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CULTURAL MAPPING AS A TOOL FOR ENVIRONMENTAL EDUCATION IN COASTAL AREAS

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Abstract

This article investigates how cultural mapping can strengthen environmental education in coastal areas of Portugal, highlighting its relevance for understanding the interactions between local communities and coastal landscapes and the development of sustainable conservation and environmental management strategies. The critical praxis developed in research, activism, and even political stances has been trying to emphasize the importance of collective constructions for a sustainable future. The cultural mapping approach presents a critical theoretical and methodological perspective and significant transformative potential in pursuing a socioecological-cultural turn toward local sustainability. To explain and debate those assumptions, this essay analyzes the urban evolution along the Portuguese coast, examining historical contexts and challenges in managing coastal territories. It emphasizes cultural mapping as a valuable approach for integrating local knowledge and fostering collaboration across diverse cultural backgrounds. The study suggests that cultural mapping enhances the relevance and resonance of environmental education projects within communities, thereby contributing to local sustainable development goals. The rationale for adopting the term "cultural mapping" is discussed, highlighting the critical movement from geographical science toward map production and its interpretation of culture within this framework. The manuscript also presents and discusses research projects utilizing cultural mapping as active and critical pedagogies and explores its potential for environmental education. Finally, cultural mapping is portrayed as an interdisciplinary and transcultural research approach employing critical methodological tools for Coastal Environmental Education.

Keywords

Cultural Mapping, Environmental Education, Coastal Areas, Local Sustainability, Local Spatial Knowledge.

Resumo

Este artigo investiga como a cartografia cultural pode fortalecer a educação ambiental nas zonas costeiras de Portugal, destacando a sua relevância para a compreensão das interações entre as comunidades locais e as paisagens costeiras e para o desenvolvimento de estratégias sustentáveis de conservação e gestão ambiental. A praxis crítica desenvolvida na investigação, no ativismo e até em posições políticas tem tentado enfatizar a importância das construções coletivas para um futuro sustentável. A abordagem de mapeamento cultural apresenta uma perspetiva teórica e metodológica crítica e um potencial transformador significativo na busca de uma virada sócio-ecológica-cultural em direção à sustentabilidade

local. Para explicar e debater estes pressupostos, este ensaio analisa a evolução urbana ao longo da costa portuguesa, examinando os contextos históricos e os desafios na gestão dos territórios costeiros. Destaca a cartografia cultural como uma abordagem valiosa para integrar o conhecimento local e promover a colaboração entre diferentes contextos culturais. O estudo sugere que a cartografia cultural aumenta a relevância e a ressonância dos projetos de educação ambiental nas comunidades, contribuindo assim para os objetivos locais de desenvolvimento sustentável. Discute-se a justificação para a adoção do termo "cartografia cultural", salientando o movimento crítico da ciência geográfica para a produção de mapas e a sua interpretação da cultura neste contexto. O manuscrito também apresenta e discute projetos de investigação que utilizam a cartografia cultural como pedagogia ativa e crítica e explora o seu potencial para a educação ambiental. Finalmente, o mapeamento cultural é retratado como uma abordagem de investigação interdisciplinar e transcultural que emprega ferramentas metodológicas críticas para a Educação Ambiental Costeira.

Palavras-chave

Cartografia Cultural, Educação Ambiental, Zonas Costeiras, Sustentabilidade Local, Conhecimento Espacial Local.

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CULTURAL MAPPING AS A TOOL FOR ENVIRONMENTAL EDUCATION IN COASTAL AREAS

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Introduction

This manuscript adopts the idea of Cultural Mapping (CM) to discuss this practice as having great potential for environmental education in coastal areas. Such coastal areas have been experiencing uncontrolled urbanization processes that can contribute to negative transformations. In this sense, CM is introduced as a possibility for understanding local culture and creating collaborative processes that enable the development of a community willing to contribute to local sustainability.

