1016-1034. https://doi.org/10.1002/jid.3388 World Bank. (2018). Data disaggregation for inclusive development: A guide for practitioners. World Bank. https://doi.org/10.1596/978-1-4648-1332-3
	Inclusive language for data collection Use clear and simple language that does not require specialised knowledge to understand the questions and answer options. Avoid using technical terms or jargon that may be unfamiliar to people who do not have expertise in a particular area. Use inclusive response categories that do not exclude minority groups. For example, instead of "male" or "female", use "male gender", "female gender" and "other gender".	The United Nations (2019) report for the inclusion of vulnerable groups	Behr, D., & Iachini, A. (2018). Plain language and survey response rates. Journal of Survey Statistics and Methodology, 6(3), 383–404. Campanelli, P., & Thorpe, J. (2019). Respondent burden and survey design: The impact of plain language on respondents' behavior in web surveys. Journal of Official Statistics, 35(1), 53–75. Fuchs, M., & Thissen, F. (2013). Effects of text simplification on readability: A meta-analysis.

	Include response options that reflect cultural and ethnic diversity. For example, instead of 'white' or 'black', use 'Caucasian', 'African', 'Asian', 'indigenous' and 'other'. If possible, allow respondents to write their own answers. This will allow them to express themselves in their own words and prevent them from feeling constrained by the pre-defined response options.		Journal of Reading Psychology, 34(4), 327–360. Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative Health Research, 15(9), 1277–1288 Krosnick, J. A., & Presser, S. (2010). Question and questionnaire design. In P. V. Marsden & J. D. Wright (Eds.), Handbook of survey research (2nd ed., pp. 263–313). San Diego, CA: Academic Press. Plain Language Association International. (2011). Clear language and design for surveys: A toolkit. Ottawa, Canada: Author. Schuman, H., & Presser, S. (1981). Questions and answers in attitude surveys. New York, NY: Academic Press. Tourangeau, R., & Smith, T. W. (1996). Asking sensitive questions: The impact of data collection mode, question format, and question context. Public Opinion Quarterly, 60(2), 275–304. Willis, G. B. (2005). Cognitive interviewing: A tool for improving

			questionnaire design. Thousand Oaks, CA: Sage Publications. Wray, R. J., McLaughlin, C. D., & Zavala, K. T. (2008). Minimal vs. elaborated text: The influence of reading difficulty on health decision making. Journal of Health Communication, 13(4), 358–376.
	Consent It is the expression or attitude with which a person consents to, allows or accepts something. It refers to the externalisation of the will to accept rights and obligations and plays a fundamental role in the framework of the autonomy of the will. Consent must be: - Free: consent must be a voluntary and free choice for the parties involved. - Informed: Lying or deliberately concealing certain intentions. - Concrete: Consenting to something means consenting to everything else. - Reversible: Consenting once does not mean consenting forever. - Enthusiastic: Says "yes" or actively expresses consent verbally and non-verbally.		Quigley, E., Holme, I., Doyle, D.M. et al. “Data is the new oil”: citizen science and informed consent in an era of researchers handling of an economically valuable resource. Life Sci Soc Policy 17, 9 (2021). https://doi.org/10.1186/s40504-021-00118-6 Anne S.Y. Cheung, *Moving Beyond Consent For Citizen Science in Big Data Health and Medical Research*, 16 Nw. J. Tech. & Intell. Prop. 15 (2018). https://scholarlycommons.law.northwestern.edu/njtip/vol16/iss1/2 Hart, Adam, et al. "The role of citizen science and volunteer data collection in zoological

			research." *International Journal of Zoology* 2012 (2012).
	Data protect **ion** Data protection refers to the set of legal and IT techniques aimed at guaranteeing and protecting, with regard to the processing of personal data, the public freedoms and fundamental rights of natural persons, and especially their honour and personal and family privacy. The European Data Protection Regulation is the legislation that regulates the processing of personal information on European territory.	Spottero Data & privacy: https://www.spotteron.net/citizen-science-app-features/privacy-data-safety	Bowser, Anne, et al. "Accounting for privacy in citizen science: Ethical research in a context of openness." Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing. 2017 Pierce, R. and Evram, M., 2022. Getting it right: implementing data protection in citizen science research. Insights: the UKSG journal, 35(0), p.2.DOI: https://doi.org/10.1629/uksg.538
Accessibility of the tools	**The digital gap** It refers to the unequal distribution of access to technology and the internet, which can result in disadvantaged individuals and communities being left behind. For example, people who live in rural areas or low-income neighborhoods may have limited access to high-speed internet or the latest technologies, which can make it harder for them to access education or job opportunities.		

