



Article

Ecomuseums in the Mediterranean Area and the Promotion of Sustainable Food Systems

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Abstract: In recent years, the growing interest in food as a central component of heritage preservation has been paired with a reflection on the sustainability of food systems. At the same time, place-based food governance has undergone processes of hybridization, opening up to a wider range of stakeholders. We argue that ecomuseums can positively contribute to the promotion of sustainable food systems that can preserve cultural heritage without undermining the development of healthy food systems. To discuss this hypothesis, we conducted an exploratory study to assess the current diffusion and food-related practices of ecomuseums in the Mediterranean area. Integrating the information of existing databases with online research of new institutions, we mapped a large sample of ecomuseums and carried out a Web Content Analysis. The main results of the research are a geolocalized map of Mediterranean ecomuseums and their activities and an index assessing their capacity to engage users on relevant topics through their webpages. The results highlight the existence of an unbalanced distribution of experiences, and the potential for growth, especially in the east and south of the Mediterranean countries.

Keywords: sustainable food systems; ecomuseum; food heritage; Mediterranean countries



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1. Introduction

Concerns regarding sustainability are progressively becoming integral to discussions on the management and planning of food systems. Within the literature, there is a large body of scientific articles, research endeavors, and grassroots initiatives integrating sustainability principles into food systems [1–9]. Achieving sustainability remains a distant goal [10], in food systems and many other areas, but food policies and governance practices are moving towards sustainability, and this awareness is shared by international institutions. For example, the European Union (EU) has been recognizing the need for a holistic approach that considers the environmental, social, and economic aspects of food systems. Key policy areas that have been promoted in the last years by the EU include the following:

- The Farm to Fork Strategy [11]: Part of the European Green Deal, this strategy aims
 to make food systems more sustainable, ensuring that the environmental and social
 footprint of food production and consumption is reduced. It focuses on areas like
 reducing food waste, promoting organic farming, and ensuring food security.
- The Common Agricultural Policy (CAP) [12]: The CAP has been reformed to promote sustainable agriculture. This includes measures to support organic farming, reduce greenhouse gas emissions, and preserve rural biodiversity.
- Circular Economy [13]: The EU's circular economy action plan includes measures to minimize food waste and ensure more sustainable food production and consumption patterns.
- The Biodiversity Strategy [14]: The EU's Biodiversity Strategy for 2030 aims to protect nature and reverse the degradation of ecosystems, which is integral to sustainable food systems.

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• Climate Policies [15]: The EU's climate policies also impact food systems, pushing for reduced emissions in agriculture and promoting sustainable land use.

Food systems can be analyzed on various scales [16,17], going from the micro-local to the global, and refer to all aspects of food, ranging from production to distribution, from processing to retail, and from consumption to waste disposal.

Although for a long time the national and supranational levels were predominant in the management of food systems, at the beginning of the 2000s, a new attention to local food policies started to emerge, with cities and local actors becoming increasingly involved in their definition and implementation [18].

This new place-based food governance paid attention to the development of local food system resources that could be more sustainable from an economic, social, and environmental point of view, aiming, for example, at the control of food quality, the promotion of local production (reducing transport costs and carbon footprints), launching campaigns to promote the production and consumption of healthy, environmentally friendly food, and regulating land use. The heightened relevance of these forms of local food systems has been characterized by an increased hybridization of the governance dynamics [19] with a growing participation of actors who were historically excluded from the governance of the food system, including civil society and food movements [20]. Among the actors involved in food governance, we can find state actors, such as government agencies and diplomatic missions, and non-state actors, such as NGOs, private companies, and civil society organizations (CSOs). This last group also includes ecomuseums, museums, and more general cultural institutions.

According to Gaitàn-Cremaschi et al. [21], hybrid food systems, described as a mix between niche innovations and mainstream practices, can be especially useful in phases of transition, as they may foster broader processes of change, by creating linkages between niche food systems and the food system's main widespread regime.

In light of the current reflection on the hybridization of food systems governance processes, the research question that orientated this article is what is the role of ecomuseums (and, more broadly, cultural institutions) in promoting sustainable food systems? This reflection is supported by the growing implication of museums worldwide in the promotion of sustainability and initiatives related to the SDG framework and the climate change emergency. Our main hypothesis is that ecomuseums and community museums have the potential of playing key roles in this field, due to their inherent ties to the local territory and their inclination towards community-based activities. To obtain a wide overview of actions and processes, we decided to consider all of the Mediterranean area, first of all, because is the area where the Mediterranean diet originated, and secondly, because the area already hosts some best practices related to food (such as the "Ecomusei del Gusto" project in Italy, or the Slow Food movement in that area). Lastly, these territories are fertile and linked with ancient food traditions, where many typical products are cultivated, produced, and processed with traditional methodologies.

In order to examine this hypothesis, this paper is organized as follows.

