

► Project *brief*

Thünen Institute of Biodiversity

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Citizen Science in applied biodiversity research in agricultural landscapes: Potentials and Recommendations

Anett Richter¹

- **Citizen Science has so far been little embedded in agricultural research, but it is gaining increasing importance.**
- **In biodiversity research, the Citizen Science method plays an important role in the recording and evaluation of biological diversity.**
- **In order to utilize the numerous potentials of Citizen Science in agricultural research, joint efforts from research, policy, and society are necessary. For the establishment of the approach, various competencies are necessary among researchers and co-researchers in order to be successfully mainstreamed.**

Background and aims

In October 2019, the Citizen Science working group was established at the Thünen Institute for Biodiversity. With this establishment, the aim was to develop and explore Citizen Science in agricultural research and specifically in biodiversity research. Citizen Science was understood as an approach to generate new knowledge about biodiversity and to support transformative processes with and for stakeholders in these systems. The accompanying research about Citizen Science applied methods from the natural and social sciences.

The main objectives of the project were:

- Establishment of Citizen Science in the MonViA- project,
- Capacity building for Citizen Science at the Thünen Institutes, and
- Empirical investigation and research of the effectiveness and functioning of Citizen Science in agricultural landscapes.

Methods

Within the framework of the project, various formats have been used to strengthen Citizen Science at Thünen. These include events organized by us, such as the two Thünen symposia on Citizen Science, the implementation of expert workshops, such as at the GFÖ conference, and strategic development of Citizen Science at the federal level as part of the development of the White Paper Citizen Science Strategy 2030, the leadership of networks and working groups, such as the MonViA AG Citizen Science, and the realization of interviews and surveys to empirically research Citizen Science.

Results

We note that participation of agricultural landscape stakeholders is already rooted in some Thünen projects and initiatives. These projects and initiatives record together with stakeholder biological and ecological variables in the agricultural landscape and link these variables to investigate processes and functions in agricultural landscapes.



In many cases, these projects are characterized by a collaborative basis rather than active voluntary participation in a research project. This is where Citizen Science differs from other participatory research projects. Citizen Science is about the voluntary involvement of citizens and interest groups (stakeholders) in research processes (Bonn et al. 2022).

In the assessment of the status quo of Citizen Science in agricultural landscapes, we were able to demonstrate that the potential for Citizen Science can be located in three thematic

areas. The approach of Citizen Science can be applied to a) conduct agricultural research together, b) establish monitoring schemes in agricultural landscapes and c) evaluate and assess agricultural policies (Richter et al. 2020).

We provided insights about the importance of key competencies on the part of researchers, as well as on the part of co-researchers, when Citizen Science is intended to be incorporated into research projects. These competencies are a) civic competencies b) science competencies as well as c) digital competencies (Figure 1).

- Generation of an added value for all participants (social, individual added value measured by the quality of the cooperation)
- Generation of an added value in the sense of acquiring e.g. scientific, artistic, humanistic education and skills
- Compliance with principles for research data e.g. FAIR and compliance with ethical and legal requirements and principles
- Expression of diversity and transparent and sustainable approaches within the project.

Summary

For the establishment of Citizen Science in agricultural research, it is necessary to ensure basic conditions and support for the practice of Citizen Science. The basic conditions include projects that are developed and implemented in such a way that they correspond to the motives of participation and that the joint research is of relevance to all involved.

Three recommendations for action to strengthen Citizen Science in agricultural spaces are recommended: 1) build capacities for Citizen Science to address agricultural science research questions, 2) strengthen existing and support the instalment of new infrastructures for Citizen Science, and 3) support newly developing Citizen Science projects in agricultural landscapes through exchange and knowledge transfer with established conservation and biodiversity-focused Citizen Science initiatives and with participatory agricultural research.



Figure 1: House of Citizen Science Competencies

In biodiversity research, Citizen Science plays an essential role in the implementation of monitoring tasks. Together with the MonViA AG Citizen Science, principles and minimum requirements have been developed (Richter et al. 2022). These principles for Citizen Science-based projects are proposed to meet the requirements of Citizen Science.

- Active involvement of volunteer researchers in research processes and in different research phases using scientific methods and applying scientific standards.

Further Information

Contact

¹ Thünen Institute of Biodiversity
Anett.Richter@Thuenen.de

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Richter, A., et al. (2020). Citizen Science-Neues Beteiligungsformat für die Forschung zur Agrar-, Forst-, Fischereiwirtschaft und zu ländlichen Räumen? (No. 146). Thünen Working Paper

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