


## Article

# Achieving Cultural Sustainability in Museums: A Step Toward Sustainable Development

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**Abstract:** Cultural sustainability is increasingly being perceived as a fourth dimension of sustainable development. So far, some studies have debated the way in which cultural sustainability can lead to economic, social, and environmental benefits, while others have highlighted how the classic pillars of sustainability can help museums to achieve their core cultural mission. However, empirical studies regarding cultural sustainability in museums are scarce. Thus, one of the aims of our research was to fill this gap by developing several econometric models that explain the influence of heritage exposure; environmental behavior; openness to the public; and effectiveness and performance in collecting, preserving, and researching the cultural heritage. A second aim was to advance the current knowledge in this field by creating an integrated frame that explains the interconnections between different variables that help museums become sustainable, as well as the place and role of cultural sustainability within the overall framework of sustainable development. To achieve these goals, an in-depth analysis of the literature was followed by a survey of 86 Romanian museums. The results show that the ability of museums to reach cultural sustainability is influenced by components of their social and economic performance, while environmental behavior proved to be insignificant.

**Keywords:** sustainability; museums; heritage; cultural sustainability; effectiveness; environment; attractivity

## 1. Introduction

Sustainable development is increasingly seen as being composed of four dimensions; namely, economy, society, environment, and culture [1]. There are multiple reasons for adding culture to the traditional three-pillar construct of sustainability. Culture includes the beliefs, values, practices, and aspirations of a society; the way in which values are expressed and applied concretely in the day-to-day life of that society; and the processes and mediums through which the preservation and further transmission of values take place [2].

In order to reach environmental responsibility, social justice, and economic development, a certain set of values and behaviors should be developed among individuals [3]. As a sustainable society depends on a sustainable culture, any action to achieve sustainable development goals must take into account not only the natural, social, and economic environment, but also the cultural environment. If the culture of a society disintegrates, so will all its other components [2]. Thus, ‘culture is essential for a sustainable society to be possible’ [4].

On the basis of these considerations, in 2001, UNESCO’s Universal Declaration on Cultural Diversity launched a process that aimed to add culture as the fourth dimension of sustainability [5].

Cultural sustainability was first defined by the World Commission on Culture and Development as inter- and intra-generational access to cultural resources [6]. Cultural sustainability also implies that development takes place in a way that respects the cultural capital and values of society [7]. Cultural sustainability is based on the principle that the current generation can use and adapt cultural heritage only to the extent that future generations will not be affected in terms of their ability to understand and live their multiple values and meanings [8]. Thus, this dimension of sustainability is primarily concerned with ensuring the continuity of cultural values that link the past, present, and future [9].

As the concept of cultural sustainability began to develop, researchers' attention focused on identifying and analyzing the practical tools and ways through which culture could be preserved, controlled, and modeled in such a way that the general objectives of sustainable development are fulfilled. An important contribution to this purpose was made by the Council of the European Union through the Digital Agenda for Europe and in particular through the European Digital Library, Europeana [10]. Cultural heritage digitisation is one of the best solutions to preserve social and collective memory and extend the public access to collections at the same time. Therefore, the aim of Europeana is to increase access to cultural heritage by allowing the public to easily find in the portal any cultural item preserved by European cultural institutions [11]. However, the process of digitisation is far from being completed and it is highly dependent on the digitization actions adopted by each country and cultural institution [12].

Given the mission of museums to collect, preserve, and research cultural artefacts [13,14], as well as to use the heritage for educational, study, and enjoyment purposes [15], they have started to be regarded as having a key role in shaping our sustainable future [16]. Firstly, museums have the task of preserving cultural resources and making these resources known to current and future generations [17]. Globalization, linguistic, ethnic, and identity changes, as well as new livelihood practices, are factors that threaten the preservation and further transmission of cultural heritage [18]. Thus, one of the fundamental tasks of museums is to collect and preserve tangible and intangible cultural heritage so that cultural knowledge and skills, as well as memory and identity issues, can be passed on [5].

Secondly, through their educational function, museums can contribute both to keeping alive and further transmitting the beliefs and practices of a community, as well as to encouraging the development of new values, attitudes, and behaviors within society [3,19]. Through their exhibitions and their involvement in discussions and debates regarding climatic and environmental changes [20,21], museums have the capacity to influence people's attitudes towards their natural environment [22], which can have a positive impact on the protection of local biodiversity [23,24]. Museums can also organize public activities and events that are focused on creating social value by promoting the adoption of 'socially responsible behaviors' in the community [14,25]. To fulfil their cultural, social, and environmental mission efficiently, museums can use modern technologies [26] that are specially designed for digital collection management [27], hands-on interactive exhibits [28], virtual reality [29], and E-museums [30]. Technological innovation allows museums to become more attractive, use their resources more efficiently, and increase exposure using online distribution and communication channels [31]. Besides attracting a higher number of visitors and a raise in the museums' own income [32], modern technologies help museums to better conserve the cultural items they hold, which has a positive influence on their sustainability.

As museums preserve, but also create culture, they are different from any other organization [4]. Thus, cultural sustainability in museums can be defined in either narrow or broad terms [33]. In narrow terms, it consists of collecting, preserving, conserving, and researching the material and immaterial cultural heritage [34,35] to ensure the access of present and future generations to cultural resources [36]. In broad terms, cultural sustainability in museums involves not only the preservation of cultural heritage, but also the use of heritage to create a certain set of values, attitudes, and behaviors among individuals, which leads to cultural vitality [3,18]. Cultural vitality is a result of cultural activities carried out by museums and a way through which museums can contribute to the achievement of economic, social, and ecological sustainability [37]. However, because cultural vitality cannot be

achieved without cultural heritage, cultural sustainability is most often associated with the preservation and conservation of cultural capital [35]. Hence, collecting, preserving, conserving, and researching cultural heritage are the core components of cultural sustainability in museums, which is why in this work, we focus on cultural sustainability in narrow terms.

Although the connection between museums and cultural sustainability is highly recognized, the studies on cultural sustainability in museums are limited to theoretical concepts and qualitative research [35]. Some scholars have focused their attention on highlighting how museums can contribute to the economic, social, and environmental goals of sustainable development by being or becoming culturally sustainable. Thus, culture has been approached as an instrument for the traditional three pillars of sustainability [38,39]. The cultural heritage of museums reflects local history and collective memories [37]. Therefore, museums can use their cultural heritage to strengthen the cultural identity of a community [19]; give a sense of place, rootedness, and belongingness to the residents; ensure continuity of traditional practices [37]; represent cultural diversity; promote intercultural dialogue, understanding, and tolerance; achieve a higher degree of social inclusion and cohesion [40]; and foster quality of life [41]. Moreover, cultural heritage is an essential resource for economic development. Museums are an important attraction for visitors and play a critical role in the field of cultural tourism [25]. Cultural heritage can also be used to develop educational programs and exhibitions that highlight the human–nature relationship and shape the values, attitudes, and behaviors of people, so as to include an ecological focus [18].

Other researchers have placed culture on an equal footing with the economy, environment, and society [35,38]. The independent role of culture in sustainability is explained by the importance of preserving, conserving, and maintaining different forms of cultural capital [3], given the fact that cultural heritage can be used to accomplish the social, ecological, and economic goals of sustainable development only after the necessary steps have been taken to preserve it [42]. A third approach sees culture as an ‘overarching dimension of sustainability’, which encloses the other three pillars of sustainability and leads to development as a cultural process [38].

