



Citizen Science in UK Environmental Policy

Executive Summary

Citizen science, or the participation of the general public in scientific projects, has gained increasing attention over the past decade. The practice of environmental citizen science, in which volunteers are involved in monitoring biodiversity and developing knowledge about local flora and fauna, or providing evidence on pollution incidents or other environmental nuisances such as noise, can contribute to many aspects of the environmental policy cycle. Environmental management and research stands out as an area in which citizen science has been accepted and used extensively. However, the rapid evolution in technologies, societal response, and projects, offer significant opportunities for citizen science to further contribute to UK environmental policy.

This research insight draws on the discussions of a policy roundtable in May 2018 on the current state, and future directions, of citizen science in environmental policy in the UK. The findings suggest that citizen science needs to have proper infrastructure and support to play a role in policy. The integration of citizen science and policymaking should be seen as an iterative process of ongoing engagement.

Introduction

The United Kingdom has a long history of innovation and excellence in citizen science. Historically, William Whewell's tide observations and modelling in the 1830s is one of the earliest parallels of what we call today citizen science. The UK has benefited from the continued participation of volunteers across the country in weather observations, providing vital information for over 150 years. Another example is the Biological Records Centre (BRC), which from 55 years has been working extensively with volunteering societies and organisations to record nature observation¹. BRC is recognised internationally as a centre of excellence in working with volunteers, and data management for research and policy. These examples demonstrate

evidence of an ongoing ability to run and manage large-scale citizen science projects, which, through the role of intermediaries - such as universities and Non-Governmental Organisations (NGOs) - can influence the different stages of policymaking.

Despite this long-standing ability, there is a certain level of reluctance to support citizen science through dedicated policy guidance and incentive mechanisms. In some cases, this lack of support may be linked to concerns around the quality of the data produced in citizen science. In other cases, lack of support may have come from a lack of standardised frameworks for working with citizens. Furthermore, there is a variety of emerging funding support for citizen science activities in other countries which is not mirrored in the UK. As technologies, societal response, and type of projects in citizen science, continue to evolve rapidly, a "business as usual" approach is unlikely to maximise the potential that citizen science can offer in the UK.

Background

To address this challenge, University College London (UCL) organised a policy roundtable in early May 2018 to discuss the current state, and future directions, of citizen science in environmental policy in the UK. The roundtable was organised with support from UCL Public Policy, the EU-Funded Horizon 2020 project "Doing It Together Science" (DITOS) coordinated by UCL, and the UK Natural and Environment Research Council (NERC) funded OPENER project. The roundtable engaged with national and international stakeholders working across environmental policy and citizen science. It aimed for a broad coverage, extending beyond the "usual suspects" - those that are already involved in the field of citizen science and are familiar with it. The aim was to follow a recruitment strategy that would provide representatives from different organisations at different scales of operation (local, national, and international) with different insights into environmental policy and citizen science. The event was coordinated in collaboration with DITOS project partner Tekiu Ltd., a small enterprise specialising in knowledge transfer for research and development, and policy exchange.

Definition: Environmental Citizen Science

The practice of environmental citizen science, in which volunteers are involved in monitoring biodiversity and developing knowledge about local flora and fauna, or providing evidence on pollution incidents or other environmental nuisances such as noise, can contribute to many aspects of the environmental policy cycle.

Mapping stakeholder relationships

A preliminary mapping of stakeholder relationships was carried out by the project team to map the stakeholders contributing to the ecosystem of environmental citizen science and policy within the UK and international contexts (Figure 1). The aim of the mapping was to consider conceptually the links between different actors and bodies within the network of organisations that facilitate environmental citizen science activities.

The role of the organisations and their links between them can vary widely - in some cases, the link is mostly focused on the transfer of information. In other cases, the main relationship will be one of providing funding (e.g. between research funders and the BRC); and in other cases the linkage is one of control and provision of guidance on how to implement and run projects. Some links are indirect and can include several organisations. The aim of the roundtable was to explain the current state of policy support to environmental citizen science and produce a set of recommendations for better integration of citizen science in the field of environmental science.

Roundtable Topics:

Data: data standards, data uses and data infrastructures that support citizen science activities, including sharing information created through citizen science activities.

Environmental Policy: the different actors involved in monitoring and managing environmental resources, including different levels of governance, from local to international levels, as well as issue-focused organisations and supranational agreements.

Science and Innovation: the organisations, activities, initiatives and incentives that relate to developing new scientific knowledge, including the development of new technologies and their applications (e.g. sensors, satellites).

Public Engagement and Behavioural Change: the activities and interactions between institutions, charitable organisations and members of the public in relation to the environment.

Key points of the discussion

Flows of power are seen to be very top-down: In the current context of environmental monitoring citizen science in policy, policymakers are perceived to determine what is relevant, rather than citizen science being used as an empowerment method to demand changes in policy and re-prioritise public resourcing based on citizens' values.

