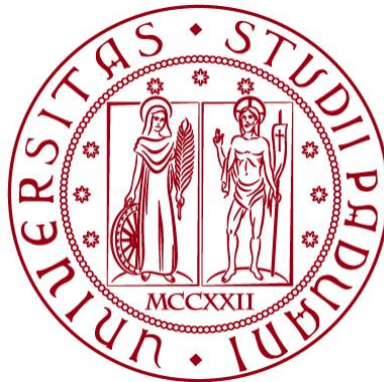


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**TESI DI LAUREA**

**Eco-climatic Agenda of Italian Museums, Analysis,  
Best Practices, Perspectives and Recommendations**

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## **1. Introduction**

The context of the study considers Italian museums, as major cultural institutions, that play a key role in spreading information and encouraging responsible consumerism, environmental awareness and climate action. In the context of the worldwide environmental problem, they can become not only locations where cultural treasure is kept, but also venues for environmental and educational projects. In this environment, museums' efforts focused on sustainable development and adaptation to climate change become increasingly significant.

The study's object is the museums located in Italy that create, develop, and conduct events and activities in in the field of sustainable development and climate action.

The study examines as its subject the activities, practices of these museums that are conducted in the direction of eco-climatic and sustainable practices.

The purpose of the study is to assess and evaluate practices and activities targeted at environmental sustainability and climate action in Italian museums. The study intends to discover effective ways implemented by museums in the field of environmental education and sustainable management, and to determine the role of museums in increasing public interest and engagement in environmental themes.

The research targets

1. To research and evaluate practices and initiatives targeted at sustainable development and climate action in Italian museums.
2. To explore the actions of worldwide, European, Italian and regional groups supporting museum projects for sustainable development and climate action.
3. To investigate and evaluate a dataset given by ICOM Italy to determine patterns and orientations of museums' actions in this direction.
4. Conduct interviews with museum representatives and study the replies gathered to better understand the internal and external variables impacting the development of sustainable practices.
5. Identify important variables and barriers impacting the implementation of sustainable practices in the museum environment.
6. To produce suggestions for Italian museums to enhance sustainable management and environmental performance based on the recognized best practices and analysis of the collected data.

During my internship at ICOM Italy, conducted for my thesis study, I examined the influence of global climate conferences on museum policy. My work comprised an assessment of ICOM's involvement at these conferences, an analysis of the organization's declarations and promises in the framework of climate efforts, and an inquiry of their influence on the strategic growth of museums. ICOM Italy provided me with an access to a useful dataset comprising information about museums engaged in sustainable and environmental projects, which became the foundation of my study. This helped me to highlight areas of excellence as well as to examine the primary difficulties confronting museums. By means of interviews with representatives of cultural institutions, I investigated the viewpoints of stakeholders; conversely, comparative studies of museum activities helped me to provide suggestions for ongoing improvement.

For this study, an integrated strategy was adopted, encompassing primary and secondary techniques of data gathering.

The first part of the study deals with the bibliographical analysis, which was aimed at assessing current research papers, reports, publications and articles relevant to sustainable development and climate action in the museum realm. This step enabled not only to identify current techniques to integrating environmental activities into museum activity, but also to establish a theoretical framework for further investigation. During this step, essential concepts and directions were discovered, which allowed for a more focused emphasis on the themes significant for this research. Extracts from the most relevant papers and publications were included in the appendix to the thesis, which gives a chance to acquaint oneself more completely with the source materials.

After the theoretical study, specific focus was paid to assessing the datasets provided by the ICOM Italy team. This file provided information on several activities and 67 projects performed by 47 museums in Italy in the subject of sustainable development and climate action (details of the participants can be found in the section 2.1 and in the Table 1 of the Annex). The analysis includes the examination and systematization of data such as the structure of activities, audience reach, modes of engagement with visitors, and the management of environmental activities of museums. This step enabled to discover relevant trends and patterns and to analyze the existing degree of museums' engagement in this area. Working with datasets made it feasible to do quantitative analyses, which gave objectivity to the research.

The third stage was to conduct 16 interviews with representatives of museums that are directly involved in the execution of environmental programs (details of the participants can be found in the section 2.2 and in the Table 2 of the Annex). This

step was crucial to acquire primary data that gave insight into the opinions and motives of the participants, as well as the complexity and issues they encounter. The interviews and questionnaires were meant to cover a wide variety of themes, from internal structure to the influence of external variables on the implementation of sustainable practices. Direct engagement with respondents not only allowed for a deeper dig into the nature of the processes, but also allowed the research instruments to be altered as needed. This stage significantly boosted the validity and dependability of the findings, as the primary information was first-hand and particular to the study environment.

## **1.1 Current issues of the environment and climate**

### **1.1.1 Global level**

The planet is currently facing many crises that threaten the planet and us. Moreover, environmental problems can be now considered to be a significant concern.

Some can believe to be small, and which affect only a few ecosystems, while others can drastically change the conditions of life that can be considered normal. The last one can surely include pollution of all the environments of the planet, like the atmosphere, the hydrosphere, the lithosphere in the form of topsoil, and the biosphere. Data from the World Health Organisation show that an estimated 4.2 to 7 million people die each year from air pollution worldwide and that nine out of ten people breathe air with high levels of pollutants.

Today plastic pollution is called as another alarming problem. The consumption generated by the human for the last 50 years has grown rapidly (Pilapitiya et al., 2024), so as numbers of population, global trade, and urbanization, resulting in humanity using more of Earth's resources than it can replenish naturally. Nowadays approximately 11 million tons of plastic make it way into the oceans yearly, damaging wildlife habitats and living animals (Bailey et al., 2020). The study underlines that without action, the plastic crisis will grow to 29 million metric tons per year by 2040 (Bailey et al., 2020).

At the same time, it is observed a significant decrease in the Earth's biodiversity. WWF's Living Planet Report 2020 shows that “populations of mammals, fish, birds, reptiles, and amphibians declined by an average of 68% between 1970 and 2016”. The report tells that this biodiversity loss is a result of various factors, but mainly to land use change, especially the conversion of habitats such as forests, grasslands, and mangroves to agricultural systems. The issue of shrinking forest areas is also critical. According to Forest Declaration Assessment “in 2022, global gross deforestation reached 6.6 million hectares worldwide and was 21 percent higher than needed to eliminate deforestation by 2030”.

It is known that the agricultural sector is a significant cause of deforestation. People clear the land to raise livestock or tradable crops such as sugar cane and palm oil. Rising temperatures and unsustainable farming practices have impacted on the water scarcity and food insecurity. Another consequence is topsoil erosion. Globally, erosion affects more than 75 billion tons of soil each year (Borrelli et al., 2017), 100 times faster than it can naturally replenish. The soil full of biocides and fertilizers ends in waterways, contaminating potable water and protected areas downstream.

But a global environmental issue of bigger concern is the planet's changing climate. Meteorologists have observed 2023 to be the hottest year on record, with some temperature records. The concentration of carbon dioxide in the atmosphere has increased by more than 50% since the beginning of the age of the Industrial Revolution (Lindsey, R., 2024).

The IPCC's Sixth Assessment Report, released in 2022 after adopting the Paris Agreement, confirms the group's position that global temperatures have increased by 1°C. According to the report, the world can no longer prevent extreme climate change. Global warming will exceed 1.5°C and 2°C in the 21st century unless significant reductions in emissions of carbon dioxide and other greenhouse gases are made in the 2020s.

The group also highlights the anthropogenic effects of current climate change (IPCC, 2023). The consequences may include more intense and frequent temperature extremes, marine temperature anomalies, heavy precipitation, droughts, intense tropical cyclones, and reductions in Arctic Sea ice, snow cover, and permafrost. Social impacts can include, with high certainty, increased human mortality and morbidity, reduced food and water security, loss of livelihoods, and loss of cultural heritage.

Addressing climate change and reducing emissions and at the same time ensuring decent and sustainable living conditions requires far-reaching transitions in all sectors of the economy and society.

Since the publication of the Brundtland Commission's report, the framework for the concept of sustainable development has begun, implying a social and economic development in which future generations are not deprived of the opportunity to meet their own needs. At the same time, currently the socio-economic aspects of development include the concept of environmental sustainability, the ability of ecosystems and their communities to self-regulate, preserve and maintain the balance of their structure, functions, mechanisms of interaction, while minimizing the negative anthropogenic impact on the environment.

The development of this conception was followed by the Rio Declaration on Environment and Development in 1992, like a one of first guides that assist countries in future sustainable development paths. Then it was the Programme of Action of the International Conference on Population and Development (ICPD) in 1994, and the Millennium Declaration of 2000, which committed its Member States to adopt the eight Millennium Development Goals (MDGs).



The next milestones were the Johannesburg Summit (World Summit on Sustainable Development or WSSD) in 2002 and the UN Conference on Sustainable Development, also known as Rio 2012 or Rio+20, held in Rio de Janeiro in 2012, 20 years after the Earth Summit. The final product of the latter was the program document "The Future We want", which marked the beginning of the definition of Sustainable Development Goals.

Based on the first eight Millennium Goals, the 2030 Agenda expands its scope and defines 17 Sustainable Development Goals (SDGs), accompanied by 169 specific objectives. The fundamental principle of the 17 Goals, which are interconnected and indivisible in their essence, is the balance between the three dimensions (also called the "three pillars") of sustainability: the environment, society and the economy, based on the model of the three pillars of sustainability adopted at the Rio de Janeiro Conference in 1992.

From this point of view, sustainable development combines the requirements of economic growth with the requirements of human and social development, quality of life and the preservation of the planet in terms of long-term well-being. The environmental, economic and social aspects of sustainable development complement and support each other in a multidimensional design with the aim of building a more equitable, healthy and harmonious society to improve the quality of life of the world's population while preserving the planet and its resources.

### **1.1.2 European level**

Lowering down to the regional level of the studies, it can be assessed what problems European Union and Europe in general are facing. Today, according to the European Environment Agency (State of Europe's Environment, 2024), "the continent continues its trend to consume more resources and affect more on environmental degradation than other regions of the world". The important environmental problems of the region are loss of biodiversity, resource overuse, the effects of climate change, and environmental risks to health and well-being of its citizens.

Although legal and political measures taken by the European authorities to protect nature have benefited some areas, many problems still exist, and some worsen. For example, the reduction of pollution has improved water quality, but only 37% of the EU's surface waters have reached a good ecological condition by 2015 (State of Europe's Environment, 2024). Land use has improved, but landscape fragmentation continues to grow, harming ecosystems, habitats and biodiversity. Today, around three quarters Europe's ecosystem is contaminated with high level of nitrogen, which leads to eutrophication. The impact of climate change on biodiversity and ecosystems increases. At the same time, agriculture, fishing, transport, industry, and

energy production continue to impact on biodiversity loss, resource extraction, and harmful emissions. The region has made good progress in air pollution reducing by industry, transport, and households, which also has lowered the number of deaths connected to air pollution. But still more than 10% of annual premature human deaths in the region are connected to the environmental pollution. The evidence is that the health of citizens can be negatively affected by dangerous chemicals. The 2030 perspective suggests that more than the current rate of progress will be required to achieve the climate and energy goals for the periods 2030 and 2050 (State of Europe's Environment, 2024).

It is possible also to look on the European context regarding its way of achieving the Sustainable Development Goals and from there realize that the trends in individual indicators of the progress are more pessimistic. Although, according to estimates for 2021, the EU has already reduced net greenhouse gas emissions by about 30% since 1990, more significant progress will be needed to achieve the ambitious set target of 55% reduction by 2030 (State of Europe's Environment, 2024). As for the impact on the climate and adaptation to it, monetary loss from climate disasters increased sharply in 2021. On the positive side, the EU has constantly increased its contribution for the financing of the climate programs of the developing countries.

### **1.1.3 Italian level**

Among the environmental problems Italy faces now, some of them are crucial because of their severity and the wide impact they have on both the environment and human lives. First, it can be mentioned the issue of natural landscape degradation and loss of biodiversity. Due to deforestation, urban sprawl, and intensive agricultural practices, the country is experiencing significant land and soil degradation, which makes it less productive.

The Italian National Strategy for Sustainable Development (SNSvS) appeared in 2017 based on an environmental action strategy. It incorporates all dimensions of sustainability, formulating strategic choices and national goals characterized by the interaction between several SDGs.

This strategy confirms the country's commitment to achieving the Sustainable Development Goals. It also aims to identify common areas of cooperation and tools to strengthen its inclusive and communicative capacity and ensure coherence of sustainable development policies across sectors and at different territorial levels.

The SNSvS strategy is divided into 2 main parts that formulate the structure of the document:

The first part is dedicated to elements such as sustainability vectors, for which, in consultation with key stakeholders were identified common goals, potential areas of work, planning, and interaction, as well as metrics for monitoring achievements and the current situation. The "vectors" link together many aspects of the Sustainable Development Goals of the Agenda and are noted as elements capable of stimulating transformations in society, administrations, and territories.

One of the vectors is "Policy coherence for sustainable development," aimed to integrate and harmonize the Italian national policy in sustainable development with the international, regional, and local levels. Forming a synergy of actions, this vector is responsible for identifying and eliminating possible consequences and impacts that could appear during the realization of specific goals and have a negative impact, spreading to both domestic and foreign policy.

The next vector is "Participation in the interests of sustainable development," which aims to develop and strengthen various types of cooperation to implement the 2030 Agenda.

The last vector name is "Culture for Sustainability." It focuses on questions in the sphere of education for sustainable development and considers the educational needs during the implementation and revision of the strategy, as well as during consultations with territories (regions, autonomous provinces, and capital cities) and other central government bodies.

Sustainability vectors represent favorable terms to start and support the country's sustainable development path and embark on the way of transformation by the key principles of the Agenda. Vectors play central role, because they represent elements through which the strategy implementation process can be strengthened, expanded, and integrated in a structured and gradual manner at all levels and with the cooperation of the entire system of SNSvS entities.

The second part of the strategy is dedicated to five areas, the "5 P" agendas: People, Planet, Prosperity, Peace, and Partnership. The Italian Sustainable Development Goals have been defined in these areas with corresponding targets and indicators.

The sphere of "People" aims to develop social aspects to improve the population's life quality and contribute to the realization of the potential. In this context, poverty eradication is linked to economic and social and environmental factors: the fight against inequality in the interests of greater social cohesion and lowering the population's impact to environmental risk factors.

The “Planet” section focuses on addressing issues related to climate change and its consequences because of anthropogenic activities: loss of natural capital and biodiversity and reduction of ecosystem services from the point of view of viability and public health.

In “Prosperity”, the foundations are being laid for creating a new, circular economic model that guarantees the full development of human potential and more efficient and responsible use of resources. This area develops a mechanism that minimizes the negative impact on nature, promotes the rational and multiple use of resources, and increases the value of human capital.

The “Peace” work is built together with the “People” to implement social protection and poverty reduction policies, paying attention to the most vulnerable groups, including people with disabilities, minors, and migrants. It aims to promote the development of peaceful, just, and inclusive societies through mechanisms to support the fight against various types of discrimination and measures to combat organized crime, corruption, and violence in all its forms.

The “Partnership” area refers to the external provisions of the country's cooperation strategy, considering the provisions of all previous areas of the strategy. It uses a human rights-based approach: the right to health, clean water and food security, a healthy environment, work, education, gender equality, the gender equality, and the creation of effective, accountable, and inclusive institutions everywhere.

#### **1.1.4 Triveneto level**

Three Italian regions consisting of the Triveneto area, Trentino Alto Adige, Veneto, and Friuli-Venezia Giulia, have developed sustainable development strategies reflecting their unique approaches to achieving the global sustainability goals set by the United Nations.

Each region adapts its strategies to local characteristics while striving to integrate with international and national goals, allowing them to solve local problems and contribute to global efforts for sustainable development.

Trentino's strategy approved in 2021 is closely linked to the 2030 Agenda, it is document focused on the possible future, which defines strategies to be implemented by 2030 to promote sustainable development models in Trentino. To define this strategic document, the authorities decided to use an approach focused on the medium and long-term future planning, following the example and guidance of the European Commission (Menapace et al., 2021). The strategy focuses mainly on climate change and social inequality. The main goals are the promotion of the

innovation, environmental sustainability, infrastructure improvement, and social inclusion. The document pays special attention to the involvement of citizens and stakeholders in the organization and planning processes, which makes it an inclusive approach and integrated management. This method allows the region to develop in a balanced way, support both economic prosperity and the social well-being.

Simultaneously the strategy possesses 20 objectives, which achievement can contribute to the realization of other goals; they are considered as "challenges" because they represent real problems for Trentino but also, they are thought to be "opportunities" because they can create synergies and cross-cutting and long-term benefits. The targets are following:

- Water (Minimizing pollution loads on soils, aquifers, considering system ecological health, maximizing water use efficiency, and adjusting water intake to water shortage).
- Agricultural industry (Protection and restoration of genetic resources and natural ecosystems in agriculture, forestry, and aquaculture).
- Biodiversity (Enhancing conservation status of species and habitats, expanding protected areas, and fostering urban-rural ecological connections).
- Housing (Reducing housing problems and improving the quality of housing).
- Rights (Ensuring the efficiency of the social protection and social security system, welcoming and integrating residents, fostering diversity, and fighting prejudice).
- Circular economy (Enhanced economy through dematerialization, resource efficiency, waste reduction, and secondary raw material market development).
- School education (Eliminating school dropouts and developing inclusive quality education).
- Labour (Improving employment and quality of work and ensuring rights and education).
- Legality and the fight against crime (Combating deviations via preventative and social integration, improving security capillary control and enhancing crime and corruption prevention).
- Sustainable mobility (Increasing the sustainable mobility of people and goods).
- Gender equality (Ensuring gender equality, preventing violence against women and children and providing adequate assistance to victims).
- Poverty (Reducing poverty and combating material and food deprivation).

- Innovation and the digital agenda (Increase R&D, execute the digital agenda, improve smart grids, promote new processes and products, and enable technology transfer).
- Corporate social responsibility (Promotion of social and environmental responsibility initiatives in companies and administrations and environmental taxation).
- Reducing emissions (Reducing climate-damaging emissions, improving energy efficiency and producing renewable sources energy).
- Healthcare and medical services (Ensuring access to effective and high-quality health and care services and combating inequality).
- Territorial security (Preventing natural and anthropogenic threats and increasing the sustainability of communities, ensuring sustainable forest management).
- Healthy lifestyle (The dissemination of a healthy and sustainable lifestyle and the strengthening of prevention systems).
- Land (Stop land consumption, sustainable management and conservation of territories and cultural heritage).
- Sustainable tourism (Encouraging demand and increasing supply of sustainable tourism and reducing the tourists' ecological footprint).

Alto Adige emphasizes its own responsibility as one of most developed Italian regions, and it wants to become a leader in sustainable development (Südtiroler Landesregierung, 2021). The 2030 strategy includes reducing CO2 emissions and developing a circular economy. The document highlights the importance of specific and measurable goals, such as promoting low-emission vehicles and increasing use of public transport and moving in the bicycles. The strategy is made that it is possible to conduct transparent monitoring of progress and ensure accountability for its results.

Veneto's strategy (adopted in 2020) focuses on the challenges posed by the COVID-19 pandemic and underlines the importance of sustainable development in the new environment.

Veneto's strengths (Cabina di Regia et al., 2020) include economic, training, social, medical, and civil protection. The area boasts one of Italy's greatest GDP growth rates, and an active labor strategy based on a high-quality education system has enhanced the production-vocational training relationship. As for environmental sustainability, Veneto has a high percentage of differentiated urban waste collection, high domestic raw material consumption, and a growing number of government agencies purchasing goods and services with minimum environmental criteria. CO2 emissions are falling, although Veneto provinces vary.

The Regional Strategy for Sustainable Development guides institutions, communities, civil society and business to create a more inclusive region focused on economic development with social and environmental balance. The approach considers the six strategic macro-areas positioning report's strengths and shortcomings, internal procedures, involvement mechanisms, and the pandemic:

1. Make the system stronger and self-sufficient for sustainability.
2. For comprehensive innovation: to make the economy and manufacturing system more competitive globally.
3. To promote community and individual prosperity.
4. To create an appealing region, safeguard and strengthen the socio-ecological ecosystem and the environmental ecosystem.
5. Reducing air, water, and land pollution for natural capital reproduction.
6. Responsible governance: using new technology to reimagine local government.

In general, the region tries to integrate economic growth with social and environmental sustainability by supporting health, education, and innovation initiatives. The Veneto Regional Strategy provides for close cooperation with the European Union and national programs, contributing to the combination of efforts and increased efficiency.

Friuli-Venezia Giulia's strategy (2023) focuses on international cooperation and innovation, participating in initiatives like the European Green Deal. The regional Strategy actively engages universities and research institutions to achieve sustainable development goals, which allows the region to solve local problems and strengthen its international position (Gruppo di Lavoro Interdirezionale et al., 2023).

Moreover, the Friuli-Venezia Giulia Positioning Report on the 17 goals of the 2030 Agenda, prepared in 2020, analyzes the situation before the pandemic using ISTAT data, and the October 2022 ISTAT report updates regional trends for 17 goals, although it is not comparable to earlier assessments. The results allow strengthening positions on the SDGs of the first group (1, 4, 8, 10, 11, 13, 17), the second group (2, 3, 5, 7, 16), and the last group more significantly (6, 9, 12, 14, 15) (Ministero della Transizione Ecologica et al., 2021).

An internal analysis involving Central Directorates and regional authorities, considering regional alignment with Sustainable Development Goals and a comparison with civil society resulted in the identification of 12 distinct thematic areas of activity, recognizing the potential synergistic impact of various directorates' initiatives on shared subjects.

The designation of thematic macro-areas underscores the emphasis of the SRSvS on priority intervention areas for the Friuli-Venezia Giulia region and illustrates the collaborative efforts of regional entities in executing the Strategy. This synergy necessitates cooperation between central directorates and regional entities that contribute to the same domain of activity and/or to domains that fall within the same macro area. Correlations and synergies also occur across regional structures functioning in various macro areas, since their subjects exhibit substantial interrelations.