A newer view is expressed by Loach et al. [4], who emphasize the need to analyze how the measures taken by museums to become economically, socially, and ecologically sustainable contribute to the fulfillment of their core cultural mission and, in this way, to the achievement of cultural sustainability. This approach is justified by the fact that financial constraints and the intense competition for attracting funds have led many museums in recent years to change their focus from cultural heritage to market [43]. In order to collect resources for their survival, museums have started to apply management strategies that often seek to maximize the economic, social, and cultural value they provide for their users [17,44]. Such strategies allow museums to gain a competitive advantage and financial support from tourists, authorities, and community members. Thus, sustainable management can be a tool that helps museums earn money for preserving the heritage by satisfying the visitors’ needs and contributing to the community well-being [14]. However, ‘the pressure to meet targets and demonstrate value’ by becoming socially, economically, and environmentally sustainable can lead museums to neglect their original mission of acquiring, preserving, and researching collections [4].

Given this background, several questions arise: What is the place of cultural sustainability within the sustainable development framework in museums? Is it an instrument for achieving economic, social, and environmental sustainability, or is it supported by economic, social, and environmental sustainability? Can the four pillars be placed on equal levels/positions?

While the role of culture in achieving social, economic, and environmental sustainability has more frequently been debated in the literature, the opposite approach, according to which the three pillars of sustainability help a museum to become culturally sustainable, has received scant discussion. For this reason, our empirical study seeks to test the theoretical model proposed by Loach et al. [4], in which the three classic dimensions of sustainability contribute to the achievement of cultural sustainability in museums. Therefore, our aim is to develop the current knowledge in this field by trying to answer the following questions: What are the factors that influence cultural sustainability in museums? To what

extent do the social, environmental, and economic sustainable goals of museums support their core cultural mission of keeping the heritage objects safe?

Starting from these questions, our study provides an integrated approach that places cultural heritage in a central position of the sustainable development process in museums. In our view, cultural sustainability can influence social, economic, and environmental sustainability, but it is also influenced by components of these three classic dimensions of sustainable development. Thus, culture is a resource for economic, social, and environmental sustainability, but also a result of the three pillars, which support the cultural mission of museums as well.

Besides proposing a theoretical framework that reunites the input and output approaches of cultural sustainability in relation to the economy, society, and environment, this paper extends previous research by providing empirical evidence regarding the factors that can influence cultural sustainability within museums. To our knowledge, the previous research regarding cultural sustainability has not statistically examined and validated the different possible connections claimed to exist between cultural sustainability and the other three pillars of sustainable development in museums. Thus, the value of this paper is enhanced by the fact that the theoretical findings are empirically tested using econometric techniques. More precisely, the regression models we developed highlight how a museum's characteristics and results (i.e., relevance of collections, number of visitors, heritage exposure, openness to the public, effectiveness, and performance) can influence its cultural sustainability, viewed as the ability to fulfil its cultural mission of acquiring, preserving, and researching the cultural heritage. Paradoxically, although environmental hazards may seriously damage the cultural heritage, the environmental behavior of a museum turned out to be insignificant in relation to cultural sustainability.

The paper is structured as follows: the second section sets the theoretical foundation for defining the hypotheses and describes the survey structure, museum sector in Romania, survey methodology, and sample profile; the third section presents the findings of the empirical research; and the final section discusses the results, summarizes the conclusions, and proposes several suggestions for future research.

## 2. Materials and Methods

### 2.1. Defining the Hypotheses

Measures adopted to increase effectiveness and performance are an important part of economic sustainability [14] that allow a museum to fulfill a larger number of cultural objectives with the same amount of resources. Despite the variety of economic, social, cultural, and environmental benefits generated by museums, one of the great problems for these institutions is under-funding [17]. Consequently, during the last economic crisis, many museums were compelled to apply strategies to improve their competitive advantage and effectiveness [43]. Those who failed to implement such strategies were forced to sell works from their collections, or even merge with other museums to survive [17]. Given the limited and often insufficient financial resources of museums and the fact that they must incur certain costs in order to perform conservation and restoration activities [45], we assume that an increase in effectiveness and performance can positively influence cultural sustainability.

**Hypothesis 1 (H1).** *Cultural sustainability is positively related to effectiveness and performance.*

Cultural sustainability involves the protection of museum heritage. To preserve the artefacts, museums must install safety and security systems and ensure adequate microclimate conditions in exhibitions and warehouses [14]. Light, humidity, and temperature are the most important parameters, which require special attention. By using modern devices, museums should not have difficulties in keeping these parameters between the recommended limits. However, other factors caused by climate changes and natural imbalances are more difficult to control and may seriously damage museums' collections. Drought, floods, fires, hurricanes, and landslides are just some of these factors [46]. Therefore, to protect the integrity of their cultural assets, one of the first duties of museums is to keep the natural environment safe [47] (pp. 7,8). Green practices help to control the microclimate conditions

inside and outside the museum, which contributes to the achievement of heritage preservation objectives [47] (p. 2). Hence, we argue that there is a positive connection between the environmental behavior of museums and their cultural sustainability.

**Hypothesis 2 (H2).** *Cultural sustainability is positively related to environmental behavior.*

The social contribution of museums to sustainable development consists of building new relationships with their communities and particular groups of people [48], so as to stimulate intercultural understanding and acceptance [49], social cohesion, and a sense of belonging [50,51]. In this context, inclusiveness and openness are basic requirements for a socially responsible museum [48]. Beside improving the quality of people's lives, a socially responsible museum, with a visitor-centric perspective, is more attractive to community members and tourists [25]. This can lead to an increase in the financial resources the museum manages to attract from various sources (visitors, government, donors, sponsors). As a result of this financial support, the museum can successfully fulfill its primary mission of enriching, preserving, and researching cultural heritage. Therefore, we can state that a positive connection exists between cultural sustainability and the museum's openness to the public.

**Hypothesis 3 (H3).** *Cultural sustainability is positively related to openness to the public.*

Social interaction and interconnection between people from all social classes and ethnic communities [51] (p. 359) take place within exhibitions or at other events and activities organized by museums around their collections [52,53]. Therefore, heritage exposure is the primary way in which museums use the cultural resources they hold to serve the society and generate cultural vitality. At the same time, exhibitions are the basic product that differentiates museums from other cultural institutions and the reason most visitors choose to enter a museum. Related services such as restaurants or educational programs can improve the quality of visiting experience, but in the absence of exhibitions, they would not have the capacity to produce the same socio-cultural impact in the community. Also, exhibitions can increase the attractiveness of a museum, and in this way, the revenue attracted by it. In turn, high incomes allow a museum to achieve its heritage conservation goals to a greater extent. Because exhibitions are an important way to generate a high social impact, but also to financially sustain a museum, worldwide museum strategies focus on increasing the exposure of collections over the limits imposed by a museum's space. The practical application of this strategy involves organizing temporary exhibitions in other locations or even opening exhibition centers or satellite museums abroad [54–56]. On the basis of these considerations, we argue that there can be a positive link between cultural sustainability and heritage exposure.

