GreenHeritage

The Impact of Climate Change on the Intangible Cultural Heritage

Deliverable D 2.2

GreenHeritage

Primary and secondary data research findings

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EXECUTIVE SUMMARY

This report, D2.2 “Primary and secondary data research findings”, summarises the research work carried out within the project “The Impact of Climate Change on the Intangible Cultural Heritage” (GreenHeritage, ERASMUS-EDU-2022-PI-FORWARD-LOT1, GA No. 101087596). The GreenHeritage project aims at developing a holistic, innovative, and inclusive approach toward direct and indirect CC impact on ICH. Until recently, this problem has received quite scant attention. Developed as part of the WP2 “Needs analysis & development of GreenHeritage Methodology”, with its overall aim of capturing data regarding the impact of CC on ICH and existing adaptation practices across the EU and in partner countries, it presents the results of the project tasks T2.1 “Needs analysis” and T2.2 “Mapping of existing practices”. The report has been carried out by ILFA, the WP2 leader, in cooperation with project partners, CNR, CUEBC, CMCC, FSMLR, and UAEGEAN, who all have made an intellectual contribution to the set of the case studies.

These specific objectives of the WP2 have been considered when designing the study:

- take stock of different definitions of ICH at national (Greece, Italy, Latvia and Spain) and EU levels and consider a common definition;
- capture data in partner countries and across the EU regarding types of threats to ICH linked to CC;
- provide a causal link or probability of causation between CC and ICH degradation;
- detect and map existing management, conservation, and protection practices across the EU.

This document presenting the primary and secondary data research findings consists of the following major sections:

- analysis of current ICH definitions;
- methodological overview of primary and secondary data retrieval;
- 14 case studies;
- summary of the survey;
- overview of awareness of CC problems in UNESCO lists and national inventories;
- CC threats to ICH;
- adaptation to CC: existing practices, national and EU policies.

This research is primarily addressed to the GreenHeritage project partners, CNR, CUEBC, CMCC, FSMLR, ILFA, and UAEGEAN, for the complementary implementation of further activities. Inter alia, it will serve the objectives of T2.3 “Development of methodology” and other working groups: WP3 “GreenHeritage ICT tools”; WP4 “GreenHeritage course: Blended-learning & Microcredentials”; WP5 “Policy dialogue, dissemination and exploitation”. However, the document is relevant for other ICH and CC researchers, other academics and university students, ICH communities and stakeholders from outside the communities, policy makers at both the national and EU levels.

Introduction

1. Document Organization

The present document is organized in the following sections:
Section 2: an analysis of international and national conceptualization and definitions of ICH
Section 3: an overview of primary and secondary data retrieval methodology and sources; approaches to data analysis
Section 4: a set of case studies from the GreenHeritage project partner countries (Greece, Italy, Latvia, and Spain) and beyond
Section 5: summarizes the online survey "The Impact of Climate Change on the Intangible Cultural Heritage"
Section 6: presents the CC threats to ICH identified in UNESCO lists and national inventories as well as in the EU countries' periodic reporting under UNESCO's 2003 Convention for the Safeguarding of the Intangible Cultural Heritage
Section 7: summarizes the major CC threats to ICH
Section 8: an analysis of mitigating CC threats to ICH in EU countries: existing practices, national and EU policies
Section 9: concluding remarks

2. Reference Documents

Document name	Reference number
GreenHeritage – Annex 1: Description of Work	Grant Agreement No. 101087596
GreenHeritage – Project Management Plan	Deliverable D1.2
GreenHeritage – Privacy and Open Data policy and procedures	Deliverable D1.7
GreenHeritage – Research Protocol	Deliverable D2.1

3. Acronyms and Abbreviations

Acronym	Description
AdaPT Mont-Blanc	Adapting Territorial Planning to Climate Change in the Mont-Blanc region
AM	Before noon
Art.	Articul
BC	Before Christ
C	Celsius
CAI	Italian Alpine Club (Club Alpino Italiano)
CAP	Common agricultural policy
CC	Climate Change
CCAMM	Climate Change Impacts on Alpine Mass Movements
CH	Cultural Heritage
Cm	Centimetres