	This digital divide can exacerbate existing inequalities and lead to social exclusion, where certain groups are marginalized and excluded from important social and economic opportunities. For instance, children who do not have access to a computer or the internet at home may struggle with homework or fall behind in their studies, which can have long-term implications for their education and future prospects. Therefore, it is important to work towards bridging the digital gap by providing equal access to technology and the internet to all individuals and communities. This can be done through policies and initiatives aimed at improving infrastructure and making technology more affordable and accessible. By closing the digital divide, we can promote social inclusion and create a more equitable society where everyone has equal opportunities to thrive		
	Digital divide A lack of access to technology can lead to a digital divide between those who have access and those who do not. This can create disparities in information access, communication, and opportunities for personal and professional growth.	Iberdrola https://www.iberdrola.com/social-commitment/what-is-digital-divide	DiMaggio, P., & Hargittai, E. (2001). From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increases. Princeton University Center for Arts and Cultural Policy Studies, Working Paper, 15.https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&

			doi=4843610b79d670136e3cdd12311f91f5cc98d2ee Norris, P. (2001). Digital divide: Civic engagement, information poverty, and the Internet worldwide. Cambridge University Press. Van Dijk, J. A. G. M. (2006). Digital divide research, achievements and shortcomings. Poetics, 34(4-5), 221-235. Warschauer, M. (2003). Technology and social inclusion: Rethinking the digital divide. MIT Press. Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. Review of Research in Education, 34(1), 179-225.https://journals.sagepub.com/doi/pdf/10.3102/0091732X09349791
	Accessibility language Is also known as communication accessibility, refers to the names, resources and linguistic systems that facilitate the participation of people with disabilities in everyday life. It	Age inclusive language https://creena.educacion.navarra.es/web/	Soto, Angel Pio González, and Juan Domingo Farnós Miró. "Usabilidad y accesibilidad para un e-learning inclusivo." *Revista de educación inclusiva* 2.1 (2016).

	encompasses different topics, such as how to refer to people with disabilities in a correct and humane way, specific communication methods such as sign language or Braille, tactile sign language, Morse code, among others The risks of technologies not being accessible to all people are significant, and efforts should be made to ensure that technology is available and accessible to everyone. Some risks associated with technologies not being accessible to all people: for example: People living in precarious economic situations may have difficulty accessing technologies due to financial constraints. Older people too may have difficulty accessing technologies due to unfamiliarity with the technologies or age-related health problems. Attention should also be paid to people with disabilities who may have difficulty accessing technologies due to physical or technical barriers that make it difficult to use them. People in rural or remote areas: people living in rural or remote areas may have difficulties accessing technologies due to the lack of technological infrastructure in those areas. As can be observed, certain groups of people are unable to access or use technology, and may be at a disadvantage compared to those who can. This can lead to increased inequality		

	in areas such as education, employment, healthcare, and social and economic opportunities.		
	Marginalization: People who are unable to access or use technology may be marginalized and excluded from certain aspects of society. This can result in feelings of isolation and reduced participation in social, economic, and political activities.	W3C Web Accessibility Initiative (WAI) Strategies, standards, and supporting resources to make the Web accessible to people with disabilities.).https://www.w3.org/WAI/people-use-web/tools-techniques/ World Health Organization. (2021). Assistive technology. World Wide Web Consortium. (2021). Web Accessibility Initiative (WAI). https://doi.org/10.1002/9780470685818.ch1 Designing for Interaction: Creating Smart Applications and Clever Devices https://doi.org/10.1145/1297144 "Inclusive Design Patterns" de Heydon Pickering: https://doi.org/10.1007/978-1-4842-3904-6 "The Accessible Technology Coalition" (ATC): https://www.atcoalition.org. This non-profit coalition works to make technology more accessible to all people by providing resources, toolkits and training for designers, developers and other professionals interested in technology accessibility. "The Center for Inclusive Design and Innovation" (CIDI): El sitio web del CIDI	

		tampoco tiene un DOI específico, pero puedes acceder a su página web aquí: https://www.buffalo.edu/cidi.html	
	Limited innovation: When large groups of people are excluded from technology, there is a risk of limiting innovation and slowing progress in areas such as healthcare, education, and social development.		
	Perceptible information Physical, sensory, cognitive, and intellectual disabilities can affect an individual's ability to perceive and understand information. If the information in a questionnaire is not accessible to people with functional diversity, they may be excluded from participating in the survey, which can lead to inaccurate or incomplete data and a lack of representation in decision-making processes. Making sure that the information in a questionnaire is perceptible to people with functional diversity can involve using **accessible formats**, such as braille, large print, audio recordings, or sign language interpretation, among others. It can also involve using clear and simple language, avoiding jargon, and providing explanations of technical terms.		