CM is a pedagogical tool encompassing place-based environmental education through exploring and representing the place (Jagger, 2013). With a collaborative and action-oriented approach, CM contributes to creating a database of local spatial knowledge, enabling the visualization and analysis of community narratives and establishing connections between these narratives and other landscape biophysical and cultural elements. By analyzing community narratives alongside the biophysical and cultural elements of the landscape, CM enables the identification of patterns, connections, and interdependencies that may not be obvious in isolated analysis. This can lead to important insights into local environmental, social, and economic issues and inform the development of more appropriate and sustainable policies and practices.

Through a comprehensive literature review and following up on the work being developed in collaboration with local coastal communities by the Ocean Literacy Observatory – part of the Marine and Environmental Sciences Centre, ARNET - Aquatic Research Network Associate Laboratory, Portugal, this essay presents practical cases of CM inquiry that contribute to environmental education practices in coastal areas.

For this purpose, an analysis of urban evolution on the Portuguese coast is conducted, presenting a historical context and some challenges for managing these critical and sensitive coastal territories. Thus, CM is highlighted as a valuable tool for integrating local knowledge and fostering collaboration among diverse cultural backgrounds. It is

suggested that with CM, environmental education projects can achieve greater relevance and resonance within communities, ultimately contributing to local sustainable development goals. Afterward, the reason for choosing the term cultural mapping, which involves a critical movement from geographical science to map production, is discussed, as well as how the idea of culture is apprehended in this context. Some research projects that have utilized CM practices as active and critical pedagogies are presented and discussed, as well as the possible use of these practices for environmental education. As a final consideration, CM is underscored as interdisciplinary and transcultural research that employs critical methodological tools for Coastal Environmental Education.

Coastal Areas in Portugal: context and challenges

Over the last decades, there has been a noticeable densification and increase in geographic complexity along the coastal bands of mainland Portugal, ranging from Braga to Setúbal and from Lagos to Olhão (Fernandes & Sexias, 2018). Since the 1970s, economic expansion and urban development along the Portuguese coast have had a notable surge. Approximately 75% of the Portuguese population resides in coastal regions, roughly 14% living less than 2 km from the shoreline during high tide (APA, 2017). This figure continues to rise, significantly impacting estuarine and coastal waters (Taveira-Pinto *et al*., 2022).

Urban development primarily impacted the southern coastal regions, particularly the stretch from Portimão to Faro. It exhibited significant intensity around major metropolitan hubs in the northwest and along the central coast, specifically Porto and Lisbon (Tonini et al., 2018). Several case studies in coastal areas of Portugal have shown how these areas have been under pressure and lack the necessary attention for positive transformations. We can observe that Portimão remains a coastal area under significant pressure from tourism and urbanization (Deus *et al*., 2023), while Lagoa de Óbidos and Martinhal have been paying particular attention to their sedimentation processes following extreme natural events (Costa *et al*., 2012). The contact and proximity to the ocean enable extreme natural phenomena, including those driven by climate change, which can negatively impact coastal societies. "Extreme events such as abrupt marine invasions due, for example, to tsunamis, extreme storms, and co-seismic subsidence, have an undoubtedly important significance for coastal evolution" (Costa *et al*., 2012, p. 1367).

In recent decades, the construction of buildings, promenades, and other structures along waterfronts has often encroached upon beaches and dunes, altering morphological conditions. This phenomenon has exacerbated coastal risks, at least in localized areas, by contributing to changes in the landscape (Taveira-Pinto *et al*., 2022).

There is difficulty in implementing coastal management guidelines in Portugal due to a lack of integration among the approximately 100 entities responsible for decisions regarding the Portuguese coast "(6 ministries, 11 secretaries of state, 27 institutes and general directors and 51 municipalities)" (Oliveira *et al*., 2020, p. 34).