The overall strategic vision of regional activities, based on the priority intervention themes presented by the SRSvS macro-districts, is presented in Image 1, which shows how this strategic approach, consistent with the paradigm of sustainable development, allows achieving goals related to three dimensions of sustainability: economic, social and environmental.

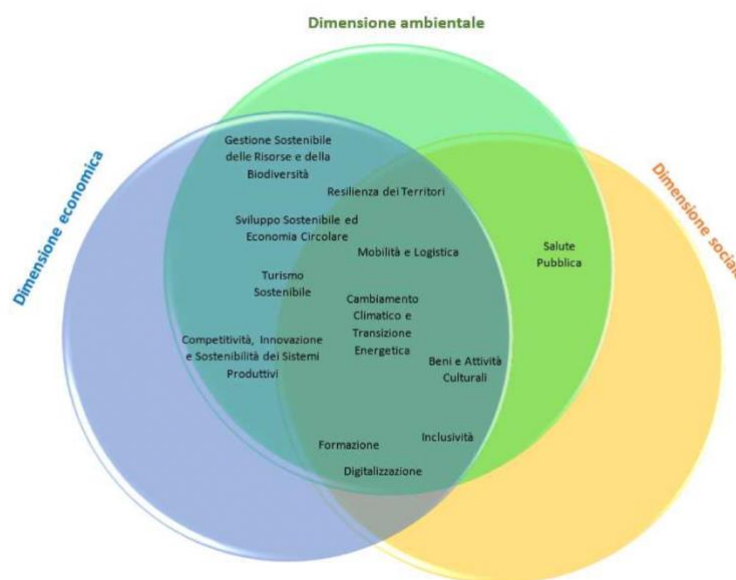


Image 1. Macro areas of Friuli-Venezia Giulia's strategy and sustainability measurement (Source: La Strategia per lo Sviluppo Sostenibile della Regione Autonoma Friuli Venezia Giulia, 2023)

Despite their unique approaches, all regions show how to effectively integrate local actions into global efforts to create a sustainable future.

## 1.2 Environmental and climate impact on museums' activity

Speaking about the cultural sector and museum institutions, the organization do not stand apart from any other social and economic sectors and face challenges created by the environmental problems and climate change consequences (Pencarelli et al.,



2016). Climate change forces museums around the world to adapt to new terms and concerns.

One of the key aspects of the impact of climate change is the threat to the preservation of collections, buildings and infrastructure. Changes in climate conditions, such as rise of the temperature fluctuations, extreme precipitation and humidity, negatively effect on works of art, especially in cases when museums do not have modern climate control system equipment.

In this regard, museums will be put into position that they have to invest significant resources in upgrading their structures to ensure the protection of their collections (Janes & Grattan, 2019). The means can include the installment of advanced climate control systems able to respond to changes in temperature and humidity, as well as improving the isolation of buildings to protect against extreme weather conditions. Moreover, museums located close to water bodies and in coastal areas (like in areas of Venice) face additional risks associated with rising sea levels, which requires increased protection measures against flooding and coastal erosion.

Climate change is also affecting the exhibition activities of museums. Extreme weather conditions can make it difficult and costly to transport and temporarily store works of art, especially during international exhibitions. In such circumstances, museums may be forced to reconsider their exhibition plans, limiting the number of mobile exhibitions or redirecting their efforts to local collections.

In addition, climate change may lead to changes in the organization of exhibition spaces, where more adaptive approaches will need to be used to maintain optimal conditions for exhibits.

The museums also face the economic consequences of climate change. The increase in energy consumption costs to maintain the microclimate, as well as for the repair and modernization of buildings, can significantly impact on budget and financial situation of museums. With usually limited funding opportunities, many institutions will have to choose between the option of preservation and maintaining the works or developing and elaborating new projects (Davis, 2020).

Climate change is surely changing visitor flows. Extreme weather conditions can affect museum attendance, especially in regions depended on touristic sector. In some cases, museums may have to temporarily close or change their opening hours due to adverse climatic conditions. This, in turn, leads to a decrease in institutional income and perception by guests, and requires the search for new forms of interaction with the audience, such as virtual exhibitions and online events.

Museums located in regions that are particularly susceptible to climate change may also experience increased pressure from local communities and authorities demanding active actions to adapt to new terms. As a result, museums would have to rethink their role in society and focus on sustainable development issues, including participation in environmental initiatives and education related to climate change.

In general, climate change has a complex impact on the museum institutional sector, affecting both the technical aspects of preserving collections, as well as the organizational and economic issues of their activities. To successfully confront these challenges, museums need to develop and implement adaptation strategies that will not only protect cultural heritage, but also continue to fulfill their educational and educational mission in a changing environment.

### **1.3 Concept of culture and education's role in addressing sustainable development and climate change issues**

#### **1.3.1 Activities of international organizations**

Culture plays a key role in the way of advancement the sustainable development agenda, as it can shape values, norms, and behaviors, influence society's perceptions of environmental, social, and economic issues. At the same time, culture is able to stimulate public awareness of the importance of sustainable development activities and actions through art, education, collaborations, and media, forming people's understanding of the need for changes towards a more sustainable future (Soini & Dessein, 2016; Stylianou-Lambert et al., 2014).

In addition, culture promotes innovation and sustainable practices adapted to people's specific conditions and necessities. Respecting and integrating such cultural aspects into the global sustainable development agenda can surely help in addressing challenges like climate change, biodiversity conservation, eradication of poverty and social justice (Orea-Giner et al., 2019).

The 2030 Agenda has in its own the direct reflection of the significant role of culture as a critical method in creating and promoting sustainably developed future. The leaders indirectly and directly indicated references to culture and its impact in the policies and documents.

The cultural approach includes promoting cultural heritage, supporting creative industries, promoting local and ethnical culture, using a creative and innovative mechanisms, using the potential of local communities, applying local materials, and supporting cultural diversity. The experience of creating and conducting

development projects shows that it can be secured and guaranteed the sustainable progress in various fields, from health to education by going to use cultural aspects and local knowledge.

Culture, as a source of economic and social benefits, can significantly enhance the effectiveness of development measures. This broad approach highlights the importance of applying sustainable working methods aimed at meeting the objectives of the 2030 Agenda and using integrated cross-sectoral approaches that achieve several goals at once rather than individual tasks measured solely by statistical indicators. Culture plays an important role in implementing activities in each of the five key areas of sustainable development: people, planet, prosperity, peace, and partnership.

At the same time as a result and a good impact sustainable development's economic, social, and environmental aspects create conditions for preserving cultural heritage and developing creative abilities. Some Sustainable Development Goals, especially those related to education, gender equality, sustainable communities, economic growth, partnerships contribute to human development and can be more effectively achieved through culture (United Nations, 2015).

Target 4.7	By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.
Target 8.9	By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
Target 12.b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.
Target 11.4	Strengthen efforts to protect and safeguard the world’s cultural and natural heritage.

Target 13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
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Table 1. Mentions of culture in the targets of SDG

The Paris Agreement also confirms the importance of education, public awareness, participation, access to information, and cooperation at all levels in combating climate change and adapting to its consequences. It calls on the parties to cooperate in taking all possible measures to achieve these goals.

### 1.3.2 UNESCO

All UNESCO conventions and programs in the field of culture are created in a way of respect and promoting the principles of sustainable development. However, each has its own specifics or orientation, depending on the scope and conceptual framework.

The Climate Action Policy for World Heritage Sites talks about the importance of climate change as a severe threat to World Heritage sites, affecting their exceptional universal values and the socio-economic development of their associated communities.

It is possible to observe the history of climate action within UNESCO from 2005 and it leads us to the adoption the Policy Document in 2007. The importance of natural World Heritage sites as natural buffers and cultural sites as examples of traditional mitigation and adaptation strategies to climate change is emphasized on a way of the continuous scientific evidence on the growth of greenhouse gases and global warming (UNESCO, 2007).

The main objective of the Policy is to guide the enforcement and stimulate heritage site protection by methods to fight climate change and secure coherence with the global frameworks such as the UNFCCC, the Paris Agreement, and the 2030 Agenda. The Policy provides the climate action goals for the adaptation, mitigation, and sustainability of World Heritage Sites, underlines the importance of measures to reduce the greenhouse gas emissions and anthropogenic impact.

The Policy also mentions the points of effective implementation. To reach the goals it says about the needs to establish an enabling environment, including efficient management, adequate financing, and technological innovations. Implementation should occur at the level of the World Heritage Committee, national governments,

and World Heritage sites. The Policy also stresses the importance and the role of collective action involving international, national, regional and local stakeholders and points out that World Heritage sites can serve as good examples and booster for broader changes in combating climate change.

UNESCO's Climate Change Strategy 2018-2021 was adopted at the aim to support its Member States in taking action to fight climate change consequences. The main spheres of activity include education, science, culture, communication, and information. Special attention is paid to including the results of international agreements such as the Paris Agreement and the 2030 Agenda for Sustainable Development. The Strategy includes principles and criteria that should strengthen all UNESCO actions on climate change. These include meeting the needs of Member States, using existing organizational programs and strategies, raising awareness of the intersectoral nature of climate change, and prioritizing projects with an option of expanded scale to ensure the systematic funding for its participators.

Based on sustainable development principles, UNESCO has also created and introduced the “Indicators of the contribution of culture to the implementation of the 2030 Agenda”. These indicators are a comprehensive system of thematic parameters designed to monitor and assess the contribution of culture at the national and local levels to achievement the goals and objectives of the 2030 Agenda. In this way the system makes it possible to assess the role of culture as a unique separate sector of activities and its interdisciplinary contribution to the implementation of various SDGs.

The thematic indicator area "Environment and sustainability of life" serves as a basis for the assess and examine the role and contribution of culture in creation of the ecologically safe environment. The focus of the is built on preservation of cultural and natural heritage sites and insurance of healthy environment in cities. This point also can correspond to the "Planet" direction within the Agenda 2030. The "Environment and sustainability of life" area covers moreover the tangible, intangible, and natural heritage, considering them as instruments to promote sustainable development goals. The indicators also include evaluation of the physical and spatial aspects of the quality of the urban environment, involving public spaces and cultural infrastructure.

One of the direction indicators corresponds to questions of climate change adaptation and resilience mechanisms and processes. It helps to get understanding and give an assessment to the measures aimed to mitigation and adaptation to climate change and promoting a sustainable lifestyle through the long-term conservation and management of tangible, intangible, and natural heritage.

This indicator is based on the provisions of the Sendai Framework for Disaster Risk Reduction for 2015-2030, as well as on recommendations used in preparing reports on the implementation of UNESCO conventions, including the policy document "Preserving World Heritage in the face of climate change".

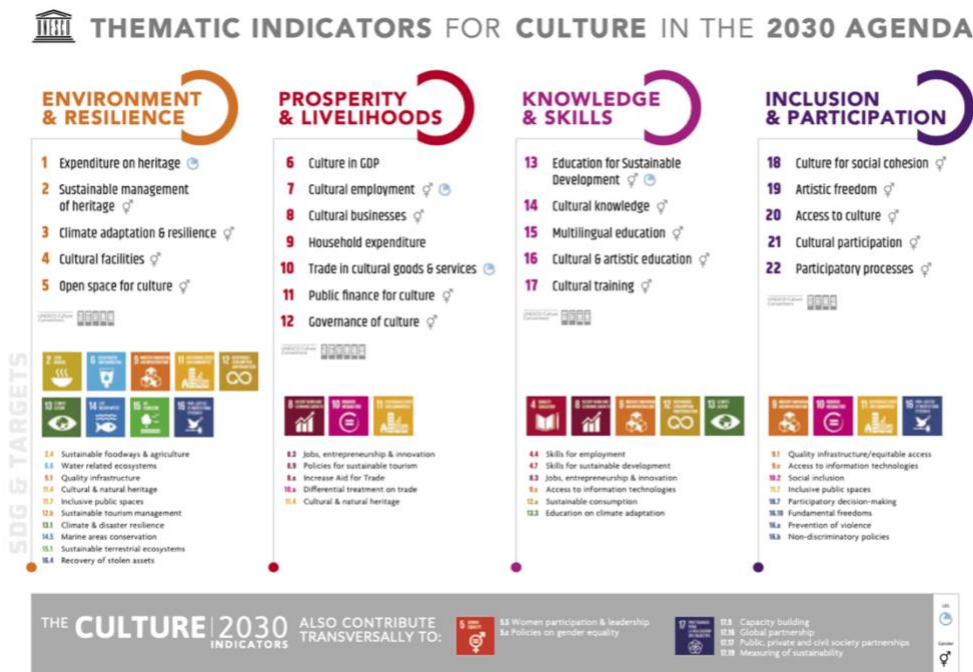


Image 2. Indicators of the contribution of culture to the implementation of the 2030 Agenda (Source: UNESCO, Culture | 2030 indicators, 2019)

Another area of indicators of the contribution has the direct focus on aspects of knowledge and skills. This conceptual structure provides a framework for assessing the contribution of culture, including local knowledge and cultural diversity, to the development of the theoretical knowledge and practical skills. The area pays attention, in particular, on the impact of culture to the transfer of locally available cultural values, knowledge, and skills, to empowerment through training, and to the development of methodologies, guidance documents, and recommendations in the field of education.

Two indicators are important. The first is the education for sustainable development. This measurer will assess the extent to which the principles of global citizenship education and education for sustainable development (with an emphasis on cultural diversity) are considered at the following levels: (a) national education policy, (b) curricula, (c) teacher training and (d) academic achievement assessment.

The second indicator is cultural knowledge. This indicator will examine the contribution of cultural knowledge to strengthening and developing practical

approaches to sustainable development, emphasizing the importance of cultural heritage and traditions in achieving results.

### **1.3.3 ICOM**

Discussion of the role of museums in sustainable development and actions to combat climate change, can begin with the definition the concept of “museum” by the the International Council of Museums.

The International Council of Museums (ICOM) is the international organisation uniting museums and museum professionals to support the preservation and promotion of cultural and natural heritage. Founded in 1946, it serves as a platform for sharing knowledge, setting standards and promoting best practice in the museum sector. ICOM also plays a key role in protecting heritage, combating illicit trade in cultural property and promoting sustainable development. The organisation has over 40,000 members from 138 countries and holds regular conferences, including triennial General Assemblies.

Thus in 2022 the General Assembly of ICOM approved a proposal for a new definition of a museum, and it was framed as: "A museum is a not-for-profit, permanent institution in the service of society that researches, collects, preserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible, and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing". The role of museums in the museum sector in supporting and promoting sustainable development was finally consolidated, making it a hub where communities, researchers, and the public can intersect. It is worth saying that the museum definition made a long path of evolution to reach this point of inclusivity and sustainably thinking.

Also, three year earlier, in 2019 at the 34th ICOM General Assembly in Kyoto were adopted several resolutions, some of them considered to be more precisely. The resolution No. 1 highlights the importance of sustainable development and implementation the 2030 Agenda "Transforming our World". The document recognizes that the current way of meeting the needs of people round the planet is unsustainable and lead to unprecedented environmental and social crise. And as the results of this behavior the resolution points as consequences the growth of inequality, poverty, climate change, loss of biodiversity, different political and military conflicts. And at the same time museum institutions are recognized and named as sources of knowledge, infrastructure, skills with unique capabilities and

solutions to engage communities and contribute to global society in developing and creating a sustainable future in partnership and cooperation.

Among the assembly's recommendations were a call to rethink values and missions with a goal and mission to provide a response to sustainable development challenges, unification with the 2030 Agenda, and its use as a guide for integrating the principles of sustainable development into operational and educational work. Moreover, the resolution points out a separate recommendation is, it calls to decrease the level of the anthropogenic environmental impact, including the carbon footprint, through the capabilities of organizations and by the work with visitors and communities, helping to ensure a sustainable future for all inhabitants of the planet.

In addition, another resolution focuses our attention on the importance of increasing of the support and recognition of the role of museums and public organizations in achieving the UN Sustainable Development Goals. Based on the Declaration of Santiago de Chile (UNESCO, 1973) and previous ICOM resolutions, as well as acknowledging the concept of an “expanded museum” from the Milan Resolution of 2016, the Assembly called for the support of public organizations that do not meet the definition of a museum, but simultaneously play a key role in the environmental, social and economic development of communities, which contributes to achieving the goals of the UN 2030 Agenda and climate justice promotion. The document additionally recommends expanding the capacities of public museums and ecomuseums in their transformational approaches to sustainable community and territorial development, as well as in protecting and improving cultural landscapes.

These recommendations tell us about the importance of museums and public organizations in promoting sustainable development, cultural diversity, and global cooperation.

On the 18<sup>th</sup> of May 1977 the ICOM introduced the event of the International Museum Day (IMD), the introduction was the consequence of the adoption of a resolution by the Council to create an annual event “with the aim of further unifying the creative aspirations and efforts of museums and drawing the attention of the world public to their activity”. On this day, which usually aimed to raise awareness and inform the people of the role of institutions in society, the Council chooses one topic to which it pays particular attention in a certain year. The several Days were dedicated to raise the public attention to all aspects and spheres of sustainability, like an environmental or social. It was “Museums and environment” in 1992, “Museums for peace and harmony in society” in 2000 and “Museums: building community” in 2001, but also 2008 of “Museums as agents of social change and



development”, “Museums for social harmony” in 2010, and “Museums for a Sustainable Society” of the Day in 2015.

In 2023, in promoting the idea of Kyoto resolutions, this topic became "Museums, Sustainability and Well-being". In addition to the stressing the crucial role in enlightening and increasing knowledge of environmental problems and promoting sustainable practices, the events and practices of that Day pointed out the issue of the ability and capacities of museums as institutions to enhance mental and emotional well-being.

With a focus on sustainability and well-being, the event of 2023 has the target and goal to encourage and support museums to reflect on their impact on the environment and society and explore innovative ways to promote sustainability and well-being through their collections, exhibitions, programs and communication. The techniques of the IMD include initiatives such as reducing the carbon footprint, encouragement of the renewable energy use, support of the local communities, and development and assistance in the inclusivity, equality and diversity.

Paying attention to and admitting the social, economic, and environmental challenges the museum community faces, ICOM established in 2018 a Working Group on Sustainable Development (WGS). The objectives of the group are to integrate the goals of the 2030 Agenda and the Paris Agreement into the Council's activities and practices and moreover to aid and support to its members and affiliated museums actively achieving these goals, especially in efforts to adapt to climate change and mitigate its impacts.

Apart from this, the WGS developed a list of suggestions covering actions carried on four pillars both inside and outside ICOM: People, Organization and Operations, Collections and Public Communication, Partnerships and Cooperation. The first part covered the ICOM Executive Board's duties and obligations both inside ICOM and as leaders of the industry on a worldwide scene. The second part enumerated activities to be carried out inside the ICOM membership and structure. Highlights included tackling institutions' language barrier, our conferences and activities' carbon footprint, and how it may efficiently gather and share knowledge to involve more young people.

The chair of the Working Group on Sustainable Development is Morien Rees, architect and art historian, who is on different positions in the museum sphere for more than 30 years. The Group also comprises members from various regions engaged in sustainable development matters within the museum and cultural heritage sectors. The group aims to addressing the significant global problems, guided by the UN Sustainable Development Goals, the Paris Agreement, and the

ethical obligations of fulfilling human needs, promoting social fairness, and adhering to environmental limitations.

The Working Group on Sustainable Development will study and elaborate various methods for the implementation of the sustainable development practices in museums, considering their potential involvement in cross-sectoral initiatives for sustainability. Later in 2023, the International Committee on Museums and Sustainable Development replaced the Working Group on Sustainable Development after two mandate periods from 2018 to 2023.

Developed by the Sustainable Development Group, the ICOM Action Plan 2030 is a set of activities whose main objective is to include all ICOM committees in the worldwide museum movement to fight the climate crisis and support sustainable development by knowledge sharing, networking, commitment, and actual actions. Emphasizing the need of flexibility, cost-effective policies, and respect of human rights, cultural context, and the rights of minorities and indigenous peoples, the plan comprises ideas based on the Glasgow Climate Education Action Program and the Policy Coherence Framework for Sustainable Development.

Improving efficiency by means of long-term planning, raising aspirations for sustainable development, and guaranteeing policy coherence constitute the key activity areas. Considering national and international settings as well as the needs of people whom museums now underservice, ICOM asks the committees to create action plans for sustainable development. Every year the Committees should raise their goals and targets, and document development achieved at the General Conferences for 2025 and 2028. To further sustainable development, ICOM also underlines the need of organizing resources and forming alliances with outside companies and universities.

The strategy also emphasizes on equipping ICOM members with skills and exchanging knowledge so they may properly seize chances for sustainable development. In the framework of present professional needs, committees should spot skill shortages and needs and create monitoring and reporting systems to guarantee openness of actions and adherence to sustainable development pledges. One approach national and international committees might include sustainable development into their operations is including references to the Sustainable Development Goals in reporting.

Developed by the Organization for Economic Cooperation and Development (OECD) and ICOM, the guide "Culture and Local Development: Maximizing the Impact" makes recommendations on the use of cultural legacy to support sustainable local development. Emphasizing the need of including culture into local

economic development plans, the paper helps to create jobs, boost income, and enhance social capital.

The management sees as fundamental components of urban and regional growth museums. By encouraging social integration, learning, and cultural interaction, museums not only draw visitors and provide economic activity but also carry a significant social role. Through providing forums for communication and cultural diplomacy, the paper shows how museums may help to address urgent societal issues including globalization, migration, and climate change.

Local administrations are being advised several ways to include museums into their own growth. The paper stresses the need of working together among companies, educational institutions, museums, and other cultural groups. To draw more guests, it advises building infrastructure, organizing combined activities, and running advertising campaigns. In this sense, museums can become strong engines for social and economic development in their local areas.

The International Council of Museums has been also participating in the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). It is an annual meeting of the parties to international agreements on climate change, organized within the framework. The main purpose of the COP is to discuss and take measures to reduce greenhouse gas emissions and adapt to climate change.