**Hypothesis 4 (H4).** *Cultural sustainability is positively related to heritage exposure.*

## 2.2. Survey Structure

To test the hypotheses regarding the factors that might have an influence on cultural sustainability in museums, we opted for a quantitative analysis based on the application of a questionnaire at national level. The reasons that prompted us to opt for this research tool are that it requires less time and financial resources than other tools and allows more data to be collected from an extended geographical area. At the same time, the possible weaknesses of a questionnaire-based research, such as the fact that the qualitative level of the data collected depends on the honesty of the respondents and the degree to which they understand the questions, are similar to those of other research instruments [57].

The first step in designing the survey was to search and identify in the literature other relevant questionnaires regarding the sustainable development of museums. Thus, we noticed that previous research focused on assessing museum effectiveness and performance [58], improving energy



efficiency [59], identifying sustainability initiatives and measures adopted by museums [60], and evaluating the satisfaction of museum visitors [61]. Although those studies include some economic, environmental, and social sustainability issues, none of them cover all four dimensions of sustainability, and the cultural pillar is almost absent within them. Therefore, starting from the theoretical findings and the previous empirical research conducted in the field of museum sustainability, we designed a new questionnaire able to collect relevant data for testing our hypotheses. Before distributing the questionnaire at national level, it was first refined and improved based on the opinions expressed by three faculty members, a statistician, and several museum employees. The clarity of the items and the ability of museums to answer them was checked by applying the survey within the County Museum of Art ‘Baia Mare Artistic Centre’.

The final version of the questionnaire consists of two parts. The first part includes 27 items that use a five-point Likert scale (1—total disagreement, 5—total agreement). Six items are related to cultural sustainability and investigate the ability of museums to collect, preserve, and research cultural heritage. Effectiveness and performance are measured through seven items that assess different output–input ratios (the results of the museum compared with the resources used to achieve the results). The five items dedicated to environmental behavior focus on the measures taken by museums to improve the use of electrical and thermal energy, fuel, water, and materials. Social relevance was split into two variables: heritage exposure (two items) and openness to the public (seven items). Heritage exposure measures the efforts made by a museum to make its heritage available to the public by organizing exhibitions inside and outside of the museum walls. Openness to the public evaluates the ability of a museum to offer attractive products and services on the market, satisfy the cultural needs and desires of its users, collaborate with community members for organizing various exhibitions and events, and attract a wide and diversified audience that is representative of all community groups and ethnic minorities [14]. The second part of the survey includes 16 questions related to the characteristics of the respondents and of the museum to which they belong. The questionnaire used for this research can be consulted in Appendix A.

In addition, the contact details of the respondent are requested at the end of the questionnaire (name, address, email). Despite the potential risk that the response rate would be affected by requesting this information, the reasons we decided to keep the contact data in the questionnaire are to avoid duplication of answers from the same institution, the possibility of having a clear list of responding and non-responding museums, the possibility of re-contacting institutions that have not responded before a certain time, and the possibility of asking for clarifications in the case of incomplete questionnaires. Respondents were assured that their responses would be kept confidential and without their prior agreement, no material would be published suggesting a possible link between their museum and their answers.

### 2.3. Museum Sector in Romania

After setting up the research hypotheses and developing the questionnaire, our next step was to analyze the size, structure, and main characteristics of museums in Romania in order to identify the conditions that must be fulfilled by the sample.

According to the National Institute of Statistics (NIS) [62], the Romanian network of museums and public collections included 431 units in 2015 (without branches and satellite museums). Given the characteristics of our research, from this total, we excluded monuments, botanical gardens, zoos, aquariums, dendrological parks, and natural reservations (41 units). However, no data were available regarding the number of museums and the number of public collections. Thus, despite the mission, aims, and activities of museums being more complex than those of collections, in the lack of separate evidence regarding the two categories, we had no choice but to continue our analysis based on the premise that in Romania, there are 390 museums and public collections. The structure of these museums and collections depending on their type, the heritage objects they own, and the number of visitors recorded by them in 2015 is presented in Table 1.

**Table 1.** The structure of Romanian museums and public collections in 2015.

Type	Museums and public collections		Heritage objects	Visitors in 2015
Art	96	24.62%	483,409	2,543,467
Archeology and history	59	15.13%	4,342,209	3,033,069
Natural history and science	10	2.56%	3,221,822	592,112
Technology and science	14	3.59%	71,899	156,620
Ethnography and anthropology	119	30.51%	1,111,344	1,425,414
Specialized	29	7.44%	813,150	867,378
General and mixed	63	16.15%	3,987,383	1,221,600
TOTAL	390	100.00%	14,031,216	9,839,660

Source: adapted from Iagăr [63].

Considering the relevance of the heritage, the Romanian network of museums and public collections is structured as follows: 70% local museums and collections, 13% county museums and collections, 5% regional museums and collections, and 12% national museums and collections. Regarding the ownership, 18.79% of museums and collections are private, while 81.21% are public [63].

#### 2.4. Survey Methodology

As the NIS does not provide the names and contact details of the museums included in their statistical reports, in order to further perform our research, we tried to identify the total population of Romanian museums. At this stage, the database ‘Museums and Collections in Romania’, made available online by the National Heritage Institute (<http://ghidulmuzeelor.cimec.ro>), proved to be particularly useful. This database allows museums and collections to be sorted by county, locality, and type, and also provides their contact information. Unfortunately, we found that many museums do not have an email address or website, which made it impossible to send the questionnaire online to these museums. By accessing each unit in this database, we were able to create a list with 186 museums that have an email address and a distinct manager/administrator. Museums with the same manager were counted only once because they were part of the same organizational structure, and the survey questions were designed for an organization as a whole.

On 3 October 2016, the questionnaire was sent by email to the museums included in the list. Given that the research was conducted at national level, we opted to manage the online questionnaire distribution using the facilities offered within the Google Drive platform. At the same time, printed questionnaires were collected from the museum managers who attended the National Conference of Cultural Managers (Bucharest) and the General Meeting of the National Network of Romanian Museums (Sibiu) from 29 October to 2 November 2016. The data collection ended on 29 November 2016, with 87 responses and a response rate of 46.77%. The Google Form survey was set up to accept the submission only if all the required questions were answered. In this way, very few cases of partial response were recorded. However, one of the printed questionnaires had to be removed as a result of incomplete answers. Therefore, the statistical analysis is based on 86 valid responses.

#### 2.5. Sample Profile

Museums from all eight development regions of Romania completed the survey. The smallest number of answers (five) come from the Southwest Region and the highest number of completed questionnaires were collected from the Northwest Region (17). The last column of Table 2 shows the representativeness of each region, calculated as a ratio between the number of responses received and the number of museums and public collections in the region.

**Table 2.** Sample representativeness of each region.

Region	Number of responses	Number of museums and public collections	Sample representativeness
Bucharest-Ilfov Region	7	28	25.00%
Center Region	14	123	11.38%
Northeast Region	11	57	19.30%
Northwest Region	17	38	44.74%
West Region	8	39	20.51%
Southwest Region	5	43	11.63%
South Region	14	43	32.56%
Southeast Region	10	19	52.63%
Total	86	390	22.05%

Thus, if we take as a reference the total number of museums and public collections, it can be seen that each region's sample representativeness is over 11%. Because of the large number of museums in the Center Region (123), it has the lowest representativeness (11.38%), even though it recorded more responses than other regions (14). At the opposite end is the Southeast Region, with the fewest museums (19) and the highest sample representation (52.63%). Overall, the ratio between the collected responses and the total number of museums and public collections that exist at national level is 22.05%. Therefore, given that the answers come from all regions of the country, and the fact that a significant part of the 390 units is public collections and not museums, we believe that the research results can be considered representative at national level.