> *In Portugal, since the 1990s, the development of Integrated Coastal Management (ICM) has stimulated a more integrative and participative approach to coastal management, with the government developing legislation for coastal zone protection, recovery, management, and governance. […] Application of the national strategy has taken its first steps, but clarity and communication are key aspects for the future ICZM implementation* (Oliveira *et al*., 2020: p. 44).

However, beyond that, there is a lack of knowledge (Oliveira *et al*., 2020) and a lack of collaborative involvement with local communities regarding the necessary and desired intervention plans for a particular territory. Collaborative practices such as CM contribute to community engagement and involvement of other stakeholders, providing a space for dialogue and inclusion of multiple forms of knowledge, contributing to a co-creation process, valuing citizens' local spatial knowledge, and allowing them to be part of the management of their place, thus contributing to local sustainability.

This discussion is part of a doctoral project in which a CM praxis is applied in Lagoa de Albufeira, Portugal. This coastal lagoon in the municipality of Sesimbra has special ecological significance, being a nesting area for birds and a Ramsar site in addition to its scenic beauty and historical significance. However, it has been experiencing abrupt changes in its landscape, mainly due to uncontrolled urbanization processes, which bring not only people with some connection to the place but also citizens from other places who do not have past ties to the location. Thus, applying CM to the local community aims to contribute to the perception of local reality, conflicts, and individual and collective desires. This practice is believed to contribute to a dialogical learning process and even allow for the creation of affection and responsibility towards the place.

Cultural Mapping: co-construction, community involvement, and place-based learning in research

Theoretical-methodological practices that contribute to the process of inclusion and environmental education within local communities, such as CM, represent alternatives with the potential to contribute to local sustainable development. Simultaneously, it facilitates reciprocal knowledge exchange wherein older generations impart narratives from the past, elucidating historical lifestyles and experiences. New inhabitants, including those from different cultural backgrounds, can absorb these narratives while also contributing their own stories and rationale for choosing the locality as their residence. Such interactions serve as educational opportunities for younger individuals, instilling aspirations for the future. This exchange mechanism nurtures a heightened communal spirit and a sense of obligation toward advancing local sustainable development. Additionally, given its collaborative nature, it engenders increased openness and innovation, fostering the co-creation of agreements, initiatives, and resources aimed at fortifying efforts for socio-ecological equilibrium within the community.

In pursuing scientific progress and sustainable development, it is paramount to recognize the value of co-construction and community involvement. This entails integrating local knowledge into the scientific discourse and co-creating knowledge alongside communities.

Indigenous wisdom, traditional practices, and community insights offer invaluable perspectives that enrich scientific understanding and inform more holistic approaches to sustainability. By acknowledging and incorporating these diverse knowledge domains, environmental education projects can transcend conventional boundaries and achieve greater relevance and resonance within local contexts.

Why Cultural Mapping?

Collaborative mapping approaches in research have been used in an interdisciplinary and transcultural manner to promote social and environmental justice, allowing for the sharing of knowledge, experiences, and desires about the place in the form of maps (Pedregal, 2020).

This research methodology has its roots in a movement of critical cartographies (counter-mappings) that shed light on the power of maps (Wood, 1993; Wood, 2010) and the need to rethink for whom the production of these maps serves (Harley, 1990). This critical cartographic movement stimulated a series of new mapping methodologies that, although spread across different disciplinary areas, share the same premise of producing maps collaboratively with local communities and seeking to reveal and valorize local knowledge that can contribute to the sustainability of the place. Such critical cartographic methodologies have been titled differently in science, ranging from social mapping (Silva *et al*., 2019) or social cartography (Cruz-López *et al*., 2022) to participatory mapping (Mere-Roncal et al., 2021) to public participation geographic information system (PPGIS) or participatory GIS (PGIS) (Monteiro de Carvalho *et al*., 2021). This essay will use Cultural Mapping (CM) to encompass all these terms.

