

Understanding Motivations for Citizen Science

Motivations, meaning and the use of citizen science

Citizen science delivers environmental data, forms the basis of scientific research and policy, and is an enjoyable activity. To ensure projects provide benefits to science and society, our research asked why citizen scientists, environmental volunteers (potential participants) and stakeholders from science, policy, and practice participate in citizen science. Understanding their motivations is vital in order to recruit volunteers, maintain involvement, maximise data quality, and ensure institutional buy in. This summary presents results from our social science project, revealing the use of the term citizen science, the motivations of participants, potential solutions to motivational challenges, and the importance of accommodating motivations through evaluation.

The definition of citizen science is changing. Stakeholders accepted its popular meaning as data collection by citizens for use by scientists and extended it to suggest that citizens must also benefit from participation. Many stakeholders involved in running projects and using data self-identified as 'citizen scientists', e.g. recording species in their leisure time. Such distinctions between amateur and professional expertise were broken down further by the varied use of the term to brand projects and activities. Most projects remain contributory, but collaborative and co-designed projects are gaining followers.

This document is of relevance to stakeholders already using or considering citizen science, and can be read alongside a full report on the research findings.¹

¹ Geoghegan, H., Dyke, A., Pateman, R., West, S. & Everett, G. (2016) *Understanding motivations for citizen science. Final report on behalf of UKEOF, University of Reading, Stockholm Environment Institute (University of York) and University of the West of England.*



Motivations: citizen scientists, environmental volunteers and stakeholders

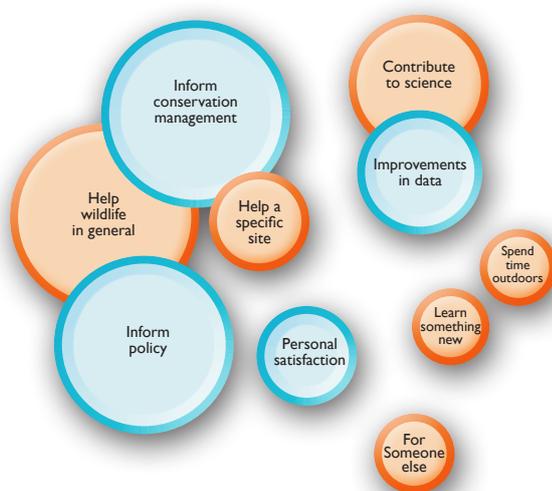
Motivations can be inherently satisfying or lead to some other outcome. They must be understood in order to successfully recruit participants, sustain participation, and enhance output quality. Our study revealed 'to help wildlife in general' and 'to contribute to scientific knowledge' as primary motivations for both citizen scientists and environmental volunteers. We also identified dispositional factors such as enthusiasm, enjoyment, and skills development as important motivators, and organisational factors relating to feedback and good project management as vital to maintaining participation. Over time, motivations largely remained the same, but participants were encouraged to undertake more active roles, such as leading projects and testing protocols. The shared motivations between citizen scientists and environmental volunteers suggest that citizen science projects may also appeal to many environmental volunteers.

Scientists' motivations are well documented in the literature, relating to informing science, policy, conservation and land management, as well as raising awareness and engagement. Policy and practice stakeholders held additional motivations around science, as well as public engagement, publicity and education. A new category of individual stakeholder motivation emerged around 'personal satisfaction', which included enjoying their work, enabling equity for participants and generating impact for others' lives. Stakeholders also identified positive changes in institutional motivations for citizen science, specifically technological innovations, the potential for public engagement and media coverage, and the ability to undertake more sophisticated monitoring and surveillance activities.

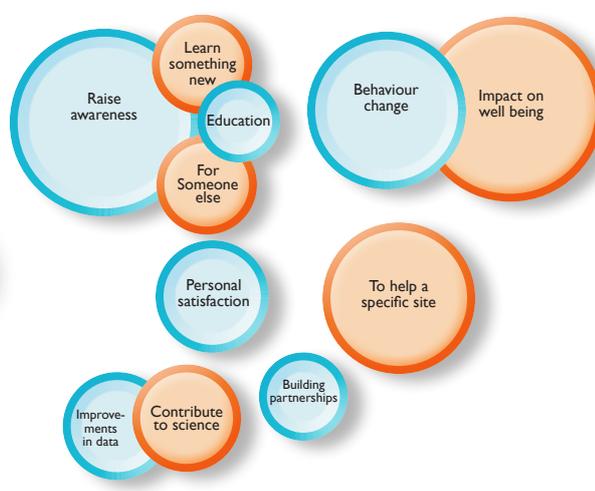
The importance of aligning citizen scientist and project motivations