At the COP26, held in 2021 in Glasgow, the Council points out the pivotal role of museums and cultural institutions in addressing the problem climate change and its consequences and impacts. ICOM, in collaboration with worldwide cultural organizations, purposeful on the role of museums in mitigating climate change through the reduction of carbon emissions and the enhancement of public common knowledge on climate issues. The event was conducted in partnership with the Climate Heritage Network and Reimagining Museums for Climate Action, outlining the importance of global partnership creation in tackling climate and social disparities.

ICOM also underlined measures and mechanisms which can help at decreasing museums' carbon footprint and fostering sustainable practices. A significant aspect of the discussions was the function of museums as educational centers and platforms for public participation that can stimulate behavioral and attitude change and advocate for climate justice. The group showcased instances of effective programs and policies designed to mitigate environmental damage and improve communities' resilience to climate change.

During the COP27 ICOM highlighted cultural projects that advance sustainable development and enhance social sustainability. The Art Culture Heritage COP27 event addressed how museums could promote climate action. ICOM President Emma Nardi facilitated a panel discussion on cultural networks and climate mobilization. The group has launched initiatives to diminish the carbon footprint of museums and advocate for sustainable practices.

At the COP28 the organisation assisted and participated in a panel discussion with the International Federation of Library Associations (IFLA) focused on promoting cultural projects in sustainable communities. Emma Nardi, the ICOM President, and Medea Ekner, ICOM General Director, engaged in a prominent Ministerial Dialogue on Climate Action, resulting in the establishment of an informal coalition known as the Friends Group for Climate Action Based on Culture (GFCBCA).

A crucial resolution of COP28 was the endorsement of a Joint decision on Culture and Climate Action, which will be deliberated at COP29 in Azerbaijan in 2024. This resolution seeks to incorporate culture into climate policy and emphasizes the cultural sector's role in combating climate change. ICOM has endorsed a worldwide call to action to motivate cultural institutions to engage in these efforts.

Consequently, at all three sessions, ICOM repeatedly advocated for the significance of museums and cultural institutions in climate action. The group engages in international events, launches programs, and interacts with diverse partners to advocate for sustainable practices and enhance public knowledge of climate challenges.

The activities and initiatives dedicated to sustainable development and climate change issues possible to observe having a look on the program document of International ICOM Committees. In total the ICOM is consisted of the 32 International Committees, that bring together professionals in museum disciplines. The Committees are international groups of experts, who establish standards, formulate suggestions, and disseminate professional expertise and scientific knowledge among ICOM members and partners.

The strategy plan for 2022-2025 of the Committee of Museums and Collections of Musical Instruments (CIMCIM) delineates diversity, equality, inclusion, accessibility (DEIA), sustainability, and provenance as principal areas of emphasis.

The International Committee of Historical House Museums establishes rules for the management, preservation, and sustainability of these museums, while also fostering professional engagement and education through conferences, seminars, and websites. The committee's responsibilities encompass establishing

collaborations with communities, increasing visibility, and fostering tourism development.

The International Committee on Audiovisual, New Technologies, and Social Media's role in promoting sustainable media production and technology utilization is significant. An essential initiative is an online workshop focused on virtual reality and sustainability within the framework of the climate crisis, co-hosted with the University of St. Andrews in Scotland.

International Committee for Museums and Collections of Instruments and Music	CIMCIM Strategic Plan 2022–2025 highlighting three pillars: DEIA, Sustainability, and Provenance.
International Committee for Historic House Museums	<p>Focuses on the conservation and management of house museums, ranging from castles to cottages, from all periods. Develops standards for management, conservation, sustainability and accessibility of house museums; supports professional networking and education through conferences, workshops and website; works on improving community relations, visibility, and tourism.</p> <p>Objective: Development of management, conservation, restoration, security, and sustainability of house museums.</p>
International Committee for Audiovisual, New Technologies and Social Media	<p>Objective: To encourage sustainable media production and use.</p> <p>Online Workshop with the University of St Andrews, Scotland: Museums, Virtual Reality and Sustainability in the Climate Emergency.</p>
International Committee on Museums and Sustainable Development	<p>Consolidate the work undertaken by the entire organization in relation to museums and sustainable development.</p> <p>Support in the implementation of for the 2030 sustainability action plan for ICOM.</p> <p>Offer all members the opportunity to contribute to achieving sustainable futures for the organisation and the public.</p>
International Committee for	Supports the collection, preservation, research and interpretation of diverse biological, paleontological

Museums and Collections of Natural History	and geological collections, the scientific study of the world's natural heritage, natural environments, sustainability and the engagement of schools and the broader public in these and related subjects. Being involved in issues of sustainability and the SDG's. Collaboration with ICOM FRANCE in the project "Museums and their environmental and societal responsibilities: towards an ethical and sustainable model".
International Committee for the Training of Personnel	Museums facing their environmental and social responsibilities: towards an ethical and sustainable model.
International Committee for Conservation	Participation in the ICOM France special project (2023) Museums and their environmental and societal responsibilities: towards an ethical and sustainable model.

Table 2. The sustainability activities and initiatives of the International ICOM Committees

### 1.3.4 ICOMOS

Founded in 1965, ICOMOS (International Council for the Protection of Monuments and Places of Interest) is an international non-governmental entity dedicated in safeguarding cultural legacy all around. Seeking to save monuments, historical places, and cultural landscapes from damage, the company assembles professionals in architecture, archaeology, restoration, and other allied fields. International norms and guidelines for the management of cultural legacy also depend much on ICOMOS, including adaptation to the demands of climate change and sustainable development.

By means of the preservation of cultural legacy, ICOMOS (International Council for the Protection of Monuments and Places of Interest) actively supports sustainable development. Emphasizing that the preservation of monuments, historical places, and traditional knowledge helps to strengthen identity and community cohesiveness, the company views cultural legacy as a major resource for sustainable development. Seeking to strike a balance between the preservation of cultural values and economic development, ICOMOS aims to include the ideas of sustainable development into cultural heritage management techniques.

Developing plans to fit cultural sites to climate change and other environmental concerns is a crucial component of ICOMOS' efforts in the framework of sustainable development. The company advocates applying conventional building techniques and methods that have shown over ages their sustainability. It also supports the introduction of creative ideas for handling cultural legacy. In this sense, ICOMOS helps to preserve cultural identity while fostering the growth of more sustainable communities equipped to meet social, economic, and environmental obstacles.

In conclusion, these organizations, activities and initiatives they conduct, demonstrate the importance and great potential of the culture and museum institutions in the process of promotion of the sustainable development and environmental and social responsibility. The institutions provide cultural organizations and professional and experts in this sphere with the necessary tools, resources, knowledge and support to implement environmentally and climate friendly practices, contributing to reducing the carbon footprint and improving sustainability indicators within all organizations' activities. Through the efforts of above-mentioned organizations, the sphere of art, culture and museums is becoming an active participant and contributor in the global environmental movement, supporting the creation of a more sustainable and informed future. At the same time, it would be crucially important to continue integrating environmental principles adopted within the internationally documents and programs into the cultural field to maximize the positive impact of art and culture on society and the planet.

#### **1.4 Activities of European organisations**

It can be scaled down one more time to get the view of the context of European region, and surely noted the developed programs and strategies which are dedicated to the interrelationships of culture and sustainability, climate change questions and the role of culture and museums in promoting and achieving the goals and objectives of the 2030 Agenda.

Among such documents it can be mentioned as the important one is the “New European Cultural Agenda”, adopted in 2018 by the European Commission. The program document sets out key actions and objectives for the cultural sphere and it is divided into three strategic goals to support EU Member States in carrying out and fulfilling cultural policies and links these efforts to sustainable development and actions to combat climate change through several initiatives and policies.

The first goal of the agenda is to use cultural opportunities to strengthen social cohesion and improve the well-being of the citizens. The second goal says about the support of the creative and cultural activities that can promote education,

enlightenment, innovations, jobs creation, and economic growth. The third goal points out the strengthening the international cultural connections, collaborations and partner communication on international cultural relations and cultural heritage.

The agenda also mentions the initiatives that can be related to sustainable development and climate change issues. The initiatives are the adaptive reuse of cultural heritage sites for the revival of urban and rural areas, the practice and promotion of affordable and sustainable cultural tourism, supporting and securing the sustainable stimulation and marketing of Europe's cultural heritage places, fostering the sustainable cultural routes, integrating cultural heritage into environmental, architectural and planning policies, and supporting sustainable economic development.

These initiatives in general reflect the European Union's commitment to integrating cultural heritage into the broader context of sustainable development and action to fight with climate change and mitigate its impacts. The agenda also tries to ensure that the cultural heritage positively contributes to environmental, social, and economic sustainability.

Another document is the recommendations of the Committee of Ministers of the Council of Europe, adopted in Turin in 2022. The document dedicated to the role the culture, cultural heritage, and landscape play in the way to addressing the global environmental, climate, social, economic challenges. The paper recognizes culture as key mechanisms for all aspects of sustainable development and for strengthening democracy and human rights. This highlights the need to integrate cultural aspects into sustainable development strategies.

The recommendations also call for the use of resources and capacities of culture and the institutions to undertake the global challenges such as climate change and social inequality. Moreover, the document underlines the role of culture as the mean to format and develop the sustainable communities and the promotion of the inclusive strategies.

The next document which also valuable in the discussion of the culture matters in the achievement of Agenda 2030, is the resolution of the Council of the European Union on the EU's cultural work plan for 2023-2026. The paper highlights the importance of culture as one of the main components of European society. According to the document, in the face of modern challenges such as Russia's war against Ukraine, the COVID-19 post-pandemic recovery, and climate change impacts, culture is becoming an important tool for sustainable development and support for social cohesion. This resolution tells us that culture has many aspects, which can range from the source of inspiration and innovation to the expression of



the human spirit and aesthetics. And, it plays an important role in shaping communities' identity and intercultural dialogue.

The priorities of the Work Plan for 2023-2026 include the support and sustain the artists and cultural professionals, increasing cultural participation, and using culture to achieve sustainable development goals. In addition to this, the plan reinforces the cultural cooperation at the international and interregional level, which contributes to the development of intercultural dialogue and the support and promoting of human rights. The implementation of these priorities involves:

- the preparation of reports,
- the exchange of experience and best practices,
- the active use of digital technologies and the encourage of environmentally sustainable approaches.

Thus, in general the document sets clear guidelines for strengthening the cultural and art sector and its important role in society in the modern time.

Also, under the chairmanship of Italy, in 2021 in Rome the G-20 Meeting of Ministers of Culture approved a declaration saying about the importance of culture as a key element for achieving sustainable development. The Declaration recognizes culture as an integral part of human development, contributing to the strengthening of sustainability and the revival of economies and societies and its ability to have an improving impact on health, well-being, social inclusion, gender equality, social capital, promoting sustainable practices and improving the quality of life. It is emphasized that culture, including traditional knowledge and crafts, can contribute to the fight against climate change and sustainable development by offering climate solutions and calls for integrating measures to combat change into cultural policy and supporting cultural activities to solve climate problems.

To complement the work of governmental organizations can be mentioned one non-governmental. It is the Network of European Museum Organisations (NEMO) which was founded in 1992 as an independent cooperation of national museum organisations representing the museum community of the member states of the Council of Europe. Together, NEMO's members speak for more than 30,000 museums in 40 countries across Europe. And the NEMO is a key in promoting sustainable development through museums across the region. The organization sets high targets to make museums active players in the building of sustainable future tackling simultaneously the global environmental problems surely including climate change. The organization consider museum institutions not only as protectors of cultural legacy but also as important teaching venues able to inspire society to act in social and environmental sustainability.

NEMO's most crucial activity at the level of European policies is the advocacy. The organization actively supports the funding of museums from national governments and foreign agencies to supply the required tools and chances for sustainable development. NEMO's goal is to enable institutions to include sustainable development concepts into their operations by means of professional guidance and coordination of institutional experience sharing.

Moreover, with the advocacy and sharing of the best practices among museums, NEMO is also conducting and supporting the research. The organization collects information on the implementation of sustainable solutions in the museum industry, examines it, and then shares the findings with network players. These initiatives seek to enable museums to more successfully adjust to environmental changes and help to realize sustainable development objectives.

NEMO gives museums' educational purpose top importance. The organization considers that museums should actively influence public viewpoint on sustainable development and climate change. In order to enable museums to incorporate the concept of sustainability into their displays and activities, NEMO creates and shares several instructional initiatives and guidelines. The Network also routinely hosts public debates and conferences on current sustainability concerns as well as the function of museums in this process. The European Museum Conference, for instance, addresses the re-evaluation of museum collections in respect to their social, historical, environmental, and educational influence. These gatherings let museums exchange experiences and discover fresh approaches of public interaction.

The NEMO report “Museums in the Context of the Climate Crisis”, which offers a thorough examination of how European museums react to climate change and what issues they confront, attracting attention and helps to support the battle against it. Based on a 2022 poll of 578 museums from 38 European countries, the paper draws attention to the major challenges as well as the possibilities that museums have in trying to slow down climate change and mitigate and adopt to its consequences.

The survey involved museums from different countries, including such as Italy, Portugal, Spain and Poland, where there were the largest number of respondents. Most of the examined institutions are history museums (27%), followed by art and design museums (17%), thereby highlighting the important part of cultural and historical legacy and art collections in the museum community. Emphasizing the variety of subjects and orientations, a good portion of the museums at the same time specialize in anthropology, archaeology, and natural sciences.

With roughly 40% of the examined museums having a workforce of 10 to 50 people, most of them show an average or modest number of staff members. Simultaneously, almost 20% of respondents said their museums employ less than five staff members, suggesting fairly inadequate managerial resources. Financially, whether at the national, regional, or municipal level, around 78% of museums are sponsored by public money. About sixteen percent of museums rely entirely on private money, suggesting the part non-profit foundations and private donations play in helping cultural institutions.

The paper claims that although museums and the museum industry have chances to contribute to climate change, some obstacles prevent development even in this regard. The deficiencies were found in the consultation on public-facing activity on climate action, therefore impeding museums' ability to assist climate action. Museums are concerned about public perception of politicisation and activist status, resulting in many institutions focusing on internal results rather than paying attention to addressing global challenges, among them climate change. The study also notes a lack of solid support and commitment from museum managers or trustees for climate education, awareness and action. Another challenge is the need for greater leadership and coordination across the museum sector, including with government sector involvement.

And due to a lack of prioritisation or support, the museum sector is neither aware of opportunities to make meaningful contributions, has no specific resources to support them, nor is empowered or incentivised to direct its resources towards climate change policy and action. Difficulties are also caused by a lack of budgets, commitment, and ambition on the part of staff. In summary, as the paper observes, progress in implementing changes that meet the needs of meaningful climate action remains very slow, and there is little evidence of active leadership on the issue.

Among the results, the paper notes that less than 10% of museums have completed an analysis of the challenges of climate change in their region, and only 30% have analysed the potential climate threats they may face. The majority of museums surveyed reported that they had not seen (51,5%) or were unaware of the results (34,3%) of changes aimed at environmental sustainability. Only 14,2 per cent of museums said they had seen the results of such changes, most of which were cost reductions of less than €10,000 per year. However, respondents noted that savings on environmental initiatives were partially offset by the sharp rise in energy prices.

Less than a half of museums (41,8%) work with external experts for climate and sustainability activities, while another part (46,4%) do not, and the remaining (11,8%) did not provide a definite answer to this question.

Generally, NEMO's efforts seek to make museums significant players in a sustainable change. The organization supports museums' environmental, social, economic responsibility, informed behavior, and active participation in the struggle for the future of the earth, therefore include them into the worldwide movement for sustainable development.

## **1.5 Activities of Italian organisations**

### **1.5.1 ANMS**

The National Association of Science Museums (ANMS) is also dealing with issues of the 2030 Agenda, which unites and represents institutions that collect evidence and materials related to the sciences and their history. These include botanical gardens, zoos, aquariums and other organizations involved in communication, environmental protection and scientific research (article 1 of the Statute).

The Association emphasizes that scientific museums play an important role in society, contribute to development, inspiration, in harmony with the historical and local context. Their relevance and social significance is determined by the ability to identify the needs of society, respond to its requests and provide useful services and benefits.

In the context of rapid and profound cultural, social and environmental changes, scientific museums feel a responsibility to adapt to new realities, helping society move towards more conscious, peaceful, fair and sustainable forms of organization.

The National Association of Scientific Museums (ANMS) brings together many institutions and experts in the field of scientific museology who have a significant impact on our communities. They preserve heritage, participate in cultural production, inspire learning and interest, strengthen social ties and support institutional and territorial organizations in matters of political, cultural, scientific, technological and environmental choices.

The ANMS recognizes itself in the principles expressed in the Constitution of the Italian Republic in articles 9 "The Republic promotes culture and scientific and technical research" and 33 "Art and science are free and their teaching is free" and in the Charter of the fundamental rights of the European Union.

The ANMS complies with the principles and directives of UNESCO, ICOM and the EU, supports the Declaration on Science (UNESCO, 1999), the Faro Convention (EU, 2005), the ICOM Codes of Ethics (2013), promotes scientific culture among citizens, emphasizing dialogue and knowledge exchange, especially

about conservation and management of scientific heritage, recognizes the economic value of museums, promotes education and participation at all stages of life, actively cooperates with educational institutions, ensuring accessibility of museums to all, and strives to be a leader in cultural and social services to communities. This activity is directly related to sustainable development, as it promotes environmental and cultural education, social cohesion, economic growth through tourism and employment, as well as intercultural dialogue, which is the basis for the formation of sustainable, peaceful and just societies.

### **1.5.2 AMACI**

Another partner is AMACI, a non-profit association that today unites 24 important Italian museums of modern art. Founded in 2003 with the aim of supporting museum policy related to modernity, AMACI strives every year to further strengthen its role as an institutional reality and a reference point for the study and promotion of contemporary art research in Italy and abroad.

AMACI pays more and more attention to the problems of sustainable development and ecology in the art world. On November 24, 2023, they held a conference in Bergamo called "Museums on an Ecological Turn", which brought together artists, curators and activists to discuss the integration of environmental and sustainable practices into museum activities. This initiative highlights AMACI's commitment to fostering dialogue on environmental issues and exploring radical political action through art.

Earlier this year, on March 31, 2023, AMACI also hosted the online conference "Contemporary Art Museums and Sustainable Development: A Necessary Practice", curated by Marcella Beccaria and led by Henry McGee. The event was part of their efforts to align with the United Nations 2030 Agenda for Sustainable Development, which addressed the interrelated themes of "People, Planet, Prosperity, Partnership and Peace." The discussions highlighted the important role that museums play in ensuring the sustainability and integration of these practices into their activities.

These events reflect AMACI's proactive approach to meeting the urgent need for sustainable development of the contemporary art sector. By organizing such conferences and facilitating collaboration between various stakeholders, the organisation aims to make the way for assisting art institutions to be more environmentally responsible and socially active.

### **1.5.3 Musei Piccoli**

The Association " Musei Piccoli" (Small Museums) unites small museums and cultural institutions throughout Italy. The main purpose of the organization is to support and promote organizations that have unique collections, but often face challenges in financing and management. The Association aims to enhance their visibility by facilitating the exchange of experience and resources between museums, as well as contributing to their preservation and development.

Small museums are actively implementing the principles of sustainable development, following the Faro Convention, which emphasizes individual and collective responsibility for cultural heritage. In addition, small museums promote environmental education by focusing on the environmental, social and economic aspects of sustainability. They teach the importance of public heritage and its role in shaping educational well-being, thereby emphasizing the importance of an informed attitude towards the environment and cultural resources.

The small museums get subsidized by state and regional bodies to maintain cultural legacy, repair, digitization, and infrastructure enhancement target. Furthermore, helping small museums is the Association " Musei Piccoli" itself gives them a stage to highlight their requirements and transmit experiences. The Association arranges seminars, conferences, and forms alliances with foreign companies so museums may take part in funding programs and worldwide initiatives.

### **1.5.4 Museimpresa**

Museimpresa is an Italian association uniting corporate museums and archives. It was founded in 2001 on the initiative of Confindustria (Confederation of Italian Industry) and Assolombarda (Association of Lombardy Entrepreneurs). The Association has more than 100 members and includes both large corporations and small and medium-sized enterprises that are active in the field of preserving the cultural and historical heritage of their companies.

Among the main tasks of the association is the preservation and popularization of the history, culture and achievements of Italian enterprises through corporate museums and archives, as well as research and archiving of industrial history.

The Association also pays attention to issues of sustainable development and environmental responsibility. As part of its activities, Museimpresa supports initiatives aimed at business environmental responsibility, innovation in sustainable design and manufacturing. Many corporate museums showcase the achievements of companies in the field of environmentally sustainable technologies, innovations

in resource management and carbon footprint reduction. Museums are also engaged in promoting the concept of sustainable design, such as the use of recycled materials, reducing energy costs and the development of a circular economy.

In this way, Museimpresa promotes the integration of cultural preservation and innovation with the principles of sustainable development, creating a space for dialogue between industry and society.

In addition, among the activities of the association, the annual Business Culture Week "Settimana della Cultura d'impresa" stands out, dedicated to the promotion and popularization of industrial culture and corporate heritage of Italy. It was first held in 2002 and since then has become an important event in the cultural life of the country, reaching a wide audience. In addition to the main goals of popularizing industrial heritage, cultural and educational exchange, the event pays great attention to sustainable development. The program includes discussions and presentations on topics related to environmental sustainability, business social responsibility, and innovation for a sustainable future.

## **1.6 Triveneto area**

In two micro-areas of Veneto strategy, the tight interconnections with cultural sphere are evident. Culture significantly contributes to the maintenance of communities within their territory and the establishment of social cohesion in the realm of community and individual prosperity enhancement (Cabina di Regia et al., 2020). Access to facilities like schools and hospitals is intricately connected to cultural norms and expectations, hence enhancing social sustainability and community preservation within its boundaries. The significance of connection between public and private entities via networking is associated with a culture of collaboration that fortifies social structures and regional sustainability.

According to the strategy the culture of invention fosters both economic and social progress. Innovations can markedly enhance working conditions, education, culture, and health, while also facilitating broader information dissemination. This method subsequently fosters enhanced democracy and social fairness. The implementation of innovations across diverse sectors is inherently a cultural phenomenon, since effective adoption necessitates societal openness for change and cultural perception. Innovations rooted in cultural values can mitigate human effects on ecosystems and enhance long-term sustainable development.