The first paragraph discusses the evolving role of cultural institutions, particularly museums, in society, focusing on the emergence of ecomuseums as a significant expression of social museology. Ecomuseums, distinguished from traditional museums, are actively engaging in localized efforts for positive transformation within specific communities, and their participatory approach, deeply rooted in community engagement, is in line with the Agenda 2030 principles and the SDG goals. The second paragraph explores the roles of various cultural institutions, including museums and ecomuseums, in contributing to collaborative governance processes within the food system. Despite not being directly involved in official food policy, these institutions can still have significant impacts by raising awareness about food sustainability through exhibitions and educational programs and supporting the promotion of local networks among stakeholders. Italian ecomuseums have, for instance, developed a number of actions, including short food supply-chain

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projects, cultural itineraries linking agri-food products to local traditions, and support for local producers.

The following paragraph is dedicated to the survey carried out for this research. Museums worldwide are increasing their use of the internet to amplify their presence and engage with diverse audiences. The paragraph presents a dimensional model developed for analyzing web content applied to museums, comprising four dimensions, Information, Communication, E-commerce, and Additional Functions, and how this model was adapted and simplified to analyze the webpages of Mediterranean ecomuseums and participatory cultural institutions, considering their specificities such as small dimensions, a focus on working with local communities, and participatory practices.

The data collected are presented in the Results Section, with a focus on the characteristics connected with the effective use of webpages and the presence of food-related content among the institutions included in the sample. The last paragraph discusses the results considering the theoretical background, highlighting the potential that ecomuseums represent to foster the promotion of a sustainable food system.

We argue that the role of museums as active stakeholders in food governance has not yet been adequately taken into account. At the moment, there is a research vacuum that needs to be filled. For a start, no comprehensive census of active ecomuseums exists, and consequently, it is not possible to assess what activities are being carried out and their impact. Providing information on the diffusion of these institutions and on their involvement with participatory practices and cultural heritage is the first step needed to promote a reflection on the potential role of museums and ecomuseums in defining food governance strategies that have an impact on the system in terms of sustainability transformations. Secondly, the study will contribute to exploring an aspect of the debate that has not yet been adequately considered, namely the role of actors who are generally not formally part of food governance but who can contribute to making it more concrete and more operational in practice.

The study was conducted within the context of the activities developed by the National Biodiversity Future Centre (nbfc.it), an initiative promoted by the Italian Ministry of Research, aimed at studying and preserving the ecosystems and biodiversity of the Mediterranean area.

2. How Ecomuseums Contribute to Sustainable Food Systems

2.1. Ecomuseums and Sustainable Development

The social role of cultural institutions, in particular museums, in society, has been a debated topic since the Santiago de Chile Roundtable of 1972. The Nouvelle Muséologie movement, with the establishment of MINOM (International Movement for a New Museology) in 1985, reinforced the belief that museums should answer to the needs of society. Sustainability is nowadays one of the main issues that need to be addressed, for the creation of a fairer society that is more attentive to impacts, not only on the environment, but also on people and culture. Indeed, even the latest definition of museums by the International Council of Museums [22] highlights this concept, confirming the importance of museums as "institutions in the service of society," capable of fostering sustainability. In fact, since 2018, ICOM has established a Working Group on Sustainability, dedicated to "conducting surveys, collecting data and investigating what sustainability meant: globally and in the context of the museum sector" (Further details are available at the webpage https://icom.museum/en/news/get-to-know-icom-wgs/, accessed on 26 June 2024.) It is worth remembering that ICOM Italy has constituted a WGS composed of Italian experts on this topic.

Sociomuseology examines "social" museum practices and is concerned with the effectiveness of those processes: the satisfaction of community needs. Ecomuseums are one expression of social museology, which also include, among other things, community museums, pontos de memoria, indigenous museums, and favela museums: in general, any museology expression that involves local actors in heritage management. Many authors

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have theorized the difference between museums and ecomuseums. According to de Varine [23], museums are composed of collections, buildings, and the public; ecomuseums, on the other hand, are formed by a community, a heritage, and a territory. If the museum were seen as a service provider, in the former case, it would be serving the collections, while in the latter, it would be serving society. Borrelli and Davis [24] also emphasize this aspect, stating that ecomuseums' focus extends beyond mere preservation and display of artifacts, embracing a proactive role in community development.

De Varine's definition is enriched and echoed by other scholars. Using de Varine's paradigm, Maggi [25] defines ecomuseums as a pact by which the community takes care of its own territory. Joubert [26] emphasizes the greater educational role of ecomuseums compared to museums. Brito [27] introduces the concept of a "museum at the service of differences", which can have or not have a territory (e.g., Pontos de Memória in Brazil, places where memory is celebrated), and they respond to society's needs (e.g., LGBT museums; in that case, museums represent categories that claim more rights and visibility). Boylan [28] underlines the interdisciplinary approach of ecomuseums in a wide area that involves inhabitants, which contribute to the management, and audience. He also proposed five criteria for distinguishing museums and ecomuseums: the reference space, the focus of interpretation, the locus of political control, organizational priorities, and the target audience.

