

Policy Brief

Integrating STEM Citizen Science and Public Engagement for Enhanced Research and Innovation Impact

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Introduction

Research and Innovation (R&I) stakeholders, including scientists, institutions, and industries, are increasingly recognizing the value of citizen science and public engagement in shaping and enhancing their endeavors. Incorporating citizen perspectives ensures that R&I activities are aligned with societal needs, enhancing the relevance and impact of research outcomes. Furthermore, engaging the public builds support for R&I initiatives, fostering a positive public perception, and potentially attracting additional funding and collaboration opportunities. This document explores the integration of participatory approaches into R&I activities, emphasizing collaboration, transparency, and societal impact. Recognizing the transformative potential of inclusive approaches to integrating STEM citizen science and public engagement, this policy brief outlines key recommendations to foster collaboration, transparency, and societal impact within the R&I sector.

Issues and Challenges

- **Accessibility:** Equal access to resources or opportunities to participate in citizen science projects is uneven resulting in limiting the number of stakeholders involved.
- **Quality Control:** Rigorous policies and protocols ensuring the quality and reliability of data collection can often be challenging in citizen science initiatives.
- **Coordination:** Coordinating large numbers of volunteers and managing their contributions effectively can be challenging.
- **Sustainability:** Long-term engagement in citizen science projects require institutional frameworks and access to steady funding, as opposed to the norm of relying on volunteering and short-term activities.
- **Communication and Education:** Effectively communicating scientific concepts and methodologies to a broad audience with varying levels of scientific literacy can be challenging, requiring investment in educational materials and outreach efforts.

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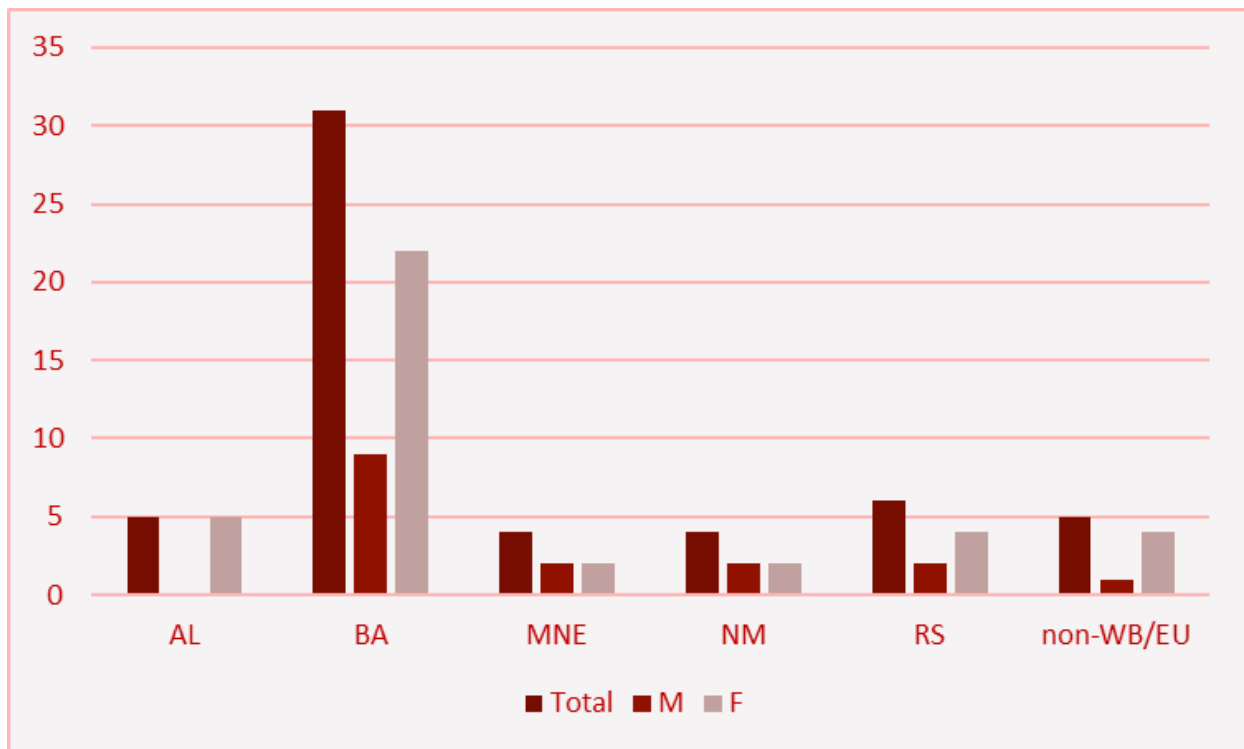
This includes lack of awareness among both the scientific community and the general public of the concept of citizen science *per se*.