Table 3 shows the structure of the responses according to museum type. Of the total number of replies, most come from general and mixed museums, followed by art museums and history and archeology museums.

**Table 3.** Sample representativeness of museums by type.

Type	Museums and Public Collections				Representativeness (Number of Responses/Total Number of Units)
	Number of Responses		Total Number of Units in Romania		
Art	12	13.95%	96	24.62%	12.50%
Archeology and history	12	13.95%	59	15.13%	20.34%
Natural history and science	9	10.47%	10	2.56%	90.00%
Technology and science	5	5.81%	14	3.59%	35.71%
Ethnography and anthropology	9	10.47%	119	30.51%	7.60%
Specialized	4	4.65%	29	7.44%	13.79%
General and mixed	35	40.70%	63	16.15%	55.56%
TOTAL	86	100%	390	100%	22.05%

Table 3 shows that almost all museums of natural history and science completed the questionnaire (90%). They are followed by general museums and technology museums with a representative rate of 55.56% and 35.71%, respectively. Ethnography museums and art museums have the smallest degree of representation. This is explained by the fact that the vast majority of public collections that could not be excluded from the total population belong to these two categories. Also, specialized museums are slightly under-represented (13.79%), because many of them are managed by private enterprises and could not be contacted or did not want to respond.

Regarding the relevance of collections, the sample has the following distribution: county museums—30 answers; local museums—21 answers; national museums—23 answers; and regional museums—12 answers. If we analyze this structure in relation to the number of existing units at national level, we can notice a good degree of representation of national museums (46%), regional museums (57.14%), and county museums (52.63%). Because most public collections are of local relevance and could not be excluded from the analysis, the representativeness of local museums could not be accurately established. In the literature, it has frequently been stressed that museums with



a heritage of high cultural and artistic relevance are more likely to have a higher degree of public success [39,64]. Thus, we used the museum's relevance as a control variable in order to increase the accuracy of our results.

Regarding the number of visitors in 2015, 27.9% of the interviewed museums reported fewer than 5000 visitors, 37.2% registered between 5000 and 30,000 visitors, and 34.9% exceeded 30,000 visitors. As the number of visitors is an important criterion according to which the attractiveness of a museum is appreciated [17,65], in order to not influence the research results, we used the number of visitors as a control variable.

At the same time, it was found that museums belonging to the National Network of Romanian Museums (NNRM) were more open to completing the questionnaire. Of the 186 museums included in the list, only 64 were members of the NNRM. However, 53 of the 86 responses came from museums belonging to the NNRM. For this reason, we believe that NNRM membership is a possible influencing factor on museum sustainability, which is why we use it as a control variable.

Because of the variety of the collected data, we concluded that the sample can be considered representative of Romanian museums. Therefore, we continued our statistical analysis in order to test the hypotheses. The most important findings are presented in the next section.

### 3. Results

The relationship between cultural sustainability (CS) and the independent variables discussed above was empirically examined using the following hypothetical research model:

$$CS = \beta_0 + \beta_1 EP + \beta_2 EB + \beta_3 OP + \beta_4 HE + \beta_5 R + \beta_6 V + \beta_7 NW + \varepsilon. \quad (1)$$

CS (cultural sustainability) is the dependent variable (DV) and denotes the ability of museums to collect, preserve, and research the heritage; EP, EB, OP, and HE are the four independent variables (IVs) that indicate a measure of effectiveness and performance (EP), environmental behavior (EB), openness to the public (OP), and heritage exposure (HE); R (relevance), V (the number of visitors), and NW (member of the NNRM) are the three control variables;  $\beta_0$  to  $\beta_7$  are the model coefficients; and  $\varepsilon$  is the error term added to show the inaccuracy of the model.

The statistical processing of the collected data and the analysis of the relationship between the DV and the IVs were performed using IBM SPSS 22.0 software.

Initially, the dependent variable was analyzed in order to evaluate the distribution of the collected data. The descriptive statistics for the items included in the cultural sustainability scale show that mean and median are almost equal, while the highest standard deviation is 1.246 (Table 4). The negative values of the skewness coefficient indicate in all cases a deviation to the right from the empirical distribution. This means that a greater number of museums declared that their heritage is very well preserved, compared with the number of museums that did not agree with this statement. The kurtosis is used to measure the 'flatness' or the 'peakedness' of a distribution, and a value close to zero denotes a normal distribution. In our case, three items recorded positive values of kurtosis, which indicates that the distribution of the answers in these cases is more peaked than normal, while the other three items recorded negative kurtosis coefficients, which is a sign of 'flatness'. The lowest kurtosis value can be noticed in the case of the fifth item, which denotes that Romanian museums tend to have difficulties regarding the inclusion of their heritage in a digital database. This result is in line with a previous research conducted by Fanea-Ivanovici [10], who revealed that Romania has only 154,830 items included in Europeana, which places it in 24th position out of a total number of 44 providing countries. However, besides the first item, the skewness and kurtosis coefficients have values between  $\pm 2$ , which are considered acceptable [66].

**Table 4.** Descriptive statistics for the items included in the variable ‘cultural sustainability’.

Item	Mean	Median	Std. deviation	Skewness	Kurtosis
The heritage objects held by the museum are very well preserved	3.895	4	0.736	−1.281	3.177
All the heritage objects are stored in good conditions	3.825	4	1.118	−1.039	0.511
Conservation files are available for all heritage objects	3.127	3	1.135	−0.503	−0.742
Research files are available for all heritage objects	3.441	4	1.184	−0.576	−0.557
All the heritage objects are recorded in DOCPAT <sup>1</sup>	2.895	3	1.246	−0.319	−1.190
During the last year, the microclimate conditions were within the minimum and maximum admissible limits	3.883	4	1.056	−0.989	0.494

<sup>1</sup> DOCPAT is a computer program offered by the Romanian National Institute that helps museums to organize and manage a digital database with all their material cultural heritage.

The next step was to verify the reliability and internal consistency of each scale included in the questionnaire using the Cronbach’s alpha coefficient [67]. The results of the reliability analysis indicate a good internal consistency of the ‘cultural sustainability’ component (Cronbach’s alpha coefficient 0.85), the ‘effectiveness and performance’ component (0.841), the ‘environmental behavior’ component (0.922), the ‘openness to the public’ component (0.783), and the ‘heritage exposure’ component (0.727) (Table 5). The items included in the five scales are also intercorrelated (Cronbach’s alpha coefficient for the total scale is 0.922), which means they can be used to measure the sustainability of museums.

**Table 5.** The results of the reliability analysis and adequacy of the sample. KMO—Kaiser–Meyer–Olkin.

Dimension	Items	Cronbach’s alpha	KMO	Variance extracted (%)
Cultural sustainability (CS)	6	0.850	0.794	57.795
Effectiveness and performance (EP)	7	0.841	0.808	51.470
Environmental behavior (EB)	5	0.922	0.876	76.327
Openness to the public (OP)	7	0.783	0.780	45.004
Heritage exposure (HE)	2	0.727	0.524	76.177

The adequacy of the sample for each variable included in the model was measured using the Kaiser–Meyer–Olkin (KMO) test. The results of the KMO test exceed the minimum level of 0.5 [68] (Table 5) and the Bartlett’s Test of Sphericity proved to be significant as well ( $p < 0.001$ ), which means the collected data are suitable for structure detection (factor analysis).