A definition that contributed to the decision to use the term "cultural mapping" was elaborated by the Amazon Conservation Team - ACT Brazil and provides the following definition for Collaborative Cultural Mapping:

> *A cultural map is a cartographic tool aimed at demonstrating cultural, historical, and customary aspects of a traditional territory of one or more peoples. Cultural mapping can take on various forms, but the defining aspects are clear: it must be carried out by the community itself, combined with cartographic rules, so that the final result is precise and orderly. It is part of a cultural and social diagnosis process that can lead to strong political instruments and form the seed capable of creating good policies for the involved communities, such as indigenous education plans, environmental management, and territorial protection. The map should not constitute an end goal but rather a tool within a work of cultural and territorial strengthening of traditional communities.* (ACT Brasil, 2008: p. 7).

Although the document will primarily address indigenous communities in the Amazon region, we understand that this approach can be equally important for other non-indigenous or native communities and other regions of particular socio-ecological interest, such as coastal areas in Portugal and worldwide. Coastal areas undergo intense transformation due to being the frontier and meeting point between oceanic waters and the terrestrial spaces inhabited by human society. These dynamic zones are subject to various environmental, social, and economic pressures, including coastal erosion, rising sea levels, habitat loss, pollution, and urbanization (Crossland *et al*., 2005).

The term "Cultural Mapping" encapsulates the analytical process of unraveling cultural nuances interwoven within the local landscape, encompassing a spectrum ranging from discerning the catalysts behind landscape transformations to unraveling the rich tapestry of stories and narratives that underpin local cultures. Recognizing the contemporary epoch as the Anthropocene, or more aptly, the Capitalocene, underscores the profound imprint of human activity on landscapes and the global ecological equilibrium. Hence, discussing cultural mapping transcends mere cartographic delineation; it encapsulates a holistic comprehension of the broader cultural fabric, dissecting a local culture across its diverse systems and facets. Ultimately, it epitomizes the endeavor to decipher the intricate cultural landscapes that shape our world.

Culture carries a series of meanings depending on the local context or even the disciplinary area in which it is used. It has commonly been associated with artistic expressions and cultural planning - aimed at the valorization of artistic and creative expressions such as operas, symphonies, and theaters, which has contributed to the marginalization of other cultural expressions that are usually already marginalized (Dick, 2015) stemming from the very constructive history of the place. Beyond the arts and the creative sector, culture should be understood broadly, encompassing at least two other categories: cultivation of the mind and way of life (Williams, 1976). Admitting the analysis of a local culture under these categories allows for a more complete and complex view of the place, in which all citizens and local communities become an intrinsic part of this culture. It is necessary to value citizen narratives and stories and to go beyond just mapping tangible assets and recognize the importance of intangible cultural resources (Dick, 2015).

The cultures of each society are developed from their landscapes and, at the same time, are responsible for the constant alterations in these landscapes. Such planetary landscapes are, especially in an era of the Anthropocene, cultural landscapes shaped and reshaped by a web of collaborations between physical resources and human activities (Sauer, 1925).

Cultural Mapping as a Praxis for Environmental Education

CM can be understood as a praxis of environmental education since it involves citizens and communities in dialogical learning and individual and collective empowerment. CM is not just the creation of maps - final products, but the process itself is of immense

importance, as it is a space for collaboration among community members. In this sense, it becomes essential to understand the place, create intra-community bonds, form identity, map conflicts, discuss dreams and desires, and even create social contracts.

In the context of CM as a tool for environmental education, we understand that the process of CM itself operates within the spectrum of education for local sustainability. The idea of mapping in collaboration with local communities can be seen as a process of Participatory Action Research in which citizens and communities are integral parts of the investigative process and bring forth questions, discussion topics, and their local knowledge. Blending scientific knowledge with local knowledge through collaborative mapping activities allows for exploring and discussing topics important to local culture, creating an environment of empowerment and inclusion.