In Trento's sustainability strategy proposals till 2030, the connection between culture and sustainable development sectors is evident via the focus on education, cultural heritage, and environmental consciousness (Menapace et al., 2021).

As for area of fostering the educational communities, the significance of cultural institutions, such as museums, libraries, and music schools, for the educational and social advancement of individuals across all age groups is underscored. These institutions help to preserve cultural history while also fostering an environment for growth and self-actualization, so enhancing human development as well as the advancement of regions and communities. This pertains directly to sustainable development, since these educational institutions foster awareness of the significance of cultural and historical legacy, enhance social cohesion, and promote understanding of the interconnections among culture, society, and environment.

The relationship between culture and sustainable development in the area of sustainable tourism promotion is seen in the advancement of “slow tourism” and the endorsement of diverse tourist destinations. The promotion of tourism has its roots in the cultural and natural heritage fosters awareness of the necessity of sustaining and conservation these sites for future generations and simultaneously aids in the sustainable growth of the local economy.

As for aspect of the environmental conservation and management of tourism destination capacity, the culture contributes by encouragement of respect for environment, a crucial element of sustainable development. Educational initiatives focused on imparting the notion of "limit" are linked to a culture of responsible and conscientious stewardship of environment and resources. This establishes a conduct rooted on environmental respect and an understanding of the necessity to preserve natural resources, which is the primary objective of sustainable development.

Cultural and educational dimensions are crucial components in these strategic goals, contributing to both legacy preservation and the cultivation of sustainable practices rooted in respect for environment, society, and future generations.

## **1.7 Activities of ICOM Italia**

### **1.7.1 ICOM Italia**

The national Italian ICOM committee also as the international introduced the Working Group on Sustainable Development fundamental in order to identify relevant issues in the national context and to correspond them and influence the activation, initiation, promotion and development of best practices in the museum and cultural sector.

The main mission of the Working Group is to monitor and discourse on new relationships that will characterize the Agenda debate. This group intends to promote and take into account emerging international trends in the field of



sustainable development within museology and establish connections with the specific aim of influencing national visions and strategies with international implications. The Group pays special attention also to the aspects of the sustainability of museum institutions, thanks to the special knowledge and experience of the members of the working group.

The Working Group sets itself three main tasks. The first is to create a space for discussion and debate, facilitating the exchange of experience, knowledge and skills between professionals in the field of museum and heritage working in various contexts, and creating an environment for discussing museology issues for sustainable development. The analysis and research of sustainable development practices and further development of proposals for museums are the second key task of the group. In addition, the group is working to establish links with the International Committee for SUSTAIN ICOM and other associations dealing with sustainable development issues, such as ASVIS Culture, NEMO.

The work of the working group will consider national priorities, but at the same time it will always be guided by what arises in the international context, especially in the European one. The link with SUSTAIN and the previous work of the Sustainability Working Group (2018-2022) will be particularly strengthened.

One of the key projects of the group was "Museintegrati", which was held for two years from 2020 to 2022. The project was initiated and led by MUSE (the Science Museum in Trento), with the support of the Italian Ministry of Environmental Transition (MiTE). ICOM Italia and ANMS acted as partners. The main goal of the project was to promote a culture of sustainable development through museums.

The project aimed to create a platform for the exchange of best practices in the field of sustainable development, to involve museums in active participation in local and national sustainable development strategies, as well as to promote museums as centers of cultural and civic interaction capable of contributing to the achievement of the 17 Sustainable Development Goals.

The methodology of the project included the creation of a multi-level participation structure, which made it possible to involve 30 museums at various stages of the study. An important aspect was the flexibility and the ability to adapt the project to the conditions of specific museums and regions.

### **1.7.2 Museintegrati project**

The Museintegrati project is closely linked to the Italian National Strategy for Sustainable Development (SNSvS), which aims to implement the principles and

goals of the global 2030 Agenda. The project focuses on the role of museums in promoting these areas through educational and awareness-raising programs.

The main aim is to enable museums to contribute to the Sustainable Development Goals (SDGs) and promote sustainable local development.

- Objective 1: Facilitate the establishment of a network of Italian museums.
- Objective 2: Conduct research and documentation on the role of museums in the interplay between local development commitment, sustainable development initiatives at national and regional levels, and the 17 Sustainable Development Goals (SDGs).
- Objective 3 Advance and cultivate the focus on the 17 Sustainable Development Goals (SDGs) and associated national and local initiatives within the educational and communicative endeavors of museums.
- Objective 4 To enhance the function and initiatives of museums as vital community hubs for the dissemination and advocacy of effective practices and policies that bolster local sustainable development plans.



Image 3. Map of museums participants of Museintegrati project (Source: ICOM Italia, Museintegrati project, Report Finale, 2022)

To attain this objective, an initial network of 30 museums was identified and selected within the national territory of ICOM - Italy and ANMS, based on several selection criteria, including equitable geographical distribution across the country; diversity of museum types; demonstrated innovations concerning one or more sustainable development issues related to the environment and sustainability, knowledge and skills, inclusion and participation; the complexity of the management structure capable of ensuring the fulfilment of project objectives; and significant importance as a public museum.

Throughout the project, working groups were organized and experiments were conducted within the network of museums participating in the project, including seminars, the development of educational materials and the implementation of campaigns to raise public awareness about sustainable development. The project has achieved significant results in promoting the concept of sustainable development among museums and the general public.

Plans to expand the project include further strengthening partnerships between museums and other institutions, involving new participants and expanding the program's reach to new regions. The strategy of sustainable development is considered as a long-term process that requires constant attention and adaptation to new challenges and conditions.

## **2. Research and methods**

In this part of thesis, a methodological analysis of the dataset tables on Italian museum activities collected by a team of ICOM Italia employees and experts will be presented at the beginning. Next, a methodological analysis of the interviews and surveys conducted with museum managers and workers for this study will be presented.

### **2.1 The ICOM Italia Dataset analysis on the museums' activities**

Analysing a dataset given to me during my internship at ICOM Italia is the first aspect of my research. This dataset is an Excel file including data on field of sustainability and climate policy actions of museums. Analysing this information helps one to determine which sort of projects museums in Italy are working on and how they help to realize environmentally friendly objectives.

ICOM Italy's dataset table offers a whole collection of museum projects aiming at sustainable development and climate action. This instrument enables thorough investigation of how Italian museums help to advance social and environmental objectives. Every project includes details on the starting organization (Soggetto proponente), its location, and the city where they take place (Luogo), so enabling one to grasp the geographical distribution of the projects and to examine the extent of coverage of the several areas of the nation.

Links to web resources and initiative pages (Link/sito web dell'iniziativa) allow simple access to further information and in-depth research of every project, therefore augmenting project data. Emphasizing the need of inter-museum and inter-organisational cooperation in building sustainable projects, the column with partner organizations (in cooperazione con) displays which museums and other institutions are collaborating in the project.

Among the main points underlined in the table is the congruence of the aims of the projects with the UN Sustainable Development Goals (SDGs) and the priorities of the Italian National Strategy for Sustainable Development (SNSVS). The table shows the "5Ps," People, Planet, Well-being, Partnership and Peace, to help one determine which goals the programs are tackling and how they fit national and worldwide sustainable development agendas. This strategy allows museums to determine which facets of sustainability are most relevant to them and how they are included into their daily operations.

The table also shows the kind of projects (Tipologia iniziativa), which enables one to categorize projects based on the mode of execution: they may be scientific

research, educational programs, interactive events, or exhibits. The data also shows the target audience—that is, children, young people, adults, or professional communities—which allows one to determine which population group the programs are meant for. Analyzing the degree to which museums seek to involve various social groups in conversation about sustainable development and climate change is dependent on this.

Furthermore, included in the chart are criteria related to interaction with urban and regional programs (*Interazione with Agende Urbane e territoriali*), degree of initiative maturity (*Livello di maturità*), and project budget (*Budget*). These facts enable one to evaluate both the financial and organizational resources committed in every project as well as the integration of museum activities into local development strategies. Including the degree of maturity—from first phases to long-term initiatives—helps one to understand the scope and sustainability of every project.

Additionally included are dissemination platforms (*Piattaforma di condivisione se rilevante*), which help one to understand the channels museums choose to interact with viewers. Given the requirement of digital information distribution, this might include social media, websites and other online resources, which is very vital. Columns detailing project objectives (*Scopo proposta*), achievements attained (*Risultati significativi*) and aspects allowing the initiative to be readily adapted to other museums and organizations round out the table. By means of their projects, these indicators allow to evaluate the actual outcomes of museums and support the spread of effective strategies.

The original ICOM Italy dataset was extensively changed and adjusted to the goals of the study in order to provide a more comprehensive examination of museum activities in the sphere of sustainable development and climate action in Italy. First, from the overall catalog only Italian-based museums were chosen. This shift enabled the identification of the particularities and creative solutions of Italian museums to sustainable development and their contribution to the cultural and environmental legacy of the nation, therefore helping to concentrate on the regional setting.

Institutions not classified as museums and those who do not formally identify themselves as such were also omitted as part of the preparation for a representative sampling. Eliminating pointless companies helped to prevent data uncertainty and concentrated the analysis. Therefore, the research concentrated only on such cultural and educational institutions in the conventional sense of a museum, therefore improving the accuracy and relevance of the results to the subject of museums. Ultimately, the sample comprised 47 museums and 67 of their respective projects.

Extra features of museums were chosen to augment the fundamental data from the dataset in order to present a more whole picture. Apart from the location of the museum (Luogo), three main elements were added to define every institution: museum status (public, private, cooperative, etc.; areas of operation of the museum, e.g., nature museums, art galleries, history museums; visitor count). Public and internet sites were the sources of these data. These criteria allowed one to evaluate how various kinds of museums, ranging from modest galleries to major public institutions, contribute to sustainable development and how their size and profile of activity can affect the strategy of project execution.

Key elements chosen to depict the aims of sustainable development and their connection to cultural and environmental objectives helped one to examine the project component of museums. Particularly employed were criteria including the 5P of SNSVS - the fundamental orientations of the Italian National Strategy for Sustainable Development: People, Planet, Well-being, Partnership and Peace. Understanding these threads helped one to appreciate how museums include sustainability into their operations and what issues they give top priority for their initiatives. Taken into consideration was how well museum projects matched the global sustainable development goal. The addition of the keywords Culture 2030 gave a chance to grasp how museum initiatives reflect objectives in maintaining cultural legacy and increasing public knowledge of cultural and environmental sustainability as well as how they connect to cultural aims.

Additional crucial elements were project aim (Scopo proposta) and target audience group (Target iniziativa). Examining the target audience helped one to determine whether the initiatives of the museums were meant for children, young people, adults, or professional groups. Clearly stating the goals of the programs allowed one to grasp what particular aims they target, from local community involvement and awareness-raising of climate change to environmental education. The adaptation of the dataset made it feasible to perform a more thorough research of museum initiatives, to identify variations in the approaches of museums of different status, scale and activities, and to evaluate their contribution to the promotion of sustainable development goals at the local and international levels.

Therefore, the first section of the research consists in a thorough investigation of the dataset, therefore enabling a better knowledge of the present situation of sustainability actions of Italian museums and their impact on environmental problems.

### 2.1.1 Data analysis by region

Looking for the regional distribution of the museums – participators, the institutions represented in the dataset, the region of Tuscany has the largest share in the implementation of projects related to sustainable development, with a share of 19.1% or 9 museums. This result is not surprising, since Tuscany is one of the cultural centers of Italy with a rich historical heritage and a large number of museums. Further on the second place was located Piedmont with a share of 14.9% (7 museums). It is also a culturally significant region that actively implements projects in the field of sustainable development. Projects in this region include programs related to biodiversity, ecofriendly practices and the involvement of local communities in cultural initiatives, valorisation of connections between humans and nature, promotion of inclusivity and civil rights.

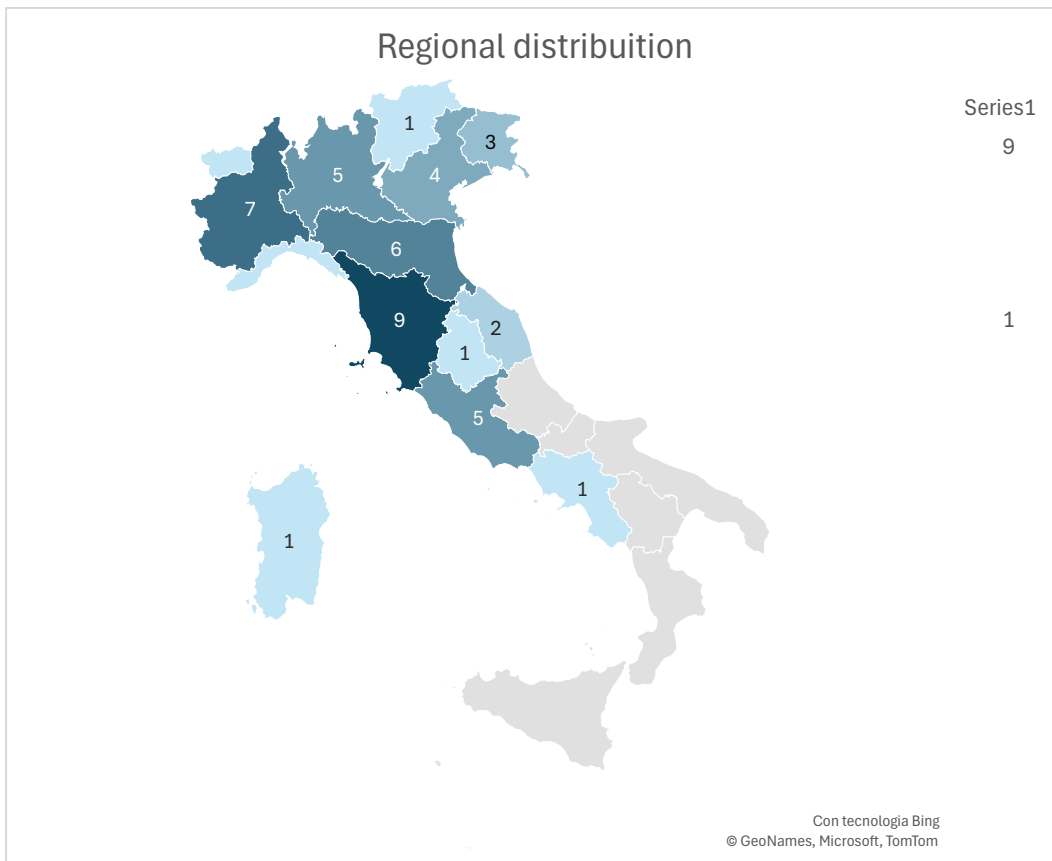


Figure 1. Map of regional distribution

Emilia-Romagna ranks third with 6 institutions or 12.8%. It is an important region both economically and culturally. Projects focused on the preservation of cultural heritage, the development of ecotourism and the introduction of sustainable practices and eco-friendly in activities are being implemented here.

This is followed by Lazio and Lombardy, each of which occupies 10.6%. Lazio, where Rome is located, has a rich cultural history and many museums of world importance, which explains the activity of the region's institutions in supporting sustainable development projects. Lombardy, an important economic and cultural center, also plays a significant role in this area, supporting initiatives aimed at sustainable urban development and the preservation of cultural heritage.

Going further on the north-east of the country, the regions of Veneto with 8.5% and Friuli-Venezia Giulia with 6.4% (4 and 3 museums) take the middle positions. These regions have significant cultural and natural heritage, which explains the active participation of the institutions in the sustainable development and eco-climatic projects.

Marche, with a share of 4.3%, and Sardinia, Liguria, Trentino-Alto Adige, Umbria and Aosta Valley, each with 2.1%, belong to regions less represented in the field survey of museum projects for sustainable development. This can be considered due to fewer museums or less developed infrastructure. However, these regions are also involved in projects related to the preservation of cultural heritage and the support of sustainable tourism.

The distribution of sustainable development efforts throughout many major cities indicates significant engagement in several locations. Turin is the foremost museum participant in sustainable development programs, currently overseeing six ongoing initiatives.

With five projects, Rome ranks second. Rome demonstrates significant engagement and plays a pivotal role in the execution of environmental objectives within the museum sector. Florence is on the third place in activity, with four organizations. This highlights the significant engagement of cultural institutions in the city, hence bolstering initiatives for sustainable development. Milan, Reggio Emilia, and Venice each rank fourth with three projects each. Their level of commitment to sustainability is commendable, yet their involvement is slightly inferior to that of the leading cities.

Thus, the geographical distribution of sustainable development projects in museums highlights the importance of large cultural regions and points to potential opportunities for increased activity in other parts of Italy.

### **2.1.2 Status of museums**

The next aspect of analysing the museum representative is the assessment of the way the museum is organized. Sustainable development initiatives are



predominantly executed by State museums, which represent 13 organizations (e.g. Museo Egizio di Torino, Museo storico e Castello di Miramare, Palazzo Barberini, MaXXI - Museo delle arti del XXI secolo, Galleria Nazionale d'Arte Moderna e Contemporanea, Galleria Borghese, Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci, Gallerie dell'Accademia, Gallerie degli Uffizi, Museo Nazionale dell'Ebraismo italiano e della Shoah, Reggia di Caserta, Museo Statale tattile Omero). This is logical, as state museums possess consistent funding, governmental backing, and requisite resources to execute long-term initiatives. Public museums frequently serve as pioneers in innovation and sustainable development, systematically incorporating sustainable development goals into their operations.

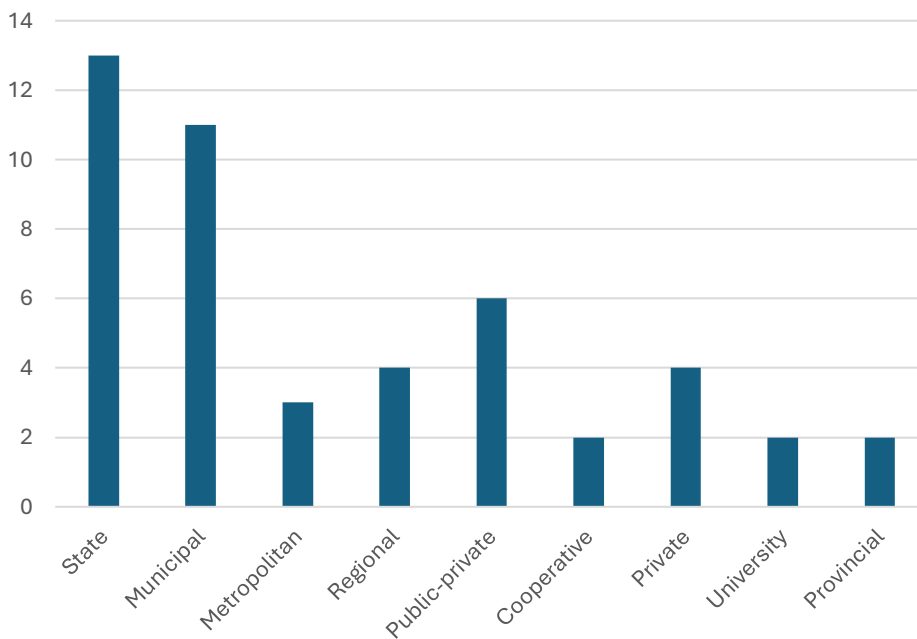


Figure 2. Museum status

Municipal museums which are 11 (Museo di Storia Naturale di Ferrara, Museo Novecento, Museo Naturale della Maremma, Museo della città (Comune di Genova), Museo Naturale della Maremma, Fondazione Palazzo Te, Musei Civici di Reggio Emilia, Museo della Canapa, Museo Etnografico del Friuli, Museo Friulano di Storia Naturale, Fondazione Musei Civici di Venezia) institutions presented in the survey significantly contribute to the promotion of the Sustainable Development Goals through the execution. Municipal museums are more intimately linked to local communities and may more effectively respond to their needs and demands. Consequently, they can swiftly address emerging concerns and include social and environmental efforts into their activities that directly affect the local community.

The six museums (GAMEC, Museo del Bali, Museo Poldi Pezzoli, Museo della Biodiversità, MAcA, M9 - Museo del '900) functioning as public-private

partnerships significantly contribute to sustainable development initiatives. The consolidation of public and private resources enables these institutions to undertake more ambitious and innovative initiatives. Such agreements frequently emphasize the conservation of cultural treasures or the advancement of sustainable tourism.

At the same time the four private museums (8.5% of the total - Museo Salvatore Ferragamo, MuBa, Museo del Risparmio, Palazzo Grassi - Punta della Dogana) contribute to the advancement of sustainable development. Such institutions usually possess greater flexibility in selecting their operational domains, recourses and capacities, allowing them to concentrate on environmental initiatives, promotion of social economic aspects of sustainability and encourage the development of climatic actions and measures of climate consequences mitigation. Private museums frequently pursue novel strategies for sustainable development.

Metropolitan museums (Castello di Rivoli Museo d'Arte Contemporanea, Museo diffuso della resistenza, Polo del '900), along with cooperative (Museo delle Maschere Mediterranee, Explora - Il museo dei bambini di Roma), university (Orto botanico di Padova, Museo Universitario Gemma), and regional museums (Forte di Bard, Museo Guatelli, Fondazione Museo del Tessuto di Prato, Museo dell'Agricoltura e del Mondo Rurale), are infrequently represented in the sample of such initiatives, with each category comprising three instances. Nonetheless, their capacity to advance the Sustainable Development Goals is significant, particularly when evaluating their worldwide effect and ability to engage an international audience.

The involvement of diverse types of museums in sustainable development initiatives underscores the variety of methodologies and tactics available to attain global sustainable development objectives by including cultural, social, and environmental dimensions.

### **2.1.3 Areas of activity of museums**

An examination of museum operations reveals that art museums and natural science museums execute the highest number of initiatives (11 and 10 organizations). Their subject matter facilitates the adaptation of programs to contemporary concerns, including environment, inclusion, and cultural education. Art institutions, for instance, regularly advocate for cultural diversity and equality through the organization of exhibitions and educational initiatives that address significant social and environmental concerns.

