



Cultural Mapping in Street Art: A Systematic Literature Review

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Abstract

This article presents a systematic literature review (SLR) that provides an overview of existing research on cultural mapping practices, focusing on their applications, benefits, and outcomes, particularly in relation to urban art. This review is driven by the need to discern and synthesize the diverse range of cultural mapping applications, methodologies, and outcomes that stem from this practice, understood as a methodological tool for preserving local cultural resources. In parallel, it explores the potential of cultural mapping to support the preservation of the intangible cultural heritage (ICH) associated with urban art.

The main research question guiding this SLR is: "How are projects, activities, or experiences related to cultural mapping characterized from the perspective of urban art?". To answer this question systematically, the PRISMA method is applied, resulting in a review of 22 selected studies. The findings reveal that cultural mapping has been used across a wide range of urban cultural resources, including built heritage, landscape, and historic centres, alongside various artistic expressions, namely *graffiti*, traditional art, and photography, illustrating its adaptability and versatility to different cultural contexts.

Research addressing *graffiti* emphasize the relevance of documenting these practices as forms of community interaction with urban space, closely linked to sense of place, meaning, and identity. Although research specifically addressing contemporary urban art remains limited, it can be concluded that cultural mapping holds significant potential for preserving the ICH associated with urban art, safeguarding its memory by recording practices, meanings, and community connections that define the spaces where these expressions occur.

Keywords

cultural mapping; urban art; street art; intangible cultural heritage, sense of place

1. Introduction

1.1. Sense of place, culture, and cultural heritage

The growing concern and scientific interest in 'sense of place' emerged in the 1970s. It was precisely during this period that specialists and researchers linked to heritage developed the first theories across different fields of study concerning space and place (Savić, 2017). The literature indicates that this interest stems from the rec-

ognition of a "rich array of meaning and significance" (Taylor, 2013, p. 50) that abound in everyday life, from the "spirit" that a given place carries "through the resources and communities associated with it" (Cabeça, 2018, p. 2), as well as from the history, feelings, and experiences that, over time, are created, developed, and lived there. It is within this line of thought that the geographer Yi Fu Tuan (1979) stated that, unlike 'sense of place' understood as 'location', the concept of 'place'

sustains within itself a greater essence and conception, a deeper sense, that configures a "unique entity", with "a history and meaning" that "incarnates the experiences and aspirations of a people" (p. 387).

In this way, the places through which we pass and live gain distinction and value through their different tangible dimensions (relating to what is material and palpable, such as monuments, gardens, buildings, churches, objects, archaeological and/or historical sites, among others) and intangible dimensions (relating to what is immaterial and not palpable, such as traditions, memories –individual and collective–, sounds, rituals, odors, knowledge, among others), constructed over time by the respective community. It should therefore be noted that the tangible and intangible dimensions are anchored to the concept of 'culture' (Taylor, 2013). While acknowledging its holistic properties, Taylor (2013) presents the traits that are common to definitions of 'culture': it presupposes a set of traditions, values, and ideas (whether material or immaterial, that is, tangible and intangible dimensions) that expresses a sense of identity of a given place, and that is represented by a social group holding a shared worldview; "while including the arts, 'culture' is [also] a holistic idea of the way we do things collectively at local, regional, or national society levels" (p. 53).

Accordingly, the International Council of Monuments and Sites – ICOMOS, an international non-governmental organization dedicated to the conservation of the world's monuments and sites in order to "protect and promote the spirit of places" (ICOMOS, 2008, s.p), recognized, through the Québec Declaration on the Preservation of the Spirit of Place, the interdependence of 'sense of place' with tangible and intangible values:

The 16th General Assembly, and more specifically the Youth Forum, the Aboriginal Forum and the Scientific Symposium, have provided an opportunity to further explore the relationship between tangible and intangible heritage, and the internal social and cultural mechanisms of the spirit of place. Spirit of place is defined as the tangible (buildings, sites, landscapes, routes, objects) and the intangible elements (memories, narratives, written documents, rituals, festivals, traditional knowledge, values, textures, colors, odors, etc.), that is to say the

physical and the spiritual elements that give meaning, value, emotion and mystery to place. Rather than separate spirit from place, the intangible from the tangible, and consider them as opposed to each other, we have investigated the many ways in which the two interact and mutually construct one another. The spirit of place is constructed by various social actors, its architects and managers as well as its users, who all contribute actively and concurrently to giving it meaning. Considered as a relational concept, spirit of place takes on a plural and dynamic character, capable of possessing multiple meanings and singularities, of changing through time, and of belonging to different groups. This more dynamic approach is also better adapted to today's globalized world, which is characterized by transnational population movements, relocated populations, increased intercultural contacts, pluralistic societies, and multiple attachments to place. (ICOMOS, 2008, s.p)

Considering the concept of 'cultural heritage', UNESCO (2009) defines it as follows:

Cultural heritage includes artefacts, monuments, a group of buildings and sites, museums that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance. It includes tangible heritage (movable, immobile and underwater), intangible cultural heritage (ICH) embedded into cultural, and natural heritage artefacts, sites or monuments. The definition excludes ICH related to other cultural domains such as festivals, celebration etc. It covers industrial heritage and cave paintings. (UNESCO, 2009, s.p)

As UNESCO (2009) states, tangible and intangible values are likewise inseparable from the concept of 'cultural heritage' (since it includes 'tangible cultural heritage' – tangible; and 'intangible cultural heritage' – intangible), an assertion that is also evidenced in the Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO, 2003). Consequently, 'sense of place' is also interdependent with cultural heritage. Thus, this factor suggests that the stronger the 'sense of place' and cultural identity in relation to a place, the greater the asso-

ciated cultural heritage value and the need for its safeguarding. According to Ma et al. (2023), this is, moreover, "the first dimension (...) [of] the contribution of sense of place in conserving cultural heritage" (p. 1478).

As the tangible and intangible values of a place are continuously reconstructed, reinvented, and reinterpreted due to generational continuity (ICOMOS, 2008), it is natural for the narrative of 'sense of place' to undergo constant change. This emerging reality therefore requires active participation, cooperation, and ongoing awareness on the part of communities and other stakeholders, under the risk of losing the connection to the territory and even the deterioration and disappearance of the respective cultural heritage.