CM, through its geographic dimension, serves as a tool for uncovering local spatial knowledge and illuminating intangible aspects that shape a community and its internal dynamics (Gibson, 2010). CM can be an important inquiry that allows the identification of local identities and socio-environmental conflicts experienced by the community by sharing and recording citizen narratives and valuing local knowledge. In this sense, it allows for a dialogic learning process of enormous value for environmental education practices, shedding light on the intrinsic and inseparable relationships between nature and culture (Silva *et al*., 2018).

The methods employed in CM encompass a range of techniques such as mind maps, emotional maps, narrative cartography, visual analysis of media, drawings, and advanced Geographic Information Systems (GIS). In the following sections, we will introduce several projects that delved into CM from diverse perspectives, each with unique goals and methodologies. It is worth noting that these projects not only offer valuable insights into cultural diversity but also present a significant opportunity in the realm of environmental education. By integrating cultural elements with socio-ecological insights, these initiatives enhance our understanding of the interactions between communities and their natural surroundings. They also foster a broader awareness of the importance of environmental preservation and sustainability.

The importance of collaborative mapping approaches in environmental education and policy development

A project conducted by the Environmental Education, Communication, and Arts Research Group from the Federal University of Mato Grosso demonstrated the potential of collaborative mapping practices, even in shaping public policies for the state (Sato et al., 2014). As a methodology for environmental education, this project facilitated the mapping of vulnerable social groups and the identification of socio-environmental conflicts that expose these groups to risks, providing valuable insights for managers and decision-makers dealing with local, territorial planning issues (Sato *et al*., 2014). This collaborative approach informs policymakers and decision-makers about socio-environmental conflicts and vulnerabilities and emphasizes the importance of participatory approaches in environmental education and policy development. By

involving local communities in the mapping process, the project fosters a sense of ownership and empowerment while ensuring that the perspectives and needs of those directly affected by environmental issues are considered (Sato *et al*., 2014). Such an inclusive approach can lead to more effective and sustainable solutions that address the root causes of environmental challenges while promoting social equity and resilience. Moreover, the project's success in influencing public policy underscores the value of interdisciplinary research and collaboration between academic institutions, governmental bodies, and local communities in addressing complex environmental issues.

Walkscapes: Collaborative map of the micro-territory

CM can utilize various methods, which will depend on the contexts of each project and the proponents' areas of training and research. Ortega Nuere e Bayon (2015) present methods imbued in CM, based on Jane Jacobs and Francesco Careri, such as Walkscapes - which are global movements where local citizens and other visitors walk together to map the problems of the city as a community. These movements are rooted in the principle that the collective, the networked community, has a greater capacity for critical observation of their local spaces than the individual alone. These Walkscapes create momentum for dialogical learning - between, for example, researchers and citizens, about local culture and allow for the creation of a collaborative map for that micro-territory. Walking collectively as a method of observation and intervention in territories creates an environment of curiosity, communication, and affectivity, building a greater sense of belonging and responsibility for common spaces (Ortega Nuere & Bayon, 2015).

Environmental education program for geography teachers, employing CM practices, including Community Mapping and Photovoice

Through the implementation of an environmental education program for geography teachers, utilizing CM practices, including Community Mapping and Photovoice, it was deduced that such collaborative methods actively contribute to the development of geographical knowledge and understanding of regional environmental conflicts (Cho & Kim, 2022). Furthermore, this pedagogical tool significantly enhances community competencies and active citizenship, as participating citizens collaboratively engage in their communities to effect positive changes in their surroundings (Cho & Kim, 2022).

The photovoice method emerges as an intriguing tool for environmental education. Equipping citizens with cameras to capture the conflicts and potentialities of their surroundings, this technique empowers communities as investigators of their everyday lives, facilitating the visualization of situations through the perspective of those who live and experience the place (Cho & Kim, 2022; Goodchild, 2007). By documenting everyday aspects of the environment through photos, videos, and narratives, this method contributes to the cultivation of critical awareness. It enables the co-creation of a democratic and inclusive space. Here, marginalized individuals can express their opinions and knowledge, exerting pressure to ensure proper attention is given to local issues and

advocating for territorial interventions to foster a more sustainable community (Cho & Kim, 2022).