Therefore, we used confirmatory factor analysis (CFA) to evaluate the extent to which the items explain the latent variables [69]. The last column of Table 5 shows that for the variable ‘cultural sustainability’, the six items explain the variance by 57.795%. For the variable ‘effectiveness and performance’, the seven items explain the variance by 51.470%. For the variable ‘environmental behavior’, the five items explain the variance by 76.327%. For the variable ‘openness to the public’, the seven items explain the variance by 45.004%. In the case of ‘heritage exposure’, the two items explain the variance of the latent variable by 76.177%.

The results of the CFA indicated that latent variables can be expressed as a linear combination of items. Thus, based on the items included in each scale, we generated five synthetic variables. Subsequently, to verify the links that exist between latent variables, the correlation coefficient was calculated. This coefficient may have values between −1 and +1. Values close to +1 indicate that there are direct positive relationships between two variables, while values close to −1 indicate the existence of negative associations [70] (p. 24).

The coefficients presented in Table 6 show the existence of positive, significant correlations between cultural sustainability and all four exogenous variables. Because the coefficient does not tell us the extent to which one variable depends on another, the results can be interpreted in a double sense. On the one hand, a museum that has taken all necessary steps to preserve, conserve, and research its collections has greater potential to organize attractive exhibitions for the public and to carry out social and environmental actions and activities. In turn, the social performance of the museum can lead to an increase in the number of visitors and financial resources it attracts, while environmentally responsible

behavior can reduce the consumption of natural and material resources. Thus, effectiveness and performance indicators are positively influenced by increasing output and decreasing input.

**Table 6.** The correlation coefficient between different variables.

	EP	EB	OP	HE	CS
Effectiveness and performance (EP)	1				
Environmental behavior (EB)	0.436 ***	1			
Openness to the public (OP)	0.533 ***	0.607 ***	1		
Heritage exposure (HE)	0.096	0.354 **	0.313 **	1	
Cultural sustainability (CS)	0.509 ***	0.437 ***	0.534 ***	0.493 ***	1

\*\* Correlation is significant at the 0.01 level (two-tailed); \*\*\* correlation is significant at the 0.001 level (two-tailed).

On the other hand, organizing attractive exhibitions and meeting the community's needs are factors that have the capacity to help a museum attract the financial resources needed to fulfill its goals of preserving, conserving, and researching the cultural heritage. Furthermore, increasing effectiveness and manifesting environmentally responsible behavior by reducing the consumption of natural resources (energy, water, materials, etc.), reusing resources as much as possible, and recycling what can no longer be used in the current form [47] (p. 6) allow a museum to achieve more cultural objectives with the same amount of financial, human, and material resources.

In order to find out if there is any difference between the cultural sustainability of museums with various characteristics, we have used the analysis of variance (ANOVA). The ANOVA test infers whether there are any significant differences in the means of the corresponding population groups [71]. The null hypothesis assumes that all the museum groups have an equal cultural sustainability mean. Thus, by performing this test we intended to answer the following questions:

- (1) Does the number of visitors have any effect on cultural sustainability? Do museums from the three categories differ significantly in achieving cultural sustainability? Which group has a higher cultural sustainability?
- (2) Does the relevance of museums, according to their cultural heritage, have any effect on cultural sustainability?
- (3) Does membership of the NNNRM have any effect on cultural sustainability?

The results presented in Table 7 indicate that there are significant differences between the cultural sustainability of museums with different numbers of visitors. An annual number of visitors fewer than 5000 has a negative influence on the cultural sustainability of a museum. A large number of visitors (above 30,000) positively influences the cultural sustainability, but in a lower measure compared with the interval of 5000–30,000. Therefore, we can conclude that the best performances regarding cultural sustainability are obtained by museums with an annual number of visitors of between 5000 and 30,000. These results are in line with previous theoretical findings. According to Pop and Borza [72], a very high number of visitors contributes to the financial prosperity of a museum (which helps it to take all the necessary measures for keeping the heritage in good conditions), but may also represent a risk for the proper conservation of the exposed objects, especially if the exhibiting area is small [73,74]. Conservation of cultural objects requires a constant climate and large visitor numbers may cause an imbalance in temperature and humidity within exhibitions [75]. Also, visitors are a source of hydrogen sulfide, which affects silver and copper objects [76]. On the other hand, museums with low numbers of visitors may encounter difficulties in attracting the financial resources they need for preventive conservation and restoration of their collections.

**Table 7.** The analysis of variance (ANOVA) test for cultural sustainability and control variables. NNRM—National Network of Romanian Museums.

Control variable	Categories	Frequency (%)	Mean variable CS	Test F-value	p-value
The annual number of visitors	<5000	27.9	−0.544	5.581	0.005
	5000–30,000	37.2	0.267		
	>30,000	34.9	0.150		
The relevance of museums according to their cultural heritage	local	24.4	−0.343	2.709	0.050
	county	34.9	0.307		
	national	26.7	0.125		
	regional	14.0	−0.409		
Is the museum a member of the NNRM?	yes	61.6	0.174	1.643	0.203
	no	38.4	−0.109		

Significant differences were also found regarding the cultural sustainability of the local, county, national, and regional museums. The average cultural sustainability is higher among county and national museums, while the local and regional relevance of collections proved to negatively influence the cultural sustainability of a museum. The better results of national museums compared with local museums can be attributed to the fact that the former succeed in attracting larger resources because of the historical and cultural value of their collections. However, the fact that county museums record an average cultural sustainability higher than regional museums is surprising. A possible explanation may be the fact that county museums are financed by county councils and national museums are usually financed by national authorities (e.g., the Ministry of Culture), while regional museums do not have an equivalent regional authority to whom they belong. Our research revealed that most of the regional museums included in the sample are financed by county or local councils. County councils seek to fulfill goals relevant to the well-being and interests of their county community members. On the other hand, regional museums hold heritage objects that are relevant to a broader area, not only to the county that finances them (a region includes more counties), and implicitly, their mission and goals refer to the entire region. Thus, it is likely that county authorities have less motivation to spend money on regional museums compared with county museums, simply because regional museums do not reflect the county values, identity, and history in the way that county museums do. The same explanation can be provided for justifying the higher cultural sustainability of county museums compared with national museums. While most of the national museums are financed by the Ministry of Culture or another ministry, in six cases, the respondents declared that they function under the authority of a county council.

Although we expected to see a higher level of cultural sustainability among the museums that belong to the NNRM, the ANOVA test proved to be insignificant in this case ( $p$ -value > 0.05), which means that this characteristic does not significantly influence the cultural sustainability of a museum.

On the basis of these preliminary results, the next step was to perform multiple linear regression in order to explore the relationship between DV and IVs [25]. Because there is a correlation between the exogenous variables (predictors) (see Table 6), we proposed two models to explain the link between the predictors and the DV, so that the multicollinearity effect can be avoided.