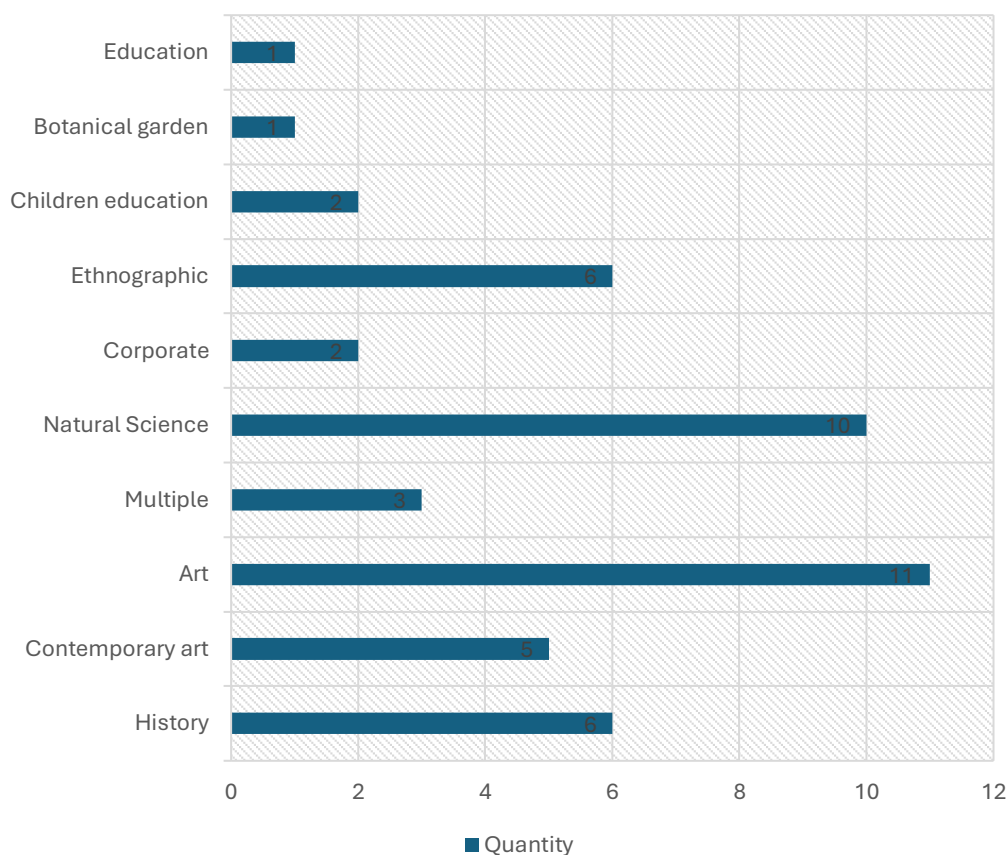


Figure 3. Museums activity area

Natural history museums are crucial in advancing environmental education through exhibitions and programs focused on environmental conservation and biodiversity preservation. These organizations frequently serve as venues for addressing global environmental issues, thereby enhancing public knowledge of climate change, species extinction, and environmental pollution.

Historical museums exhibit a lower propensity to engage in sustainable development initiatives, with only seven projects undertaken. This may stem from the difficulty of reconciling their primary mission—preservation and investigation of the past—with contemporary challenges. Numerous historical museums have commenced initiatives that link history with pertinent sustainable development themes, including cultural inclusion and the conservation of historical and natural landscapes.

#### 2.1.4 The number of visitors

The dimensions of museums also influence their engagement in sustainable development initiatives. Small museums implement most initiatives, attracting up to 50,000 visitors annually (19 museums – e.g. Museo Benozzo Gozzoli, Museo di

Storia Naturale di Ferrara, Museo Nazionale dell'Ebraismo italiano e della Shoah, Museo Novecento, Museo Salvatore Ferragamo, Museo Naturale della Maremma, MUSMED - Museo di Storia Naturale di Livorno, Museo delle Maschere Mediterranee, MuBa, Museo Poldi Pezzoli). Notwithstanding constrained resources, small museums possess the agility and capacity to promptly address the requirements of local communities. They are engaged in educational and social programs to involve local citizens in sustainable development efforts. Owing to their scale, such museums can collaborate closely with local schools, NGOs, and other entities, rendering them vital contributors to the initiative of sustainable development.

Medium-sized museums, attracting yearly attendance between 50,000 and 500,000 visitors, are engaged in sustainable development activities (15 organizations – e.g. Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci, Orto botanico di Padova, Musei Civici di Reggio Emilia, Explora - Il museo dei bambini di Roma, Galleria Nazionale d'Arte Moderna e Contemporanea, MaXXI - Museo delle arti del XXI secolo). These museums frequently possess substantial resources and can execute extensive programs, encompassing interregional and worldwide activities. They possess the requisite resources to provide educational programs that engage a broad audience.

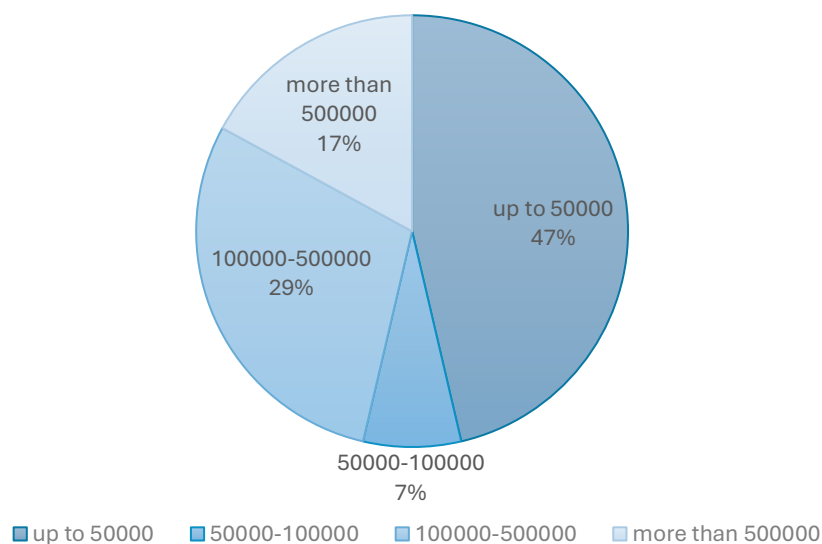


Figure 4. Number of museum visitors

Major museums, defined as those attracting over 500,000 visitors (e.g Reggia di Caserta, Gallerie degli Uffizi, Gallerie dell'Accademia, Galleria Borghese), demonstrate diminished engagement in sustainable development initiatives,

undertaking only seven projects. This may be attributable to their emphasis on permanent and extensive exhibitions that necessitate substantial financial and human resources. Nonetheless, their societal impact is substantial, and the engagement of prominent museums in advancing sustainable development can yield considerable positive effects globally, chiefly through partnership with other cultural institutions and partners.

## 2.2 The interview of museums representatives

I have conducted a series of 16 interviews with representatives from several museums to get a better understanding of Italian museums' actual initiatives in sustainability and climate policy. These interviews enabled me to gather qualitative data on how museums are reacting to climate change problems and what efforts they are implementing to promote the Agenda 2030.

Non-random sampling of museums was utilized as a representation of museums. One of the sampling methods employed was the usual case approach. The most representative individuals of the investigated population were selected, interviewed, analysed, and examined. Conventional museums encompassed entities associated with the Museintegrati project, executed by ICOM Italia, alongside active contributors to organizations such as ANMS, AMACI, Musei piccoli, and Museimpresa.

My study on environmental sustainability and climate change will center the Triveneto area, which includes Veneto, Friuli-Venezia Giulia, and Trentino-Alto Adige. This area's unique mix of natural and cultural settings makes sustainable development and interaction with climate change concerns especially fascinating. Notably active in environmental sustainability education and outreach initiatives, it is the site of museums like MUSE in Trento and Il Magazzino dei Venti in Trieste, Museo Friulano di Storia Naturale in Udine, Museo di Storia Naturale in Venice. The region's historical function as a cultural capital of Europe and its physical placement at the junction of Alpine and Mediterranean ecosystems give rich material for the study of sustainable practices and climate change. Moreover, the choice is made by my personal relation to the area as I am getting the master's degree here and have seen the local social and environmental issues. Through this point of view, I can evaluate the museums' contribution to sustainable development and examine the ways in which cultural institutions might help to achieve global sustainability goals.

A spontaneous sample, consisting of volunteers, was utilized, and data was gathered in an unstructured manner, resulting in incomplete communications from all participants in the sample of typical instances. Consequently, museums selected spontaneously were included in the study, with spontaneity defined by factors such as location, activity orientation, organizational size, and historical involvement in eco-climatic initiatives. Consequently, it is infeasible to ascertain precisely who opted to partake in the study, the rationale behind their decision, and the factors contributing to the sample's lack of representativeness, which poses a danger of data distortion.

With the interviews I addressed several major issues in the examination of the data. First, I looked at the geographical distribution of museums to see how approaches to sustainability differed by location. This contributes to the identification of regional features and priorities in museum activities. Second, the state of the museums involved in the interviews was investigated. This helps to discover which museums are at the forefront of environmental measures and how active they are in sustainability programs.

The museum representatives who participated in the interviews were also an essential element of the research. The employment levels and roles of the participants were examined, offering a clearer knowledge of who in the museum industry is involved in sustainability concerns. Finally, the examination focused on the museums' areas of activity. This exposes the most significant sustainability concerns and sectors for museums, as well as how they incorporate them into their work.

### **2.2.1 Interview questions**

I developed a series of interview questions that can assist in deeper understanding and analysing of the museum's mission, its environmental goals, and the environmental mitigation measures already implemented and planned.

- What is the mission of museum? Would you like to change or add something to the mission?
- Are environmental sustainability and climate change relevant topics in your museum?
- What's the museum's main goal regarding sustainability and in particular climate change?
- Has your museum analysed the climate impacts / footprint it may face in relation to your region? Has the museum analysed how climate change could affect its collections, infrastructure, and operations?
- Have you seen results from climate friendly changes you have already implemented?
- What challenges museum faced in implementing sustainability practices?

- Do you think your museum has sufficient knowledge about the Sustainable Development Goals and climate action in the context of the museum environment?
- Are you part of a network of museums/heritage organizations active in sustainability and climate change?
- Do you collaborate with external experts on climate and sustainability issues?

The developed questions cover the several aspects. Firstly, the aim was to understand the museum's core mission and, if available, the museum's willingness to expand its mission to integrate aspects of sustainability and climate responsibility. Also, I assess how high a priority these issues are for the museum and whether the museum sees itself as an active participant in environmental initiatives. The questions in this section sustainability and Agenda 2030 goals seek to identify the museum's strategic objectives and ideas related to sustainability and identify specific initiatives the museum is undertaking to reduce its carbon footprint. Further I investigate whether the museum has conducted a climate risk analysis of the climate risks affecting its operations and assessed the potential impacts of climate change on collections, infrastructure, and operations. Moreover, I consider that it can be important to identify successful environmental initiatives and measurable outcomes achieved by the museum through climate-friendly change. At the same I would like to look at what major obstacles the museum has faced on the path to sustainability, whether financial, logistical, or cultural barriers. I add also a section that focuses on how aware the museum is of the SDGs and their role in managing climate change in the museum environment. Surely, we can look at whether the museum is part of a network or associations that support sustainability, allowing it to interact with other institutions and share best practices. And finally, we investigate whether the museum engages climate and sustainability experts to improve its initiatives and better adapt to current challenges.

These questions help uncover the extent of museums' awareness and engagement with climate change issues, their willingness to collaborate with experts and other institutions, and identify barriers and good practices in sustainability.

### **2.2.2 Geographical distribution of museums**

An unusual geographical dispersion of participation by cities and areas of Italy was exposed during interviews with sixteen sustainable development-oriented museums. The many locations of the museums around the nation highlight the variety of cultural sector interest in the issue of sustainable development. From



well-known cultural hubs like Rome and Venice to less-known towns like Termoli and Gibellina, involvement in the initiative took place in a broad spectrum of geographical areas.

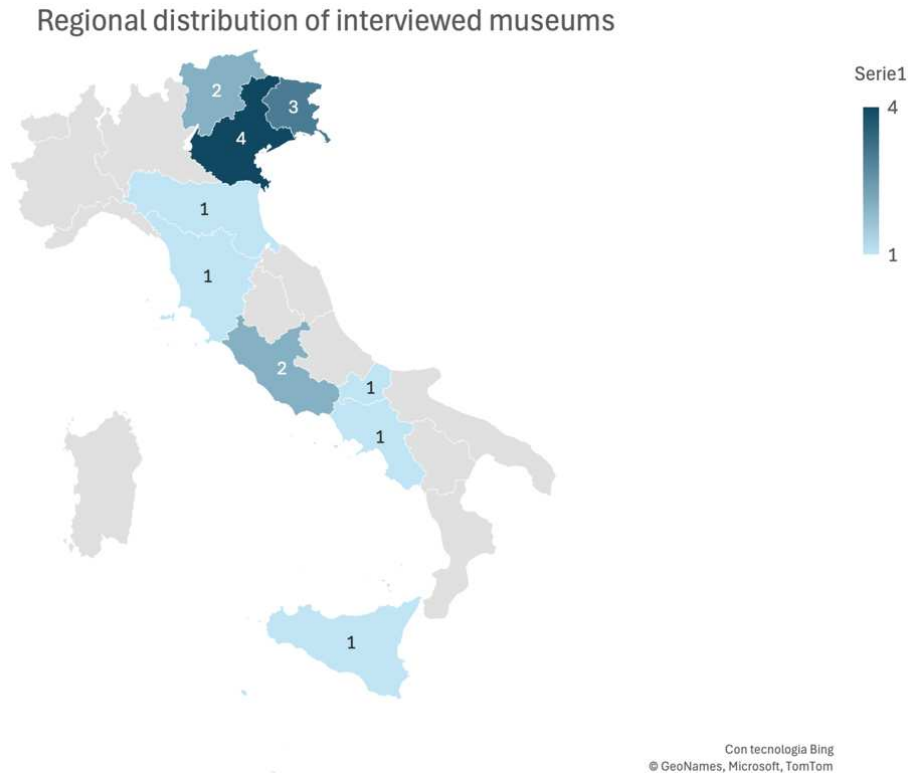


Figure 5. Regional distribution of interviewed museums

Museums from different regions of the country participated in the study, representing a wide geographical coverage. The largest number of museums is involved in the Veneto region, where four museums are included in the study. Three museums represent the Friuli-Venezia Giulia region and two represent Lazio. The regions of Campania, Emilia-Romagna, Tuscany, Sicily, Trentino-Alto Adige and Molise are represented by one museum each.

The large bias towards the Triveneto regions (Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia) has already been described in the sample of interview participants, and yet this distribution of participants emphasises the cultural diversity, as each region of Italy contributes in its own way, given its historical and natural characteristics. The participation of museums from different regions allows the study to reflect different approaches and perspectives, which can further help to deepen the understanding of cultural and social specificities in the context of the topic under investigation.

Therefore, the research encompassed several geographical regions of Italy, which enables us to make generalizations regarding several degrees of participation in sustainable development in culture and diverse methodologies.

### 2.2.3 Status of interviewed museums

The graphic shows the many kinds of museum institutions that took part in interviews about environmental sustainability and climate change problems. The study of the distribution reveals several kinds of museum administration, therefore indicating a great spectrum of methods for running cultural institutions.

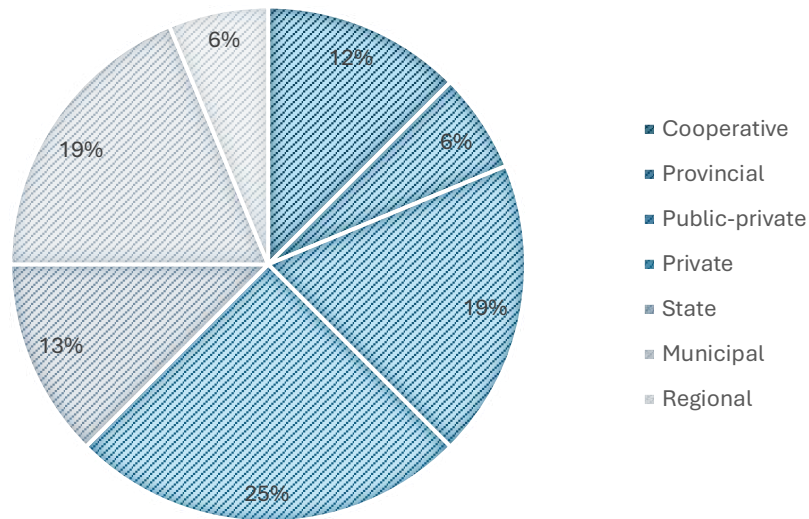


Figure 6. Status of museums

Private museums account for 25% of the interview participants. This implies that initiatives for sustainable development are actively engaged by private museums. Their freedom enables them to apply changes in their activities and adjust faster to new practices.

About 19% of all the participants are from cooperatives, state and municipal museums. At the level of State institutions and local governments, state and municipal museums also significantly assist efforts at sustainable development.

Provincial museums and public-private partnerships respectively account for 12% and 13%. Public and private sector partnerships might point to the necessity of combined funding and resource utilization to apply sustainable development strategies. Being a part of a more regional cultural scene, provincial museums actively participate in such projects as well.

Just 6% of regional museums and museums run under provincial administration are participants of the interview. This might be the result of reduced engagement at the level of regional structures in programs connected with sustainable development or more constrained resources.

The range of different kinds of museum organizations engaged in the interview emphasizes, independent of ownership and management, the relevance of the issue of sustainable development for the cultural sector.

A study of the interview participants' viewpoints on sustainable development in museums reveals a wide range of professional activities, indicating an integrated approach to the problem of sustainable development in cultural institutions.

### 2.2.4 Representatives of museums participating in the interview

The largest group of participants consists of directors, who number eight. This is hardly unexpected given that museum directors make critical strategic choices, including the implementation of sustainable practices. Their involvement in the interview demonstrates the museum management's strong commitment to the theme of sustainable development.

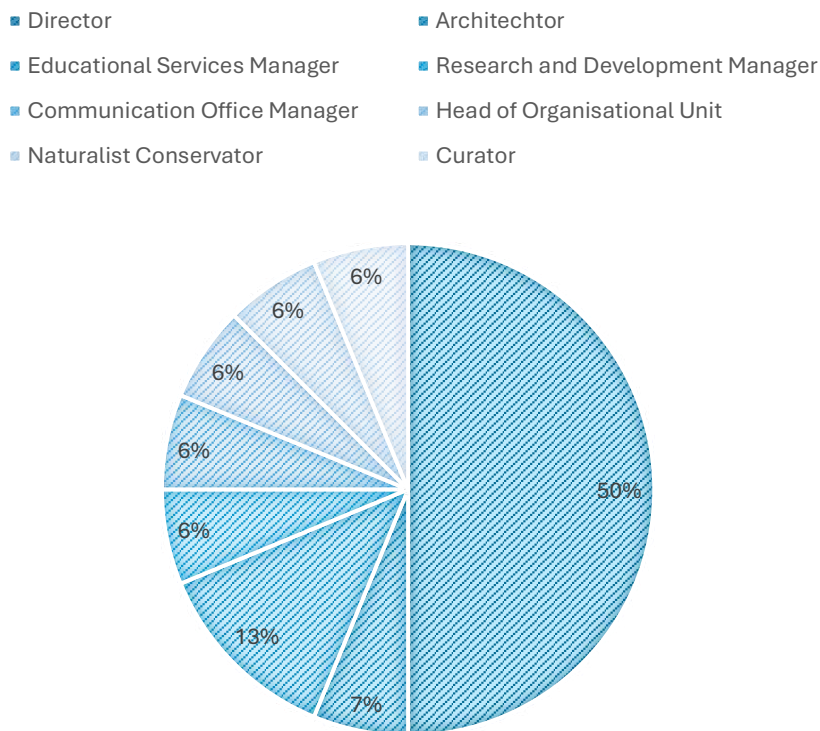


Figure 7. Representatives of museums participating in the interview

Educational service managers and research and development managers are also key players in this discussion. The two educational services managers who took part underline the importance of educational programs that raise awareness of sustainability concerns among museum visitors. One head of research and development emphasizes the importance of research and innovation in promoting sustainable practices in museums.

Communication managers and heads of organizational units, one for each position, emphasize the strategic relevance of external and internal communications in the effective implementation of sustainable development initiatives. These professionals play an important role in maintaining good public contact and museum coordination.

The involvement of both the architect and the naturalist-conservator demonstrates the value of an interdisciplinary approach. The architect is most often involved in the design or adaption of museum spaces that adhere to sustainable architectural and environmental requirements. As part of the museum's goal, the conservationist naturalist works to preserve natural treasures while also conserving the environment.

Curators and other professionals play a significant role in discussions about sustainable development, particularly in terms of cultural and natural resource protection. The participation of one curator emphasizes the need of a scientific approach in the development of exhibition projects centered on environmental and sustainability concerns.

Thus, the interview participants' backgrounds reflect the multidisciplinary and strategic nature of the work on sustainable growth in museums, where both administrative and scientific responsibilities are significant.

### 2.2.5 Areas of activity of museums

Examining the activities of the museums engaged in the interview reveals the variety of their subject concentration, therefore reflecting a broad spectrum of interests in sustainable development in many spheres of knowledge and industry.