CMCC	Foundation Euro-Mediterranean Centre on Climate Change
CMO	Common Market Organisation
CNR	National Research Council (Italy)
CO	Confidential
CO2	Carbon dioxide
COVID-19	Coronavirus
CS	Case study
CUEBC	European University Centre for Cultural Heritage
D	Deliverable
DKK	Danish krone
DNA	Deoxyribonucleic acid
DUP	Documento Unico di Programmazione (Single Programming Document)
EC	European Commission
EDYTEM	Mountain Environments, Dynamics and Territories (Environnements, Dynamiques et Territoires de Montagne)
EEA	European Environmental Agency
EEC	European Economic Community
e. g.	For example
ERASMUS-EDU-2022-PI-FORWARD-LOT1	Erasmus+ Programme, Partnerships for Innovation - Forward-Looking Projects - Cross-sectoral priorities
et al.	et alia (Latin), 'and others'
etc.	et cetera (Latin), 'and so forth'
EU	European Union
EUR	Euro
FACE	Free-Air Carbon dioxide Enrichment
FICLU	Federazione Italiana dei Club e Centri per l'UNESCO (Italian Federation of UNESCO Clubs and Centres)
FIUC	Fédération Internationale des Universités Catholiques (The International Federation of Catholic Universities)
FSMLR	Foundation of Historical Heritage of Santa María la Real
Ha	Hectare
HERACLES	Heritage Resilience Against Climate Events on Site
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICH	Intangible Cultural Heritage
ICOMOS	International Council on Monuments and Sites
ICPI	Istituto Centrale per il patrimonio immateriale (Central Institute for Immaterial Heritage)
ICT	Information Communication Technology
ILFA	Institute of Literature, Folklore and Art of the University of Latvia
IMDEA	Madrid Institute for Advanced Studies
INAH	Instituto Nacional de Antropologia and History (National Institute of Anthropology and History of Mexico)
IPCC	Intergovernmental Panel on Climate Change, United Nations
Kg	Kilogram
Km	Kilometre
KNMI	The Royal Netherlands Meteorological Institute

KNSB	Koninklijke Nederlandse Schaatsenrijders Bond (Dutch Ice Skaters Union)
LIFE	The LIFE Programme (EU's funding instrument for the environment and climate action)
LIFE Natura 2000 Value Crete	Awareness-raising for ecosystem services in areas of the Natura 2000 Network in Crete
LIVIND	Creative and living cultural heritage as a resource for the Northern Dimension region project
MedINA	The Mediterranean Institute for Nature and Anthropos
mg	Milligrams
MIC	Ministero della cultura (Italian Ministry of Culture)
mm	Millimetres
Mosel-AdapTiV	Klimawandel und Anpassungshandeln von Tourismus und Weinbau in einer Mosel-kommune (Climate change and adaptation actions of tourism and viticulture in a Mosel municipality)
Mr.	Mister
n.d.	No date
NGO	Non-Governmental Organization
No.	Number
OSPAR	OSPAR Convention
P.	Page
PCI	Projects of Common Interest
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PLANALP	Platform on Natural Hazards of the Alpine Convention
PM	After noon
PO	Project Officer
Pp.	Pages
PP	Restricted to other programme participants
P.R.O.S.I.T.	Planning and restoring of Cinque Terre coastal traditional agricultural landscape 2001-2004
PU	Public
RDP	Rural Development Plan
RE	Restricted to a group specified by the consortium
ReadLab	Research Innovation and Development Lab
St.	Saint
T	Task
TT&RR	Transhumance Trails and Rural Roads
UAEGEAN	University of the Aegean
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UPV	Universitat Politècnica de València (Valencia Polytechnic University)
WP	Work package
WSL	Swiss Federal Institute for Forest, Snow and Landscape Research (Die Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft)
WWF	World Wide Fund for Nature

Section 2: Definition of Intangible Cultural Heritage

Intangible cultural heritage is one of the core concepts used in the GreenHeritage project, which merits providing some initial insights into its definition. There is a common international reached consensus on what this concept means; however, there are also certain variations of its definition at the national level. Instead of being contrary to the international definition, these variations mostly provide some additional specificity regarding the domains of intangible cultural heritage (ICH).