Table 8 shows that the second model, which includes heritage exposure, effectiveness and performance, and openness to the public as significant predictors, achieved the highest value in the likelihood ratio (LR) test (67.356) and the highest R squared (0.33) of the two models. Although cultural sustainability is correlated with each of the four independent variables (Table 6), when their cumulative effect on cultural sustainability is analyzed, we note that environmental behavior becomes insignificant. This result can be explained by the fact that measures taken by museums to protect the natural environment, such as material recycling, the use of energy-efficient devices and systems, and encouraging an eco-friendly attitude among visitors and employees [77], influence cultural sustainability mainly through economy of financial resources, which allows for greater investment in the acquisition, preservation, and conservation of heritage. In the first model (Table 8), this effect is likely to have been taken over by the effectiveness and performance variable, given the significant

positive correlation that exists between environmental behavior and effectiveness and performance (see Table 6). Consequently, the second hypothesis, that there is a positive relationship between cultural sustainability and environmental behavior, is rejected. Thus, in the case of Romanian museums, it is found that green practices adopted by museums do not have a significant effect on controlling the climatic conditions and avoiding the natural imbalances that could pose a threat to the safety of collections.

**Table 8.** Summary of estimated models for cultural sustainability.

Model Variable	Model 1		Model 2	
	Coeff.	Wald Test	Coeff.	Wald Test
Member of NNRM (yes)	−0.291 *	3.175	−0.275 *	2.906
Number of visitors				
>30,000	−0.076	0.105	−0.088	0.149
5000–30,000	0.203	0.922	0.207	0.994
<5000	–	–	–	–
Relevance of museum				
regional	0.181	0.502	0.172	0.470
national	0.458 **	4.215	0.448 **	4.244
county	0.504 **	5.760	0.444 **	4.622
local	–	–	–	–
Heritage exposure	0.362 ***	18.256	0.352 ***	18.861
Environmental behavior	0.024	0.066	–	–
Effectiveness and performance	0.397 ***	15.959	0.352 ***	12.626
Openness to the public	–	–	0.194 **	4.268
Intercept	−0.193	1.816	−0.184	0.875
R squared	0.32		0.33	
Likelihood ratio test (LR)	64.639 *** (df = 9)		67.356 *** (df = 9)	

\* Indicates significance at 10% level or less, \*\* significance at 5% level, \*\*\* significance at 1% level.

The first hypothesis, according to which cultural sustainability is positively related to effectiveness and performance, is accepted. Museums that optimize the ratio between their results (e.g., the number of events, the number of visitors, the revenue level) and the inputs they have used to achieve the results (e.g., the number of employees, the number of exhibited objects, the level of expenditure) will have a higher chance of accomplishing their mission of protecting the cultural capital.

The third and fourth hypotheses, according to which cultural sustainability is positively related to openness to the public and heritage exposure, are accepted as well. These findings show that the ability of museums to preserve, conserve, and research the cultural heritage can be enhanced by organizing attractive exhibitions inside and outside of the museum's walls, exhibiting a high proportion of the artefacts they possess, providing services and products according to visitors' needs and desires, offering participative and interactive educational programs, developing accessible and inclusive programs, collaborating with the community members for organizing various events, having a diversified structure of employees and volunteers so as to reflect the structure of the local community, and attracting new users and/or disadvantaged groups of people. Museums can offer attractive exhibitions and interactive educational programs by using modern technologies, such as audio–visual media, guided presentations, interactive navigation stations, simulation media, interactive films, 3D graphics, and virtual reality [78]. By performing these actions, museums will create the opportunity for a wider number of people to 'perceive, understand, and appreciate' the value of cultural heritage, the conservation of which is important for future generations [79].

#### 4. Discussion

Museums are public institutions whose general mission is to serve society [80,81]. Given this mission, museums seek to have a positive impact on sustainable development. Financial



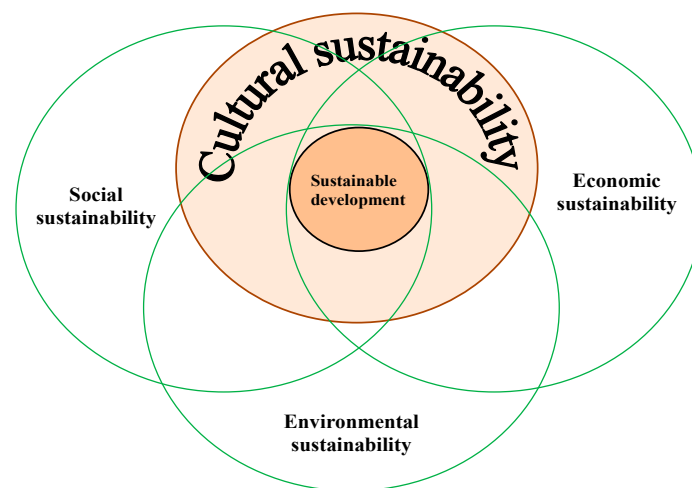
constraints have forced museums to turn their attention toward becoming organizationally sustainable. According to Moldavanova [17], organizational sustainability includes both institutional survival and intergenerational sustainability, which is understood as the ability of a museum to fulfill its cultural mission in the long run. Beside the fact that sustainable management helps museums to prove their importance and to survive, our study showed that this approach also has a positive impact on museums' ability to achieve their cultural goals.

While most of the previous research presents the importance of cultural heritage in the process of sustainable development through its role in achieving social relevance and economic prosperity, influencing visitors to practice green activities, and developing their pro-environmental behavior [69,77], this paper adopts a less debated perspective, namely the examination of possible factors that can help museums to reach cultural sustainability by better accomplishing their goals related to the preservation, conservation, and research of cultural heritage. The factors included in the analysis were defined starting from the three classic dimensions of sustainability. The variable 'effectiveness and performance' was chosen for economic sustainability, 'heritage exposure' and 'openness to the public' were selected for social sustainability, and 'environmental behavior' was a factor associated with environmental sustainability. Using this approach, we aimed to evaluate the role of economic, social, and environmental sustainability in supporting the cultural mission of museums. Quantitative research was conducted to meet the aims of the study. The statistical results allowed us to accept three out of the four hypotheses referring to the positive connection between the DV and IVs.

The findings of the present study indicate that museums' effectiveness and performance, openness to the public, and heritage exposure have a positive impact on cultural sustainability. These findings are in line with the assertions of Loach et al. [4] and Errichiello and Micera [35], who hypothesized that economic and social dimensions of sustainability can be used by museums as tools for 'implementing cultural sustainability-oriented strategies'. Sustainable museums succeed in making better use of their resources, but at the same time, they have a higher financial capital available to collect, preserve, conserve, and research the cultural artefacts. Our results are also consistent with the findings of Pencarelli et al. [14], who emphasized that Italian museums are motivated to invest in social sustainability policies, because in this way, they can ensure their future. At the same time, socially responsible behavior allows museums to receive a higher level of public funding, which has a positive influence on their performance in terms of cultural heritage preservation [45].

