Citizen science FAQs

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What is citizen science?

Citizen science, in general, means the participation of the public in science and research. It is an open and inclusive approach, with key characteristics including: (1) citizens are actively involved in research; and (2) there is a genuine science outcome, such as new scientific knowledge, conservation action or policy change.

The term 'citizen science', however, is broad and always changing, meaning that it is hard to narrowly define. Many different definitions and criteria have emerged over the years – here are some examples:

A description from the European Commission:

"Citizen Science refers to the general public engagement in scientific research activities when citizens actively contribute to science either with their intellectual effort or surrounding knowledge or with their tools and resources."

One of the first definitions from Lewenstein in 2004:

1. the participation of non-scientists in the process of gathering data according to specific scientific protocols and in the process of using and interpreting that data;
2. the engagement of non-scientists in true decision-making on policy issues that have technical or scientific components; and
3. the engagement of research scientists in democratic and policy processes.

You can find a table of different definitions here: Table 1 | What Is Citizen Science? The Challenges of Definition | SpringerLink

The ECSA working group 'Sharing best practice and building capacity' developed the 'Ten Principles of Citizen Science', which are available in thirty-eight languages. Additionally, the citizen science community, including ECSA members, developed the 'Characteristics of citizen science'.

When running your own citizen science initiative, we recommend that you define what citizen science means for the purposes of your project (keeping the 'Ten Principles' in mind), instead of trying to fit into a fixed definition.

Examples of citizen science projects can be found here:

[Projects – European Citizen Science Association (ECSA)](#)

[EU-Citizen.Science :: Projects](#)

What are the benefits of citizen science?

Citizen science helps to make scientific research more democratic, inclusive and accessible. Rather than research projects only being undertaken by academic researchers (perhaps with some citizen participation in the final phases), citizen science strives to involve citizens in many phases of a research project. Citizen science projects also raise awareness on specific relevant topics and issues such as climate change, protecting biodiversity and transforming our urban surroundings.

By involving a broader range of people, citizen science projects benefit from different kinds of knowledge and different sources of information, such as practical and experiential knowledge.

In addition, by involving more people in the scientific process, research can be facilitated on a broader scale and generate far more data. This is essential if we are to tackle some of the biggest societal and environmental challenges that we face, particularly the climate crisis.

As mentioned in the ['10 principles of citizen science',](#) CS projects have a genuine scientific outcome, and both professional scientists and citizen scientists benefit, e.g. from the publication of research, learning opportunities, addressing local and international issues, and influencing policy. Academic researchers and scientific institutes can gain a better understanding of the areas of society they are working with, and citizens can benefit from increased engagement with the scientific process and satisfaction from contributing to scientific evidence.

Read more:

[The benefits of contributing to the citizen science platform iNaturalist as an identifier | PLOS Biology](#)

[EUR Researchers on the Importance and Benefits of Citizen Science & Practical Tips on How to Get Started | Erasmus University Rotterdam](#)

What are some challenges of citizen science?

There are indeed challenges in citizen science, including ensuring data quality, addressing participant diversity, managing project logistics, and maintaining sustained engagement. Nevertheless, several tools and approaches exist to limit or overcome these challenges. These include implementing rigorous data validation and quality control measures, actively promoting diversity and inclusion through outreach and collaboration, streamlining project management with effective tools and workflows, and fostering a sense of community and purpose among participants to sustain their long-term involvement. Despite these hurdles, the potential of citizen science remains significant as it allows for the active engagement of diverse participants, contributes to scientific knowledge, and promotes a sense of community and shared purpose among individuals passionate about contributing to scientific research.

Who is involved in citizen science projects?

Citizen science projects can involve a range of participants, including civil society, public authorities, academia and industry, working together to contribute to scientific research and progress. Citizens from a diverse demographic and geographical range are at the core of citizen science projects and substantially contribute to the research, for example by gathering and evaluating data and formulating hypotheses and research questions. Anybody can join a citizen science project – people passionate about a certain topic, children and families engaging in their communities, researchers and universities looking to broaden their research.

