2. Citizen Science

One of 13 infosheets on stakeholder and citizen engagement methods for climate, energy and mobility transitions produced by SSH CENTRE in 2023.

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Citizen Science (CS) is an engagement method where citizens participate voluntarily in scientific processes as researchers or data collectors. CS entails addressing real-world problems, e.g. local pollution or climate change, with citizens scientists helping to develop research questions, conduct experiments, collect and analyse data or interpret results. CS often involves crowdsourcing voluntary assistance from a large group of individuals for online, distributed problem solving.

CITIZEN SCIENCE AT-A-GLANCE

- **Provides rich datasets, inclusive, can raise awareness, makes research accessible.**
- **Requires digital platforms and medium-to-long term funding.**

Benefits

1. Can massively increase the data available for monitoring and decision-making at (potentially) low cost.
2. Supports citizen inclusion, with CS participants able to have greater influence in decision-making.
3. Creates platforms for engagement where citizen scientists learn about open research questions and solutions.
4. Democratises research through the sharing of information between researchers and non-researchers.

Challenges and limitations

1. **Organisation:** lack of volunteer interest, participant drop-out, maintaining funding over an extended period.
2. **Data collection:** fragmentation or inaccuracy, inconsistent participant approaches. This can lead to mistrust in the credibility and comparability of CS data. Need to ensure robust legal protection of personal data.
3. **Data use:** lack of uptake of CS data due to collection concerns or availability restrictions. Some scientific journals pose restrictions on the use of volunteer-collected data.

Participants

CS initiatives are often open to everyone, regardless of age, profession, background, and skill. Whilst they may be more likely to attract volunteers who are already interested in the subject, they can also be used to engage new groups, for example by targeting design for school classes. They typically seek the largest possible number of volunteers. Digital platforms enable CS to be organised around issues which are geographically spread.

STEPS

01 SCOPE

Define priorities and identify relevant stakeholders who can take part in defining the scope of the project and help organise it. Plan volunteer recruitment and decide whether volunteers will work in groups or individually. Make plans for securing funding throughout the project period and what you aim to accomplish.

02 BUILD PLATFORM

Establish robust procedures for data collection, standardisation, sharing, analysis and communication. Participants should also be informed about how their contributions will be used. Get legal advice on privacy.

03 LAUNCH AND BUILD COMMUNITY

Be sensitive towards the needs of the community of volunteers and have a plan for how continued participation can be nurtured.

04 SUSTAIN

Focus on measures to keep participants onboard, secure funding and evaluate progress. Think about strategies for preserving data and making them available for future use.

Timeframe: *CS initiatives require substantial planning which make them more suited for mid-term to long-term (e.g. 5+ year) projects*

OUTCOMES AND IMPACT

CS produces large datasets; examples of data include photos and geo-tag registrations of climate impacts or plastic waste at beaches. Both qualitative and quantitative data can be collected, but CS methods are most beneficial when data collection is labour-intensive or involves field-based activities over extensive spatial and temporal scales. Results from CS initiatives can generate knowledge used to inform decision-making on local, national and global level levels and push scientific progress, while also involving the public in sustainability issues.

RESOURCES NEEDED

Specific equipment needs will be based on CS topic but generally include a robust technical and organisational infrastructure for data collection, data storage, data processing and data analysis. In addition, CS initiatives will often demand scientific skills related to data collection, data management, analysis and communication; training of volunteers; knowledge of digital platform use.

ONLINE/ OFFLINE

CS often involves participants collecting or registering physical evidence. Digital platforms for registration and categorisation of material are highly beneficial.

LEARN MORE +

https://www.ecsa.ngo/ecsa-guidelines-and-policies/#documents – The European Citizen Science Association has produced 10 principles of citizen science

https://scistarter.org/citizen-science - database collecting CS initiatives from around the world

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REAL LIFE EXAMPLE: ISeeChange

www.iseechange.org is generating a community record of climate change and local pollution by combining observations and photos from citizens with cross-referenced real-time data on weather conditions. The project operates on a global scale, demonstrating the potential for CS projects to address problems that are geographically dispersed.

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