The activity of collecting media, photos, and videos not only holds intrinsic educational potential but can also be enriched through the inclusion of prompts that encourage the sharing of narratives among participants. By requesting each participant to describe their own image or video, commenting on various aspects such as the content depicted in the media, the reason why the situation was captured, the media's relationship with their personal lives, and the opportunities that can be drawn from the presented situation, it is possible to promote deeper reflection and meaningful exchange of experiences (Cho & Kim, 2022).

This approach fosters individual expression and encourages empathy and interpersonal understanding, as participants can share their unique perspectives and learn from one another. Furthermore, by discussing the relationships between the media and their own lives, participants can develop critical media analysis skills and increase their awareness of how images and videos influence their perceptions and behaviors.

Simultaneously, the activity can also promote creativity, as participants are challenged to find opportunities and meanings in everyday situations captured in the media. This can lead to a greater appreciation of daily experiences and the development of a growth mindset, where participants learn to extract valuable lessons and insights from their own lived experiences.

Therefore, by incorporating these elements of reflection and narrative sharing into the activity of collecting media, photos, and videos, educators can create a rich and engaging learning experience that not only promotes the personal development of participants but also strengthens connection and collaboration within the group.

Firsthand sensory exploration of the area and inspiration to students

In addition to facilitating firsthand sensory exploration of the area, CM initiatives can inspire students to forge personal and emotive bonds with their place and surroundings and its non-human inhabitants (Jagger, 2013). According to the "knowing nature framework" proposed by Knapp (2005), CM functions can be seen as an environmental education tool encompassing at least four significant pedagogical potentials: Observing, Situated Knowing, Identifying, and Transforming (Knapp, 2005). Observing is directly linked to questioning processes about the place, observations of seasonal changes, listening, counting, and measuring environmental characteristics of the proposed study area. Situated Knowing is related to the stories and narratives about the past and present of the place, allowing for the reconstruction of local history and contemplation of the current context. Identifying is connected to perceiving the relationships between landscape elements, enabling understanding the cycles inherent in the local socio-ecological system. Transforming relates to the action research character of the CM methodology, in which participants' actions for positive changes in their local environment also benefit them physically, intellectually, and emotionally (Knapp, 2005).

Local water resource management

CM approaches have also been successful in local water resource management projects, as with some riverside communities in Chapra, Bangladesh (Hossen, 2016). The investigative process utilizing collaborative mapping techniques allowed for the inclusion and empowerment of the community regarding local development and natural resource conservation (Hossen, 2016).

In environmental education, this example is significant for several reasons. Firstly, it demonstrates the importance of active participation by local communities in the management and conservation of the natural resources surrounding them. By involving residents in identifying and mapping water resources, they become aware of the importance of these resources and active agents in their preservation (Hossen, 2016).

This example also highlights the effectiveness of collaborative approaches in environmental education. The use of CM techniques not only provides valuable information about local natural resources but also promotes hands-on learning and knowledge exchange among community members. This educational approach is more engaging and relevant for participants, thereby increasing the impact of environmental education initiatives.

Engagement and critical stimulation in youth

CM practices can also contribute to reflection processes in urban youth about their geographical space (Literat, 2013). Collaborative mapping practices are of great value for engagement and critical stimulation in youth, which would hardly be achieved with purely textual investigative methods (Literat, 2013). Collaborative mapping practices offer an effective way to integrate environmental aspects into youth education. By involving students in creating maps highlighting natural resources, green areas, and pollution, among other aspects of the local environment, they are encouraged to reflect on the relationship between their actions, the environment, and the community. This promotes a deeper environmental awareness and a sense of responsibility towards environmental preservation. Furthermore, by adopting a practical and visual approach, collaborative mapping practices can be more engaging and meaningful for youth, thereby increasing the impact of environmental education.