	Functional diversity A concept that goes beyond the traditional term of disability and that aims at a qualification that is not inscribed in a deficiency but what it points out is a daily development, a functionality, different from what is considered usual; and it also assumes that that it is not the physiological peculiarity but the social environment that produces discrimination. The concept of functional diversity, claims the respect for the dignity, integral, of the human person (Rodríguez Diaz, S., 2010).		
	Accessible formats They are formats in which information is presented in a way that is easier to understand and perceive for people with disabilities. Sometimes called alternate formats, these are ways of presenting printed, written, or visual material so that people who do not read print can access it. People who do not read print may: ● Be blind or visually impaired ● Have a learning disability that affects reading ● Have a physical disability and be unable to hold or turn pages Some common accessible formats include:	There are many websites that can help you create accessible formats to avoid the exclusion of people with functional diversity, such as: ● Accessible Digital Office Document (ADOD) Project: This project provides guidelines and resources for creating accessible digital office documents, such as Word, Excel, and PowerPoint. ● EasyChirp: This website offers an accessible interface for using Twitter, including text-to-speech and simplified navigation options. ● Accessible Icon Project: This project provides a free set of icons that	Barrie, H., Soebarto, V., Lange, J., Mc Corry-Breen, F., & Walker, L. (2019, November). Using citizen science to explore neighbourhood influences on ageing well: Pilot project. Healthcare 2019, 7(4), 126; https://doi.org/10.3390/healthcare7040126

	Braille: A tactile writing system that allows people who are blind or visually impaired to read text by touch. **Large print:** Text that is printed in larger fonts, making it easier to read for people with low vision. **Audio recordings**: Information that is recorded and presented as an audio file, which can be played back for people who are blind, visually impaired, or have difficulty reading. **Sign language interpretation**: A visual language that uses hand gestures, facial expressions, and body language to convey meaning, which can be used to make spoken language accessible for people who are deaf or hard of hearing. **Easy-to-read:** Text that is written in simple language with short sentences and common vocabulary, making it easier to understand for people with cognitive disabilities or limited literacy skills. **Closed captions**: Text that appears on a video screen to provide a written transcript of the spoken dialogue, making videos accessible for people who are deaf or hard of hearing.	depict people with disabilities in an active and engaged manner, promoting greater visibility and inclusion. • WebAIM: This website provides resources and guidelines for creating accessible web content, including tutorials on how to make websites more accessible for people with disabilities. • Blackboard Ally: This website provides tools and resources for creating accessible digital content in various formats, including documents, presentations, and images. National Center on Disability and Access to Education: This website offers resources and best practices for creating accessible educational materials, such as textbooks and course material *A research integrity check-list in the humanities and social and behavioural sciences for research conducted in cooperation with companies.* https://vastuullinentiede.fi/en/planning/research-integrity-check-list-humanities-and-social-and-behavioural-sciences-research	
	Physical accessibility: This includes making sure that materials can be reached and		

	manipulated by people with a range of physical abilities and limitations. This may involve using adjustable desks, chairs, and other equipment, as well as ensuring that materials are positioned at a comfortable height and distance for users.		
	Assistive technology: Refers to devices, equipment, software, and other tools that are designed to help people with disabilities or limitations perform daily tasks, interact with others, and access information. It can be used to assist people with a wide range of disabilities, including physical, sensory, cognitive, and developmental disabilities. Many people with disabilities use assistive technology, such as screen readers, speech recognition software, and adaptive switches, to access and manipulate materials. It is important to ensure that materials are compatible with a range of assistive technology devices and software. Multimodal options: Providing materials in multiple formats, such as audio, video, and text, can help ensure that people with a range of disabilities can access and use the materials in a way that works best for them.		Johnson, T. P. (2015). Approaches to the Design of Survey Instruments for People with Disabilities. Social Science Quarterly, 96(4), 1024-1045. https://doi.org/10.1111/ssqu.12162 Schmetzke, A., & Wacker, R. R. (2015). Ensuring Accessibility of Survey Instruments for All Respondents: Results from the Cognitive Interview Pretesting of a Survey with Visual and Motor Disabilities. Rehabilitation Psychology, 60(1), 63-70. https://doi.org/10.1037/rep0000023 Stern, M. J., Cotten, S. R., & Drentea, P. (2014). The Internet and Health Care Survey: A feasibility study of a mixed-mode survey approach to collect health information from individuals with mobility impairments. Journal of Medical Internet Research, 16(6),