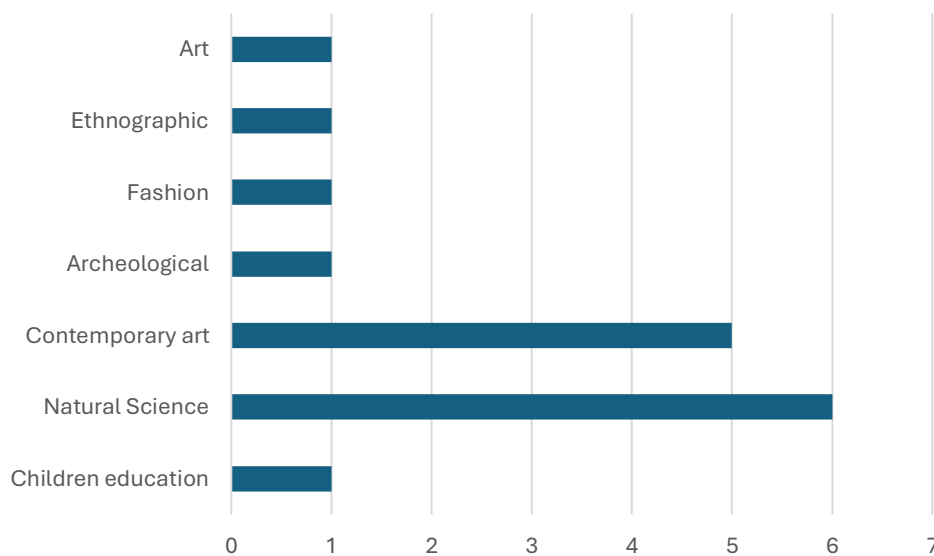


Figure 8. Areas of activity of museums

With six museums, natural sciences are the most often occurring field. This emphasizes the need of sustainable growth for museums connected to science and environment, which are probably actively engaged in the preservation of the surroundings and natural resources. Through their displays and activities, natural history museums may raise awareness of environmental problems and education on them.

Five contemporary art museums also reflect the importance of this field. This highlights the function of modern art as a platform for understanding and supporting the principles of sustainable development, where artists and cultural institutions utilize their resources to elevate the issues of ecological, social equality and sustainability by exhibits and installations.

One museum exhibits the directions of children's art and education. Through instructional activities, the museum—which addresses children's education—probably significantly shapes the perspective of environmental concerns and sustainable development among the younger generation. Furthermore, participating in cultural and environmental education might be a museum connected to art in a more general sense.

One museum in each direction stands for archeology, fashion, and ethnography. The Archaeological Museum most likely concentrates on the preservation of historical legacy against environmental obstacles including resources and climate. Through projects aiming at the ecologically friendly manufacture of textiles and apparel, which is becoming ever more crucial in the fashion business, the Fashion Museum may contribute to sustainable development. The Ethnographic Museum can then investigate in turn the customs and methods of sustainable use of natural resources in many civilizations.

Therefore, museums of many disciplines—from natural sciences to art and fashion—take sustainable development under the prism of their own topics. This suggests that sustainability is multidisciplinary and fit for any scientific or cultural subject.

### 3. Results

#### 3.1 Results of analysing the ICOM Italia dataset on museums' activities

During the research I focused on how Italian museums, including data from ICOM Italia, contribute to environmental sustainability and climate goals of the 2030 Agenda through their projects and programmes.

The key aspects of their activities which I consider: what sustainable development goals receive the most and least attention by the museums projects, how programs are distributed in the areas of sustainable development (5P), what target groups are covered by these projects, and how keywords reflect the priorities of museums' intention in the projects.

##### 3.1.1 Sustainable Development Goals: which goals are a priority?

The Sustainable Development Goals include 17 global goals, each of which is aimed at solving the most important social, economic and environmental problems. Talking about the qualitative indicator, each museum project included in the analysis covers about 2 goals (ranges from the minimum of 1 and maximum of 5). As for the most popular goals, I can indicate them as SDG 4 (Quality education), SDG 11 (Sustainable cities and human settlements), SDG 13 (Combating climate change) and SDG 12 (Responsible consumption and production). These goals completely are linked to the tasks that relate to sustainable urban development, improving education and combating environmental threats, as the important sphere – the climate change raise awareness and preparation for its impacts and consequences.

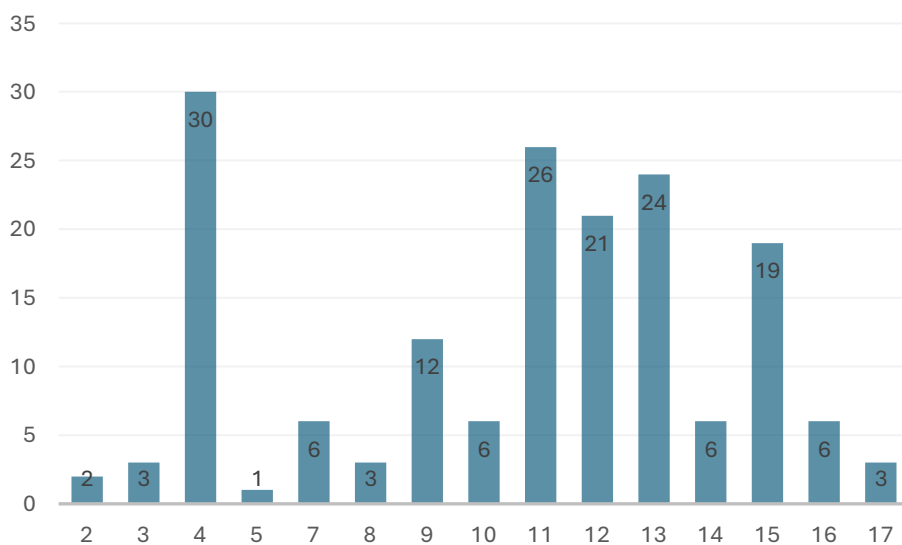


Figure 9. The number of SDGs in the museum projects

SDG 4 is the most popular goal in the examined museum projects — as many as 30 initiatives are aimed at the implementation of this goal's objectives. The museum institutions traditionally play an important role in the educational field, and this fact is reflected perfectly in the project activities. Educational programs, exhibitions and interactive events help museums become centers of education that promote the development of critical thinking and the dissemination of knowledge among various groups of the population. This includes initiatives of organizations in educational workshop, laboratory activities, gaming conduction, event organization.

The next most popular target is SDG 11 with 26 projects. Museums actively interact with the urban environment, acting as place of cultural and social interaction. Projects under this goal are aimed at preserving cultural heritage, improving urban infrastructure and creating an inclusive environment for everyone. Museum organizations are intended to make cities more sustainable and comfortable to live in by integrating into the daily lives of local communities.

The goal number 13 is the third most popular in the museums' projects. In 24 projects was found the dedication to this goal. Museums are responding to this emerging challenge. Many of them are developing programs aimed to generally provide the education and raising awareness about the effects of climate change and the possibilities of its mitigation. Such initiatives include climate change exhibitions, environmental education events, and carbon footprint reduction programs.

This ambition in this SDG is reflected in the project ClimaLab and MeteoLab in Forte di Bard offering visitors lectures and practical workshops on climate change and meteorology. The project focuses on understanding climate processes and recognising their impact on the local and global environment. The museum actively supports environmental education by teaching visitors how to adapt to changing conditions and reduce their impact on the climate.

In addition, the Galleria Nazionale's energy efficiency programme aims to reduce energy consumption and emissions. ISO 50001 certification demonstrates high standards of energy management, and the project demonstrates that cultural institutions can operate with minimal environmental impact. The museum acts as a leader in sustainable management, offering an example for other cultural institutions and promoting transformation towards sustainable practices.

The goal of responsible consumption and production under the number twelve is being implemented in 21 projects. Museums, as cultural institutions, play an important role in promoting the ideas of sustainable consumption and waste

minimization. Educational initiatives aimed at realizing the need for reasonable consumption, recycling and reducing the burden on the environment are becoming increasingly relevant.

SDG 15 is also actively supported by museums — 19 projects are aimed at the achievement of this goal. It concerns the conservation of forests, ecosystems and biodiversity. Museums are developing projects related to wildlife conservation and public awareness of the importance of protecting ecosystems. Exhibitions and educational programs dedicated to biodiversity and ecology assist the visitors and the institutional stakeholders to realize the importance of these issues and possible ways and practices to solve them and change the attitude.

I found that 12 projects of museums have incorporated into programs the SDG 9 of industry, innovation and infrastructure. Museums, although less popularly of this objective still are able to play an important role in the cultural life of society, can also contribute to the development of innovation and infrastructure, especially through projects with the goal of creating new technologies, cultural products or upgrading their buildings to ensure greater environmental friendliness.

After this the SDGs under numbers 7, 8 and 14 have received less attention from the museums with 6 projects per each. While energy and economic issues may be important, museums tend to focus more on the cultural and educational aspects of sustainable development. Contributions to marine ecosystems also remain relatively limited, which may be due to the geographical specificity of many museums and their focus on local issues. A small number of projects — from 1 to 3 — are aimed to the goals such as hunger eradication, health and well-being, gender equality, peace, justice and effective institutions and partnerships to achieve the goals. This may indicate that these areas are not yet in a top priority for most museums. However, each of these projects highlights the role of museums as institutions that could promote social change and promote equity and inclusivity.

Some Sustainable Development Goals are not presented. The under numbers Goals 1 (Poverty eradication) and 6 (Clean water and sanitation) from the table seem to be much less related to the museums' projects. It can be explained by the complexity of a direct connection with the mission of museums. Museums more often focus on cultural, educational, environmental or historical topics that are closer to their audience and collections. SDGs related to quality education (No. 4), sustainable cities (No. 11), climate (No. 13) have a more obvious connection with the mission of museums as it was highlighted above. Also it can be assumed that the poverty eradication and the provision of clean water are difficult social and infrastructural tasks that require larger — scale solutions at higher level (regional, national or



global). Museums may have difficulty demonstrating how they can contribute directly to these goals.

### 3.1.2 SDG interconnections

Realization of the project usually requires addressing more than aspects of the sustainable development. The graph illustrates the relationships among the several sustainable development goals. The thickness of the lines linking the objects likely indicates the strength or frequency of interactions. The graph clearly illustrates that certain goals exhibit substantial interconnections with others, whilst some show less associations. SDGs with the highest connectivity: 4 (Quality education), 12 (Responsible consumption and production), 11 (Sustainable cities and communities). They are situated near the heart of the graph, signifying their substantial connectivity with other objectives. The values of the SDGs 10, 16, and 17 are situated on the periphery of the graph, suggesting the fewest connections, diminished engagement in the interaction system.

From the examination of the graph and the table, the subsequent significant objectives may be discerned that the SDGs 4, 11, and 12 are fundamental goals that significantly influence interpersonal interactions. They might be pivotal in attaining other museums programs' objectives. Goals with fewer links, such as 17 Goals, may be more particular or less general, necessitating reduced interaction with other goals for the projects.

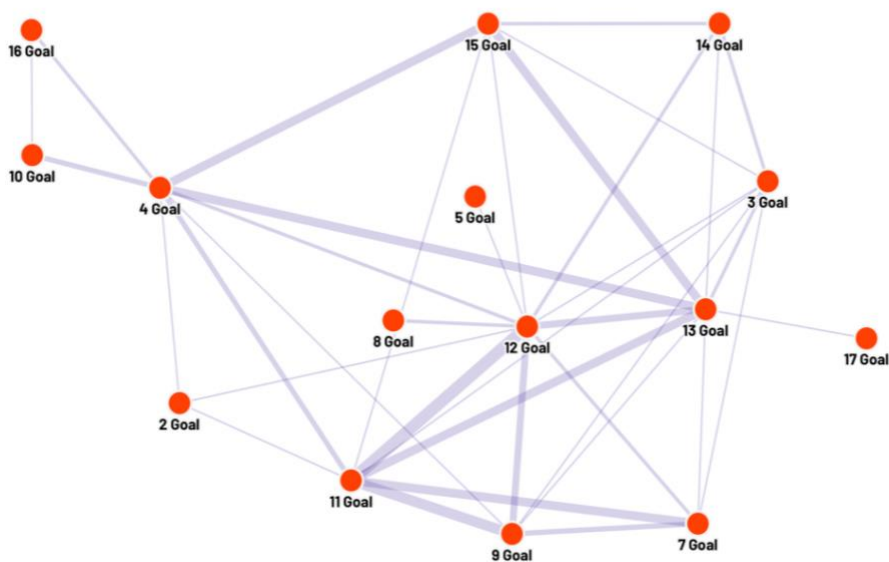


Figure 10. SDG interconnections graph

The Figure 10 indicates that SDGs 4, 11, and 12 have the most interconnectivity, whereas peripheral goals (16, 17) demonstrate diminished engagement in network interactions. This may signify the necessity to focus more intently on the primary objectives to attain the global Sustainable Development Goals.

The graph also indicates that objectives 4, 11, and 12 exhibit the highest degree of interconnection, whilst the peripheral goals (16, 17) have minimal engagement in network interactions. This may suggest the necessity of focusing more intently on the primary objectives to attain the global Sustainable Development Goals.

Thus, the priorities for museum projects are high-quality education, inclusion, sustainable urban development, combating climate change and responsible consumption, which reflects the key global problems and challenges faced by modern society.

### 3.1.3 Directions of sustainable development (5P): priorities of museums

The analysis of the directions of sustainable development (5P) confirmed that museums pay special attention to such areas as People and Planet, and Planet turned out to be even more popular than Partnerships, which underlines the growing attention to environmental issues.

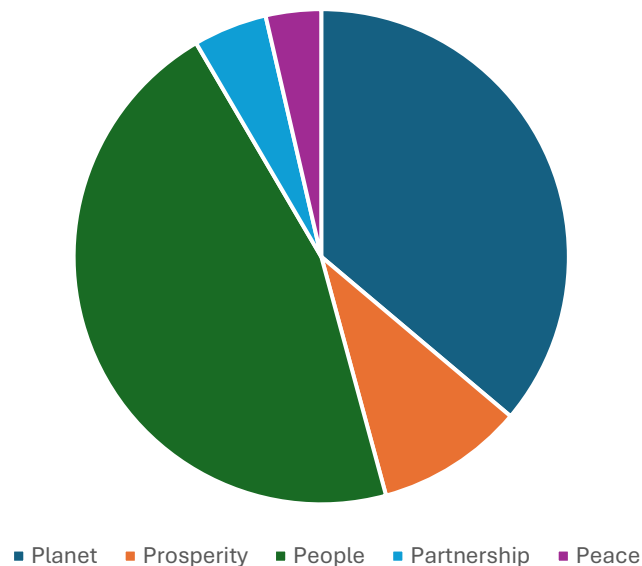


Figure 11. (5P) priorities of museums

People continue to be the most important destination for museums. This area is associated with projects aimed at improving the quality of life, improving education and inclusivity in society. Museums play an important social role by active

promotion educational programs for diverse auditorium. These initiatives include lectures, exhibitions and interactive events aimed at raising awareness about sustainable development and social justice.

However, the Planet direction, which focuses on the protection of the environment and natural resources, is gaining popularity and is beginning to play an increasingly important role in museum projects. Museums are increasingly becoming participants in environmental initiatives, holding exhibitions and programs dedicated to climate change, biodiversity conservation, sustainable consumption and waste recycling. These initiatives reflect a growing interest in eco-education and the role of culture in the fight for a sustainable future and mitigation of climate change impacts.

At the same time, Partnerships related to the cooperation of museums with other institutions and organizations turned out to be less popular than Planet. Although partnerships play an important role in the implementation of major projects and the exchange of resources, this area is not the main focus for many museums. Nevertheless, partnerships can get the assistance for the museums join forces and capacities with universities, non-governmental organizations and businesses to achieve sustainable development goals.

The Prosperity direction remains less in demand compared to People and Planet. It is related to issues of economic growth, innovation and welfare improvement, but museums are less likely to directly participate in economic initiatives, preferring to focus on the cultural and social components of sustainable development.

Peace related to human rights and justice issues is also supported by museums, but not as actively as People or Planet. Museums continue to work on projects related to historical memory, human rights and peacemaking, but this area is rather secondary.

Thus, museums demonstrate significant interest in environmental and social development issues, which is reflected in the popularity of the People and Planet destinations.

### **3.1.4 Target audience**

The most numerous target groups are children of preschool and primary school age (23 projects), secondary school students (21 projects), and young people (22 projects). This underlines the importance of museums working with younger generations, which is closely related to the educational function of these institutions. Museums strive not only to acquaint children and adolescents with

cultural and natural heritage but also to introduce the ideas of sustainable development and responsibility for the environment into their consciousness.

The next most mentioned are adults, teachers, and professors, with whom 22 and 18 projects work, respectively. Educational programs for adults and professionals are an important aspect of the work of museums, as they allow you to expand the audience by attracting people with diverse interests and professional backgrounds. The involvement of teachers and professors is critical because they can transfer the acquired knowledge and skills to their students, contributing to the dissemination of ideas for sustainable development in the educational system.

As for the specialists and workers in the sphere of museums and art, organised by Polo del '900, the initiative "Art and technologies for climate change" brings together scientists and artists to provide creative ideas on climate change. It comprises residences for academics and artists working on projects using technology and artistic techniques to assist in understanding of climate concerns. The museum turns into a stage for science and art to interact so that guests may consider how humans affect the surroundings and strategies to minimize the negative effects.

Equally important target groups are families (15 projects), which emphasizes the family-oriented approach of museums. Family-oriented projects help to involve different generations in cultural activities, strengthening family ties and raising awareness of cultural heritage and environmental issues among all family members.

Notable work is also being carried out with museum employees (19 projects). These projects include professional trainings, seminars and events aimed at improving the skills of employees, expanding their knowledge in the field of sustainable development and introducing new technologies and methodologies for working in the museum environment. This helps museums not only to improve the level of their services, but also to become more sustainable and innovative institutions.

Target groups such as the elderly (8 projects), local residents (5 projects), and sustainable development specialists (5 projects) are covered by fewer initiatives, but their importance should not be underestimated. Working with these groups requires a more specialized approach, and museums strive to offer programs that take into account their unique needs and interests. It is especially important to involve specialists, as they can make a significant contribution to the implementation of projects and transfer their knowledge to a broad audience.

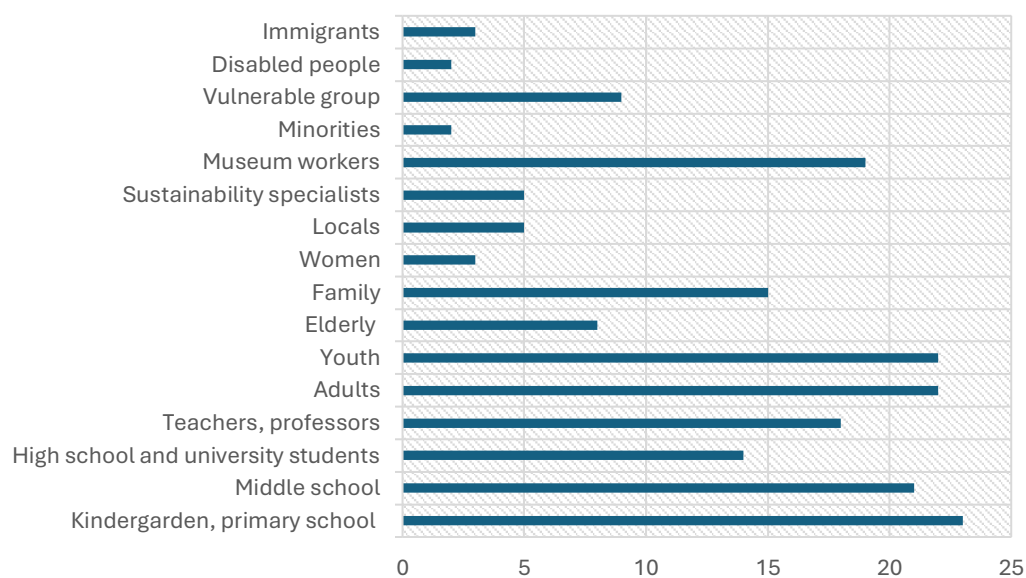


Figure 12. Projects target groups

A relatively small number of projects are aimed at groups such as women (3 projects), migrants (3 projects) and people with disabilities (2 projects). This indicates a certain gap in the work of museums with these categories of the population. Nevertheless, projects aimed at these groups can play an important role in social integration and inclusion, helping museums become more accessible and open to all.

Thus, museums continue to focus on working with younger generations and adults, while paying attention to educational initiatives and supporting the professional development of employees. However, there is potential to expand work with vulnerable and vulnerable groups such as migrants, women and people with disabilities to ensure a more inclusive and inclusive approach to sustainable development.

### 3.1.5 Keywords: how do museums describe their projects?

The keywords used in the descriptions of museum projects imply the priorities and subjects under development inside the scope of sustainable development. Among the most often used keywords is "Education" (69 projects). This underlines the

important part museums play as educational venues aimed at enlightening guests of all ages and thereby advancing knowledge. From schoolchildren to adult professionals, they provide venues for sharing knowledge on sustainable development to several target populations. Because of their covering of subjects including ecology, sustainable practices, and social justice, which makes museums significant players in building an informed and responsible society.