Cultural Mapping as Participatory Action Research: Learning by doing

CM brings the possibility of learning by doing and can design the investigative process as participatory action research, as observed in planning practices in Italy. In different contexts, stakeholders linked to territorial planning have pointed out that using CM allows for greater knowledge of territories, collaboration between scientific, technical, and local knowledge, and active leadership development that can promote positive change (Saija *et al*., 2017).

CM's collaborative and action-oriented approach plays a fundamental role in creating a database of local spatial knowledge, enabling the visualization and analysis of community

narratives and mapping relationships between these narratives and other landscape biophysical and cultural elements.

Moreover, visualizing the data collected through CM can facilitate communication and dialogue among various stakeholders, promoting greater awareness and community engagement regarding spatial and environmental issues. This can strengthen the community's capacity to make informed decisions and actively participate in managing and preserving their local environment.

Final considerations

CM plays a pivotal but often overlooked role in environmental education literature, as it has been insufficiently theorized and developed. However, recent exploration has highlighted its significance in facilitating learning, agency, and instigating change within communities. This essay examines CM as interdisciplinary and transcultural research that utilizes critical methodological tools for Environmental Education. We argue that CM has excellent potential to address coastal sustainability issues and contribute to the learning and critical empowerment of citizens and local communities in promoting equitable, local sustainable transitions.

Through CM techniques, communities mobilize knowledge about biocultural diversity, enabling the acquisition of essential information and fostering engagement in meaningful activities that relate to their cultural landscape (Belay, 2012). This process also serves as a platform for community members to renegotiate their identities within the broader community context. Moreover, the utilization of CM has demonstrated its capacity to catalyze learning and evoke a desire for change among participants. This newfound knowledge and motivation can be harnessed to adapt to evolving socio-ecological environments, ultimately contributing to the long-term resilience of social-ecological systems. Thus, CM emerges as a tool for knowledge dissemination and as a catalyst for transformative action, offering potential pathways toward sustainable change and enhanced community resilience (Belay, 2012).

Coastal areas require special attention due to significant anthropogenic pressure. On the other hand, they tend to be areas of urban expansion due to their scenic value, easy accessibility, continuity of urban sprawl, opportunities for recreational activities, fishing, and numerous other reasons that historically make coastal zone areas of great interest for human occupation and use. Many of these areas represent significant environmental importance, increasing the number of protected areas along coastal and oceanic zones as an alternative to the degradation these areas have been experiencing. However, protected areas may conflict with local communities, who are sometimes unwilling to accept usage prohibitions in those areas. It is urgent for scientific research to pay more attention to these areas and the conflicts that have been occurring.

Coastal regions are uniquely rich in cultural, tangible, and intangible heritage, biodiversity, and intricate socio-ecological dynamics. Anthropogenic influences on the Portuguese coastal zone have become increasingly significant in recent decades.

Moreover, it is anticipated that the spatial and temporal scales of these impacts will further escalate soon (Taveira-Pinto *et al*., 2022).

In coastal areas, where human activities and the impact of climate change are acutely felt, CM offers a transformative approach to environmental education. It enables communities to explore and articulate their unique connections to the coastal environment, fostering a sense of ownership and responsibility toward its preservation. CM fosters a sense of place and belonging, reinforcing the cultural identity of coastal communities intertwined with their natural surroundings. By celebrating cultural diversity and community perspectives, it promotes inclusivity and equity in environmental decision-making processes, ensuring that the voices of marginalized communities are heard and respected.

In conclusion, Cultural Mapping offers valuable tools for Environmental Education and local sustainable development in coastal areas. Its collaborative, interdisciplinary, and transcultural approach allows for a broader understanding of communities and local socio-ecological systems, contributing to creating sustainable and equitable strategies. Through its place-based learning format and creative methods that explore local spatial knowledge, Cultural Mapping can make environmental education projects more compelling, comprehensive, and engaging, helping protect and value coastal landscapes for present and future generations.

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