Therefore, ecomuseums have a distinct goal from many traditional museums, which is an active engagement in localized efforts for fostering positive transformation. Their primary objective lies in progressively enhancing the quality of life within specific communities. For example, a recent project involving a network of European ecomuseums [29] has been able to show that many of them have involved community stakeholders in identifying and defining the "sustainable world" they imagine and intend to build.

The strength of ecomuseums in achieving sustainability is rooted in their participatory approach. These institutions operate by integrating the community into decision-making processes, ensuring collaborative ownership of resources, and aligning their trajectory with the expressed needs of the local population [30].

In a recent work, McGhie [31] highlights how this participatory approach resonates with the guiding principles delineated in Agenda 2030, emphasizing inclusivity and participatory governance as pivotal aspects of sustainable development. Moreover, McGhie points out the potential of ecomuseums in reference to the goals included in the SDG framework.

Within the paradigm of ecomuseums, heritage assumes the role of a communal asset of considerable significance. Whether natural, tangible, or intangible, heritage is regarded as a resource that should be conscientiously managed rather than a mere tradable commodity. Emphasis is placed on preserving the intrinsic connections between heritage and its contextual environment, fostering a sense of belonging and continuity within the community.

In their pursuit of sustainable development, ecomuseums adopt a comprehensive approach that seeks equilibrium among social, environmental, and economic considerations. They act as catalysts for sustainable development, advocating for an integrated understanding of the intricate relationships between culture, nature, technology, and temporal continuities.

Finally, ecomuseums actively contribute to local economic sustenance. They facilitate skill development, create employment opportunities, and establish markets for locally produced goods. By doing so, they purposefully steer clear of the adverse impacts associated with mass tourism, instead prioritizing the cultivation of social capital and the holistic advancement of the community [32].

2.2. Museums and Ecomuseums Working on Sustainable Food Systems

Research has explored how CSOs, NGOs, and cultural institutions like museums can contribute to the collaborative governance processes of the food system. Even though they

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may not be directly involved in official food policy, they can implement a number of actions with direct and indirect impacts, such as the following [33]:

- 1. Promote food literacy, which involves initiatives aimed at enhancing access to nutritious food and promoting healthy eating habits.
- 2. Feed the visitor, emphasizing the integration of criteria related to health, nutrition, and sustainability into museum food services.
- 3. Using "Food as a connector", highlight efforts to strengthen relationships and forge connections with various stakeholders within the food system.

In fact, museums adopt various tools to promote food co-governance processes, including practices and initiatives in capacity building, activation of learning processes, creation and fostering of collaborative networks, communication, and information exchange, as well as integrating and implementing sustainability goals and practices in their internal processes. These efforts not only extend within museums but also involve collaboration between museums and other institutions and non-museum organizations.

Other notable examples of the work that museums are developing on the topic of sustainability are the Climate Museums, which draw inspiration from the principles of the "new museology" and aim to foster forms of active engagement with visitors, allowing them to emotionally connect with the urgency of sustainability issues, and emphasize the impact on the most vulnerable populations. The Museums & Climate Change Network serves as a community of interest focused on sharing ideas and inspiration related to effective outreach, powerful storytelling, and fostering understanding about the challenges of global environmental change. These museums are located in New York, Rio de Janeiro, Hong Kong, Oslo, and Bremerhaven (Germany) [34].

The Climate Museums are fostering a culture of action on climate change by inviting individuals from diverse backgrounds to engage in dialogue and community-building around equitable solutions. Despite widespread concern about the climate crisis in the US, many people remain silent and inactive. Leveraging the popularity and credibility of museums, the Climate Museums facilitate gatherings where people can educate themselves about solutions and become active participants in efforts to create a more sustainable future. Through various avenues for civic engagement, these museums offer multiple pathways for individuals to contribute to positive change [34]. The New York Climate Museum indicates that food is one of the most important topics on which it is relevant to be focused for tackling the climate challenges (https://climatemuseum.org/blog/talking-climate-food, accessed on 26 June 2024).