- **Institutional Integration:** Lack of integrating Citizen Science into the policies and practices of STEM research institutions.
- **Ethical Considerations:** Ensuring that citizen science projects follow the rules and regulations of ethical research, including informed consent, GDPR, data handling, acknowledgement of societal and environmental impact.

Key Recommendations:

➤ Institutional Integration:

Embed citizen science and public engagement principles into the policies and practices of STEM research institutions is one of the pillars of ensuring accessibility to citizen science projects, as well as engaging an array of different stakeholders in research. Engaging Science with and for Youth was an event hosted by the Faculty of Political Science, University of Banja Luka inside the framework of the project WBC-RRI.NET. The purpose of the event was to facilitate open dialogue between different interest groups such as pupils, students, professors, policy makers, and industry representatives; enable mutual learning and open dialogue among stakeholders; showcase innovative work and ideas from students in the Western Balkans to their peers and the wider public; highlight good practices in engaging youth in the innovation creation processes; and generate recommendations for the improvement of STEM (Science, Technology, Engineering, Mathematics) education across the region. During the 2-day event gathered 55 participants from the Western Balkans and beyond.



Source: <https://wbc-rri.net/event-review-engaging-science-with-and-for-youth/>

➤ **Involvement of citizens in co-creation of knowledge:**

Organizing co-creation workshops and forums that bring together R&I actors and citizens to collectively design and shape research projects facilitates tapping into the diverse expertise of citizens, contributing to the democratization of knowledge, and fostering innovative solutions. The [WBC.RRI.NET](#) anchor initiative in the [Kune-Vaini Lagoon](#), organized by Co-Plan Institute for Habitat Development (Co-Plan) and Ministry of Tourism and Environment of Albania (MTE) is an example of best practice. The activity aimed to strengthen institutional capacities in managing the protected area by employing RRI approaches. This initiative was seen as a test-bed for applying RRI principles in Albania, with a focus on environmental sustainability rather than industrial or digital innovation. The initiative involved citizen science activities to foster participative assessment methods for ecosystem services and aimed to empower local stakeholders with knowledge for decision-making and resource governance. This was part of a broader vision to enhance research and innovation in line with Albania's national priorities for climate change adaptation and risk reduction. The methodology for mapping and assessing ecosystem services (ES) in the Kune-Vain-Tale lagoon was successfully co-developed and completed through a collaborative process with quadruple helix (QH) stakeholders from May to December 2021. The primary goal was to co-design a detailed methodology for mapping and assessing ecosystem services, by engaging local communities and stakeholders as citizen scientists. The policy brief entitled '[Co-creating Responsible Research and Innovation activities: Experiences from the Western Balkans](#)' presents lessons learnt and best practices from all anchor initiatives, including the one in Kune-Vaini Lagoon. The results of the Kune-Vaini ES assessment were shared through local/national media and social media from November 2022 to date, fostering a national dialogue on the ES-based management of protected areas, contributing to the communication and outreach of the results of the citizen science project.

➤ **Ethical Guidelines:**

Ensuring the ethical conduct of citizen science initiatives within STEM³ research is of pivotal importance to safeguarding the integrity of scientific research and results. The University of Banja Luka established the UNIBL Academic Integrity Community of Practice (CoP) inside the framework of the [WBC-RRI.NET](#) comprising of university researchers and support staff, as well as Ethics Committee members working on changing the institutional culture related to ethical principles and practices. The workshops organised include addressing the ethical implications of artificial intelligence in science and education, showcasing the proactive engagement of the academic community on topical issues.

³ Science, Technology, Engineering and Mathematics



Suggested further reading:

European Citizen Science Association, 2024. Working Groups. Available at: <https://www.ecsa.ngo/working-groups/>

European Commission, 2022. The Role of Citizen Science in the European Green Deal. Available at: <https://projects.research-and-innovation.ec.europa.eu/en/strategy/strategy-2020-2024/environment-and-climate/european-green-deal/green-deal-projects-support/green-deal-news-archive/news/role-citizen-science-european-green-deal>

European Commission, 2024. Citizen Science for EU policies. Available at: https://joint-research-centre.ec.europa.eu/scientific-activities-z/citizen-science-eu-policies_en

WBC-RRI.NET, 2023. Implementing Open Science and Research Ethics: Sharing experiences of the BEYOND, ROSiE, VERITY, WBC-RRI.NET projects. Available at: <https://wbc-rri.net/mutual-learning-event-implementing-open-science-and-research-ethics-sharing-experiences-of-the-beyond-rosie-verity-wbc-rri-net-projects/>