1.2. Cultural mapping

It is in response to the recognition of threats of destruction, degradation, and disappearance of cultural heritage due to natural or social phenomena (UNESCO, 2003) that cultural mapping gains importance and emerges as an agent for the preservation of cultural heritage.

From a pragmatic perspective, Longley & Duxbury (2016, citing Stewart, 2007, p. 8) define cultural mapping as "a process of collecting, recording, analyzing and synthesizing information in order to describe the cultural resources, networks, links and patterns of usage of a given community or group". The same authors also point to the evolution that this tool has undergone within scientific research:

While cultural mapping has come to be closely associated with professional cultural planning practices, its recent adoption within a variety of disciplinary areas means that "traditional" approaches are being re-thought and expanded, with cultural mapping practices adopting new methodologies, perspectives, and objectives as they evolve. This growing, widespread interest in cultural mapping reflects the spatial, place-based turn in cultural and artistic studies, architecture and urban design, geography, sociology, cultural policy and planning, and e-media studies, among other areas. (Longley & Duxbury, 2016, p. 1)

Cabeça (2018) recognizes that "to map is, therefore, to construct a narrative, both discursive and visual, about the identity of a place, through the eyes of communities and groups" (p. 2). For the author, the main benefits of cultural mapping, beyond the geographic and informational visual contribution it provides, include the preservation of collective memory, of a social and cultural context, and of intangibilities that are, at the same time, decisive for expressing the identity of a place, the way "how a place is felt" (p. 2).

For Freitas (2016), cultural mapping constitutes a tool aimed at promoting the development and analysis of culture. However, the author recognizes two instrumental approaches – one dominated by concerns with economic growth, and another by concerns with "integrated human development" (Freitas, 2016, p. 9):

Cultural mapping is an instrument for collecting, locating and systematising information concerning the distribution of cultural expressions within a certain territory. (...) influenced by the objectives of whoever performs and/or contracts it. Such objectives are rarely confined to a purely intrinsic vision of culture, rather they generally have more strategic ambitions of improving the potential of the object of the analysis to contribute to development, be it economic, human or community development. (Freitas, 2016, p. 9)

By highlighting this dualism, the same author warns that different objectives naturally lead to the use of different methodologies, different handling and implementations, as well as different impacts, consequences, and potentials for change.

According to the 1994 monograph "Mapping Culture", cited by Taylor (2013) in the article, cultural mapping:

(...) involves a community identifying and documenting local cultural resources. Through this research cultural elements are recorded – the tangibles like galleries, craft industries, distinctive landmarks, local events and industries, as well as the intangibles like memories, personal histories, attitudes and values [. . .] Cultural mapping is a way of defining what culture means to the community, identifying the elements of culture that add value (both social and economic), recording, preserving

or Building on these elements in new and creative ways. Each cultural mapping project will be as individual as the community it reflects (author's emphasis). (p.54)

Based on the definitions presented, it is possible to identify a consensus within the scientific community regarding the meaning, importance, and modes of conception of cultural mapping. It is, assertively, a mode of research that is useful across various fields of knowledge to address different needs (which may include community cohesion; the creation of cultural and creative development strategies; municipal governance; the identification of artistic and cultural practices connected to urbanization; the production of geographic information and maps; among others), that has community participation as a vital part of the process, that is closely linked to the 'sense of place' of a territory, and also to knowledge of all the cultural components that confer identity upon it (Cabeça, 2018; Longley & Duxbury, 2016; Taylor, 2013).

In the face of external threats posed by urbanization, the continuous occupation of territory by new populations, and new socioeconomic narratives and discourses inherent to the natural development of the world, it is essential that cultural resources are identified, recorded, preserved, and documented in a timely manner, so that cultural heritage (tangible and intangible), collective memory, 'sense of place', and a country's cultural diversity may be safeguarded (Cabeça, 2018; Taylor, 2013).

1.3. The application of cultural mapping in urban art

Within the context of urban cultural practices, urban art stands out as a hybrid, ephemeral phenomenon that is deeply rooted in public space. It is currently considered an artistic practice "of affirmation, of socio-community appropriation, generating feelings of pride and appreciation of public space" (Galeria de Arte Urbana, 2023, p. 12). However, despite growing international media, tourist, and academic attention, acceptance, and recognition, its documentation for preservation purposes remains fragmented. And it is precisely here that cultural mapping –as a tool for the identification, representation, analysis, safeguarding and communication of the territory– can play a central role.

Among the various artistic manifestations present in public space, urban art stands out for decentralization, resilience and persistence, versatility of techniques and languages, adaptation to different urban contexts, and the capacity to operate independently of institutional powers (Campos, 2023; Campos & Câmara, 2019), characteristics that, together with its ephemeral nature, challenge traditional methods of cultural recording, preservation, and analysis. Nevertheless, this cultural expression constitutes a valuable contribution to a city's cultural identity (Merrill, 2020) and is already an integral part of public strategies for heritage safeguarding and urban rehabilitation in major metropolises such as Lisbon, Barcelona, Philadelphia, and Berlin (Campos & Câmara, 2019).

Given that there are "few images and projects that have the possibility of surviving over time and in memory" (Rivero-Moreno, 2024, p. 4), cultural mapping emerges as a particularly relevant approach for urban art, potentially functioning as a legacy that will allow future generations to understand and value this artistic manifestation.

Within this framework, it therefore became pertinent to develop a systematic literature review that would make it possible to map the state of the art regarding the application of cultural mapping to artistic manifestations, with particular interest in urban art, street art and *graffiti*, and to identify emerging trends, approaches, and challenges, contributing to the consolidation of this developing field within academic and institutional contexts.

1.4. Research questions

This systematic literature review (SLR) aims to address the following research question: How are projects, activities, or experiences related to cultural mapping characterized from the perspective of urban art?

The following secondary research questions were also defined in order to provide clearer guidance for the researcher throughout the systematic literature review process:

1-What methodologies, data collection instruments, and strategies are used in cultural mapping processes?

2-What themes and cultural expressions have guided cultural mapping studies?

3-Are there cultural mapping projects specifically related to urban art?

a. If so, can urban art contribute to giving sense and meaning to a place?