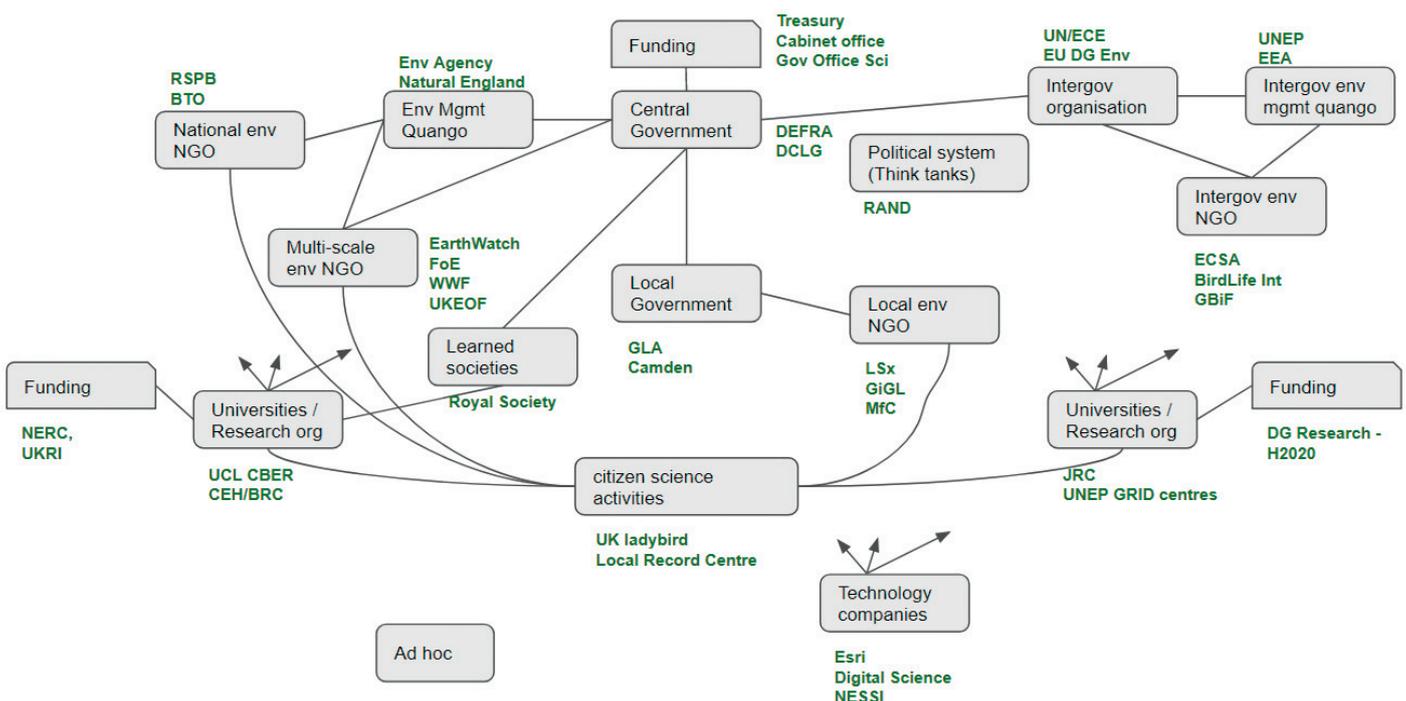


Figure 1. Preliminary stakeholder mapping

Citizen science lacks a clear mandate: none of the public bodies concerned with environmental policy have a mandate to engage with citizen science in a structured way (in comparison to the US citizen science and Crowdsourcing act). There are technical and organisational challenges which can be off-putting.

Data collection and policymaking is disconnected: there is a need to address the disconnect between data collectors and local observers on the one hand, and the information that is required by policymakers, on the other. The integration of citizen science and policymaking is not a linear process but should be iterative, with learning and adjustments on all sides.

The following three themes were selected for further reflection, as these were central in the discussions across the tables:

Open Data:

- 1. Barriers to data:** Data is often framed in terms of quality. However, issues around data flows, ownership, interpretation, and technology that are relevant here, received less attention. The discussion about data and open data was more detailed, noting its complexity and the barriers to implementing open data.
- 2. What data:** There is a mismatch between the data citizens value, or collect, and policy relevant data. In addition, there is a struggle from regulators and policymakers to understand the value of qualitative data.
- 3. International open data:** The push towards open data internationally is a current disruptor. For example, there is pressure on the National Biodiversity Network (NBN) to fit into the Global Biodiversity Information Facility (GBIF) data sharing practices, and to do open science and manage open data. But what are standards that fit into current practices and operations within the wide range of organisations that work with the NBN? How to use the data to make decisions with it?
- 4. Data ownership:** There is a perceived friction between having funding to do data management, and the push from government to make all data open. It can be seen as a clash of purposes since whilst data is a resource, much of it is locked in silos and people do not necessarily want to share their 'oil'. There are also many risks entailed in releasing the data without due considerations.

