Coastal ecosystem monitoring (Talytrus project, MNHM). Photo: Matteo Franchi

Towards a Shared National Strategy: Guidelines for the Development of Citizen Science in Italy

Summary

Citizen science is the active engagement of citizens in the collection, analysis and interpretation of data for scientific purposes. Due to its multisectorial nature, it can play a role at a social, scientific, educational and political level, contributing to raising awareness and leading to the adoption of more sustainable behaviours. As is happening in many countries across Europe, it is becoming increasingly important to transpose the principles of citizen science into local and national policies. It is also important to provide tools and guidelines that support citizens' participation to the fullest possible extent. This document summarises the main actions needed to promote the development of citizen science in Italy. It is written for Ministries, public authorities and administrations, and aims to provide guidelines and recommendations for a structural recognition of citizen science, both through its adoption in existing legislative and planning instruments, and through specific strategies. It is the output of a participatory process developed under the auspices of the National Academy of Sciences, within the framework of the Horizon 2020 programme 'Doing It Together Science' (DITOs) and coordinated by the European Citizen Science Association (ECSA) and the Maremma Natural History Museum. The process involved over 50 experts from universities, research centres, scientific museums, associations and Italian public bodies with various levels of experience in the field of citizen science. It aims to consolidate the national network of citizen science in Italy and to promote collaboration with the public administrations. Because of its process and the results achieved, this experience could be a useful reference for similar actions in other countries.

International recognition of citizen science

Citizen Science programmes include a wide variety of activities from almost all scientific disciplines, with different levels of participation by citizens.[1] Between 2013 and 2014, international associations were established in the USA (Citizen Science Association, CSA), in Europe (ECSA) and in Australia (Australian Citizen Science Association, ACSA). They promote networking, the inclusion of decision-makers and political actors in the citizen science process, as well as the exchange of good practices. ECSA, in particular, defined some key concepts that underpin citizen science, which were subsequently shared internationally and translated into 26 languages.[2] National coordination networks for citizen science have also been established in some European countries. In 2014, the online platform Österreich forscht[3] was created by volunteers in Austria, and is hosted at BOKU University in Vienna. Another platform, Zentrum für Citizen Science,[4] was launched by the Ministry of Education, Science and Research in Austria to act as an information and support centre. In Germany, a Green Paper for the 'Citizen Science Strategy 2020 for Germany'[6] was published in 2016, within the framework of the GEWISS[5] programme, and under the auspices of the German Federal Ministry of Education and Research. Based on its recommendations, the German Ministry of Education and Research developed an ad hoc funding line for citizen science. The European Commission also recognizes the importance of involving societies in scientific research. It has created two funding lines aimed at promoting citizen science under the umbrella of the Horizon 2020 programme, within the *Science With and For Society* programmes (SwafS 15 and 17 calls)[7]. Other European financial tools, such as LIFE and COST Actions, contribute to the support of several other projects. An important example of financial support at the national level is the USA's Federal Crowd-sourcing & Citizen Science Act[8] , which was transformed into law as part of the American Innovation and Competitiveness Act of January 2017. This law states that crowdsourcing and citizen science can generate several advantages for both the government and for citizens. To support citizen science further, the Administration of the Government of the United States launched CitizenScience.gov,[9] a platform that gathers all projects funded at the federal level and promotes its toolkit for citizen science.

Regulatory frameworks for citizen science

Citizen science has had a regulatory foundation in Europe since 1998, through the Aarhus Convention that inspired two European Directives: 2003/4/EC and 2003/35/EC. These directives include provisions for public participation in decision-making processes on environmental issues, which are also present in a series of official documents, such as the 2001/42/EC Directive on the assessment of programmes and actions for the environment, and the 2000/60/EC Directive to establish a community action in the framework of water bodies (the Water Framework Directive). The 2007/2/EC INSPIRE Directive, aims to homogenize environmental georeferenced information so that it is easier to share data and make them accessible to everyone. This is an interesting prerequisite for the integration of data from citizen science projects. The International Convention on Biological Diversity (CBD, 1992), implemented at a national level through the national Strategy on Biodiversity, considers citizens' education and participation as essential tools. The 2030 Agenda for sustainable development,[10] adopted by the General Assembly of the United Nations in 2015, identifies 17 Sustainable Development Goals (SDGs) to be reached by 2030. Several of the SDGs can be fully achieved through the active inclusion and participation of citizens, as shown by the recent inventory of citizen science projects that support environmental policies in the European Union.[11] Meeting the SDGs will be increasingly important for European and national instruments in the field of post-2020 biodiversity and sustainable development, as well as in the context of future planning for the 2020-27 funding period (e.g. CAP, LIFE, structural funds, etc.). To meet goals such as SDG 6 (related to clean water and sanitation) and SDG 15 (life on land), it will be important to consider a national coordination centre to collate the experience acquired and the methodologies adopted by existing citizen science projects, and to provide guidelines for developing projects that can bridge the gaps between data collection.