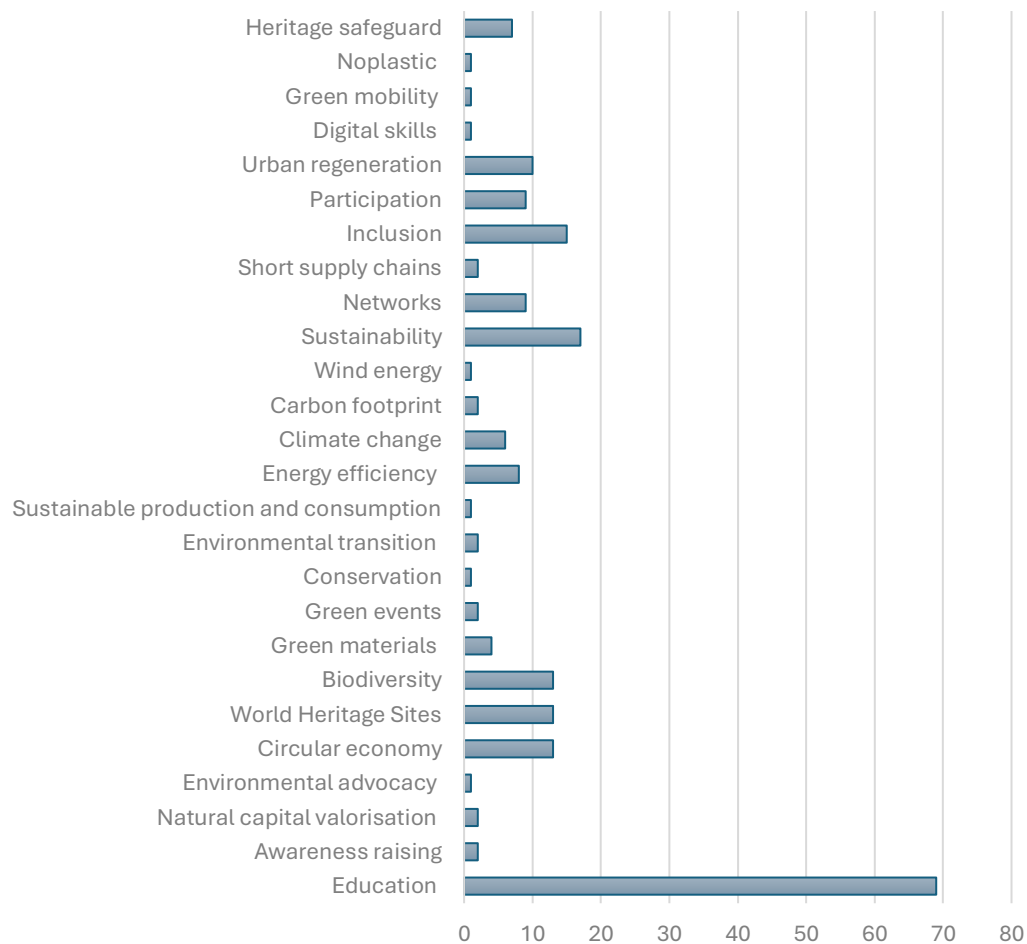


Figure 13. Keywords in museums projects

This is in line with the MUSE's "Il MUSE per la Scuola" project, which centers on engaging young guests with seminars and lectures on crucial subjects of sustainability and ecology. Through educating children and young people, the ideas of sustainable consumerism, the museum seeks to raise awareness of natural resources among them. Apart from highlighting world problems, the program provides specific guidelines for personal environmental care as well as highlights Another such is the MUVE Summer Camp for youngsters and teens at the Venice Museums, which exposes attendees to cultural legacy using eco-friendly methods. Children pick up ecological and sustainable ideas during the program, engage in

recycling projects, and learn how to see how culture may be included into a community that values the environment. The project also imparts to the younger generation methods for lowering their everyday environmental effect.

Mentioned in seventeen projects, “Sustainability” comes second in frequency of reference. This area includes public initiatives meant to encourage among guests environmentally friendly behavior. Projects connected to sustainability actively help to minimize the negative effects on the surroundings and assist in the shift to more sustainable operation of cultural institutions.

One of such projects is the exhibition is “Out to Sea? The Plastic Garbage Project” organised by MAcA to inform visitors about the dangers of plastic and how to recycle it. The exhibition details how plastic affects the environment and offers examples of alternative use and rejection of single-use plastic. The museum promotes environmental education by helping visitors to recognise the problem of pollution and the possibilities of solving it.

Third place goes to “Inclusion” with 15 mentions. Museums are actively striving to provide a welcoming space for many social groups, including migrants, persons with disabilities, representatives of minorities and vulnerable groups. Achieving sustainable Development Goals to lower inequality and boost social justice depends directly on inclusive programs seeking equal access to all facets of cultural life.

Three areas—each of which relates to 13 projects — “Circular Economy,” “Biodiversity” and “World Heritage Sites”. Projects meant to support a circular economy stress the need of reusing resources and cutting waste, therefore helping to lower the environmental impact of museums. Important features of ecological and cultural sustainability are biodiversity and the preservation of the world cultural legacy. They stress the significance of preserving cultural as well as environmental resources for next generations.

The theme of the circular economy we can see at the project of the Castello di Rivoli that combines art and circularity by presenting works that use recycled materials and demonstrate the cyclical processes of nature. The art installations are seen as a mechanism to raise awareness of reuse and recycling, emphasizing ways to reduce waste. The project is made to show the museum's mission to not only present art, but also to promote ideas of environmental responsibility and emissions reduction, engaging visitors in discussions about sustainable consumption.

The “Urban reconstruction” discussed in ten programs shows a fascinating trend in museum projects. This field of study centers on how museums may be included into urban buildings and their part in the revitalization of metropolitan regions. Reviving

cultural and historical sites, museums help to restore the metropolitan environment and raise the quality of living in nearby areas, hence driving social transformation. Furthermore, important for sustainable urban design are they help to raise the social and environmental sustainability of cities.

The idea of restructuring is well illustrated by Miramare Park, which has modernised its water supply system by using groundwater to feed fountains and irrigation, thus significantly reducing tap water consumption. This project promotes the conservation of natural resources and maintains green spaces, demonstrating the role of conservation practices in managing cultural sites and maintaining ecosystem balance.

Meeting in eight projects, “Energy efficiency” is considered to be another crucial subject stressing the need of museums to lower energy usage and apply sustainable solutions in their structures. To show environmental responsibility and reduce their carbon footprint, museums are changing to energy-efficient lighting, heating and ventilation systems.

Seven initiatives reference the “Preservation of cultural legacy”, therefore highlighting the need of safeguarding concrete and intangible resources. Particularly relevant in the framework of climate change and urbanization, heritage protection initiatives center on the preservation and restoration of historical sites. Six projects address the theme of “Climate change”, which is somewhat rare for a worldwide concern of such significance. Still, given the expanding knowledge of the need of addressing climate change, this issue is probably going to get more focus going forward.

Certain locations are still less well-known. For instance, just one to two programs address “Environmental protection” and “Sustainable production and consumption”. Given their significance in relation to the worldwide Sustainable Development Goals, this suggests the possibility for even more expansion in these spheres.

Therefore, museum projects emphasize on education, sustainability, inclusivity and urban regeneration, therefore stressing their variety and active contribution in advancing sustainable development. To better address all facets of sustainable development, though, issues like environmental preservation and climate change might get more focus and funding in the future.



## **3.2 Results of analysing the museum interviews**

### **3.2.1 Museum missions**

The interviewees expressed what the mission of their museums is, and as a result I can identify several key areas, including education and enlightenment, preservation of cultural heritage and promotion of local and world art, including support of contemporary art, promotion of intercultural dialogue and acceptance of new ideas. Also, among the voiced missions I can mention the direction of activities in the field of nature and science studies, supporting interest in scientific research and promoting awareness of the importance of the environment. There is also a particular focus on the accessibility of cultural heritage, reflecting the organisations' commitment to making their collections and knowledge accessible to a wide audience.

Meanwhile, a quarter of interview respondents favoured ideas to amend the museum's mission by adding a focus on the Sustainable Development Goals and the 2030 Agenda, as well as increasing the focus on social and environmental sustainability and inclusivity. This demonstrates that the museum recognises its role not only in cultural education but also in addressing pressing social and environmental issues. Thus, the proposed updates will enable museums to not only continue to preserve and promote cultural heritage, but also become an example of sustainability. Incorporating sustainability and inclusiveness into the core values of organisations will broaden their influence, turning them into active participants committed to positive change both locally and globally.

### **3.2.2 Sustainability and climate objectives**

Discussion about this area of issues I can start affirming that all museum representatives participated in the interviews gave a positive response to a question if environmental sustainability and climate change are relevant topics the museum.

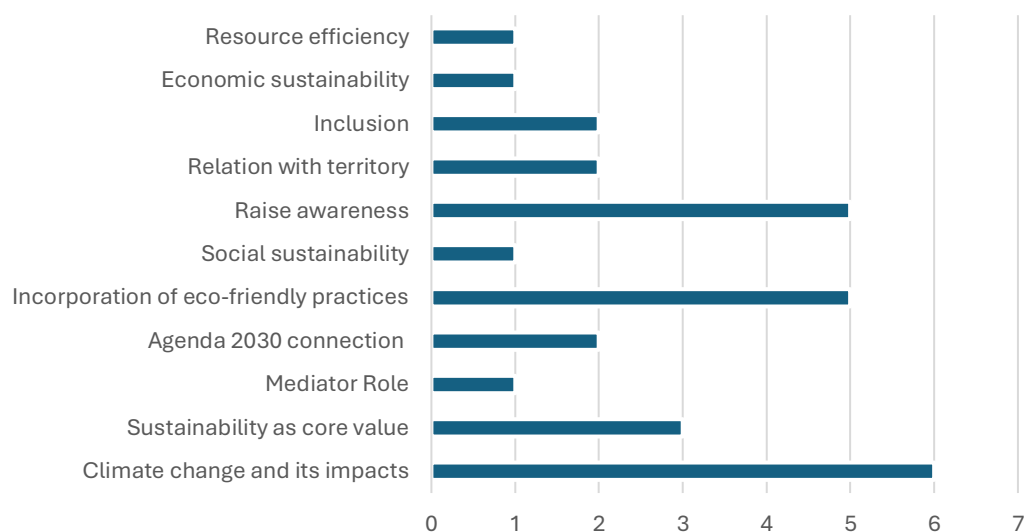


Figure 14. Museums' main goal regarding sustainability and climate change

Climate change and its impact are becoming more and more important to museums, which also have the duty to solve its effects by means of both mitigating and adapting plans meant to lower their carbon footprint. This main objective captures the dedication of museums to sustainability as they follow environmentally friendly policies like waste reduction, energy economy, and support of green technology. Along with operational adjustments, museums are committed to increasing awareness among their visitors and stakeholders, the community about environmental challenges. Viewed as powerful teaching tools that may influence public knowledge of climate action and sustainability, they also reflect on themselves.

For many museums, sustainability is not just a goal for operations but also a basic principle included into their purpose. Often, this dedication fits global models such as the Agenda 2030. Museums also stress relationships to local communities, thereby ensuring that their attempts at sustainability benefit the institution as well as the surrounding areas. Another crucial element is inclusivity and social inclusion as they want to make environmental projects useful and reachable for all.

Apart from these objectives, some museums also concentrate on social sustainability, in which case the advantages of sustainable practices are distributed fairly, and economic sustainability, which entails preserving financial stability while nevertheless being ecologically conscious. Other goals include the need of resource efficiency and the function of museums as mediators, thereby promoting cooperation among several society players on environmental problems.

This analysis shows that museums are dedicated not only to incorporating more general sustainability ideals in their operations, educating the public, and matching

with worldwide sustainability objectives like Agenda 2030 but also to reducing climate change by means of environmentally friendly methods.

### 3.2.3 Valuation of climate effect on the museums

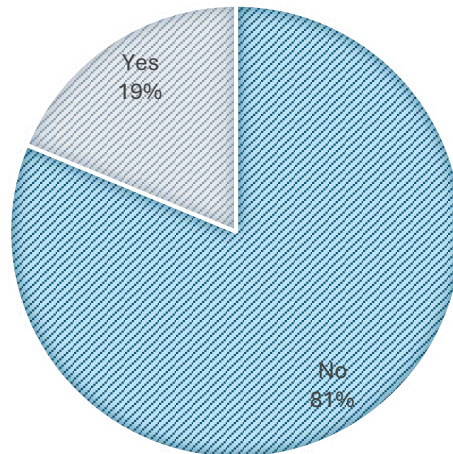


Figure 15. Percentage of museums conducted climate change impact analysis

According to the interview, just 3 out of 16 museums or 19% have studied the effects of climate change on their operations, infrastructure, and holdings. A couple such museums are actively evaluating the hazards climate change presents for their local setting. The Museion Museum in Bolzano has begun recording data on its carbon footprint to gather information that may be useful for future comparisons with other museums. The museum points out that so far it is one of the few to take such action within the AMACI network and hopes that other museums will also follow this example.

Conversely, most (81%) have not yet carried out such a study. It can alert us to a notable disparity in museum knowledge and readiness for climate change.

For example, the Museo dell'Agricoltura e del Mondo Rurale responded that the civil protection plan (Piano di Protezione Civile) does not highlight the specific climate risks associated with the location of the museum. The lack of such guidance from local authorities may mean that museums do not see this as a priority or do not have sufficient resources and knowledge to carry out the analysis themselves.

The museum Macte noted that collecting and analyzing the data would require considerable effort on the part of museum staff, who are already overburdened with ongoing tasks. It was also mentioned that the region in which the museum is located is prone to hydrogeologic risks, but that there are no long-term plans to address these threats

The trend points to a need for more awareness-raising tools and funding to assist museums in doing climate impact studies. By means of such studies, they would be able to better safeguard their assets and create future climate-related plans, therefore assuring the long-term viability of their institutions.

### **3.2.4 The results from actions**

Based on the responses given, 75% of museums have seen favourable outcomes from the environmentally friendly and sustainable adjustments they have already made. This suggests that the efforts of most institutions in fields such waste management, energy consumption reduction, or involving their communities in sustainability projects are clearly yielding real advantages.

Explora, il Museo dei Bambini di Roma, which actively promotes environmental protection and sustainability initiatives, is an example of actions and projects and also the evaluation of the result of its realization. Its green space features a rainwater harvesting system for irrigation and water installations to help conserve resources. The museum also runs environmental projects such as H2O Shore and Eacea Toby's Friends and organises environmental events including Urban Nature with WWF and the European Researchers' Night on Solar Energy.

In addition, the museum actively uses renewable energy, having installed two photovoltaic systems to generate clean energy. Since 2013, the museum has been working with Falcognana Recupero Srl to recycle waste, helping to minimise its environmental impact. The institution is also investing in green infrastructure, installing drainage covers and reducing the use of paper thanks to digitalisation.

As part of its impact assessment, the museum conducted an integral sustainability level analysis in 2023 using the NeXt Impact methodology. Based on the results of the analysis, the museum scored 76.1 points, giving it a high 'A' level ESG rating. This confirms the sustainable status of Explora - Children's Museum of Rome, which is actively implementing sustainability improvements. The highest score was achieved in the social pillar (88.4 points), followed by governance (81.8 points) and ecology (66 points), indicating a balanced approach to sustainability.



Image 4. Explora museum ESG rating (Source: Valutazione d’impatto Sociale di Explora, 2024)

Another museum dedicated to environmental and climatic sustainability by cutting carbon emissions and energy consumption, transitioning to renewable energy sources, and effectively running its buildings is the Museion. Developing a clear energy efficiency plan with an eye on lowering CO2 emissions by thirty percent over the next five years is a crucial aim. Particularly in Area 3, which generates 51 tons of CO2e, the museum intends to put systems in place to track the purchase and logistics of exhibition items, therefore helping to find areas where energy efficiency may be improved. Furthermore, the Museum's plan to shift to a low carbon economy and slow down climate change depends much on the way business travel is scheduled with minimum emissions.

Establishing a 2022 emissions database spanning all three categories—Scope 1, 2, and 3—is the first step toward reaching these targets. Thanks to 100% renewable energy, the Museum will record 13 tons of CO2 under Scope 1 and 0 tons under Scope 2 in 2022. Apart from this, plans call for the introduction of automation systems to regulate show lighting and humidity management in the exhibition halls as well as energy conservation rules. These steps should provide the museum with a 20% decrease in energy use and more pleasant surroundings for visitors and exhibitions, thereby promoting a more conscientious approach of sustainable development in society.

Among the systems for monitoring outcomes in the shape of certification and standards, the Salvatore Ferragamo Museum distinguishes itself. One of the first Italian museums to get the worldwide ISO 14064 accreditation, which guarantees its compliance with greenhouse gas reporting guidelines, This certificate attests to the museum's development of a mechanism to track and balance both direct and indirect emissions, therefore accounting for its emissions. Getting the designation

not only helps the museum's standing as a conscientious institution but also provides a model for other businesses aiming at environmental sustainability. The museum is also engaged in best practices sharing with other corporate museums as part of the initiative, therefore fostering a culture of sustainability and responsibility in business and society.

Four of the sixteen museum employees, nevertheless, claimed they did not yet see any results. This might imply that certain projects need more refining, improved tracking systems, or larger scale to have observable results, or that the effect of sustainability measures could take more time to materialize.

These findings show generally a good trend toward the efficacy of sustainable policies as well as the necessity of certain institutions for more time or help to fully appreciate their efforts.

### **3.2.5 The museums' concerns**

The analysis of the interviews also revealed the problems faced by museums.

Analysis of the interview participants' answers demonstrates that the main obstacle is the lack of specialised staff trained in sustainable development work and climate change issues. Developing and implementing Agenda 2030 programmes requires experts with specific knowledge that is often lacking in museums, and often has not historically been taught in training programmes. This makes it difficult not only to start the process, but also to sustain the programmes over the long term, and at times the level of engagement of museum staff and management.

Also, a significant challenge for museums was identified as a lack of financial resources for organisations. Sustainable projects such as energy saving measures, the introduction of environmentally friendly technologies, events and education projects often require significant initial outlays, which is not always possible for cultural institutions. Also, in the context of maintaining ethical operations, some museums refuse funding from private companies that have a significant impact on the environment and ecosystems. This also implies a reduction in budgetary opportunities for the programmes identified. As a result, in the context of highly constrained budgets (more often in the case of municipal and smaller museums), museums are often faced with a choice between maintaining their core activities and investing in long-term sustainability.



Figure 16. Difficulties for sustainability and climate projects implantation

The Museo dell'Agricoltura e del Mondo Rurale, located in a small municipality, faces limited human and economic resources, which makes it difficult to realise larger-scale projects. Because of these constraints, the museum is often forced to focus on local initiatives and is unable to develop and implement more ambitious programmes that could attract a wider audience or have a significant impact on the community.

Interviewees also raised concerns about the difficulty of tracking sustainability performance as well as climate action. Many museums report that it is difficult to effectively measure, process into a format for data analysis and visualise results. This ultimately leads to less monitoring of success in this area, and less interest and engagement from both staff and managers, as well as external stakeholders. This is due to both the lack of internal and external standards and guidelines and the problem of bureaucratic processes that make it difficult to collect and analyse data.

Additional barriers are as previously emphasised, internal misunderstanding of the problem and resistance and bureaucracy. Implementing sustainable practices requires changes in the organisational structure, which can lead to resistance of employees, lack of cooperation and failure to achieve the goals of the agenda. Bureaucratic procedures, in turn, can slow down decision-making and project implementation. This leads to the fact that even if there is a desire and willingness to change from within, museums are not always able to quickly implement the necessary innovations and practices.

For example, the implementation of environmental initiatives at the Museo di Storia Naturale faces significant challenges due to its structural and organisational characteristics. One key factor is system inertia: large organisations such as Fondazione Musei Civici di Venezia and of which the museum makes part, require

considerable effort and resources for change. Successful implementation of new initiatives requires collaboration between different services, including security and administrative departments, which often slows down the process. In addition, the lack of a unified policy on separate waste collection and disposal leads to a mismatch between theories and practice. For example, despite the availability of information materials on separate collection, the actual actions of staff may contradict these guidelines, resulting in the mixing of waste. In addition, the disconnect between the different groups of staff responsible for environmental practices creates further difficulties. Lack of clear communication and understanding among employees leads to a lack of coordination, which hinders the implementation of sustainable practices. Bureaucratic hurdles also complicate the process, as the need to harmonise initiatives with different administrative structures can cause delays.

An interview with the Pino Collection (Palazzo Grassi - Punta della Dogana) exposes typical problems encountered when trying to change entrenched habits and practices in museums. Conservatism and resistance to change are major obstacles to this, as many staff prefer to stick to established practices that are perceived as more comfortable and safer. This resistance is often linked to cultural aspects of the organisation, where innovation can be perceived as a threat to familiar routines.

In addition, an important technical problem is the condition of museum buildings. Many institutions are in old historical buildings, which makes it difficult to implement modern sustainable solutions. Some museums also face constraints as they do not own the buildings and depend on local municipalities or regional authorities for decision-making, which further complicates and delays the possibility of change.

The building that the Museion is situated in limits its ability to do environmental initiatives. The architectural and infrastructure of the building will need a review of environmental performance when they get outdated. The fact the museum has no ownership, and the building is held by the government compounds the issue. This implies that any notable developments or adjustments have to start and be authorized at the province level.

Simultaneously, the MACTE Museum struggles to sustain and realize its goals due to the unique challenges of running a municipal owned institution. The municipal government is in charge of utilities and maintenance, so reliance on a convoluted bureaucracy result. These administrative restrictions impede a flexible response to the demands of the museum as daily operational problems usually take front stage in long-term planning and intermediate goals.



A comparable and very related problem to the issue of lack of specialised staff is also the severe lack of knowledge in the field of sustainable development and climate change. The results, where only half of the museums responded positively to the question about having sufficient knowledge about the Sustainable Development Goals and climate action in the context of the museum environment, indicate significant gaps in the awareness and preparedness of these institutions. This indicates that many museums are not fully aware of how to apply the principles of sustainable development to their activities and how they can contribute to addressing global climate challenges.

One possible factor in this outcome is the lack of specialised training and information resources within the museum sector. Many staff may not have access to the latest research and practice guidelines that relate to sustainability, limiting their ability to integrate these goals into the day-to-day work of the museum. In addition, despite a general awareness of the need for climate action, the specific characteristics of the museum environment may raise questions about how these global initiatives can be implemented locally.

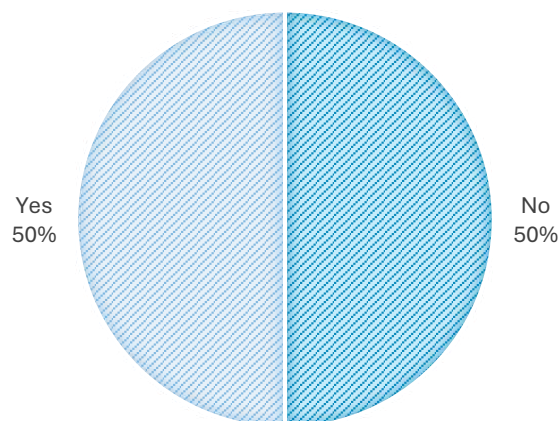


Figure 17. Percentage of museums considering having sufficient knowledge on sustainability and climate change issues

Differences in the size and resources of museums can also influence this outcome. Large museums with larger budgets and staff are likely to be better positioned to leverage knowledge and implement sustainable practices, while smaller institutions face shortages in both finances and staffing to learn and implement SDGs.