How do you set up a citizen science project?

Whether you are looking to include citizen science in your research or set up a project involving citizen scientists – there are many resources out there to help you get started! Have a look here:

- Guide to Citizen Science
- CitieS Health Citizen Science toolkit
- Citizen science for all – A guide for citizen science practitioners
- EUTOPIA Citizen Science Starter Kit
- ACTION Participatory Science Toolkit

To find even more information on how to set up a citizen science project and resources to support you, visit the eu-citizen.science platform: https://eu-citizen.science/.

Which scientific fields are covered by citizen science and what is the geographical scope of a project?

Citizen science can take place in a diverse array of fields, including ecology, astronomy, biology, medicine, computer science, history, sociology – and many more. Historically, citizen science has been mostly applied within the field of natural sciences, but the scope and application of citizen science is constantly expanding. And citizen science can happen at a range of different scales – from local projects to continental and global scales, and from short projects to those that occur over decades!

Haklay, Mazumdar & Wardlaw, 2018, Citizen Science for Observing and Understanding the Earth, Earth Observation, Open Science, and Innovation

Where can you find resources on citizen science projects?

The eu-citizen.science platform is an online platform for sharing knowledge, tools, training and resources for citizen science – by the community, for the community. There you can find more than 3500 users, more than 250 citizen science projects and over 250 organisations involved in citizen science, more than 200 resources, dozens of training resources and other platforms, among other things.

What is the eu-citizen.science platform and who is it for?

The eu-citizen.science platform serves as a knowledge hub, aiming to share knowledge, know-how, and experience between anyone doing or wanting to do citizen science. It is open to anyone interested in citizen science: practitioners, researchers, educators, communities and citizens, policy makers and funding bodies, decision makers, the press, and society as a whole.

On the platform you will find:

- Projects that are engaging the public in research via citizen science activities
- Resources that are useful for citizen science practitioners
- Training resources and materials on citizen science as a practice
- Training modules on citizen science in a wide range of themes
- Organisations that are involved in citizen science projects and research
- Events calendar
- A blog
- Forum for questions, conversations, and collaboration with the rest of the community

How can citizen science practitioners ensure diversity and inclusion?

Citizen science practitioners can ensure diversity and inclusion by actively engaging with underrepresented communities and individuals, listening to their perspectives, and valuing their contributions. They should promote accessible and inclusive project design, ensuring that participation is open to people of all backgrounds and abilities. Providing training and support for volunteers, including those with varying levels of expertise, can also enhance diversity. Lastly, fostering a welcoming and respectful environment, where diverse voices are acknowledged and appreciated, is crucial for creating an inclusive citizen science community. It is crucial to maintain an open mind and welcome criticism with a positive mindset. Let's remember that making mistakes is part of the job and always an opportunity to learn something new and improve.

Read more about this topic: How can Inclusive Citizen Science Transform the Sustainable Development Agenda? Recommendations for a Wider and More Meaningful Inclusion in the Design of Citizen Science Initiatives – Citizen Science: Theory and Practice (citizenscienceassociation.org)

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ECSA | European Citizen Science Association

Ten principles of citizen science

Citizen science is a flexible concept which can be adapted and applied within diverse situations and disciplines. The statements below were developed by the *'Sharing best practice and building capacity'* working group of the **European Citizen Science Association**, led by the Natural History Museum London with input from many members of the Association, to set out some of the key principles which as a community we believe underlie good practice in citizen science.

1. **Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.**

2. **Citizen science projects have a genuine science outcome.** For example, answering a research question or informing conservation action, management decisions or environmental policy.

3. **Both the professional scientists and the citizen scientists benefit from taking part.** Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.

4. **Citizen scientists may, if they wish, participate in multiple stages of the scientific process.** This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.

5. **Citizen scientists receive feedback from the project.** For example, how their data are being used and what the research, policy or societal outcomes are.

6. **Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for.** However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.

7. **Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format.** Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.

8. **Citizen scientists are acknowledged in project results and publications.**

9. **Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.**

10. **The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.**

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