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## **Report on state and perception of grassroots knowledge production**

*Based on Deliverable D4.1*

*by*

*Magdalena Roszczyńska-Kurasińska, Nina Wróblewska*

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## Report on state and perception of grassroots knowledge production

The report on the state and perception of grassroots knowledge production is the first deliverable of WP4, and is aimed at examining the technological solutions employed by Polish environmental civic initiatives for the implementation of citizen science projects and the fostering of citizen participation. It explores technological solutions used by grassroots movements in Poland, explores social activists' attitudes towards technology and citizen science, and discusses the use of existing technology in managing citizen science projects.

The study examines non-governmental organizations (NGOs) and grassroots movements in Poland as this is a relatively young democracy where civil society is still developing. Although it has been a member state of the European Union since 2004, it was transformed into a democratic republic only in 1989. Before then, Poland was under Soviet control and ruled by a communist government that actively discouraged the development of civil society.

Currently, there are 138,000 officially registered NGOs in Poland, whereas France, with nearly double the population, has 1,100,000 associations. In terms of volunteering, Poland's level of activity is relatively average compared to countries like Denmark, France, and Switzerland. In Poland, 15% of respondents reported engaging in volunteer work in the past six months, whereas Norway had a rate of 47%. Among the 36 European countries studied, Poland ranked 24<sup>th</sup>, close to countries such as Ukraine, Italy, Romania, Slovakia, and Hungary.

There is evidence to suggest that citizen science has the potential to bring about a significant shift in our ability to monitor the environment and enhance public understanding and trust in science, with the positive outcomes of citizen science depend on the nature of involvement in such initiatives. However, projects that involve citizens at a basic level, where their participation is limited to data collection, are the most common types of citizen science projects, and these types of projects do not fully utilize the potential of participants and do not contribute to community empowerment.

Furthermore, while citizens can participate in all stages of the research process in citizen science, without proper technological solutions, engagement becomes challenging. Technology plays a vital role in spreading information, collecting and analyzing data, and accessing databases. With appropriate technology, citizens can accomplish these tasks easily, making well-designed platforms or mobile apps crucial for long-term projects.

Technology has had a significant impact on grassroots movements and NGOs, changing the way the third sector operates:

- information technology (IT) improved organizational accountability, stakeholder relations, and public image;
- shared tools, such as the Google search engine, enabled more efficient collaboration among nonprofit organizations;
- digital tools facilitated data aggregation, analysis, and the creation of integrative knowledge;
- the adoption of SMAC (social media, mobile, analytics, cloud) has helped organizations achieve their goals and improve effectiveness.

Through interviews with 28 board representatives, managers, and initiators of social movements, as well as desk research encompassing 65 social movements in Poland, this study documented and categorized technological solutions employed by Polish environmental civic initiatives. A total of 45 different technological solutions, with the majority (78%) being software-based, were identified.

Software used by grassroots movements varied in terms of novelty and specificity, ranging from well-established platforms like emails, social media, and newsletters to customized applications designed for specific purposes, such as tracking barriers on rivers. Hardware solutions were less common but included tools for data collection and recording, such as drones, camera traps, voice recorders, and NO2 sensors. Many of these tools were multifunctional, making it difficult to categorize them into distinct subsets. However, we were able to identify two general subsets:

- i. technologies used for communication, activation, and self-organization;
- ii. technologies used for knowledge building and civic awareness.

Interviewees expressed a positive outlook on technology, emphasizing its potential to enhance work in the third sector. They recognized the numerous opportunities that technology brings, particularly in areas such as data collection, aggregation, and processing, and they acknowledged its role in simplifying and transparently sharing knowledge with recipients. Nevertheless, a few NGOs and grassroots movements faced challenges in adopting specific technology tools due to limitations in financial resources and time constraints. Insufficient dedication to managing these accounts can negatively impact their reach and effectiveness.

The study presented here is only a first step towards understanding the role of citizen science in democratic processes, especially in countries with a shorter history of democracy, such as Poland. As the technological advancement of citizens and grassroots movements plays a crucial role in planning and implementing successful citizen science projects, specific tools are needed to support all stages of the research process, from question development to data collection and analysis. The level of digital fluency and competence in utilizing existing digital platforms and mobile technologies influences the selection of the appropriate technological tool, which has a direct impact on citizen participation.

The diagnostic analysis of the technological landscape within grassroots movements in Poland highlights some main concerns including movements reliance on standard, readily available technological solutions, with minimal development of tailored or advanced technologies that could facilitate active participation in citizen science projects, and limited awareness of citizen science approaches, ultimately demonstrating that the full potential for launching citizen science projects has yet to be realized.