This result underlines the need to strengthen educational programmes and cooperation between museums to share experience and knowledge

### 3.2.6 Museum partnerships

Analysing the results of the questions about cooperation, it can be noted that the majority of museums (81%) actively cooperate with external experts in the field of sustainable development and climate action. This indicates a recognition of the need to bring in specialised expertise that may not always be available within the museum itself. Such collaboration helps institutions to develop and implement more effective strategies, which is particularly important in the face of ever-changing climate challenges.

However, despite the high level of collaboration with experts, only 69% of museums are part of networks, or organisations working on sustainability and climate change. This may indicate that some museums, although keen to adopt sustainable practices, do not see the need to actively participate in formal networks. Perhaps they see external consultants as more effective in the short term, or they simply do not have sufficient information about the potential opportunities and benefits of participating in such networks.

Those 19% of museums that do not collaborate with external experts may face limited resources or lack of information about the opportunities for such collaboration. In turn, the 31% of museums not included in sustainability networks are likely to be unaware of the value of such communities for long-term knowledge sharing, collaborative projects and enhancing global contributions to sustainability.

These results highlight the need to raise awareness of the importance of participating in specialised networks that can provide not only access to knowledge but also support in the form of collaborative projects and initiatives. Networking gives museums the opportunity not only to adopt new methods but also to play a more active role in global climate initiatives.

Interviewees also listed some of the networks and companies with whom they make partnerships. The graphic illustrates the arrangement of the networks specified by cultural institutions and museums. One may mostly get from this data the following conclusions. Most often referenced network is the International Council of Museums. This is not shocking as ICOM actively promotes sustainable development by means of its programs and activities and plays a major role in the worldwide museum scene. Among the environmentally conscious networks, ASviS and ANMS (15% each) stand out. This highlights not only the need of sustainability for cultural institutions but also the function of scientific museums, which probably center environmental problems.

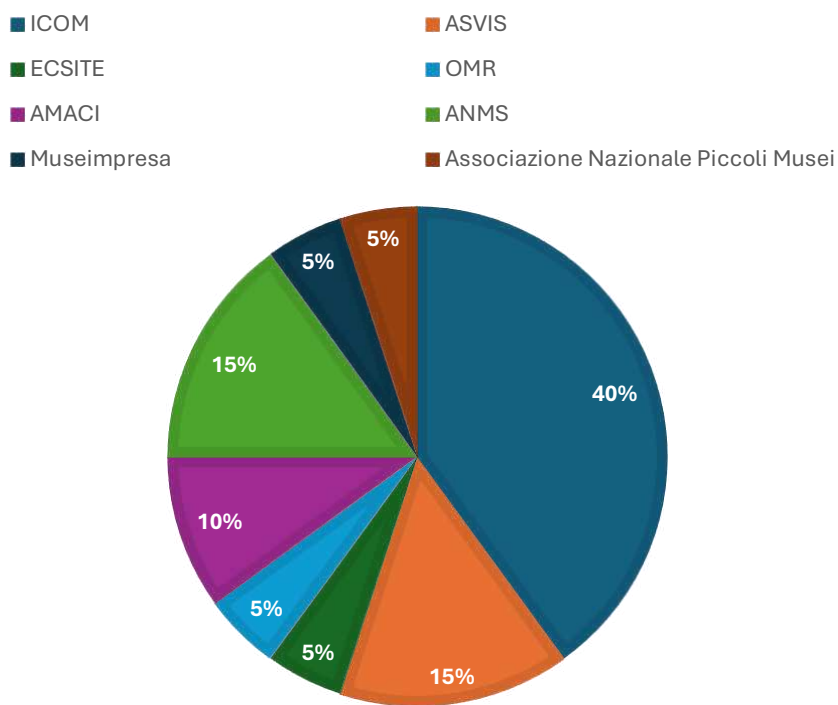


Figure 18. Museum and cultural networks

Also actively participating in the sustainability project is AMACI (10%), which shows the artistic influence on these concerns. Among the surviving networks are those of Museimpresa, Associazione Nazionale Piccoli Musei, OMR, ECSITE (European Network of Science Centres and Museums), and others. These are tiny companies, but they also help museums include environmentally friendly policies.

## **4. Discussion**

### **4.1 Key museum problems in achieving sustainability and climate projects**

The most urgent and important problems influencing the capacity of museums to create projects in the field of environmental sustainability and climate change were found by means of information analysis from the dataset and projects of Italian museums as well as interviews with representatives of the museum sector. Every one of them creates different obstacles that make it challenging to effectively carry out and realize projects in this crucial field.

Tracking project results and effect challenges influence the first-hand absence of data for decision-making to become somewhat evident. The absence of systems to monitor the outcomes and assess the influence of environmental initiatives restricts the capacity of the museum to know the degree of effectiveness of their initiatives. Accurate data helps one to evaluate if carried out initiatives are producing the anticipated social and environmental advantages. Furthermore, many times the projects of museums depend on outside money. They would find it challenging to draw more money and defend the currently allotted cash if they cannot show observable results or influence of their environmental projects.

Furthermore, important is the fact that a museum cannot properly modify its operations and change its approach to get better outcomes without a clear knowledge of triumphs and failures. This results in stagnation when initiatives keep running but without a long-term view and a clear future vision. Of course, at the end of the day, it also frequently results in stakeholders lacking confidence. Ignorance of actual statistics and proof of efficacy could erode the confidence of investors, guests, and colleagues. This makes developing long-term alliances and cooperation challenging to advance initiatives.

Lack of specific understanding about sustainability and trained personnel also have bad effects. Effective development of environmental initiatives depends on personnel with specialized knowledge and experience in sustainable development, climate risk management, environmental management and communication. Museums without such experts find it difficult to carry out thorough environmental plans and initiatives requiring particular knowledge. Without experts, museums might also suffer from poor programme design and execution, ineffective resource management, erroneous environmental calculations or non-compliance with sustainability criteria. Furthermore, I would like to point out that museums devoid of sustainability professionals cannot fully use the possibilities of such initiatives. Important elements like carbon footprint reduction, energy efficiency and eco-education campaigns might be overlooked, for instance.

Sometimes this results in museums without internal knowledge needing to rely on outside consultants. More time is required for harmonization and personnel training; hence this might raise expenses and complicate project execution.

Another issue is that the remainder of the personnel lacks awareness of sustainability, which results in less support and appreciation of the relevance of environmental projects. This lowers the general degree of staff involvement as well as the success of environmental projects.

One should also take note of the second difficulty arising from the personnel of the company. Change may be difficult for staff members who view sustainability initiatives as extra obligations requiring effort or who worry about a loss of consistency in business operations. Internal opposition can impede or slow down the acceptance of new ideas, therefore complicating development. Many times, staff members dispute their relevance or are unaware of how their work influences environmental programs and the objectives of the museum in this sense. This results in a lack of energy and a sluggish approach toward fresh projects.

Clear communication between staff members and management can help to reduce opposition. Staff members who do not know how new environmental projects will be included into their daily routines might either actively or quietly object to their execution.

Staff opposition can ultimately make it difficult to carry out the extensive adjustments required to reach the Sustainable Development Goals. Environmental projects, for instance, can be halted entirely or only partially carried out in response to staff opposition.

These difficulties taken together provide major obstacles for museums trying to undertake initiatives in the domains of environmental sustainability and climate change. The difficulty to properly monitor project results and implications keeps museums from changing their approach and drawing fresh funding. Lack of expert knowledge and staff impedes the creation of quality programs; staff opposition slows down the application of required modifications. Dealing with these difficulties calls for a methodical strategy combining staff involvement, training, and the building of a motivating corporate culture.

Successful implementation of sustainable practices in museums requires addressing these key challenges: lack of knowledge and specialised staff, lack of support and strategic direction, as well as internal resistance from staff and difficulties in monitoring and tracking the processes and outcomes of actions.

## **4.2 Recommendations for the improvements**

### **4.2.1 Building knowledge and support**

It is important for museum management to develop a sustainability policy that integrates environmental goals as key long-term priorities. This will help staff and stakeholders to understand the importance of sustainability in strategic management. In addition, co-operation with local and national authorities needs to be established and increased to gain legislative and policy support for sustainable projects. Museums can actively advocate for policy change by promoting sustainability initiatives at local and national levels. To do this, it is important to propose pilot environmental projects to the government that can serve as a model for other cultural institutions. Lack of knowledge and skills also needs to be addressed through training and exchange of experience. Museums can organise regular trainings and workshops for staff that will cover key aspects of sustainable development: resource management, energy efficiency and recycling. At the same time, Museums can encourage their staff to obtain specialised diplomas and certificates by offering tuition reimbursement or creating career opportunities in this field.

In addition, museums can develop their own sustainability training manuals or guidelines that cover all aspects of the topic. These materials could include examples of successful projects, tips on energy conservation and reducing carbon footprints.

It is certainly also an option to add at least one specialist to the team who has a specialised education or experience in the field of sustainable development. Such a person can become the coordinator of all environmental initiatives of the museum. He or she can also facilitate the creation of teams of employees from different departments of the museum (exhibitions, finance, marketing, building management) who will work together on sustainability projects. Combining knowledge and expertise from different areas will improve results. If the museum does not have the capacity to develop its own specialists, it can invite external consultants to help develop a sustainability strategy and train staff. These professionals can provide periodic training and help with planning.

Partnerships with educational and environmental organisations also play a key role. Cooperation with universities, research centres and NGOs will allow museums to receive expert support and advice, while knowledge exchange programmes with other museums will help them learn from successful cases. Also, a factor in developing the educational environment is that museum staff can attend industry conferences on sustainability, ecology and cultural institutions. This will help them

keep abreast of the latest trends and share experiences with colleagues. And in doing so, museums themselves can run their own sustainability workshops and conferences, inviting experts, other museum staff and the public. This will not only improve staff knowledge, but also create additional opportunities for partnerships and raising awareness of the topic.

#### **4.2.2 Empowering and engaging staff**

As was already mentioned, giving staff members thorough knowledge about what sustainability is, why it is relevant for the museum, and how the application of such practices will help not only society but also the institution itself and its employees fight internal resistance in an organization.

Still, employee engagement and leadership may be encouraged. First, when planning these elements, let every staff member express their worries or suggestions for applying environmentally friendly methods. One can accomplish this by means of surveys, focus groups, or in-person meetings. This method enables individuals to participate actively and feel significant during the process. Managers should also clearly outline sustainability aims and objectives and show how they complement the general direction of the museum.

Encouragement of staff members to provide suggestions for bettering the environmental policies of the museum may also assist to lower opposition and boost inspiration. Simultaneously, the adoption of fresh ideas should be encouraged by adaptability and chance for experimentation. Staff members' anxiety of new techniques decreases when they understand that mistakes are expected of course in the learning process.

Important too include openness and a clear definition of change. The change process must be explained together with how it will affect everyday tasks of staff members and what tools or assistance will be given to facilitate the shift? Employees should realize all phases of the implementation and avoid unanticipated challenges. As it is crucial to provide a staged strategy to enable staff members to adjust to the innovation, following a clear and slow implementation plan will assist to lower more resistance to the change.

#### **4.2.3 Measuring and celebrating success**

Of course, consistent observation of development supports all the mentioned projects. Monitoring the outcomes of sustainability projects in museums is a crucial activity that helps not only to assess the success of the carried out activities but also to modify them to get the optimal outcomes. Performance indicators (KPIs) include

carbon footprint, energy and water use, and waste recycled amount are among important instruments. These statistics let museums evaluate their activities' effects on the surroundings and find areas for development.

Important too are environmental audits and sustainability certifications as LEED or ISO 14001. This allows museums to inspire themselves to keep on and acknowledge their environmental successes. Apart from this, consistent sustainability reports help museums to record their achievements in resource management and let the public and partners know about their triumphs.

Tracking development depends much on digital technologies. Dashboards for data visualisation, resource consumption monitoring systems, and dedicated carbon footprint management tools help to provide more accurate and easily available analysis. This lets museums change their plans and enhance procedures fast.

Apart from internal evaluations, visitor involvement is a crucial sign of the effectiveness of sustainable projects. Through digital technology including Wi-Fi and Bluetooth monitoring as well as social media activity tracking, museums may monitor visitor behavior. Gamification and interactive display components also serve to more fully involve viewers and encourage favorable impressions of environmental issues.

Tracking the outcomes of sustainability initiatives at museums successfully calls for a tiered strategy. This covers qualitative elements such tourist involvement and community effect as well as quantitative ones as resource monitoring and auditing. Such a combined strategy helps museums not only to produce sustainable outcomes but also to effectively show their successes to the world.



## 5. Conclusion

Based on the findings of this study, it is reasonable to conclude that Italian museums play an important role in advancing the environmental and climatic agendas through cultural, educational, social, and organizational activities. In the nowadays context of the global environmental crisis caused by climate change, pollution, and biodiversity loss, museums face several environmental and financial hazards. At the same time, these institutions may play an important role in boosting public knowledge and engagement in resolving these concerns.

At the global level, international organizations, particularly UNESCO and ICOM, are actively pushing the creation of sustainable development strategies in the cultural and museum sectors. The European Union's regional programs stress the importance of integrating cultural heritage within the larger contexts of sustainable development and climate change. These programs assist museums in not only preserving cultural legacy, but also promoting social and environmental responsibilities.

The study used ICOM Italia's dataset data to analyze museums' sustainability programs, and interviews with museum officials were performed to identify the important internal and external elements impacting the execution of these efforts. According to the findings, Italian museums are actively involved in the implementation of sustainable practices, and their efforts to educate the public and execute environmental initiatives have a considerable influence at the local, regional, and national levels.

Interviews with museum representatives identified many main impediments to the adoption of sustainable practices. One of the significant difficulties is a lack of finance, which restricts museums' capacity to modernize equipment and deploy creative methods to regulate energy usage and minimize carbon emissions. Furthermore, a shortage of specialist workers with sustainable development capabilities makes it difficult to properly implement environmental projects. Some museums lack methods for monitoring and documenting the outcomes of environmental programs, making it impossible to evaluate their contribution to climate change mitigation and sustainability.

Public perception of museums' roles is also a barrier: many institutions are concerned that active participation in the environmental agenda would politicize their operations and divert visitors away from the mainstream cultural setting. A lack of sector leadership and coordination, as well as insufficient support from museum management and trustees, impedes the successful adoption of sustainable practices.

To maintain success in environmental sustainability, museums must address existing issues by enhancing teamwork and utilizing supplementary resources. Recommendations to enhance museum sustainability and their engagement with environmental and climate issues encompass broadening partnerships to utilize funding and expertise for environmental strategy development, augmenting staff skills and knowledge regarding environmental and climate matters, refining monitoring and reporting systems to evaluate performance, and adjusting environmental policies accordingly.

The study can be developed in several different ways. Firstly, the expansion of the prototype database provided by ICOM Italy and its continuous updating would be advantageous. This would result in the generation of a substantial amount of data on the activities of museums in Italy and would also allow participants to gain new insights and familiarize themselves with project options that they could adapt. Furthermore, it is possible to develop the research by expanding the base of in-depth interviews with representatives of museums and cultural specialists, including organisations from small-sized communities and regions in the center and south of the country.

In conclusion, Italian museums significantly contribute to environment sustainable development, with their initiatives in education, resource management, and social responsibility positioning them as key participants in the worldwide environmental movement. Continuing to integrate sustainability concepts into the cultural domain is essential to optimize their beneficial effects on society and the environment.

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## 8. Annex

Museum	City	Region	Status	Areas of activity
Museo Statale tattile Omero	Ancona	Marche	State	Art
Forte di Bard	Bard	Aosta Valley	Regional	Art /Natural science
GAMeC	Bergamo	Lombardy	Public-private	Contemporary art
Reggia di Caserta	Caserta	Campania	State	Art
Museo Benozzo Gozzoli	Catelfiorentino	Tuscany	Municipal	Art
Museo del Bali	Colli del Metauro	Marche	Public-private	Natural science
Museo di Storia Naturale di Ferrara	Ferrara	Emilia-Romagna	Municipal	Natural science
Museo Nazionale dell'Ebraismo italiano e della Shoah	Ferrara	Emilia-Romagna	State	History
Gallerie degli Uffizi	Florence	Tuscany	State	Art
Gallerie dell'Accademia	Florence	Tuscany	State	Art
Museo Novecento	Florence	Tuscany	Municipal	Art
Museo Salvatore Ferragamo	Florence	Tuscany	Private	Corporative
Museo della Storia della Città di Genova	Genoa	Liguria	Municipal	History
Museo Naturale della Maremma	Grosseto	Tuscany	Municipal	Natural Science
MUSMED - Museo di Storia Naturale di Livorno	Livorno	Tuscany	Provincial	Natural Science
Museo delle Maschere Mediterranee	Mamoiada	Sardinia	Cooperative	Ethnographic
Fondazione Palazzo Te	Mantua	Lombardy	Municipal	Art
MuBa	Milan	Lombardy	Private	Children education
Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci	Milan	Lombardy	State	Natural Science
Museo Poldi Pezzoli	Milan	Lombardy	Public-private	Art



Museo della Biodiversità	Monticiano	Tuscany	Public-private	Natural Science
Museo Guatelli	Ozzano Taro Collecchio	Emilia-Romagna	Regional	Ethnographic
Orto botanico di Padova	Padua	Veneto	University	Botanical garden
Fondazione Museo del Tessuto di Prato	Prato	Tuscany	Regional	Arte
Musei Civici di Reggio Emilia	Reggio Emilia	Emilia-Romagna	Municipal	Art Archeological Natural Science Ethnographic
Museo dell'Agricoltura e del Mondo Rurale	Reggio Emilia	Emilia-Romagna	Regional	Ethnographic
Museo Universitario Gemma	Reggio Emilia	Emilia-Romagna	University	Natural Science
Explora - Il museo dei bambini di Roma	Rome	Lazio	Cooperative	Children education
Galleria Borghese	Rome	Lazio	State	Art
Galleria Nazionale d'Arte Moderna e Contemporanea	Rome	Lazio	State	Contemporary art
MaXXI - Museo delle arti del XXI secolo	Rome	Lazio	State	Contemporary art
Palazzo Barberini	Rome	Lazio	State	Art
Museo della Canapa	Sant'Anatolia di Narco	Umbria	Municipal	Ethnographic
MUSE - Museo delle Scienze	Trento	Trentino-Alto Adige	Provincial	Natural Science
Museo storico e Castello di Miramare	Trieste	Friuli-Venezia Giulia	State	History
Castello di Rivoli Museo d'Arte Contemporanea	Turin	Piedmont	Metropolitan	Contemporary art
MAcA	Turin	Piedmont	Public-private	Natural Science
Museo del Risparmio	Turin	Piedmont	Private	Corporative
Museo diffuso della resistenza	Turin	Piedmont	Metropolitan	History

Museo Egizio di Torino	Turin	Piedmont	State	History
Polo del '900	Turin	Piedmont	Metropolitan	Education
Museo Etnografico del Friuli	Udine	Friuli-Venezia Giulia	Municipal	Ethnographic
Museo Friulano di Storia Naturale	Udine	Friuli-Venezia Giulia	Municipal	Natural Science
La Venaria Reale	Venaria	Piedmont	State	History
Fondazione Musei Civici di Venezia	Venice	Veneto	Municipal	Art Archeological Natural Science Ethnographic
M9 - Museo del '900	Venice	Veneto	Public-private	Ethnographic
Palazzo Grassi - Punta della Dogana	Venice	Veneto	Private	Contemporary art

Table 1. Museums represented in the dataset sample

<b>Museum</b>	<b>City</b>	<b>Region</b>	<b>Status</b>	<b>Dedication</b>	<b>Person</b>	<b>Position</b>
Explora, il Museo dei Bambini di Roma	Rome	Lazio	Cooperative	Children education	Patrizia Tomasich	Director
MUSE - Museo delle Scienze	Trento	Trentino-Alto Adige	Provincial	Natural Science	Massimo Bernardi	Deputy Director
MACTE - Museo di Arte Contemporanea di Termoli	Termoli	Molise	Public-private	Contemporary art	Caterina Riva	Director
Museion	Bolzano	Trentino-Alto Adige	Public-private	Contemporary art	Bart van der Heide	Director
Museo della Bora	Trieste	Friuli-Venezia Giulia	Private	Natural Science	Rino Lombardi	Director
Immaginario Scientifico Trieste - Museo della Scienza	Trieste	Friuli-Venezia Giulia	Cooperative	Natural Science	Raffaella Orzan	Research and Development Manager
MANN (Museo Archeologico Nazionale di Napoli)	Naples	Campania	State	Archeological	Antonella Carlo	Communication Office Manager
Museo Salvatore Ferragamo	Florence	Tuscany	Private	Fashiom	Stefania Ricci	Director
Palazzo Grassi - Punta della Dogana - Collection Pinault	Venice	Veneto	Private	Contemporary art	Ester Baruffaldi	Educational Services Manager
Fondazione Orestiadi Onlus	Gibellina	Sicily	Public-private	Contemporary art	Elena Andolfi	Educational services and library Manager
Museo Friulano di Storia Naturale di Udine	Udine	Friuli-Venezia Giulia	Municipal	Natural Science	Paola Visentini	Head of Organisational Unit
Collezione Peggy Guggenheim	Venice	Veneto	Private	Contemporary art	Karole Vail	Director
Museo di Montebelluna	Montebelluna	Veneto	Municipal	Natural Science	Giorgio Vaccari	Naturalist Conservator

Museo dell'Agricoltura e del Mondo Rurale	Reggio Emilia	Emilia-Romagna	Regional	Ethnographic	Giulia Guidetti	Curator
Museo di Storia Naturale di Venezia Giancarlo Ligabue	Venice	Veneto	Municipal	Natural Science	Luca Mizzan	Director
Galleria Borghese	Rome	Lazio	State	Art	Agnese Murrari	Architect

Table 2. Museum interview participants