			e145. https://doi.org/10.2196/jmir.3172 U.S. Department of Health and Human Services. (2020). Web Content Accessibility Guidelines (WCAG) Overview. https://www.hhs.gov/web/guidance/web-content-accessibility-guidelines-overview/index.html World Health Organization. (2011). World report on disability. World Health Organization. https://www.who.int/disabilities/world_report/2011/report.pdf
	Universal design: Universal design is an approach to creating products, environments, and materials that are usable by the widest range of people possible, regardless of their abilities or limitations. This may involve designing materials with features such as simple and intuitive navigation, clear and concise language, and consistent layout and formatting.	Hedvall, Per-Olof & Rydeman, Bitte & Granholm, Sarah & Andersson, Malin. (2018). Co-Constructing Universal Design in Citizen Science Workshops. Studies in health technology and informatics. 256. 214-222.	
Safety of the spaces	**Security concerns:** When certain groups are excluded from technology, they may be more vulnerable to security risks such as identity theft, cyberbullying, and online scams.		

	Inclusive language and security By using inclusive language, we can help to create a safe and welcoming environment for all people, regardless of their identity or background. It is important to be mindful of the words we use and the impact they can have on others, and to strive for language that is inclusive, respectful, and affirming. Tips for using inclusive language to promote safety and inclusivity: ● Use gender-neutral language: Instead of assuming someone's gender, use gender-neutral language such as "they/them" or "person" to avoid excluding or misgendering anyone. ● Avoid ableist language: Avoid using language that reinforces negative stereotypes or assumptions about people with disabilities. For example, use "person with a disability" instead of "disabled person" and "accessible" instead of "handicapped." ● Use person-first language: Use person-first language to acknowledge and respect people's identity and personhood, such as "person with autism" instead of "autistic person."		

	• Use inclusive pronouns: When addressing a group of people, use inclusive pronouns such as "folks," "everyone," or "people" instead of gendered pronouns like "guys" or "ladies." • Be mindful of cultural differences: Be aware of cultural differences in language and terminology and try to use inclusive language that is respectful of diverse cultures and backgrounds. • Avoid using derogatory language: Avoid using derogatory language or slurs that are offensive to any particular group of people		
	Inclusive and secure spaces Creating a welcoming, respectful, and safe environment in face-to-face or online meetings can have many benefits, including increased participation, improved relationships, better decision-making, reduced conflict, increased diversity and inclusion, and improved well-being. By making an effort to create such environments, we can promote productivity, inclusivity, and positivity in meetings and other collaborative settings. By implementing some strategies, meeting organizers can ensure that online meeting spaces are		Brown, B., & Benedict, R. (2020). Creating Safe Spaces for Transgender and Gender Diverse Youth: A Guide for Professionals. Journal of LGBT Youth, 17(2), 153-169. https://doi.org/10.1080/19361653.2019.1638558 Lane, J. (2020). Constructing Safe Spaces for Black Women in the Academy. Feminist Formations, 32(2), 48-70. https://doi.org/10.1353/ff.2020.0016