Monitoring freshwater quality - Freshwater Watch project.
Photo: Francesco Di Grazia

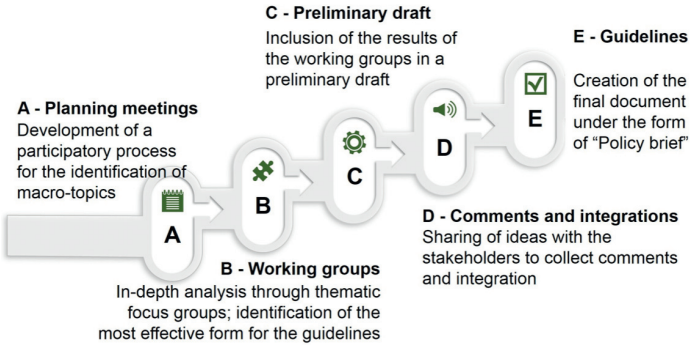
Citizen science in Italy

In recent years, citizen science has become increasingly important in the Italian scientific framework. A survey carried out in 2015[12] analysed several aspects of citizen science, such as the nature of citizens' participation, citizens' motivations and the main instruments used. This survey found that, since 2005, there had been an exponential growth in the number of citizen science projects (85% were developed over the last 10-year period), the majority of which focused on biodiversity. However, other activities also emerged that addressed a wider spectrum of disciplines, such as seismology, air quality and hydrogeological risks and epidemiology. Citizen science initiatives were mainly implemented with the support of European or ministerial funding; however, 22% of projects received no funding at all. Citizen science initiatives in Italy and abroad, are also effective means to spread scientific competencies and educational processes.

Maremma Natural History Museum BioBlitz, 2018.
Photo: Matteo Franchi

Participatory development of guidelines for citizen science in Italy

The inaugural Italian Conference on Citizen Science, held in 2017 in Rome and organized by the National Academy of Sciences,[13] was the first meeting of citizen science experts at a national level in Italy. Subsequently, the DITOs project, with its policy engagement strategy for Responsible Research and Innovation (RRI), enabled the organization of a series of round tables with the goal of identifying guidelines for the development of an Italian strategy for citizen science.[14] These meetings helped to consolidate the network of professionals working in the field of citizen science in Italy, and involved over 50 actors coming from universities, research centres, scientific museums, associations and public bodies. The network developed competencies in multidisciplinary research fields and paved the way to collaborate with the public administration and professionals at national and international levels.



Participatory process adopted to produce the guidelines for developing Citizen Science in Italy.

Objectives for the development of citizen science in Italy

It is desirable to spread citizen science in Italy by integrating it into existing planning tools and through the development of a national strategy. These activites share the following goals:

I. Increase the engagement of citizens in citizen science activities
II. Enhance the engagement of the national scientific community in participatory processes
III. Optimize scientific data collection and provide new opportunities for research, thus improving the cost-benefit ratio
IV. Raise awareness among citizens and educate them on the issues of environmental sustainability and knowledge-sharing
V. Create mutual trust between citizens and research institutions

Guidelines for developing citizen science in Italy

We suggest the following actions to develop citizen science in Italy, divided into macro topics.

Engage key citizen science actors

Citizen science promotes a new approach to research that considers inclusive processes and a sense of citizenship. To spread citizen science and this approach, it is essential to develop ad hoc engagement strategies that reach out to multiple sectors of society, thus overcoming potential barriers represented by different education levels.

Actions:

1. Promote networking activities between national and international projects, as well as the exchange of experience (e.g. FabLabs, NGOs)
2. Implement tools aimed at understanding participants' motivations, as well as possible barriers or limiting factors
3. Develop tools aimed at raising citizens' knowledge and awareness (e.g. training courses for prospective participants, field trips, scientific presentations and festivals)

Integrate citizen science into strategic and economic planning tools

This is crucial to improve the interface between politics, science and society. In other countries over recent years, targeted tools and funding have been implemented. Similar measures in Italy would be desirable and are likely to be effective.

Actions:

1. Include citizen science in the partnership agreement for future national and regional plans for economic community programmes 2021-27
2. Develop projects within budget lines at a European, national and regional level; this can help people to undertake citizen science activities and support the coordination of the national network
3. Involve private businesses in forms of compensation (i.e. green actions) and/or crowdfunding

Develop effective, reliable and accessible methods

Data collected through citizen science projects should be validated and verified before being used by researchers, citizens and decision-makers. The quality of data coming from citizen science activities can be kept high by designing specific tools and procedures.

Actions:

1. Implement standardized inclusiveness-oriented methods
2. Integrate topics related to Responsible Research and Innovation
3. Establish criteria for data policy and quality control to integrate citizen science data with those collected by professionals

Communication

Communication is a crucial element, especially when the activities carried out involve citizens. Not only does it raise citizens' and stakeholders' awareness about the use and effectiveness of citizen science, it also motivates continuous participation over the long term and the involvement of all key stakeholders.

Actions:

1. Promote citizen science values and principles through institutional communication
2. Ensure that the results obtained through projects are made public, and that citizens are kept informed through effective feedback
3. Ensure the projects have adequate visibility, including through the development of a national web platform for citizen science

Final recommendations

To achieve structural recognition of citizen science within scientific research processes at a national and regional level, we recommend the following:

- Integrate citizen science into national and regional strategic and economic planning tools
- Devise citizen science strategies for different application areas (e.g. environmental protection, sustainable development, education systems, public health)
- Adopt a participatory process when undertaking the actions described in the previous two points, based on values of inclusiveness and recognition of existing best practice
- Create national funding opportunities aimed at strengthening and supporting citizen science over time, as well as building capacity and developing infrastructures in line with what is happening in other international contexts.

One of the DITOs Round Tables, April 2018.
Photo: Aleksandra Berditchevskaia

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All the web resources were accessed in February 2019..

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Colophon

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