Within food system co-governance processes, ecomuseums also have become entities capable of stimulating reflexive capacity and learning processes, connecting networks, sharing information, and providing voices and opportunities to think and act towards common sustainability goals [35,36]. In doing so, they promote the inclusion of the views and needs of local communities, both within museum programming and with local, regional, national, and global food systems. The case of Italy represents an interesting observation point regarding the relations between museums (and ecomuseums), food, and sustainability. Italy is a country known for its rich culinary heritage and diverse regional cuisines. Concerning traditional museums, a survey from 2016 [37] mapped 99 Italian food museums, spread throughout the entire country. The museums focused on a wide range of products and beverages, with a high representation of wines (30%), but also including olive oil (10%); spirits, cheese, and honey (4%); fruit, milk, bread, and truffles (3%); beer, other alcoholic drinks, coffee, chocolate, sugared almonds, and salt (2%); and vinegar, eel, herbs, mushrooms, ice-cream, licorice, mint, chili pepper, pizza, cured meats, tea, and sugar (1%). Museums dedicated to general food culture represented 7%. Moreover, the research highlighted how the primary aim of public museums (as opposed to private ones) was to strengthen existing relationships with local communities and institutions operating at different levels, along with safeguarding and promoting the food heritage they display.

At the same time, Italy has seen, in recent years, an impressive growth in its number of ecomuseums, often focusing on the topic of eco-gastronomic heritage [38].

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Being "museums without walls" [30], their approach to sustainability is holistic. In their territories, they aim to safeguard and promote all aspects of local identity, which include food, that could be considered a vehicle of culture.

One of the characteristics of ecomuseums is their adaptation to the local context for the participatory management of heritage. Therefore, their approach to food varies in terms of their different objectives and actions depending on the territory. Indeed, there are ecomuseums aimed at preserving typical cultivations (e.g., the Ecomuseum of the Lemon Groves of Lake Garda, the Ecomuseum of Wine); others promote local products and productions (e.g., the Ecomuseum of Rye; the Ecomuseum of Castelmagno cheese).

In other cases still, they organize networks connecting different institutions; such are the cases of the network "Ecomusei del Gusto", dedicated to the enhancement of local food and wine products, or the "Paesaggi sostenibili del cibo", an initiative that connects five Italian ecomuseums proposing coordinated itineraries focusing on the topics of food and sustainability.

In general, ecomuseums promote the local economy and consequently support producers by organizing various activities that celebrate food—for example, the Ecomuseum Lis Aganis has specific projects related to local vegetables and cured meats. Moreover, ecomuseums participate in various activities related to Slow Food (Slow Food is an international non-profit association committed to restoring value to food, respecting those who produce it, in harmony with the environment and ecosystems), collaborating to preserve foods and products bearing the Slow Food label. Ecomuseums, thus, promote food in a holistic and sustainable manner: the raw materials and their processing; the production and consumption chain (favoring short supply chains); and traditional recipes. In this way, they convey values related to food, moving away from a consumption logic.

Among the actions that Italian ecomuseums are carrying out to promote sustainable and local food systems, we can find the promotion of short food supply-chain projects, the creation of cultural itineraries linking agri-food products to local specificities and traditions, the attention to agricultural products and the corresponding rural landscape as a part of the cultural heritage of the communities, the support of producers for the promotion of products, the drafting of guidelines for developing and enhancing local agricultural products, and the secondary objective of supporting the promotion of typical artisan trades [39].

3. A Survey in Mediterranean Countries

Participatory, community-based heritage research is a spreading perspective that has taken deep root among groups on many continents, particularly in Australia, Europe, and North America [40], but is still at its early stage in African countries [41].

The Mediterranean countries are traditionally linked by the so-called "Mediterranean diet," and several research studies have delved into various aspects of this shared culinary tradition, ranging from health-related aspects to more cultural ones [42–44]. A recent work [45] highlights issues of malnutrition and the environmental impact of the food system in all Mediterranean countries that would benefit from a wider spread of the Mediterranean diet.

Based on the results of previous research, we suggest that ecomuseums could represent valuable actors for the promotion of a change towards more sustainable food systems, especially at a local level, thanks to their work in food safeguarding.

The present research intends to investigate if, and how, the topic of sustainable food systems is being integrated into the activities of ecomuseums and participatory institutions in the Mediterranean countries, including in the analysis both West European countries, with a more developed tradition of research on cultural heritage, and Eastern European/North African countries, where data are scarcer.

The work is carried out in the context of the activities developed by the National Biodiversity Future Centre (nbfc.it), an initiative promoted by the Italian National Research

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Council, committed to studying and preserving the ecosystems and biodiversity of the Mediterranean area.

In order to develop a first exploratory study, we started with an analysis of the online presence of a sample of ecomuseums and other community-based cultural institutions. This approach was chosen on the basis of a vast body of research highlighting the role that webpages have come to assume in the activities of museums and cultural institutions.

In recent years, museums worldwide have increased their use of the internet to amplify their presence, showcase artifacts virtually, and engage in meaningful communication with a diverse audience [46]. Websites have become indispensable tools, providing museums with a multifaceted platform for information dissemination, interaction with visitors, and even commerce, and studies have concluded that a well-built website, as well as social network profiles, may actually increase the desire to physically visit the museum [47].

