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Book review

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Godzde Yildiz*

VENERE STEFANIA SANNA, CRISTINA CAPINERI, GIACOMO MARIA SALERNO, MICHELA TEOBALDI, CITIZEN SCIENCE, TERRITORIO E COMUNITA': PROSPETTIVE GEOGRAFICHE PER LA RICERCA E AZIONE, FIRENZE, FUP e UNISIENA PRESS, 2025, pp. 196

Global challenges, once primarily the subject of academic discourse, have now permeated everyday life, rendering geography and spatial awareness integral to society's comprehension of the world. In this "geo-enabled" era, individuals' daily movements function as a dynamic sensor network that generates unprecedented volumes of information. Within this framework, Citizen Science (CS) has emerged as a potent methodology for leveraging collective knowledge, effectively linking research, individuals, communities, and regions in meaningful ways (Kerski, 2015)[1]. Despite the growing global interest, Italian literature has yet to provide a comprehensive resource on this topic. The book "Citizen Science, territorio e comunità: prospettive geografiche per la ricerca e azione" by Venere Stefania Sanna, Cristina Capineri, Giacomo-Maria Salerno, and Michela Teobaldi, addresses this gap by serving as an extensive resource for Italian academics, professionals, and engaged citizens. The book is structured into six chapters, offering a comprehensive examination of theoretical foundations and practical applications of CS across various fields and regions. The opening chapter establishes a conceptual framework by introducing key definitions of CS from multiple perspectives. This approach underscores the complexity of the term, which

*Post-doc research fellow in Geography, Department of Social, Political and Cognitive Sciences, University of Siena, Arezzo, Italy, Viale Cittadini, 33, Arezzo, 52100, Italy. https://orcid.org/0000-0003-3757-780X

1 Kerski, J.J. (2015). Geo-awareness, Geo-enablement, Geotechnologies, Citizen Science, and Storytelling: Geography on the World Stage, Geography Compass, 9(1): 14-26. DOI: 10.1111/gec3.12193.

defies a singular definition and emerges as a dynamic, evolving concept, from being a functional resource for researchers to becoming a practice that empowers citizens in observation, data collection, and interpretation. CS is presented not only as a methodological tool but also as a socio-cultural device fostering mutual learning and strengthening science-society bonds. The authors further examine the geographical distribution of CS initiatives and projects, highlighting notable territorial disparities. Although the majority of these projects focus on biodiversity and environmental monitoring, their spatial coverage remains uneven. This highlights the ongoing challenge of achieving genuine inclusivity in CS across various local and global contexts.

The second chapter focuses on stakeholders and their roles in CS practices. It expands on Arnstein's "ladder of participation", a framework used in urban planning but criticised for its rigidity (Tritter & McCallum, 2006; Bishop & Davis, 2002)[2]. The authors propose a refined view of CS participation using Haklay's four-tier model: extreme citizen science, participatory science, distributed intelligence and crowdsourcing. They argue that citizen involvement spans practices influenced by context, objectives, and participant dynamics, rather than hierarchical stages. A key issue is the disparity in contributions; while projects aim for inclusivity, roles, responsibilities, and recognition remain unevenly distributed. Through global examples, the authors show how participation varies in intensity, form, and value assigned to different types of knowledge. This analysis led to a framework incorporating skills, engagement levels, and participation motivations. This chapter provides practical advice on creating inclusive participatory environments that respect diverse skills and address power imbalances—insights valuable for scholars developing CS initiatives.

The third chapter will be of particular interest to those seeking to design and implement a CS project. The authors present a clear, step-by-step guide to the different stages of project development, from formulating the research question to identifying stakeholders, defining modes of participation, and selecting appropriate methods. Special attention is given to training strategies and the use of digital platforms for data collection, which are portrayed as essential tools for scaling up participation and ensuring data quality. The chapter also addresses the crucial stage of data analysis, outlining the main techniques and applications available to CS practitioners. Here, the discussion extends beyond methodological aspects to consider the multiple potential areas and dimensions of impact that a project can generate, including scientific, educational, social, and even political. This multidimensional perspective underscores the versatility of CS as both a research method and catalyst for community engagement. The overview of data collection applications and crowdsourcing platforms is of particular value. The authors illustrate these tools with concrete project examples, highlighting the diversity of objectives they serve, from biodiversity monitoring to urban planning. These case studies enrich the chapter, offering readers inspiration and practical insights into how digital infrastructures can be leveraged to foster participation and expand the reach of CS.

Chapters Four and Five turn the spotlight onto Volunteered Geographic Information (VGI),

2 Tritter, J. Q. & McCallum, A., 2006. The snakes and ladders of user involvement: moving beyond Arnstein. Health Policy, 76:156-168. Bishop, P. & Davis, G., 2002. Mapping public participation in policy choices. Australian Journal of Public Administration, 61(1):14-29.

a central component of many CS initiatives. The authors carefully unpack the defining features of VGI, structured around three interrelated components: where the data are collected, what information is being gathered, and who the contributors are. This tripartite framework effectively conveys the essence of VGI as information generated by individuals who consciously or unconsciously act as sensors and supply valuable geospatial data. The fifth chapter addresses the crucial issue of data quality, a recurring concern in both CS and VGI scholarship. The authors systematically examined different dimensions of quality, including thematic accuracy, positional accuracy, temporal accuracy, logical consistency, and completeness. This detailed treatment is particularly relevant, given the diversity of contributors and contexts in which CS data are generated. Beyond theoretical considerations, this chapter also explores the practical aspects of data validation and the role of metadata in ensuring reliability and reusability. The final chapter broadens the perspective by examining the diverse domains in which CS is currently applied and highlights its transdisciplinary nature. The authors show how CS is increasingly recognised as a valuable tool for advancing scientific research and addressing global societal challenges. Particular attention is given to its contributions to the Sustainable Development Goals (SDGs), wherein citizen-generated geodata can fill crucial gaps in monitoring and policy implementation. Biodiversity conservation has also emerged as a major field of application, building on the strong tradition of citizen involvement in environmental monitoring. Equally compelling is the discussion of CS "in, with, and for" urban planning, illustrated through case studies that demonstrate how participatory data collection and analysis can inform more inclusive and responsive urban policies.

By framing CS as a transdisciplinary practice, the book underscores its potential to integrate knowledge, communities, and territories in ways that support sustainable futures. Throughout each chapter, the authors skillfully blend theoretical frameworks, methodological instruments, and illustrative case studies. By using specific examples, including digital platforms for data collection, they clarify the opportunities and challenges involved in managing and validating information generated by citizens. Composed of scientific rigor yet accessible prose, the volume encourages readers to move beyond definitions and isolated case studies, prompting reflection on the spatial, social, and technical dimensions of CS. Across multiple domains, it demonstrates CS's ability to transcend disciplinary boundaries, foster collaboration across sectors, and bridge the gap between research, policy, and community action. In doing so, the book consolidates current knowledge while projecting the transformative potential of CS in diverse contexts, rendering it an invaluable resource for researchers, practitioners, and community actors alike.