4- To understand whether there are cultural mapping projects specifically related to urban art and, if so, to identify the terms under which they are implemented.

This review is divided into three sections. First, the systematic literature review process is described, including the exploration phase, the study selection process across databases, and the number of studies obtained. Second, the meta-analysis and discussion of results are presented. Finally, the review concludes with the conclusions and possible future work.

2. Systematic literature review process

This section details the systematic literature review process and assesses the methodological quality of the systematic reviews included through the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Moher et al., 2009), a protocol widely used to ensure transparency, rigor, and reproducibility in systematic reviews. It begins by identifying the databases used to conduct the SLR, describes the criteria used to select the keywords and define the boolean equation, and finally explains the logic underlying the filtering of the bibliography.

2.1. Exploration and definition of keywords

The initial phase involved conducting an exploratory bibliographic search on studies related to cultural mapping. The choice of this approach served a "triple purpose", as noted by Marconi & Lakatos (2003, p. 188): to formulate hypotheses, clarify concepts, and improve the researcher's understanding of the topic, while also providing greater familiarity with the subject matter. In addition, it yields more results, allowing the researcher to analyze the different approaches that various authors adopt regarding the concept and topic under analysis and to determine which are most appropriate for the stage of research being undertaken. In this way, the likelihood of obtaining valid results that are more closely aligned with the research objective is increased.

In this context, the researcher conducted a search in the Scopus and Web of Science (WoS) databases, using the

1.5. Scientific contribution and document structure

This systematic literature review is part of a broader research project integrated into the Doctoral Program in New Media at the University of Aveiro, which seeks to contribute to the issue of conservation and archiving of intangible cultural heritage related to urban art, through the collaborative construction of memories and narratives.

Accordingly, the objective of this SLR is to provide an overall overview of practices related to cultural mapping processes, as well as of the benefits, possibilities, and experiences that may arise from the application of this methodology, while simultaneously aiming to analyze its potential for the preservation of urban art in its intangible dimension. To this end, specific objectives were defined to provide structured and sustained guidance for the researcher in relation to the general objective:

- 1- To identify cultural mapping projects related to the artistic sector that exist or are currently being developed worldwide;
- 2- To identify the different cultural expressions that are the focus of practices related to cultural mapping and how they are being managed;
- 3- To understand the methodologies and data collection instruments implemented in cultural mapping practices;

following main keywords: 'cultural mapping', 'urban art', 'heritage' and 'methodolog*' – the latter with a wild-card (*) at the end in order to encompass all of its orthographic variations. To restrict the number of results and narrow the search, making it more representative of the topic of interest, synonyms were subsequently associated and different combinations were tested. Thus, the following keywords were added:

- 'sense of place' and 'placemaking', as synonyms for 'cultural mapping';

- 'street art' and 'contemporary art', as synonyms for 'urban art';
- 'intangible cultural heritage' and 'cultural heritage', as synonyms for 'heritage'.

This set of keywords (see Table 1) resulted from the researcher's intention to understand how cultural mapping is situated within the context of cultural heritage, more specifically within the artistic field (particularly urban art). In addition, this systematic literature review aims to identify which methodologies and data collec-

Category	Associated keywords	Justification / Relation to the topic
Cultural mapping	'cultural mapping', 'sense of place', 'placemaking'	Capture studies that address cultural mapping processes and cultural cartography practices, as well as conceptual approaches frequently associated with the mapping of cultural and urban phenomena.
Urban art	'street art', 'urban art', 'contemporary art'	Terms that define the central object of analysis of the systematic literature review, framing contemporary artistic practices situated in urban space.
Cultural heritage	'heritage', 'intangible cultural heritage', 'cultural heritage'	Capture studies that address cultural mapping as a tool for heritage preservation, interpretation, and mediation, including approaches relevant to the analysis of urban art within its cultural and intangible framework.
Methodology	'methodolog*'	Capture studies that explicitly describe methodological frameworks and approaches, allowing for the identification of works that detail research processes, analytical strategies, and investigative procedures.

Table 1. Summary of keyword categories used in database searches and corresponding rationale.

tion instruments are appropriate for implementation in cultural mapping projects, which justifies the inclusion of the keyword 'methodology' in the search equation. This approach allows the researcher to obtain a broad understanding of the multiple characterizations, challenges, and different contexts of application of cultural mapping, given its multiplicity of uses, as mentioned in Chapter 1 – the Introduction.

For this purpose, the research used the following Boolean search equation: ({cultural mapping} OR {sense of place} OR {placemaking}) AND ({urban art} OR {street art} OR {contemporary art}) AND ("heritage" OR {in-

tangible cultural heritage} OR {cultural heritage}) AND (methodolog*). The decision was made to apply the equation across all search fields ('all fields') in both databases, in order to obtain results that were sufficiently significant for conducting this SLR. The following section presents the results obtained from the application of this equation, as well as the process used to filter the retrieved studies, considering the results available up to January 16, 2025.