In a specific exploration of online communication's effectiveness within museums in Campania, Italy, researchers highlighted the web's role in establishing connections with both existing and potential audiences, especially for small- and medium-sized museums [48], as it is often used by ecomuseums and other participatory institutions. Various studies have delved into the extent to which museums utilize the web for communication, employing different perspectives. Some authors have assessed the level of dialogic communication and scrutinized museums' utilization of web platforms and social web applications [49]. Others have concentrated on the efficiency of museums' online communication [50]. In one study, Theocharidis et al. [51] identified six dimensions, reviewing the characteristics of 53 Greek museum websites: Contact–Communication, Visit the museum, The museum, Education, Website features, and Use of social media.

In their recent work, Crisobal-Fransi [52] developed a dimensional model for analyzing web content applied to museums, the Web Content Analysis (WCA) model. The WCA comprised four dimensions: Information, Communication, E-commerce, and Additional Functions. In the Information dimension, aspects such as information about the museum, facilities, services, surrounding area, and promotions are evaluated. The Communication dimension assesses the capacity for interaction between museums and visitors, emphasizing the importance of effective communication tools. E-commerce focuses on the website's ability to facilitate the acquisition of museum products and services, including tickets, with considerations of payment mechanisms and data security. The Additional Functions dimension covers aspects such as data protection, quality certifications, and the existence of mobile apps.

An adapted, simplified version of the WCA model was adopted to analyze the webpages of Mediterranean ecomuseums and participatory cultural institutions. The main differences between the original model and the version adopted stem from the previously described specificities of ecomuseums and community museums when compared to traditional museums: small dimensions and a focus on work with the local community and on participatory practices.

3.1. Materials and Methods

The first step of this research consisted in the realization of a census of all the ecomuseums and other participatory heritage management institutions in the Mediterranean area active in 2023.

In order to create a wide database of all the principal ecomuseums, community museums, and participatory heritage management institutions, we realized a census of these cultural institutions. The census of Italian ecomuseums (from the Italian Ecomuseums network, EMI) provided the original list of institutions. This list was integrated thanks to new research on Google Maps, where the terms "ecomuseums" and "community museums" were searched for all of the countries that are touched by the Mediterranean Sea, plus Portugal. After the complete set of institutions that could be found online was mapped, we contacted them by email to collect suggestions about other similar institutions in order to enrich our sample, as some small organizations do not have a strong online presence,

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and it is hard to find them by Google Maps or other web surveys. The main aim of this phase was to have a list of all the ecomuseums or even traditional museums promoting participatory practices in the Mediterranean area.

The final set consisted of 495 institutions, mostly located in Italy, but covering a total of 21 countries.

The tool to analyze the webpages included the following sections and items:

Anagraphic:

- Name of the institution, country, type of institution;
- Specific focus of the institution on the topics of food, biodiversity, tourism, immaterial cultural heritage, and storytelling.

WCA simplified version:

- Information: the institution has its own page (not shared with other institutions), readability of the page, the page has more than one section, presence of sections dedicated to regular updates (i.e., news), presence of recent updates (less than six months old);
- Communication: presence of links to the institution's social networks, presence and type of contact (form to be filled out, email address, telephone number, physical address), no. of languages available, presence of an interactive section (i.e., comment section);
- E-commerce: presence of a section selling tickets or collecting donations;
- Additional Functions (focused on the specificities of ecomuseums): mention of training activities organized by the institution, presence of a section describing projects developed by the institution, presence of a section dedicated to the local community, presence of a section related to biodiversity topics, presence of a section related to food or food systems, presence of a section related to tourism.

The statistical analysis was run using STATA 18 and SPSS 29.0.1.0 (171)

3.2. Results

Among the 497 institutions included in the initial sample, 54 institutions had a webpage "not available" or "under work", 40 seemed to have ceased their activities, and 14 shared their webpage with other ecomuseums/institutions.

As for their nature, 318 were ecomuseums, while the remaining were classified as Human Science Museums [35], Natural Science Museums [10], and "other" [53], a category that mostly included different kinds of local administrations. It was impossible for the researchers to classify 78 of the pages of the sample, due to lack of information (i.e., page unavailable or under work). It is worth reminding that all the institutions included in the sample were selected because they promoted forms of active work with local communities that were considered in accord with the principles of ecomuseums.

Among the sample, 230 had a section of their webpage dedicated to biodiversity and related topics, 178 institutions explicitly worked on the topic of tourism, and 90 worked on the topic of food (Table 1).

Table 1. Institutions in	luded in the sample,	by country and	by presence of food to	pic.
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Country	\mathbf{n}° of Institutions (Frequency)	Working with Food (%)
Italy	273	23.1
France	69	14.5
Spain	41	19.5
Portugal	27	11.1
Greece	23	9.5
Cyprus	10	0
Israel	9	0
Tunisia	9	0
Lebanon	7	0

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Table 1. Cont.