Responsible Agents:

- 1. Brokering:** New responsible agents are required to mediate, broker and communicate the importance of environmental monitoring citizen science in policy. Such agents were envisaged as consultants or think tanks or NGOs who would manage relationships, influence, build skills, knowledge, shared language and communication around citizen science in policy. This is particularly true in terms of the roles of technology, data and the private sector. Such brokers could drive change and could act as a central hub and facilitator. The question of where agents would be located was also raised. Would they be within each organisation or within a specifically dedicated organisation or hub? How would 'responsible agents' interact and work with existing organisations in the environmental policy landscape?
- 2. The role of NGOs:** Citizen science includes a multitude of 'little players' who are all active in promoting public engagement in environmental monitoring. NGOs were presented as a good candidate for the role of responsible agents. These could be localised and small NGOs, national or international NGOs, and even quasi-NGOs - arms-length organisations that are part of central government. However, the presentation of the role of NGOs differed between tables - for example, some perceived the conflicts between NGOs. Others presented NGOs in a more favourable light, as "trusted" and potential "honest brokers" to mediate between government and citizens. The question of whether the role of NGOs was something specific to the UK was also raised.
- 3. Connection to different policy levels:** NGOs were perceived as both enablers and barriers to progress. NGOs are well suited to unlocking the potential use of citizen science in environmental monitoring policy and making connections. However, they lack the resources and connections to different levels of policymaking.
- 4. Disruption:** There is the potential for disruption in citizen science because NGOs have to adapt to these new practices, roles of participants, and technologies.
- 5. Language barriers:** There is a significant language barrier between citizens, academics and policymakers. Science communication workshops are needed, in addition to 'translators' (knowledge brokers and data centres) to break down the language barriers between different groups.

Scales of Engagement:

- 1. Environmental citizen science is currently piecemeal:** Some environmental citizen science areas are already on the agenda for policymakers and regulators while others have far to go. There is inconsistency and piecemeal success across the range of topics within environmental citizen science. If citizen science funding exists at a national level but a project operates on a very local level, there may be a mismatch, or vice versa.
- 2. Citizen science involves multiple stakeholders at multiple levels:** Citizen science projects are useful multi-actor mechanisms that can help bring together different stakeholders within the Science and Innovation citizen science ecosystem, and link higher-level organisations and citizens. The scales at which citizen science occurs are determined by existing social or governance frameworks (e.g. community centres and/or local authority vs national funding). Citizen science is located in-between categories and levels of governance. This inherent interdisciplinarity is a challenge in the traditionally hierarchical Science and Innovation structures.
- 3. Citizen science can enhance the work of NGOs:** NGOs operate at different levels which do not easily map onto the policy or Science and Innovation infrastructures. NGOs can mobilise public opinion to, for example, put pressure on government. There is a potential new role for NGOs in terms of liaising from the bottom up. However, there is a considerable difference in the size and scope of NGOs and a threat of territoriality about them.
- 4. Different geographical scales of engagement:** There are different geographical scales of engagement in citizen science projects (local, international and global). Policymakers and scientists need to be connected to the situation, both locally and nationally.

References

- Roy, D., Harding, P., Preston, C. and Roy, H. (eds.) (2014). Celebrating 50 years of the Biological Records Centre. Centre for Ecology & Hydrology.

Recommendations for policymakers

- 1. Policymakers, and civil servants who work as intermediaries, should be involved in the design of citizen science projects** so they can understand how they operate, and improve trust in citizen science outputs. The role of such intermediaries could help to ensure that projects are producing policy relevant outputs and outcomes; and to address the disconnect between data collectors and analysts and policymakers.
- 2. Government policy should take account of citizen science on an ongoing basis.** The integration of citizen science and policymaking should be acknowledged as an iterative process of ongoing engagement. Citizen science projects evolve in relation to policy needs, but government strategy should also be informed by the findings from the citizen science.
- 3. The communication between policymakers and citizen science groups could be improved,** so as to share research interests. A primary way in which to do so could be to make the Areas of Research Interest (ARIs) more visible through effective and clear communication, and to establish citizen science networks of action for the ARIs.
- 4. Pilot projects and follow-on funding for citizen science should be made available by policymakers to incentivise action research and citizen science approaches.** An example of a successful scheme that could be replicated or expanded upon is the government's Science and Society Community Challenge Fund.
- 5. Policymakers need to provide proper infrastructure and support for citizen science to play a role in policy.** Citizen science projects can only exist at the level of where there is funding.

How to Cite

DITOS Consortium (2019) Citizen Science in UK Environmental Policy. DITOS Policy Brief 7.

Colophon

This policy brief was facilitated by the lead authors at UCL. While this was carried out as part of the H2020 'Doing It Together Science' (DITOS) Coordination and Support Action project, the views expressed in it do not reflect the consensus opinion of DITOS partners.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 709443. Additional support was provided by UCL and NERC.