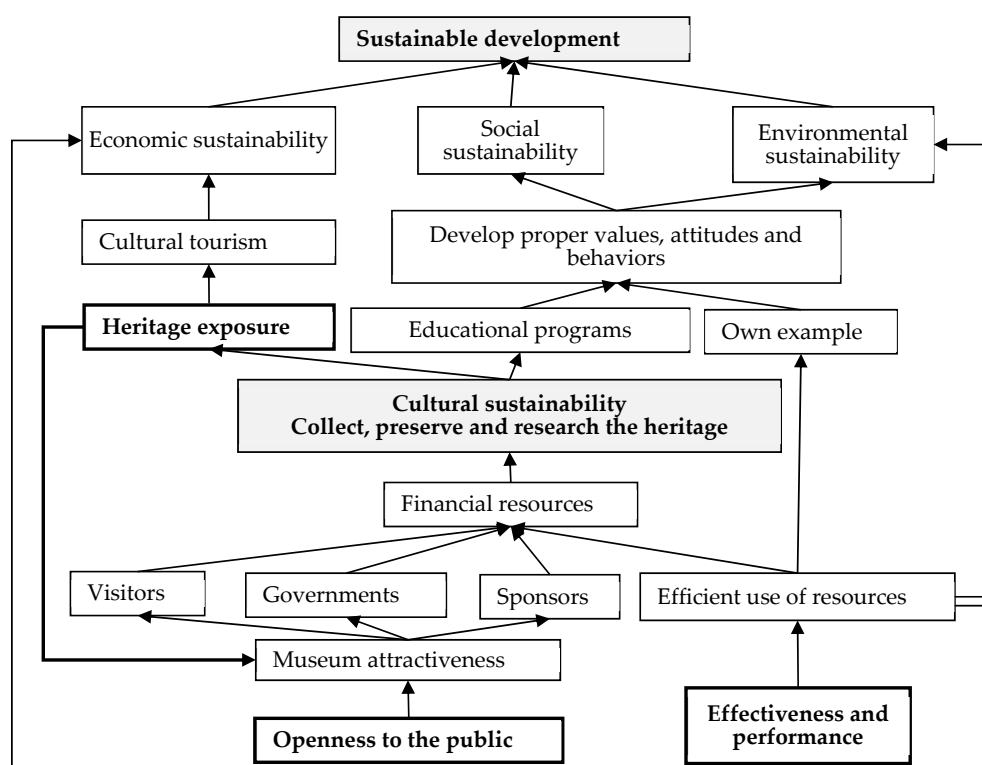
Even though the correlation between environmental behavior and cultural sustainability proved to be significant, environmental behavior had no direct impact on museum cultural sustainability. Museum collections are not better preserved and conserved merely because they have an eco-friendly attitude and behavior. Therefore, the assumed impact of museum environmental behavior on protecting cultural heritage was not supported. The influence of pro-environmental behavior on cultural sustainability is rather indirect, through the economy of resources, which leads to higher effectiveness and, in this way, to cultural sustainability.

In conclusion, cultural heritage can be used as a resource for achieving economic, social, and environmental goals, but at the same time, our study has shown that some components of social and economic sustainability have the capacity to influence cultural sustainability within museums. Therefore, cultural sustainability has the role of both input and output in relation to the other pillars of sustainability, which reinforces the conclusions of previous studies that culture can be regarded as a fourth independent pillar of sustainability, equal to the economic, social, and environmental pillars [35,38], as illustrated in Figure 1.



**Figure 1.** The four pillars of sustainable development in museums.

In museums, culture, economy, society, and environment together create an ecosystem in order to achieve sustainable development. These structures are all resources/instruments and destinations/goals at different points in the cycle. Museums are financed by local communities and cultural vitality is the way in which museums reward the community for its effort. First, society invests money and resources in a museum. Second, the museum acquires, conserves, preserves, and researches cultural heritage artefacts. Third, the museum repays the community by using the heritage to create cultural vitality and economic development and to develop pro-environmental and socially responsible behaviors among its visitors (Figure 2). The value created by the museum motivates authorities, sponsors, donors, and other stakeholders to continue to support it. The cycle is then repeated.



**Figure 2.** The input–output approach of cultural sustainability in museums.

However, it should be clarified that effectiveness and performance, openness to the public, and heritage exposure are not the only factors that have an influence on cultural sustainability. Guccio et al. [42] pointed out that the efficiency of cultural heritage preservation works is influenced by the professional characteristics of the specialists who take the decisions to carry out conservation work. The authors highlighted that specialized heritage authorities that belong to central government are less efficient in implementing conservation contracts than less specialized authorities. Errichiello and Micera [35] also examined the role of public–private partnerships and collaborations between cultural organizations and local stakeholders in achieving cultural sustainability. Another important factor is the national support offered to cultural institutions for digitizing their heritage. As Fanea-Ivanovici [10] highlighted, in Romania, the lack of funds is the main reason for which the number of objects included in Europeana per number of inhabitants is one of the lowest in Europe.

Given this background and the results of our research, future studies should focus on exploring the influence of other possible factors on cultural sustainability in museums. Because market orientation, innovation, and the high value offered to customers have a positive impact on economic and social sustainability of museums [82], they might influence cultural sustainability as well. In particular, technological innovation was found to be a source of competitive advantage for museums [32] and, consequently, it could have a great impact on cultural sustainability as well. Other possible factors could include web-based services and digital tools [67], which were found to be relevant regressors of the museums' attractiveness [25]; financial structure and organizational size, which impact the level of performance in museums [45]; and retailing activities, which are a source of self-generated revenue [44].

In addition, the conclusions of the present study should be confirmed through research conducted in other countries and geographical areas with different cultural and environmental background. In Romania, the occurrence of natural hazards is low, which is why their negative effect on cultural heritage is almost missing, and implicitly, the measures taken by museums for environmental protection have proven to have an insignificant effect on the preservation of cultural heritage. However, the results could be different in countries that are frequently confronted with problems related to natural hazards caused by climate instabilities.

The results may also differ according to the level of cultural consumption that exists among various countries. Figure 3 illustrates the percentage of people of the age of 16 years or over who participated in cultural activities offered by European cultural sites (historical monuments, museums, art galleries, or archaeological sites) in 2015, by country of origin.

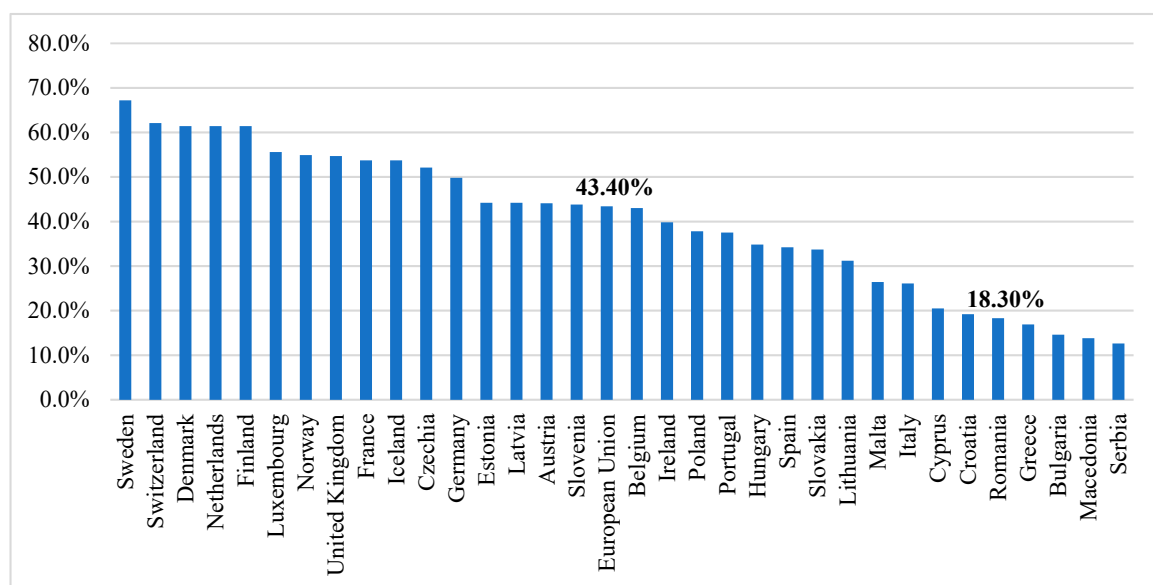


Figure 3. Participation in cultural activities offered by cultural sites in 2015; source: [83].