Country	n° of Institutions (Frequency)	Working with Food (%)	
Croatia	4	50	
Malta	4	0	
Morocco	4	0	
Slovenia	4	25	
Turkey	4	0	
Albania	2	0	
Egypt	2	0	
Bosnia and Herzegovina	1	0	
Gibraltar	1	0	
Monaco	1	0	
Montenegro	1	100	
Palestine	1	0	
Total	497	18.1	

The topic of food is present only in eight countries, with Italy hosting 70% of the institutions that work on it, France 11%, Spain 9%, and the rest are located in Portugal, Croatia, Greece, Montenegro, and Slovenia. None of the southern countries analyzed seemed to work on the topic of food (Table 2).

Table 2. Details of the institutions working on food.

Country	N° of Food-Related Institution (Frequency)	% of Food-Related Institutions of the Total of Food-Related Institutions		
Italy	63	70		
France	10	11.11		
Spain	8	8.89		
Portugal	3	3.33		
Croatia	2	2.22		
Greece	2	2.22		
Montenegro	1	1.11		
Slovenia	1	1.11		
Tot	90	100		

A positive correlation between the topic of food and biodiversity is observed (Phi = 0.244; p < 0.001), as most of the institutions working on the topic of food also work on the topic of biodiversity.

To examine the institution's level of use of the webpage to present itself and engage potential participants in its activities, the answers to a selection of the items of the WCA simplified version were analyzed. The items included in this analysis are listed in Appendix A. As a first step, the internal coherence of the items was checked, and a Cronbach alpha of 0.84 is considered adequate.

A principal factor analysis was performed to better understand the relations between 12 items. The first factor obtained shows an eigenvalue of 4.00044. No other factors have been retained as they exhibit eigenvalues lower than 1. Table 3 reports the factor loadings for factor 1. Factor loadings express the correlation between each item and the factor: the higher the load, the more relevant is the item in defining the factor dimensionality. The items with the strongest factor loadings are the presence of various sections on the webpage and the existence of a webpage specific to the institution, while the items with the lowest factor loading are sections dedicated to the local community and to the sale or collection of donations. From this principal factor analysis, we have obtained a factor that represents a standardized Index of Webpage Engagement Capacity, used to further understand the different profiles of institutions in the Mediterranean area. The high alpha that was found among the items confirms the internal consistency of the index.

Variable	Factor Loading
Presence of various sections	0.8086
Page of its own	0.8061
Presence of a news section	0.7602
News less than six months old published	0.6822
Links to SNS	0.5786
Section dedicated to training activities	0.5741
Section dedicated to institution's projects	0.4620
Page readability	0.4383
Contact info available	0.4011
Possibility of comments or other interactions	0.3963
Section dedicated to sales	0.3654
Section dedicated to the local community	0.3638

Table 3. Factor loading for each item included in the factor analysis.

By analyzing the distribution of the index among the sample (Figure 1), it is possible to observe a polarization, with a consistent number of institutions obtaining very low scores, and a group of highly proficient users, while fewer institutions obtained intermediate values.

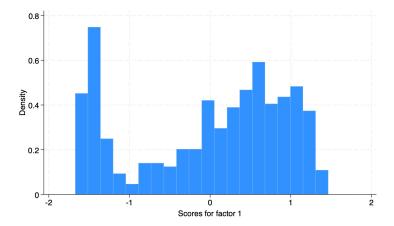


Figure 1. Frequency distribution of the Index of Webpage Engagement Capacity.

This distribution is quite different from a normal one, where we would find most of the institutions obtaining values close to the average and a thinning-out on the slopes. It seems, therefore, quite relevant for the understanding of the use of webpages among ecomuseums.

To deepen our understanding, the countries were then grouped according to geographical location and number of institutions to create four comparable groups and verify differences in the use of the internet and in the diffusion of projects related to food. The groups are as follows (Table 4):

- 1. Italy;
- 2. West Europe (Portugal, Spain, Gibraltar, France, Monaco);
- 3. East Europe (Slovenia, Albania, Bosnia and Herzegovina, Cyprus, Croatia, Greece, Montenegro);
- 4. Southern Mediterranean (Malta, Egypt, Israel, Lebanon, Morocco, Palestine, Tunisia, Turkey).

It is interesting to point out that the mean value obtained in the webpage engagement capacity index grows as the number of institutions included in the groups decreases, so that the Italian institutions score the lowest mean values, while the Southern Mediterranean and East Europe groups report the highest mean values.

Table 4. Four country groups by number of cases, presence of food-related experience, and webpag	e
engagement capacity index mean score.	

