

Citizen Science in the recommendation for electronic information tools

The European Citizen Science Association,
including:

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Summary

- We welcome the inclusion of citizen science activities in the text of the recommendation



- ECSCA and its members can support the signatories, the secretariat, and CSOs in developing robust, effective, and cooperative citizen science activities within the context of the Aarhus convention



European Citizen Science Association (ECSA)

- Launched in 2013 (during EU Green Week) and established in Germany in 2014



- Vision: “all citizens in Europe are valued and empowered as actors in advancing knowledge and innovation, and thus supporting sustainable development.”
- A network of over 500 practitioners and researchers of citizen science with universities, natural history museums, science centres, and civil society organisations

Developing best practice



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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ECSA's characteristics of citizen science

Introduction

Citizen science is a common name for a wide range of activities and practices. It is possible to understand it by considering the characteristics of those activities and practices, which are described in this document. These are found in different scientific disciplines – from the natural sciences to the social sciences and the humanities – and within each discipline, the interpretation of citizen science can be slightly different. Yet despite these differences, citizen science is an emerging area of research and practice, with evolving standards on which different stakeholders are developing methodologies, theories and techniques. It is, therefore, useful to establish some level of shared understanding, across disciplines and practices, as to what to expect from an activity or a project that is set out to be a citizen science one.

There is little doubt that a project with an open call to a wide range of volunteers to take part in either data collection or data analysis of a clearly defined research hypothesis will be recognised as citizen science. However, this is only one type within a large set of activities, practices and forms of participation, resulting in diverging views about what is – and isn't – citizen science. Because of these differences in disciplinary and cultural contexts, attempting to define a universal set of rules for exclusion or inclusion is difficult, and might even limit the advancement of the field.

Instead, this document attempts to represent a wide range of opinions in an inclusive way, to allow for different types of projects and programmes, where context-specific criteria can be set. The characteristics outlined below are based on views expressed by researchers, practitioners, public officials and the wider public. Our aim is to identify the characteristics that should be considered when setting such criteria (e.g. a funding scheme), and we call upon readers to determine which subset of these characteristics is relevant to their own specific context and aims.

These characteristics build on (and refer to) the [ECSA 10 principles of citizen science](#)¹ ("the 10 principles") as a summary of best practice – and projects are expected to engage meaningfully with them. Where it is especially pertinent, we refer to them in the characteristics below.

The rest of the document covers the characteristics of citizen science under five sections: (1) core concepts; (2) disciplinary aspects; (3) leadership and participation; (4) financial aspects; and (5) data and knowledge. Further explanation and background are provided in the 'ECSA's characteristics of citizen science: explanation notes' document. Note that we use the terms 'scientific research' and 'research' interchangeably – and we explain these terms from the perspective of citizen science practices.

¹ See ECSA (2015) 'Ten principles of citizen science' DOI:10.14274/111.0781787352320



Suggestions – General points

- We recommend keeping the definition of "citizen science" open and not too prescriptive, as a science & society activity that needs to adapt to local cultural and regulatory practices



- Citizen science is part of a wider Open Science movement that is emerging across the world






- We call for caution in the assumption of “open by default” for community generated data, especially for vulnerable communities and with respect to indigenous data sovereignty and environmental campaigners

Suggestions – Introduction



- We suggest recognising the Human Right for Science, following Farida Shaheed (2012), UN Special Rapporteur in the field of cultural rights:
“opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research”

Suggestions – General policy

- **Para 9:** add “and provide data and other forms of evidence” which is generated by the public
-  **Para 11:** ensuring that “best available state-of-the-art technologies” are also “most appropriate” since the former reduces the ability of broader populations to participate in data collection and analysis
-   **Para 16:** explicitly mentioning “such as citizen science data” as a complementary source

Suggestions – General policy

- **Para 18:** Promote the use of citizen science, crowdsourcing, and local and indigenous knowledge through electronic information tools to support the performance of public functions and the provision of public services related to environmental monitoring *to facilitate the rights and ability of the public to submit data and information to inform decision-making in environmental matters, including proposed activities, plans, programmes, policies and legally binding instruments and to promote meaningful environmental contributions and awareness among the public*



Suggestions – Priority types of information & tools and infrastructure

- **Para 22(xiv):** add "citizen science" to crowdsourced by a public authority



- **Para 28(i):** add “participatory mapping, crowdsourcing and citizen science platforms” – these are common enabling tools



- **Para 34:** add “low cost and mobile sensors” – these are important to facilitate wider participation

Suggestions – Engagement of the public

- **Para 40:** Encourage the collection of local knowledge, citizen science and crowdsourced data provided or generated by members of the public through citizen science observatories, **projects**, or other relevant **participatory** initiatives, and promote the interoperability **and integration** of such data **with traditional forms of environmental data** in accordance with best available international standards;
- **Para 41:** Promote and support efforts towards the development of methodologies and mobile applications and tools to support the public in collection and sharing of environmental information;



Annex Definitions

“**Open science initiatives**” encompass activities to make the primary outputs of publicly funded scientific and research results – publications and the research data – publicly accessible in digital format with no or minimal restriction as a means for accelerating research;



“**Citizen science**” means a form of open collaboration in which members of the public participate voluntarily in the scientific process, engineering research or environmental monitoring in various ways;



“**Citizen Science observatories**” refer to are community-based environmental monitoring and information systems, that invite individuals to share observations, typically via mobile phone or the web;

Annex Definitions

“**Participatory mapping**” means the use of a growing toolbox of techniques that can help members of the public record and share spatial knowledge through the use of participatory methods and cartographic representations, often in a digital form;



“**Datathons**” means a collaborative computer-programming for data analysis event, typically lasting several days and involving data scientists, software developers, and members of the public etc.;



“**Hackathon**” means a collaborative computer-programming or open-hardware event, typically lasting several days and involving computer programmers, software developers, hackers, makers etc.;

Suggestions – Annex Definitions

(e) **citizen science data**, which means data collected by members of the public, often in collaboration with or under the direction of professional scientists, *non-governmental organizations* and scientific institutions;



(h) **citizen-generated data** which means data produced through citizen sensing, citizen science and other forms of civic monitoring that share the common denominator that the data collection process is primarily carried out by volunteer individuals actively joining the initiative;

More information

- ECSA blog post on the Aarhus Convention:
<https://eu-citizen.science/blog/2020/10/06/supporting-environmental-democracy-and-aarhus-convention/>
- We suggest a link to the discussion on the human right to the benefits of scientific progress and its applications. Citizen science can be seen as a [manifestation of this and other human rights, as discussed in the context of health citizen science](#) (Berti Suman and Pierce 2020).
- The webinar [“Citizen Sensing: towards a right to contribute to environmental information”](#) explored how citizen science could voice people’s desire and right to contribute to environmental information [when faced with official data gaps](#).
- The [European Commission guidelines and best practices on citizen science for environmental monitoring](#) provide insights and recommendations for governmental authorities, citizen science communities and associations, and other stakeholders that are relevant to the Aarhus Convention.



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