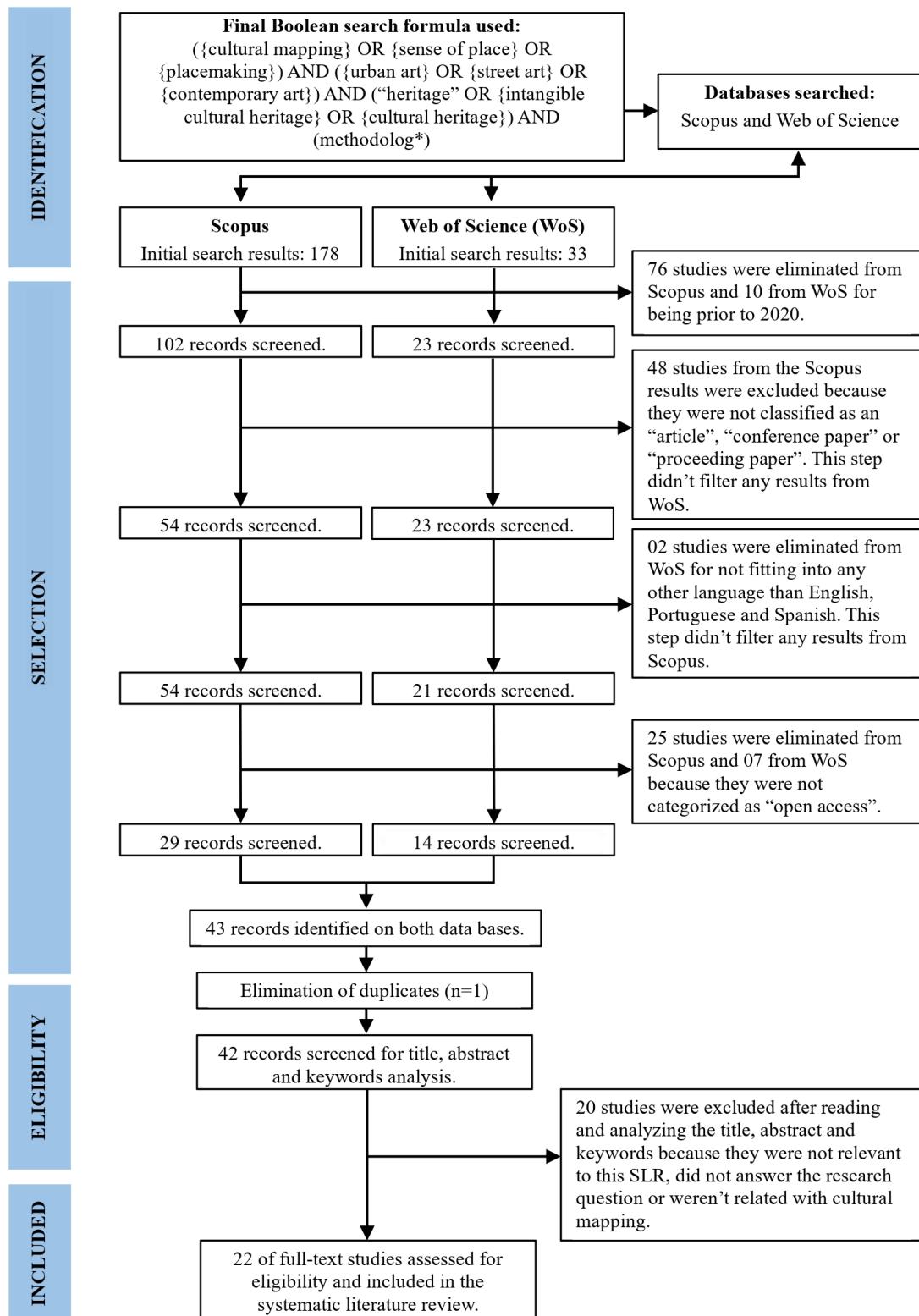


Figure 1. Process of selection included studies based on the PRISMA flow diagram.

2.2. Study selection process

After determining the final Boolean search formula, the next step was to select the studies from the selected databases. Figure 1 illustrates the entire process carried out for the selection and filtering of studies, using the PRISMA method (Moher et al., 2009).

The initial search produced a total of 211 results, of which 178 were retrieved from Scopus and 33 from WoS.

The first selection criterion applied focused on the publication date, limiting the review to studies published between 2020 and 2025, in order to understand current trends in the use of cultural mapping within the artistic sector. Accordingly, a total of 86 studies were excluded from both databases, resulting in 125 articles selected for analysis.

Consequently, all studies that were not classified as 'articles', 'conference papers' or 'proceeding papers' (n=48) were excluded, thereby eliminating books, book chapters, editorials, article and book reviews, meeting proceedings, among other types of documents. This stage, in which 77 articles were selected for analysis, aimed to ensure that the studies maintained high standards of quality and depth of content, while being subjected to rigorous scrutiny to guarantee their validity and reliability. Subsequently, only two studies were excluded for not being written in English, Portuguese, or Spanish, the languages in which the researcher is proficient for study analysis. Of the 75 articles eligible for analysis, 32 were eliminated for not being open access, resulting in a total of 43 studies selected at this stage. As previously mentioned, the researcher chose to include conference-related communications in order to extract a sample of studies representative of the topic under analysis; for the same reason, no filtering related to research subject areas was applied. This was followed by a comparison of the results obtained from the two databases, which led to the removal of a single duplicate study.

To complete the selection process, the title, abstract, and keywords of the 42 selected articles were analyzed,

resulting in the exclusion of 20 studies for not exemplifying or portraying the application of the cultural mapping methodology, for not addressing the research question, or for not aligning with the objectives of this study.

Finally, the application of the exclusion criteria ensured the eligibility of a total of 22 studies to form this systematic literature review, which were analyzed exhaustively in accordance with the research question and objectives of the review.

3. Meta-analysis and Discussion

The present systematic literature review analyzes a total corpus of 22 studies, published between 2020 and 2025, selected from the Scopus and WoS databases after the application of the inclusion and exclusion criteria defined according to the PRISMA protocol (Moher et al., 2009).

This chapter first presents the main results of the SLR, focusing on the characterization of the studies analyzed, namely their temporal and geographical distribution, disciplinary contexts, types of cultural expression and heritage addressed, as well as the methodologies, methods, instruments, and technologies identified. In a second phase, the results are subject to an interpretative and critical reading, allowing for the identification of emerging trends, methodological potentialities, and structural challenges associated with the application of cultural mapping in urban contexts.

3.1. Main results

With regard to the studies analyzed in this systematic literature review, Table 2 presents the corresponding characteristics examined by the researcher. These include the geographic distribution of the authors, the type of cultural expression identified, and a description of the application context. The table also details the methodologies and data collection and analysis techniques, as well as any other methods applied in the studies under review. Whenever it was not possible for the researcher to identify a specific type of information, the corresponding field was filled with the code "n.d." (meaning *no data available*).