Country Group	n° of Cases	% of the Whole Sample	n° of Food-Related Experiences	% Within the Group	Webpage Engagement Capacity Index Mean
Italy	273	55	63	23.08	-0.07
West Europe	139	28	21	15.11	-0.05
East Europe	45	9	6	13.33	0.28
Southern Mediterranean	40	8	0	0.00	0.32
Tot	497	100	90		

The relations between the described variables were tested to assess the impact that different aspects of ecomuseum's (or other participatory institution's) activities have on their use of the web to engage the public. We ran a multiple linear regression, adopting the enter method. This method allowed us to predict the behavior of the dependent variable based on the values of the independent variables. The R² coefficient is the value that allows to see what proportion of the total variance of the independent variable can be explained by the model, and can range between 0% (no variance explained) to 100% (we can perfectly predict the values of the dependent variable based on the values of the independent variables). We included in our analysis the 388 webpages that had available data for all the variables of interest, excluding all the institutions whose page was "under construction" or "unavailable", or shared with other institutions.

The results of our analysis are summarized in Table 5. The model presents an R^2 of 0.158 and an R^2 adj of 0.147. As pointed out by Ozili [54], we consider the R^2 value acceptable, because the main aim of this model is to assess whether our independent variables actually have a significant impact on the dependent variable and not to predict the value of the webpage engagement capacity index solely on the basis of our independent variables set list.

Table 5. Regression model results.

Variable	B Value	95.0% Confidence Interval for B		β	t	р
		Lower Bound	Upper Bound			
Constant ¹	6.415	5.846	6.984		22.182	< 0.001
Biodiversity Section	1.689	1.029	2.349	0.251	5.033	< 0.001
Food	0.870	0.100	1.641	0.109	2.221	0.027
Intangible Heritage	1.601	0.936	2.266	0.225	4.731	< 0.001
East European	1.526	0.457	2.594	0.135	2.807	0.005
South Mediterranean	2.369	1.143	3.595	0.185	3.800	< 0.001

¹ The constant can be defined as the mean of the dependent variable when all the independent variables in the model are set to a value of zero.

All of the variables included in the model are dichotomic and present positive and statistically significant beta values. This means that the presence of each of the included characteristics predicts a higher score in the Index of Webpage Engagement Capacity.

Other variables that were included in the analysis but did not yield significant impacts were the fact that the institution had a section dedicated to tourist activities on its webpage, and its geographical location in Italy or other Western countries.

4. Discussion and Conclusions

In this article, we explore the potential role that specific cultural institutions, such as ecomuseums or community museums, may play in promoting sustainable food systems (Figure 2).

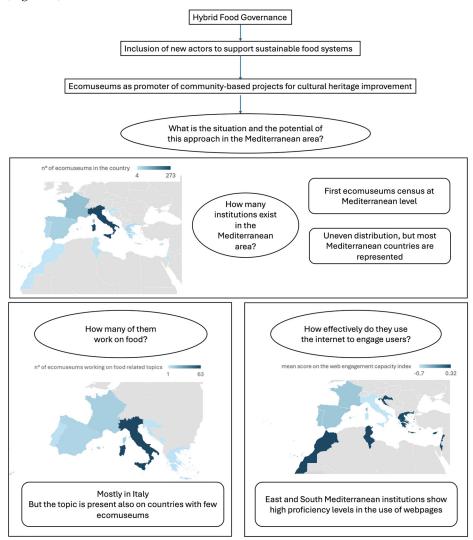


Figure 2. Distribution of ecomuseums in the Mediterranean area, with a focus on their work on food and their efficiency in the use of webpages.

Given their inherent ties to the local territory and their inclination towards communitybased activities, we hypothesize that these institutions could have a significant impact, particularly on the communication and promotion of the sustainability of the food system.

The first step of the research was the realization of the first census of active ecomuseums and community museums operating in the Mediterranean area, to gain a better understanding of their diffusion and involvement in the development of participatory activities, mobilization of local resources, and promotion of cultural heritage, including food heritage. The data collected reveal a marked difference in their distribution within the Mediterranean area. Even though the concept of ecomuseums has its roots in the reflections of the French Nouvelle Muséologie, their spread in Italy is significantly broader compared to all other countries under consideration. In Western European countries (with France at the forefront), the presence of these institutions is lower than in Italy but still significant, while it is much scarcer in countries in the eastern and southern Mediterranean areas (except for Greece and Cyprus).

Regarding the focus on the theme of food and food systems, it appears that the predominance of Italian experiences is even more pronounced. However, it is interesting to note the presence of ecomuseums focusing on food topics in some of the Eastern European countries, where the overall presence of ecomuseums is low. This theme could, therefore, prove to be of interest even for those countries with a less rooted tradition of ecomuseums.

Almost all ecomuseums addressing the theme of food also work on biodiversity, confirming a particularly attentive approach to the systemic dimension of food and the connection that production and consumption have with maintaining ecosystem balances. In this sense, the ecomuseums' vocation of focusing on the conservation of cultural heritage and the promotion of local development combines with aspects more closely linked to environmental sustainability.