When key motivations of participants and stakeholders are aligned, a project is more likely to meet its objectives. Some motivations may not be matched, but need to be sufficiently recognised and satisfied in the design and conduct of the project to make it appealing to the participant and to meet the stakeholder's needs. Scenarios A and B present typical types of project and show how participants' and project initiators' motivations can be aligned.

Scenario A



Scenario B



Scenario A, a typical recording project, with **scientists involved in monitoring** and **participants involved in recording**. The size of the bubble represents the importance of the motivation.

Scenario B, a project where the participant has an immediate interest in the data, with **scientists involved in education** and **participants with an interest in the impact of the data** on a particular site or on wellbeing. The size of the bubble represents the importance of the motivation.

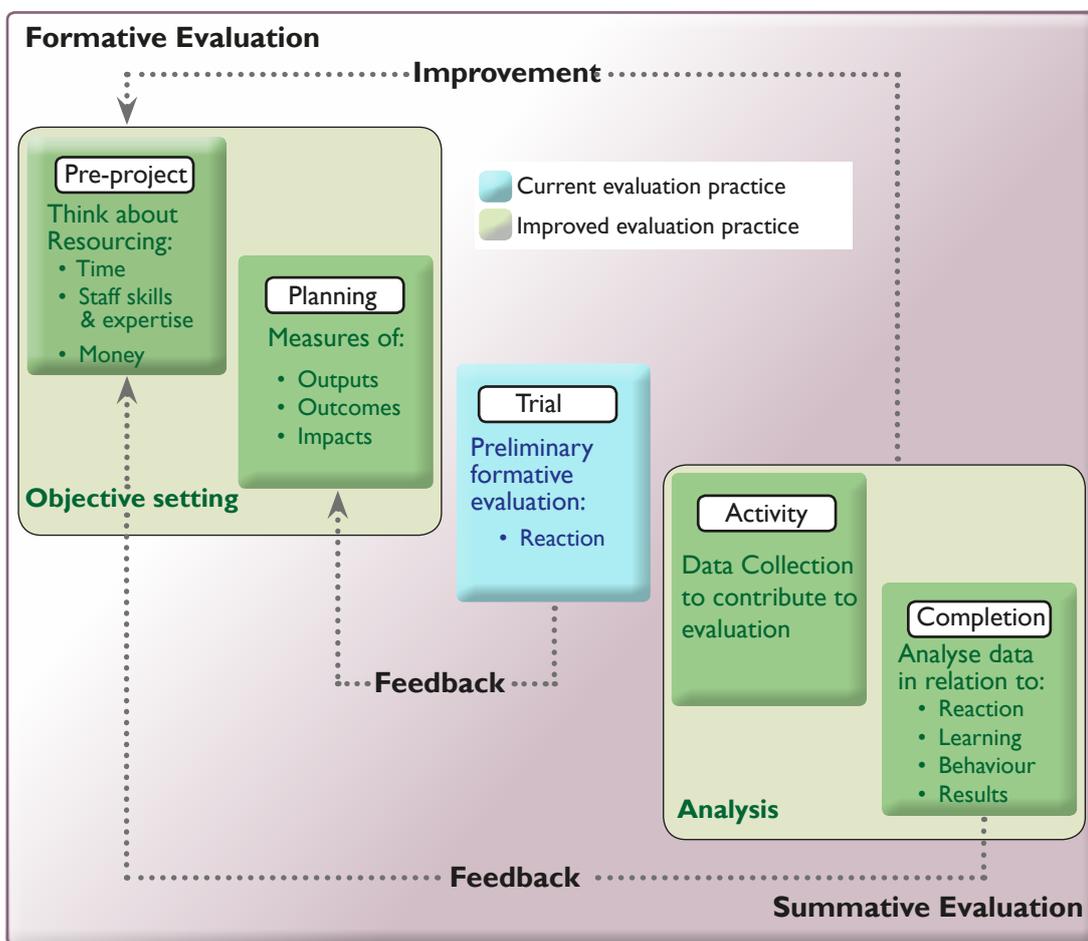
However, different motivations need to be met depending on whether the project is contributory, collaborative or co-designed.