Authors (Year)/Country	Cultural expressions	Does it directly address urban art/street art/graffiti?	Methodology	Methods/Techniques/Data collection instruments	Technologies used
1. Pareti & García-Henche (2021) / Chile	Artistic district	No	Qualitative	Literature review; interviews; media impact analysis	Social media, blogs, and diverse digital press outlets
2. Abdurahiman et al. (2024) / India	Kuttichira historic tank precinct	No	Mixed-methods	Literature review; application of quantitative surveys (based on the RPII) and qualitative surveys (on history, opinions, perceptions, among other parameters)	n.d.
3. Gülcin & Yalçinkaya (2024) / Turkey	Landscape surrounding Lake Bafa	No	Mixed-methods	Collection and analysis of georeferenced photographs, AI-based content analysis, landscape correlation, landscape character assessment, viewshed analysis	Flickr, Google Earth, Google Vision Cloud API, QGIS, photo-searcher library in R programming language
4. Rezafar (2022) / Iran	City of Mousleh	No	Qualitative	Literature review, case study analysis	n.d.
5. Mantzou et al. (2023) / Greece	Stories, myths, and oral traditions	No	Qualitative	Collection of stories through interviews and questionnaires, collection of diverse materials for app development, semantic content analysis	Palimpsest mobile app, Rest API
6. Trentin et al. (2023) / Cyprus, Italy, and Israel	Historic graffiti	Yes	Mixed-methods	Literature review, documentation and analysis of graffiti based on case studies, direct observation	Photogrammetry, Raking light, Infrared imaging, Laser and structured light scanning, Reflectance Transformation Imaging, Gigapixel imaging
7. Fekete et al. (2021) / Hungary	Historic gardens	No	Qualitative	Documentary research, archaeological survey, analysis of technical and structural elements	n.d.
8. Spennemann (2021) / Australia	Ephemeral sites related to COVID-19	No	Mixed-methods	Documentary research and analysis, direct observation, interviews, and visual documentation (photography and audiovisual)	n.d.
9. Cai et al. (2024) / China	Traditional Chinese art	No	Quantitative	Spatial and statistical analysis of national projects related to ICH, using models such as the nearest neighbor index, Moran's I index, kernel density analysis, and imbalance index	Xiangxi Miao Embroidery app, robotic embroidery machines, AI, blockchain certificates
10. Askarizad et al. (2024) / Spain	Street puppet theatre	No	Mixed-methods	Urban and spatial morphology analysis; observation and evaluation of performances; demographic data collection	Video cameras; UCL Depthmap 10 software

11. Downey & Sherry (2020) / Northern Ireland	Derry–Londonderry Temple	No	Qualitative	Ethnography, netnography, interviews, participant and non-participant observation, analysis of artefacts and inscriptions	Photography, videography, social media, and online platforms
12. Sanz & Rodríguez-Labajos (2023) / Chile	Activist actions and expressions	No	Qualitative	Network analysis; semi-structured interviews	ATLAS.ti and Ucinet softwares
13. Jiménez-Peralta et al. (2021) / Chile	La Matriz neighbourhood	No	Qualitative	Ethnography, interviews, narrative analysis, spatial mapping	n.d.
14. Vilcea et al. (2023) / Romania	Historic buildings and monuments	No	Quantitative	Documentary research and analysis, field reconnaissance, questionnaire survey, perception mapping using the Emotional GIS methodology	GIS tools, Google Maps
15. Ben Ghida (2024) / France	Urban space of the Viaduc des Arts	No	Mixed-methods	Revisão de literature, Literature review, documentary research, project analysis, case study	n.d.
16. Verhoeven et al. (2022) / Austria	Graffiti of the Donau-kanal	Yes	Mixed-methods	Collection of audiovisual materials, image capture (photography), 3D modelling, surveys for database creation, spatial analysis	Laser scanning, spectrometer, GIS tools, online platform, reflex cameras
17. Pierdicca et al. (2023) / Uzbekistan	Emir of Bukhara Palace	No	Quantitative	Collection, analysis, and processing of metric and geometric data	Terrestrial laser scanner, 3D data processing software, HBIM modelling, 3D photogrammetry, orthophotos
18. Rangarajan (2023) / Cambodia and Indonesia	Photography	No	Qualitative	In-depth visual, interpretative, and conceptual analysis with art criticism based on artists' photographs	n.d.
19. Ma & Sun (2024) / China	Ancient city of Dongxi	No	Mixed-methods	Documentary analysis; heritage mapping and classification; formulation of management strategies through the application of the Historic Urban Landscape model	GIS tools and digital mapping tools for layered analysis
20. Mathuria (2024) / Northern Ireland	Belfast city centre	No	Qualitative	Ethnography, walking go-along interviews	Audio recording and transcription technologies
21. Sapucaia (2024) / Portugal	Sound installation	No	Qualitative	Arts-based research, sound mapping, ethnography with observation of urban spaces	Microphones, proximity sensors, and software for the construction of the sound artefact
22. Caroti et al. (2023) / Italy	Historic pavement	No	Quantitative	Collection of metric and geometric data through photogrammetric 3D survey	3D photogrammetry software, high-resolution digital camera

Table 2. Overview of the included studies assessing the various contexts in which cultural mapping can be applied.

The chronological analysis of publications reveals a progressive increase in the number of studies in recent years, rising from a residual number in 2020 (n=1) to an increase in 2021 (n=4), followed by a slight decrease in 2022 (n=2) and a more expressive and consistent growth from 2023 onward (n=7), reaching its highest value in 2024 (n=8). This trend suggests a recent strengthening of academic interest in cultural mapping within urban contexts.

With regard to linguistic distribution, a predominance of the English language was observed, serving as the main medium for 19 studies (n=19), followed by Spanish and Portuguese with marginal representation of two (n=2) and one study (n=1), respectively. These studies are distributed across 18 scientific journals belonging to 12 different publishers. Among these, the Multidisciplinary Digital Publishing Institute (MDPI) stands out with eight articles (n=8), followed by the International Society of Photogrammetry and Remote Sensing (ISPRS) with three articles (n=3) and Springer Nature with two articles (n=2). The journals span areas such as heritage, urban planning, information technologies, architecture, arts, and sustainability, demonstrating the interdisciplinary nature of the topic under analysis.

In terms of geographical distribution, Europe leads scientific production with 11 studies (n=11), followed by Asia with eight studies (n=8) and South America, represented by three studies (n=3). This distribution highlights a clear predominance of research developed in European contexts, often associated with historic centers, built heritage, and institutional cultural policies.

