

**CITIZEN SCIENCE
IN CENTRAL AND EASTERN EUROPE**

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CITIZEN SCIENCE INTEGRATION IN SERBIA: THE ROLE OF LIBRARIES

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Serbia has made substantial progress in aligning its research ecosystem with European Open Science (OS) principles and increasingly recognises Citizen Science (CS) as a valuable instrument for transparent, participatory, and socially responsible research. CS is seen as central to building inclusive and socially embedded research practices. This study examines Serbia's policy landscape, highlights institutional actors driving CS development, and presents illustrative CS projects from the natural sciences. Special attention is given to the University Library "Svetozar Marković" (UNILIB), which has emerged as a national leader in integrating CS within library services (Dakić, Trtovac, and Janković 2023). The analysis draws on insights from the *Citizen-Enhanced Open Science in South-East Europe (CeOS_SE)* project coordinated by LIBER.

National Policy Framework and Institutional Actors

Serbia's OS strategy is anchored in key policy and legislative instruments. The *Open Science Platform* (Ministry of Education, Science and Technological Development 2018) and *Open Science Platform 2.0* (Ministry of Education, Science and Technological Development 2024) established procedures for depositing research outputs, clarified institutional responsibilities for training and implementation, and emphasised open data, transparency, and public participation. The *Law on Science and Research* (Službeni Glasnik Republike Srbije 2020) reinforces these commitments, advocating for OS infrastructure to strengthen public trust in science. In 2023, the Ministry of Science,

Technological Development, and Innovation introduced dedicated funding lines for OS and CS, promoting sustainable research policy. A major milestone was the launch of *eNauka*¹, a unified national registry of researchers, institutions, and outputs, which facilitates integration of citizen-generated data into national workflows.

Several institutions are central to Serbia's CS ecosystem. The Center for the Promotion of Science (CPN) under the Ministry of Science, Technological Development, and Innovation, serves as Serbia's principal coordinator of CS activities, developing educational programmes, organising events, and offering competitive funding schemes for CS projects. In the past two years, CPN has successfully conducted two public calls for funding citizen science projects. These calls, funded by the Ministry and aligned with national OS priorities, have provided structured financial support for pilot citizen science initiatives across Serbia, enabling libraries, universities, and community organisations to engage citizens directly in scientific research. This has further strengthened Serbia's position as a regional leader in integrating CS within OS frameworks while demonstrating practical pathways for citizen participation in addressing local challenges².

On the other hand, UNILIB plays a unique role as a knowledge mediator and training provider, actively fostering citizen engagement in research and educational initiatives (Dakić and Trtovac 2024). Over the past decade, the library has coordinated and supported several projects based on the principles and concept of citizen science, including Wiki-Librarian³, the Democratization of Digitization project⁴, the use of the Transkribus tool for processing archival materials⁵, and the Language Laboratory⁶. Through conferences, professional workshops, cross-sectoral collaborations, and the development of training materials, UNILIB has advanced CS awareness and practice. These activities demonstrate how libraries can serve as community-driven hubs, connecting citizens with researchers, providing tools and skills for participation, and embedding participatory approaches into scientific and cultural processes.

1 More at: <https://enauka.gov.rs/?locale=en>

2 More at: https://www.cpn.edu.rs/javnipoziv_gni_2024/

3 More at: <https://commons.wikimedia.org/w/index.php?search=viki+maraton&title=Special:MediaSearch&go=Go&type=page>

4 More at: <https://novisad2022.rs/demokratizacija-digitalizacije-centralna-radionica/>

5 More at: <http://unilib.rs/transkribus/tehnologija.html>

6 More at: <http://lab.unilib.rs/about>

The CeOS_SE Project and Roadmap for CS in the Balkans

The *CeOS_SE* project (2022–2024), coordinated by LIBER, aimed to integrate CS into OS practices across South-East Europe. Partners from Serbia, Croatia, Bulgaria, Greece, and Cyprus collaboratively conducted policy mapping and gap analysis, developed CS training modules for librarians and researchers, organised pilot projects, produced multilingual educational resources, and strengthened regional collaboration. Serbia contributed case studies, pilot actions, and played a leading role in producing regional guidelines.

UNILIB coordinated a dedicated work package that produced the *Roadmap on Citizen-Enhanced Open Science in the Balkans* (Dakić and Trtovac 2023). A regional survey of 99 academic libraries mapped current CS activities, infrastructure readiness, and training needs. Respondents from Serbia, Croatia, Greece, Bulgaria, Bosnia and Herzegovina, North Macedonia, Montenegro, and Cyprus provided insights that informed actionable recommendations for CS implementation. Key competencies identified for librarians included communication and public engagement, analytical and data stewardship skills, educational skills for workshops and training, and outreach via local networks and social media. Strategic and operational recommendations emphasised partnership building, institutionalisation of CS, integration of CS methodologies into curricula, OS-supporting infrastructure, and training researchers on participatory approaches.