Challenges to citizen scientist and stakeholder motivations and potential solutions

Recognition of participant motivations by stakeholders is vital, so too are effective feedback and communication with participants, allowing them to feel that they are making a contribution. Successful feedback must be immediate, specific and interpretable. Whilst environmental volunteers might be encouraged to undertake citizen science, barriers include being over-committed and age. Our research identified challenges facing stakeholders. Lack of resources was a common barrier across all communities. Data quality and biases were concerns for science and policy, whereas barriers for practitioners included survey design and access to technology. Stakeholders frequently find solutions to issues, e.g. statistical techniques to overcome data problems and raising the profile of citizen science within institutions.

Incorporating evaluation into project design

Evaluation is key to understanding and accommodating the motivations of citizen scientists. Our research revealed stakeholders recognise the importance of evaluation, but tend to encounter barriers due to insufficient resourcing and lack of experience, resulting in a superficial evaluation of participant reactions. The figure below illustrates our method for researching and accommodating motivations at all stages of a project.



Some directions for future research on motivations

- Motivations are deep held and change over time. A longitudinal ethnographic study of citizen science participants is required to capture the long-term impact of citizen science.
- Citizen science is taking an increasingly participatory turn. We need a greater focus on the motivations of participants in projects that have been co-designed.
- Motivations differ between cultural groupings. We need to understand the motivations for citizen science in biodiversity rich areas that are threatened by environmental change.
- Evaluation is integral to successful projects, but is poorly understood. Stakeholders require training to implement evaluation and accommodate participant motivations.

ACKNOWLEDGEMENTS

We would like to thank the UK Environmental Observation Framework (UKEOF) for funding and supporting this project, in particular the UKEOF Management Team, Citizen Science Working Group and the Steering Group for this project. This report would not have been possible without the contributions of our anonymous survey respondents, and the generosity of our stakeholder interviewees. We want to thank you for your time and opinions. Finally, we would like to thank Erik Willis, Sarah Halliday, Natalie Clark, Jake Morris, Paul Griffiths and Patrick Bell for their involvement.



UKEOF PARTNERS

UKEOF works to improve coordination of the observational evidence needed to understand and manage the changing natural environment. It is a partnership of public sector organisations with an interest in using and providing evidence from environmental observations. Contact us at office@ukeof.org.uk

Department for the Environment, Food and Rural Affairs, Department of Energy and Climate Change, Economic and Social Research Council, Environment Agency, Forestry Commission, Joint Nature Conservation Committee, Met Office, Natural England, Natural Environment Research Council, Natural Resources Wales, Northern Ireland Environment Agency, Scottish Environment Protection Agency, Scottish Natural Heritage, The Scottish Government, UK Space Agency, Welsh Research Environment Hub, Welsh Government.



Our institutions

The Department of Geography & Environmental Science at the University of Reading is home to the Human Geography Research Cluster with research interests in caring societies and participation. The University of Reading is ranked as one of the UK's 20 most research-intensive universities and is in the top 1% of universities in the world. It enjoys a world-class reputation for teaching, research and enterprise.



The Stockholm Environment Institute (SEI) is an international non-profit research organization that has worked with environment and development issues from local to global policy levels for a quarter of a century. SEI works to shift policy and practice towards sustainability. The SEI York centre is a self-funded, multi-disciplinary research unit in the Environment Department at the University of York.



The Centre for Floods, Communities and Resilience (CFCR) is an interdisciplinary centre of excellence within the University of the West of England, Bristol. The Centre focuses on promoting resilient futures in the context of a changing climate, delivered through an integrated portfolio of world class research, knowledge exchange and co-production, science communication, community engagement and training for decision makers at all levels. The Centre works with a wide variety of key partners including communities, policy makers, expert practitioners, academics, learned institutions and research councils, building on its extensive networks throughout the UK and internationally.

www.ukeof.org.uk

 @UKEnvObs

This guide can be freely distributed in its original form for non-commercial purposes. Please feel free to forward it to anyone you think will be interested. All content is copyrighted and no images or sections of text can be extracted elsewhere without first obtaining permission from UKEOF.