The analysis of the objects of study reveals a predominance of investigations focused on tangible/built cultural heritage (n=8), including, among others, historic gardens classified as monuments, different heritage infrastructures (such as monuments, viaducts, and palaces), structural elements (such as stone paving), and photography. In second place, simultaneously and with the same level of representation (n=6), are intangible cultural heritage –which includes the study of stories, myths, oral traditions, sound installations, acts of activism, theater, traditional Chinese art, and ephemeral in-

stallations— and urban areas, a category encompassing urban enclosures, neighborhoods, cities, urban centers, and natural landscapes. With regard to the presence of urban art, street art, or *graffiti*, only two studies (n=2) explicitly include these practices: one addresses *graffiti* in a historical and medieval context, in contrast to another study that focuses on '*contemporary graffiti*' as a living urban artistic practice, more specifically in the city of Vienna (Verhoeven et al., 2022). It should be noted that urban art and street art are mentioned in other studies; however, in most cases they appear in a peripheral or contextual manner and do not constitute the main focus of the research, which is why they were not accounted for by the researcher in this analysis.

Regarding research methodologies, there is a predominance of qualitative approaches (n=10), followed by mixed methodologies (n=8) and, finally, quantitative approaches (n=4). The use of qualitative approaches occurs mainly in studies focused on the analysis of lived experiences and community perceptions of built heritage, cultural practices, and participatory processes. Quantitative approaches, in turn, appear primarily in studies associated with spatial and geometric analysis of built heritage, urban morphology, or statistical analysis. Within this spectrum, the Emotional GIS methodology (Vilcea et al., 2023) deserves particular mention, as it is used to map perceptions of attractiveness, emotion, and feelings of a group of individuals in relation to specific geographic spaces, transforming qualitative data into quantifiable spatial data.

The most frequently used methods include document analysis, ethnography, interviews, and case studies. Among the data collection instruments employed, semi-structured interviews, walking go-along interviews, direct participant and non-participant observation, photographic and audiovisual capture, participatory cartography, historical archives, as well as questionnaires and surveys stand out.

With regard to the use of technologies, 14 studies rely on digital tools, including Geographic Information Systems (GIS), photogrammetry, 3D modeling, laser scanning, georeferenced databases, spatial analysis software

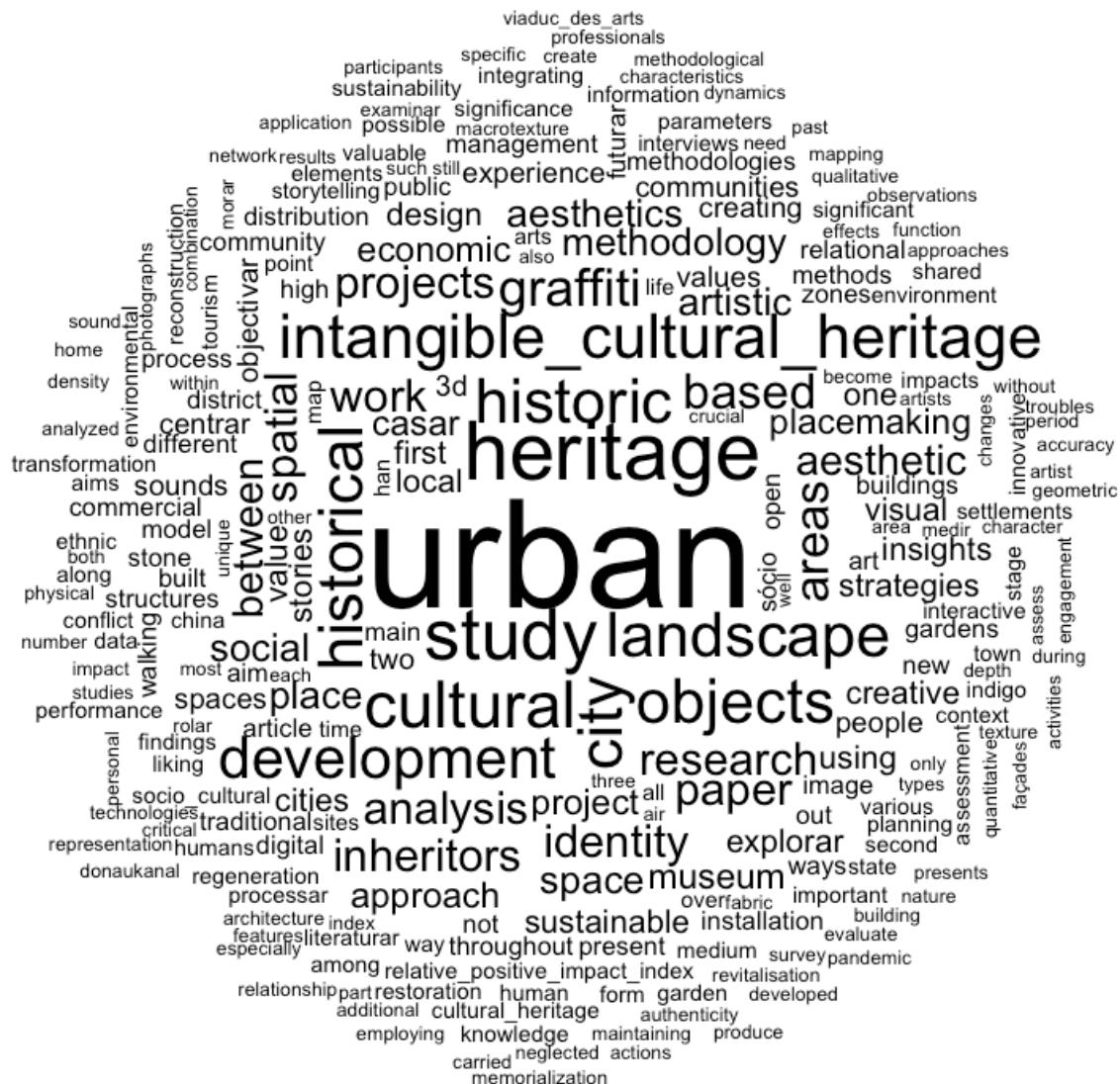


Figure 2. Word cloud of abstracts included in the systematic literature review using IRaMuTeQ software.