Finally, the construction of an index for assessing the effectiveness of webpages in engaging the public has highlighted the fact that institutions presenting experiences related to food and biodiversity seem to be more proficient in this regard. More generally, two particularly widespread profiles of webpage engagement capacity are observed.

On one hand, there are the low-proficiency users, prevalent especially in countries with a higher presence of ecomuseums, where at least some of the analyzed pages present less elaborate experiences, lacking effective references to activities engaging the local population.

On the other hand, there are the high-proficiency users, institutions whose webpages appear particularly suited to promote and elicit participation. While countries with a high presence of ecomuseums present a mix of high- and low-level pages, it seems that in countries with a low diffusion of ecomuseums and other institutions dedicated to promoting participative activities, the presence of high-proficiency users is particularly high. These are instances of excellence that could pave the way for a wider dissemination of this type of experience.

An explanation for the wider difference in profiles found in Italy and Western countries can be found in the observation that the proliferation of initiatives led to a distancing, at least in some of the ecomuseums, from the original principles guiding their actions. For example, the census of Italian ecomuseums published by D'Amia [38] observed how, among the large body of institutions recorded, some ecomuseums proved to be long-lasting organizations well rooted in the territory; others were ephemeral bodies, created occasionally to intercept resources provided on the basis of local or European funding. The author observes that the name "ecomuseum" could be defined as a catchy term, which lends itself to multiple interpretations (and distortions), even those far removed from the definitions formulated by ecomuseology. In this scenario, it is easy to imagine that not all the ecomuseums may have the same level of resources dedicated to their promotion and their use of the internet.

In recent years, institutions like the International Council of Museums (ICOM) have increasingly recognized the importance of sustainability and the role museums can play in promoting it [55]. Through dedicated initiatives and working groups, these institutions are actively exploring ways in which museums can contribute to sustainability efforts on both global and local scales.

One area where museums can make a significant impact is in addressing sustainability within food systems. Museums can be strategic partners for the involvement of users in regional food innovation processes [53]. They can serve as experiential and participatory spaces where it is possible to build solutions for regional challenges, and forge collaborations with other actors in the system, such as academia, food producers, restaurants, and local and tourism organizations. Food systems play a crucial role in environmental, social, and economic sustainability, particularly in regions like the eastern and southern Mediterranean where agricultural practices are deeply intertwined with cultural heritage and local livelihoods [56]. In accord with other recent studies [57], this research suggests that increasing the level of involvement and interaction between museums, cultural institutions, and other local actors in these areas would allow the exploitation of latent effective but still underutilized resources.

These results could be taken up by food policy makers not only at the local level, but also and especially at the national and European level: for example, the European Union could invest in these institutions by promoting research or research projects that verify the impact of food-related actions promoted by museums and ecomuseums. By partnering with local actors and communities working on sustainability in food systems, ecomuseums can contribute to the development of hybrid models of governance that can facilitate the transition from dominant food systems to more sustainable ones, integrating niche experiences and traditional heritage [21].

By reinforcing their efforts to connect with local actors in eastern and southern Mediterranean countries, institutions like ICOM can facilitate knowledge exchange, capacity building, and collective action towards more sustainable food systems.

In conclusion, by strengthening their networking efforts with local actors working on sustainability in food systems, institutions like ICOM can enhance their impact and contribute to positive change in the eastern and southern Mediterranean region. By leveraging the power of museums as platforms for education, dialogue, and advocacy, we can collectively work towards a more sustainable future for all.

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Appendix A

Table A1. The simplified WCA and the items included in the Index of Webpage Engagement Capacity.

Section	Item	Type of Answer	Included in the Index of Webpage Engagement Capacity
	Name of the institution	Open	No
Anagraphic	Country	Open	No
	Type of institution	Closed	No
	The institution has its own page (not shared it with other institutions)	Y/N	Yes
	Readability of the page	Likert 1 to 4	Yes
Information	The page has more than one section	Y/N	Yes
	Presence of sections dedicated to regular updates (i.e., news)	Y/N	Yes
	Presence of recent updates (less than six months old)	Y/N	Yes

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Table A1. Cont.

Section	Item	Type of Answer	Included in the Index of Webpage Engagement Capacity
	Presence of links to the institution's social networks	Y/N	Yes
Citi	Presence and type of contact (form to be filled out, email address, telephone number, physical address)	Closed, multi-answer	Yes (transformed in a Y/N)
Communication	No. of languages available	Open	No
	Presence of an interactive section (i.e., comment section)	Y/N	Yes
E-commerce	Presence of a section selling tickets or collecting donations	Y/N	Yes
	Mention of training activities organized by the institution	Y/N	Yes
Additional Functions	Presence of a section describing projects developed by the institution	Y/N	Yes
	Presence of a section dedicated to the local community	Y/N	Yes
	Presence of a section related to biodiversity topics	Y/N	No
	Presence of a section related to food or food systems	Y/N	No
	Presence of a section related to tourism	Y/N	No

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