Citizen Science Training

In 2023, Serbia launched the region's first accredited Citizen Science (CS) seminar for librarians, titled *Citizen Science: Libraries as a Link Between Civil Society and Science* (Dakić and Trtovac 2025, in press). The first of many training sessions was held in Novi Sad on 8 March 2023, attracting over 200 librarians from academic, public, and school libraries across Serbia. The curriculum included:

- Principles and types of CS
- Designing and managing CS projects
- Data collection and ethical considerations
- Tools for engaging diverse community groups

- Alignment with EOSC and Horizon Europe standards
- Workshop on potential CS project ideas

This training has been integrated into Serbia's professional development portfolio for librarians, enabling them to take proactive roles as CS facilitators and community science educators. To date (by the end of 2025), about 550 librarians have gained knowledge and skills in CS through this seminar.

Participant feedback highlighted the seminar's practical relevance:

- "I now feel confident to lead small CS projects in our community library."
- "We plan to collaborate with local schools on water quality monitoring."
- "The workshop was very useful and creative. The information provided offers unlimited opportunities for collaboration and for connecting citizens with scientific work through the library, as well as with other forms of human creativity."
- "There is a clear need to popularise the concept of Citizen Science among the heads of research organisations and cultural institutions, as key figures for promoting its broader implementation and effective operationalisation."

By equipping librarians with accredited CS knowledge and practical skills, Serbia is building a sustainable foundation for libraries to become active hubs of citizen participation in science across the region.

Project Case Studies

In recent years, several successful citizen science (CS) projects have been organised in Serbia, demonstrating the practical value and impact of citizen participation in research. These initiatives highlight how localised engagement can directly contribute to achieving national research objectives while fostering community ownership of environmental monitoring and scientific data collection. By actively involving citizens, these projects not only generate valuable datasets but also strengthen public awareness and stewardship of local environmental and societal challenges.

The following projects illustrate the practical benefits of citizen science in Serbia:

Obtectus Finders⁷ engages citizens in collecting seed beetles (*Acanthoscelides obtectus*) to study genetic diversity. Led by the Institute for Biological Research "Siniša Stanković" and the Faculty of Biology, University of Belgrade, and supported by CPN and the Start Up for Science programme, the project expands sampling coverage and contributes to future biocontrol strategies (Serbian Evolutionary Society 2025). Volunteers send collected beetles by post, creating a crowdsourced dataset visualised on an interactive map. Media coverage has boosted public participation, making the project one of the most visible biodiversity initiatives in Serbia. This project could be found at the European Citizen Science platform⁸.

Monitoring the Spread of *Megachile sculpturalis*⁹ addresses the invasive sculptured resin bee, first detected in Belgrade in 2017 and established by 2019. The Centre for Bee Research at the Faculty of Biology coordinates citizen reporting of observations from urban, suburban, rural, and semi-natural areas. The project documents the species' spread, interactions with native and exotic plants, population dynamics, ecological impacts, and genetics. Citizen contributions have been vital for early-warning monitoring and regional biodiversity research. More information:

In addition, 11 ongoing projects funded by the Ministry of Science of the Republic of Serbia – supported through the Ministry's calls for proposals and public announcements – further demonstrate the growing role of citizen science in the national research landscape.

Together, these initiatives show how citizen science can serve as a practical tool for addressing local challenges while contributing to Serbia's broader research and environmental objectives, offering a replicable model for regional and national strategies.

Globally, stakeholders typically operate within hybrid models that combine top-down policy support with bottom-up civic engagement. Libraries act as facilitators, trainers, and community connectors; researchers ensure methodological integrity and analyse collected data; and citizens participate through workshops, school collaborations, and voluntary monitoring. This collaborative model strengthens public trust and enhances research outcomes.

7 More at: <https://www.opasuljise.rs/en/>

8 More at: <https://citizenscience.eu/project/290>

9 More at: <https://srbee.bio.bg.ac.rs/english>

Achievements, Challenges, and Recommendations

Serbia's CS ecosystem has achieved significant outcomes: increased national visibility of CS, strengthened collaboration between researchers, libraries, and civic groups, accredited training integrated into professional development, new biodiversity and agricultural datasets, and enhanced scientific literacy among the public. Persistent challenges include limited public awareness of CS, uneven digital access, cultural scepticism toward volunteering, and the need for systematic data-quality procedures. Addressing these requires sustained investment in training, outreach, and digital infrastructure.

Libraries are ideally positioned to support CS due to their accessibility, trustworthiness, and information management expertise. Through CS, they diversify services, support lifelong learning, and reinforce societal roles. Key recommendations for sustainable development of CS include integrating it into national library and higher education strategies, providing dedicated funding, expanding accredited training, producing multilingual guidance, supporting cross-border networks, aligning with European OS standards, and implementing monitoring and evaluation frameworks for CS projects.

The CeOS_SE project demonstrates that CS can become a structural component of OS in the Western Balkans. Serbia's experience shows that strategic policy support, institutional leadership, and active community engagement can foster rapid and sustainable CS ecosystem development. Libraries, particularly UNILIB, have proven essential as mediators between science and society, enabling collaboration, learning, and inclusive research participation. Long-term institutional commitment and cross-sectoral cooperation remain vital for the continued mainstreaming of CS and ensuring that research meets societal needs.

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