(such as UCL Depthmap), social networks, and collaborative digital platforms, as well as audiovisual and sound recording technologies. However, with the exception of articles such as Caroti et al. (2023), Pierdicca et al. (2023), and Verhoeven et al. (2022), in which technology constitutes a structural component of the methodological design –highlighting its potential for advanced documentation, analysis, and representation of cultural heritage— in the majority of the remaining studies analyzed, these technologies assume an instrumental role, functioning mainly as support for data collection, organization, or visualization.

3.1.1. Word cloud

To complement the main results analysis, a word cloud (Figure 2) was generated using IRaMuTeQ software (Carmargo & Justo, 2013), based on the frequency of lexical forms across the abstracts included in the systematic literature review. This type of textual analysis provides a straightforward highlight of dominant themes and key concepts, where the size of each word matches its frequency in the dataset, providing a snapshot of the overall focus of the articles.

As illustrated in Figure 2, the most prominent terms are 'urban', 'heritage', 'cultural', 'historic', and 'landscape', reflecting the strong emphasis of the literature on urban contexts and both tangible and intangible cultural heritage. The concept 'urban', specifically, operates throughout the 22 abstracts primarily as a modifier or adjectival qualifier, rather than as an autonomous artistic or cultural marker. In most cases, it precedes nouns or nominal cores within compound nominal constructions –such as 'urban areas', 'urban development', 'urban heritage', 'urban identity', 'urban landscape', 'urban design', and 'urban policy'– which helps to explain its high frequency and central position in the word cloud.

Methodological terms such as 'study', 'research', 'analysis', and 'methodology' also appear with high frequency, which is consistent with the systematic and research-oriented nature of the corpus.

In contrast, the term '*graffiti*' appears with noticeably lower frequency and reduced visual prominence, occupying a peripheral position in the upper area of the word cloud. This visual pattern supports the findings, specially of the object-of-study analysis, indicating that while *graffiti*, *street art*, and urban art are occasionally mentioned within the reviewed articles, they are rarely positioned as central analytical objects, instead functioning mainly as contextual or secondary references.

3.2. Discussion of results

The analysis of the 22 studies shows that cultural mapping has been applied more consistently from 2023 onward, across different disciplinary and territorial contexts, establishing itself as a methodology with elastic applicability and particular relevance for the documentation, interpretation, and valorization of cultural resources in urban contexts. However, the results also reveal a set of trends and limitations that justify a critical and in-depth interpretative discussion of the data.

3.2.1. Trends and advantages of cultural mapping

Based on the analysis of the results, a predominance of studies applying cultural mapping to tangible/built cul-

tural heritage is observed (Caroti et al., 2023; Pierdicca et al., 2023), such as monuments, urban pavements, and infrastructures considered historical and/or heritage related. This finding is aligned with the greater methodological ease and interest in preserving physical, measurable, tangible, and georeferenceable elements, whose heritage classification is also more straightforward when compared to intangible, ephemeral, non-palpable, or informal phenomena. Indeed, the use of Geomatics has become consolidated due to its ability to produce physical and metric records of objects with high precision, which explains why quantitative methods are more consistently applied to material/built heritage – suggesting, in turn, that advanced geospatial technologies may play a particularly promising role in the documentation of complex urban cultural practices, including urban art.

Nevertheless, and although in smaller numbers, collective memory, emotional dimensions, and local narratives are also being mapped (Jiménez-Peralta et al., 2021; Mathuria, 2024; Vilcea et al., 2023), with scientific contributions that are particularly relevant to 'sense of place'. On the one hand, the study conducted in Valparaíso (Jiménez-Peralta et al., 2021) showed how mapping memories and emotions can counteract the social stigma associated with a specific location, enabling the creation and projection of a more positive image of that place, transforming it into a space of belonging that had previously been devalued. The integration of the 'geography of emotions' as a heritage management tool, as mentioned by Jiménez-Peralta et al. (2021), reinforces the relevance of cultural mapping methodology in traditional urban planning and in the resignification of public space. On the other hand, the mapping of perceptions and emotions carried out among residents of Craiova regarding historic buildings in Romania, with the support of the EGIS methodology, demonstrated that it is possible to convert feelings and emotional attachments (qualitative data) into quantifiable spatial data, produced on a map with precise geographic locations (Vilcea et al., 2023), suggesting an as yet unexplored potential for the mapping of urban art. This factor suggests that the use of the EGIS methodology may allow not only the documentation of the location of urban artworks, but also the georeferencing of their emotional impact and their

capacity to generate 'sense of place'. No less important, this finding also indicates that cultural mapping methodology privileges community participation and collaborative construction, since it is the human collective that holds the social memory capable of demonstrating the symbolic value of cultural heritage and, in turn, justifying the potential need for its safeguarding.

3.2.2. Challenges and limitations of cultural mapping

It is certain that the use of technology in cultural mapping processes has, undeniably, methodological advantages, regardless of whether the object being mapped is material or intangible in nature. Nevertheless, there are challenges that should be considered in advance by researchers working with this type of process, in order to ensure, as much as possible, the long-term sustainability of research projects.

First, there is the challenge that "digital tools and formats may become obsolete over relatively short periods of time" (Verhoeven et al., 2022, p. 3), potentially leading to data loss and compromising information preservation. Second, there is the need for "continuous updating, maintenance and technical support" (Pierdicca et al., 2023, p. 6), which, together with the former, may also become a barrier to long-term maintenance and development. Third, despite the proven positive results of the EGIS methodology, the authors acknowledge that its implementation "requires specialized technical expertise and significant digital infrastructure" (Vilcea et al., 2023, p. 11), which limits its applicability in contexts with lower technical or institutional capacity.

Although community participation is often presented as a central pillar of cultural mapping, the systematic literature review reveals that such participation tends to be concentrated at specific moments in the data collection process (for example, during interviews), rather than being fully integrated throughout the entire research process. Sapucaia (2024) notes, on the one hand, that "maintaining participation beyond the initial mapping phase proved challenging" (p. 9), particularly when dependent on short-term funding. On the other hand, Sanz & Rodríguez-Labajos (2023) state that "par-

ticipatory mapping processes are often constrained by predefined institutional agendas, which shape both the scope of participation and the outcomes produced" (p. 7), assuming a lack of feedback, dialogue, and subsequent validation with participants, which in turn "raises questions regarding the extent to which mapped cultural values truly reflect evolving community perspectives over time" (Rangarajan, 2023, p. 14). For this reason, it is possible to infer that this limitation does not stem from a lack of technical or analytical skills on the part of communities, but rather from the procedural nature of cultural mapping methodology, which shapes the conditions of community participation, ultimately calling into question the valorization of their contribution and hindering their continuous involvement in research.