	inclusive and respectful, promoting a positive and productive environment for all participants. A space of interaction free from harassment can be ensured for all individuals, regardless of their sex, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, or religion: ● Use inclusive language: Use language that is inclusive and avoids stereotypes or offensive terms that could make some participants feel excluded. ● Provide accessible materials: provide materials in accessible formats, such as screen reader compatible files, and ensure that the platform being used is accessible to all participants. ● Set ground rules: establish ground rules for the meeting that promote inclusivity and respect, such as not interrupting others, using respectful language, and avoiding assumptions or generalizations. ● Encourage participation: encourage participation from all participants and provide opportunities for those who might not feel comfortable speaking up in larger groups to share		Mason, L. R. (2019). Creating Safe Spaces for Sexual and Gender Minority Students in K-12 Schools: A Meta-Ethnography. Journal of LGBT Youth, 16(4), 402-419. https://doi.org/10.1080/19361653.2018.1558297 Osterman, L. L., & Kollar, M. A. (2019). Creating safe spaces for trans and gender diverse youth in schools: A critical review of the literature. International Journal of Transgenderism, 20(4), 372-386. https://doi.org/10.1080/15532739.2019.1635177 Walton, R., & Cohen, G. L. (2011). A question of belonging: Race, social fit, and achievement. Journal of Personality and Social Psychology, 101(6), 1219–1228. https://doi.org/10.1037/a0025942 UNESCO (November, 2021) Creating safe digital spaces https://www.unesco.org/en/articles/creating-safe-digital-spaces Panion “Creating Safe Spaces within Your Online Community” https://panion.com/blog/creating

	their ideas, such as using breakout rooms or anonymous feedback tools. ● Use visual aids: use visual aids, such as captions, to support participants who may have hearing impairments or who speak languages other than the primary language used in the meeting. ● Address disrespectful behavior: address any disrespectful or discriminatory behavior that may occur during the meeting, such as using offensive language or making derogatory comments. Create a safe space for participants to voice their concerns and ensure that consequences are established for repeat offenders. ● Provide a feedback mechanism: provide a feedback mechanism for participants to share their thoughts and ideas on how to make the meeting space more inclusive and respectful		-safe-spaces-within-your-online-community
	Inappropriate practices reporting Reporting any inappropriate practices and any abusive or harassing behavior is essential to ensure inclusive participation in meetings because it sends a message that such behavior is not acceptable and that		Chaulk, K., & Melody, T. (2020). Preventing Workplace Harassment and Discrimination: Strategies for Employers. Journal of Business and Psychology, 35(3), 307-319.

	individuals will be held accountable for their actions, protecting participants from further harm and ensuring their safety (WHO, 2021). Examples of abusive or harassing behavior may include physical violence, verbal attacks, bullying, cyberbullying, stalking, sexual harassment, discrimination based on race, gender, sexuality, religion, or other factors, and other forms of behavior that cause harm or distress to others. It is important to recognize and address abusive or harassing behavior in order to create safe and respectful environments for everyone. Organizations, institutions, and individuals should take steps to prevent and address such behavior, such as developing and enforcing clear policies and procedures, providing training and education, and offering support and resources for those who experience or witness such behavior. In addition, it ensures that all participants feel respected and valued and sets the tone for a positive meeting culture, where all participants feel safe and supported. Moreover, it provides valuable feedback to meeting organizers, who can then take action to address the behavior and prevent it from happening again in the future.		https://doi.org/10.1007/s10869-019-09631-9 Hershcovis, M. S., & Barling, J. (2010). Towards a Multi-Foci Approach to Workplace Aggression: A Meta-Analytic Review of Outcomes From Different Perpetrators. Journal of Organizational Behavior, 31(1), 24-44. https://doi.org/10.1002/job.623 Katz, J. H. (2016). Preventing Sexual Harassment and Assault: A Guide for Business Leaders. Journal of Business and Psychology, 31(2), 161-170. https://doi.org/10.1007/s10869-015-9419-4 Klenert, A., & Pohlmann, B. (2019). Preventing Abusive Leadership: A Multilevel Meta-Analytic Review. Journal of Business and Psychology, 34(6), 651-669. https://doi.org/10.1007/s10869-019-09562-5 Lipscomb, S. (2017). Preventing Sexual Harassment: A Call to Action. Journal of Nursing Education and Practice, 7(10), 121-127.

			https://doi.org/10.5430/jnep.v7n10p121 Marques-Quinteiro, P., Curral, L., & Passos, A. M. (2020). Prevention of Workplace Bullying: A Review of Organizational Strategies. Journal of Business and Psychology, 35(3), 281-305. https://doi.org/10.1007/s10869-019-09621-x Nielsen, M. B., & Einarsen, S. (2018). Outcomes of Exposure to Workplace Bullying: A Meta-Analytic Review. Work & Stress, 32(2), 107-123. https://doi.org/10.1080/02678373.2017.1423080 Van den Bergh, L., & Vrachimis, K. (2020). Preventing and Tackling Sexual Harassment in the Workplace: A Review and Recommendations for Research and Practice. Journal of Business and Psychology, 35(3), 251-280. https://doi.org/10.1007/s10869-019-09603-z Spiers, H., Swanson, A., Fortson, L., Simmons, B., Trouille, L., Blickhan, S. and Lintott, C. (2019). Everyone counts? Design considerations in online citizen