While in EU countries, 43.40% of the sample population participated at least once in cultural activities in 2015, in Romania, this percentage is only 18.30%. The main reasons for non-participation in cultural activities offered by Romanian cultural sites were the following: financial reasons—20.1%, no interest—26%, none in the neighborhood—22.3%, and other—31.5% [84]. A very interesting aspect is that, compared with other European countries, Romania has the highest percentage of people who declared that they have not participated in cultural activities because of the fact that there ‘is none in the neighbourhood’ (22.3%). This means that Romanian cultural institutions should increase the number of exhibitions and activities organized in different locations in order to support the development of cultural sustainability.

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## Appendix A The questionnaire

Please rate the degree to which you agree or disagree with each of the following statements related to the management and sustainability of your museum, by using the following 5-point Likert scale:

- 1 – Strongly disagree
- 2 – Disagree
- 3 – Neither agree, nor disagree
- 4 – Agree
- 5 – Strongly agree

No.	Statements	Answer				
<b>CULTURAL SUSTAINABILITY</b>		1	2	3	4	5
1.	The heritage objects held by the museum are very well preserved					
2.	All the heritage objects are stored in good conditions					
3.	Conservation files are available for all heritage objects					
4.	Research files are available for all heritage objects					
5.	All the heritage objects are recorded in DOCPAT					
6.	During the last year, the microclimate conditions were within the minimum and maximum admissible limits					
<b>SOCIAL SUSTAINABILITY—Heritage exposure</b>		1	2	3	4	5
1.	The museum exhibits a very high proportion of its heritage objects					
2.	The heritage objects which are not exhibited in the museum can be visited at exhibitions organized in other locations or museums					
<b>SOCIAL SUSTAINABILITY—Openness to the public</b>		1	2	3	4	5
1.	The permanent exhibition/exhibitions of the museum are very attractive to the public					
2.	Messages left by visitors in the museum’s guestbook and/or Facebook page are reviewed in order to adopt improvement measures					
3.	The museum’s exhibitions and programs are accessible and inclusive					
4.	The museum allows community members to organize various events, local meetings, and exhibitions in its spaces and buildings					
5.	The museum aims to attract new users and/or disadvantaged groups of people					
6.	The museum staff and volunteers are diversified enough to reflect the structure of the local community					
7.	The museum offers participative and interactive educational programmes					
<b>ENVIRONMENTAL BEHAVIOUR</b>		1	2	3	4	5
1.	The museum has implemented measures to increase the efficiency of electricity consumption					
2.	The museum has implemented measures to increase the efficiency of thermal energy consumption					
3.	The museum has implemented measures to improve the efficiency of water consumption					
4.	The museum has implemented measures to improve the efficiency of office materials consumption					
5.	The museum has implemented measures to improve the efficiency of fuel consumption					

No.	Statements	Answer
<b>ECONOMIC SUSTAINABILITY—Effectiveness and performance</b>		
1.	The ratio between the annual number of events organized by the museum and the average number of employees is high	
2.	The ratio between the annual number of visitors registered by the museum and the average number of employees is high	
3.	The ratio between the annual income earned by the museum and the average number of employees is high	
4.	The average number of visitors registered by the museum per square meter of exposure area is high	
5.	The ratio between the museum's revenue from the sale of tickets and the number of objects exhibited in the museum is high	
6.	The ratio between the annual number of visitors and the museum's total expenditure is high	
7.	The share of own revenues in the total revenue earned by the museum is high	

### Information about organisation and respondent

- Is the museum part of a museum complex?  
☐ Yes ☐ No
- The museum is:  
☐ Private ☐ Public
- Is the museum a member of the National Network of Romanian Museums?  
☐ Yes ☐ No
- The type of museum according to the importance of its collections is:  
☐ National museum ☐ Regional museum  
☐ County museum ☐ Local museum
- The museum's profile is:  
☐ Natural Sciences ☐ Art ☐ History ☐ Science and technology  
☐ Ethnography ☐ Mixed ☐ Memorial ☐ Archaeology ☐ Other: \_\_\_\_
- The upper hierarchical institution of the museum is:  
☐ Ministry of Culture ☐ County Council ☐ Another museum ☐ Other: \_\_\_\_\_  
☐ Local Council ☐ A private company ☐ A university/faculty ☐ The museum does not have a superior hierarchical institution
- Does the museum have its own legal personality?  
☐ Yes ☐ No
- The museum where you work has:  
☐ Less than 11 employees (very small museum) ☐ Between 11 and 20 employees (small museum)  
☐ Between 21 and 50 employees (medium museum) ☐ Between 51 and 150 employees (large museum)  
☐ More than 150 employees (very large museum)
- Does the museum have its own income and expenditure budget?  
☐ Yes ☐ No (go to question 12)
- The total revenues recorded by the museum in 2015 were: ..... lei.
- How many percent are the museum's own revenues from total revenue?  
☐ Under 6% ☐ Between 6% and 10% ☐ Between 11% and 20% ☐ Between 21% and 30%  
☐ Between 31% and 40% ☐ Between 41% and 50% ☐ Between 51% and 60% ☐ Between 61% and 80%  
☐ More than 80%
- Was the museum in which you work open to visitors in 2015?  
☐ Yes ☐ It was only partially open ☐ No (go to question 14)
- The number of visitors registered last year by the museum was:  
☐ Under 5000 ☐ Between 5000 and 15,000 ☐ Between 15,001 and 30,000  
☐ Between 30,001 and 50,000 ☐ Between 50,001 and 70,000 ☐ Between 70,001 and 100,000  
☐ Between 100,001 and 150,000 ☐ Between 150,001 and 300,000 ☐ More than 300,000
- The number of heritage objects owned by the museum at the end of 2015 was: .....
- What are the main issues affecting the sustainability of your museum (you can choose more options)?  
☐ Insufficient financial resources ☐ Lack of museum specialists  
☐ The legislative system applicable to museums ☐ Lack of motivation among employees  
☐ Excessive internal bureaucracy ☐ Excessive bureaucracy in relation to other institutions  
☐ Reduced autonomy of the institution ☐ Insufficient storage and exposure space  
☐ Others \_\_\_\_\_
- How long have you been working at the museum?  
☐ Less than a year ☐ 1–3 years ☐ 3–7 years ☐ 7–15 years ☐ Over 15 years

### Contacts:

The function of the respondent . . . . .

The name of the museum . . . . .

Museum address . . . . .

Museum e-mail address . . . . .



Please be advised that the data collected in this questionnaire is confidential and, if published, will not allow association with your museum without prior written consent.

Thank you for your time!

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