These observations do not undermine the potential of technologies when applied in cultural mapping processes, but they do highlight the need for more critical, sustainable, and methodologically mature approaches, reinforcing the relevance of systematic literature reviews such as the one presented here.

4. Conclusions

The present systematic literature review made it possible to offer a broad and structured overview of the various contexts in which cultural mapping is applied.

It was possible to demonstrate that the field of cultural mapping is technologically mature but methodologically segmented. Indeed, an absence was identified of a mapping model capable of articulating the technical rigor of technology in the documentation of tangible/built cultural heritage with the interpretative richness of social narratives arising from community participation, which is fundamental to a more holistic understanding of space. Although mapping tools and new media are crucial for preserving memory and 'sense of place', the present systematic literature review has shown that urban art—a form of heritage that is simultaneously material and intangible—has not, to date, benefited from an integrated mapping model that combines these two dimensions. This observation is consistent with the lexical and thematic marginality of urban art and *graffiti* identified throughout the *corpus*, and points to significant op-

portunities for future research regarding the application of cultural mapping to this artistic expression.

The results show that this methodology has been used as a tool for documenting and enhancing cultural heritage, while enabling the identification, protection, and reinforcement of the 'sense of place' of a given location and community. However, the absence of relevant results demonstrating the application of this methodology to contemporary artistic cultural practices, particularly urban art, street art and *graffiti*, points not only to a limitation of the review but also to an under-representation of this phenomenon in indexed scientific publications, where it remains clearly underexplored. Of the two studies that address *graffiti*, only one maps 'contemporary *graffiti*', while the other does so within a historical framework (referred to as 'medieval *graffiti*', removed from contemporary practices), raising questions about the academic legitimacy attributed to *graffiti* as an object of cultural and heritage research. This lack of scientific publications may be interpreted in light of the informal, ephemeral, and at times illegal nature of *graffiti*, factors that hinder its integration into institutional models of heritage recognition and documentation. Nevertheless, the results obtained from studies on memory, emotions, and 'sense of place' suggest that cultural mapping once again constitutes a particularly suitable methodology for capturing these intangible dimensions associated with urban cultural practices. In the specific case of urban art, cultural mapping may help address the specific challenges of ephemerality (which demands an immediate and systematic response), despite urban transformation and ongoing debates surrounding authorship. By enabling the documentation of meanings, narratives, and emotional attachments rather than solely material permanence, cultural mapping offers a promising avenue for engaging with urban art beyond conventional heritage frameworks.

The researcher also acknowledges the importance of considering the inclusion of other terminologies during the study selection phase of the bibliographic search (such as 'participatory mapping', 'community mapping', 'memory map' / 'narrative mapping', 'urban memory', 'digital heritage mapping', among others), since investigating the use and nuances associated with these terms may reveal a broader range of results with methodolog-

ical approaches complementary to those presented and discussed in this document, and contribute to enriching the theoretical framework as well as to a more comprehensive understanding of the phenomenon under study. As a final note, and within the scope of the ongoing doctoral research, this systematic literature review constitutes a starting point for the development of future empirical work. In the short to medium term, the design and implementation of a participatory methodological device is envisaged, in the form of a workshop aimed at the collection and systematization of memories associated with urban art. This step seeks to deepen the understanding of the potential of cultural mapping as a methodology for documenting intangible cultural heritage, allowing for the exploration of its applicability to different practices and intentions of urban art and contributing to the valorization of narratives and meanings inscribed in urban space.

4.1. Limitations of the systematic literature review

Despite the methodological rigor adopted by the researcher, the present systematic literature review identified a set of limitations that should be made explicit, namely at the level of terminology and the academic recognition of certain urban artistic practices.

Specifically, it is worth highlighting how the search and selection of studies in the Scopus and Web of Science databases were conditioned by the terminology used during the search phase: it was observed that the use of the keyword '*graffiti*', when combined with the remaining terms, frequently resulted in null returns, regardless of the number of combinations tested. This statistical silence does not necessarily reflect the absence of *graffiti* within the academic domain, but rather the possible lack of publications that intersect this urban artistic expression with practices of preservation, cultural mapping and/or emotions and perception of 'sense of place'. In turn, this finding indicates that 'contemporary *graffiti*', in the form in which it currently presents itself, is not yet fully recognized by peers as a cultural asset suitable for systematic mapping for the purposes of safeguarding intangible cultural heritage and fostering a sense of belonging to place. This lack of recognition may also be linked to normative assumptions regarding

legality, authorship, and permanence that continue to shape dominant heritage discourses. The application of cultural mapping to 'contemporary graffiti' requires a reassessment of what is considered heritage worthy of documentation. While Trentin et al. (2023) demonstrate that 'historical graffiti' is accepted as an "invisible layer covering the natural and anthropic landscape" (p. 1) and as a testimony of past "human presence, interaction, and perception of (...) places" (p. 1), 'contemporary graffiti' lacks such formal recognition.

By contrast, the INDIGO project (Verhoeven et al., 2022) constitutes one of the rare exceptions identified through this SLR that runs counter to this trend, arguing that 'contemporary graffiti' represents a "lost and forgotten part of the Anthropocene's global stratification" (p. 513) and that contemporary markings (ranging from murals to anarchist tags) constitute a "volatile and peculiar cultural heritage" (p. 514) that should be digitally monitored and preserved to enable future socio-political-cultural analyses. Notwithstanding the excellent work demonstrated in the technical and quantitative documentation of the 'what', 'where' and 'how', the researcher highlights a neglect regarding the study of the 'why' and 'for whom' in the INDIGO project.

For the reasons presented, it is suggested that future research should not overlook the mapping of so-called 'contemporary graffiti', which has equal or even greater potential than 'historical graffiti' to reveal new layers of social meaning, memory, and 'sense of place'.

Conflict of Interests and ethics

The author declare no conflict of interests. The author also declare full adherence to all journal research ethics policies, namely involving the participation of human subjects anonymity and/ or consent to publish.

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