			science JCOM 18(01), A04. https://doi.org/10.22323/2.18010204
	Safe Environment A safe space in which people can participate, develop and grow, built from a rights-based approach and based on responding to the real needs of the people who participate in it, assuming attention to diversity in all its dimensions. The people involved are aware of their work and commitment to real protection and mutual care. It is effectively prevented, and any real or potential situation that may pose a risk to the physical, psychological, emotional or social integrity of people is detected, notified and acted upon. It is an environment that evaluates and updates the analysis of internal and external risks and designs measures to prevent, eradicate, neutralise and/or reduce them. The effectiveness of the proposed measures must be evaluable (Universidad de Deusto, 2022).	UNESCO (November, 2021) Creating safe digital spaces https://www.unesco.org/en/articles/creating-safe-digital-spaces Panion "Creating Safe Spaces within Your Online Community" https://panion.com/blog/creating-safe-spaces-within-your-online-community	Brown, B., & Benedict, R. (2020). Creating Safe Spaces for Transgender and Gender Diverse Youth: A Guide for Professionals. Journal of LGBT Youth, 17(2), 153-169. https://doi.org/10.1080/19361653.2019.1638558
	Violence Any act which results in physical, sexual or psychological harm or suffering, as well as threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in		

	public or private life. (Universidad de Deusto, 2021).		

6. Conclusion & next steps

The analysis of the work carried out in SOCIO-BEE so far allows us to affirm that there is a predisposition and a favourable attitude towards the reflection and the incorporation of the inclusive perspective in the decisions and actions that will be developed in the project. In this regard, we highly value the decision taken to advance the analysis of inclusivity (initially planned for month 22) to the very early stages of the project.

However, real inclusion will come into play in the subsequent phases of the project, where the testing of the technology will transition to its effective implementation in the field, having a real impact on people. In preparation for these next phases, we propose we propose to continue to apply the tool in each phase of the project to incorporate continuous improvement in terms of inclusivity on it.

In addition, specifically, we make the following recommendations:

1. To promote representativeness of the hive:

- Incorporate new forms of participation for individuals and groups identified so far as "possible excluded" and/or those who may be identified as such in the future.
- Include milestones in the data collection process to alert any imbalances in the representation of individuals and groups, in terms of gender and intersecting axes.
- Incorporate inclusive language, particularly in gender-related matters, in the project's texts and audio/video materials.
- Promote workshops, training, and consultancy on gender-related issues.

2. To promote equal data collection and analysis:

- Add necessary elements to the data collection tools developed by SOCIO-BEE to include the required information for conducting intersectional inclusion analysis.
- Facilitate access to data to the project's pilot agents.
- Establish milestones and access methods for citizen scientists involved in the project to be informed about the obtained data and about the analysis conducted.
- Design channels for citizen scientists to provide feedback on their assessment of the data obtained and the conducted analyses.

3. To promote project accessibility:

- Provide training and organize workshops on accessibility.
- Incorporate non-tech alternatives in the tools and devices used in the project.
- Allow third parties to use the devices on behalf of or to assist vulnerable individuals who are unable to use them.
- Consider the professionals operating drones and the individuals using the devices as representatives of third parties as inclusion agents. Provide them with the necessary information regarding their role in promoting inclusion and offer required training if needed.

4. To promote safe environments:

- Provide guidelines on the safety of the environments.
- Encourage and promote the involvement of pilot project stakeholders as representatives of vulnerable individuals and experts knowledgeable about their situations and needs.

- Clearly establish the exercise of rights and reporting policies for irregularities in project documents, apps, audio, and video materials.

The approach we have adopted to foster inclusiveness in citizen science is based on the reflection and self-analysis of the groups involved in citizen science in one way or another. While it is true that this can sometimes make the tool itself dense and overly theoretical, the lack of knowledge identified reinforces our commitment to maintaining this approach. To this end, the dissemination and adaptation of the tool for the website will be complemented in the following months with the preparation of information pills that will help interested groups/persons to delve deeper into each of the constituent blocks.

The usability of the tool itself presents weaknesses from the point of view of inclusion, derived from the availability of resources to make it functional. In the following months, collaboration with key partners (such as HKU) will be strengthened in order to assess the margin for improvement of the tool.

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