In the context of the GreenHeritage project, aspects related to nature and environment, including references to sustainable development and climate change (CC), will be highlighted in the following definitions of ICH, and in some broader insights into a common European understanding of cultural heritage.

1/ International definitions

Intangible cultural heritage is a concept the global outreach of which is grounded in the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003). Although this term, with variations, has been used also previously by some states in their national laws (Vaivade 2020: 209), the UNESCO Convention is a global major reference for the common international understanding of intangible cultural heritage.

Furthermore, 181 States Parties of the Convention have accepted this definition, even if it may have some slight variations in national laws and policies. The definition of ICH provided in the UNESCO 2003 Convention reads as follows:

> "1. For the purposes of this Convention, 1. The "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts, and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity. For the purposes of this Convention, consideration will be given solely to such intangible cultural heritage as is compatible with existing international human rights instruments, as well as with the requirements of mutual respect among communities, groups, and individuals, and of sustainable development.
>
> 2. The "intangible cultural heritage", as defined in paragraph 1 above, is manifested inter alia in the following domains: (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; (b) performing arts; (c) social practices, rituals, and festive events; (d) knowledge and practices concerning nature and the universe; (e) traditional craftsmanship. [...]"

About the domains of ICH, as named in the UNESCO 2003 Convention's definition of ICH, "knowledge and practices concerning nature and the universe" is recognized as a separate domain. During drafting the Convention, it was preliminarily named as "cosmologies and knowledge systems; beliefs and practices about nature" (Ubertazzi 2020: 73). This domain, as formulated in the Convention, is now seen as the one that "most clearly contributes to sustainable development through the sustainable management and use of natural resources" (Blake 2006: 38, cited in Ubertazzi 2020: 76).

From 676 elements on UNESCO Lists of Intangible Cultural Heritage and the Register of good safeguarding practices, 245 elements are such where this domain has been selected as relevant at the time of nominating elements. However, the number of elements that are concerned by changes in environment and nature are more than that, if not all.

Additionally, when addressing the issues of education in the Convention, it is stated that "Each State Party shall endeavour, by all appropriate means, to: [...] promote education for the protection of natural spaces and places of memory whose existence is necessary for expressing the intangible cultural heritage."

In the European region, the Council of Europe and European Union address the field of cultural heritage through policies and legal instruments, and both provide an interpretation of cultural heritage. However, none of these organizations provides an alternative version for defining ICH, but instead uses the concept, while relying on its globally adopted definition and common understanding. With regard to general views on cultural heritage, including intangible cultural heritage, the core reference concerning the Council of Europe is Council of Europe Framework Convention on the Value of Cultural Heritage for Society (2005), according to which:

> "For the purposes of this Convention, a cultural heritage is a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge, and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time."

As for the European Union, the most significant reference with regard to policy-making where an understanding of cultural heritage, including intangible cultural heritage, is provided is the Communication 'Towards an integrated approach to cultural heritage for Europe' by the European Commission (2014):

> "Europe's cultural heritage, both tangible and intangible, is our commonwealth our inheritance from previous generations of Europeans and our legacy for those to come. It is an irreplaceable repository of knowledge and a valuable resource for economic growth, employment, and social cohesion. It enriches the individual lives of hundreds of millions of people, is a source of inspiration for thinkers and artists, and a driver for our cultural and creative industries. Our cultural heritage and the way we preserve and valorise it is a major factor in defining Europe's place in the world and its attractiveness as a place to live, work, and visit. Cultural heritage is a shared resource, and a common good. [...]"

This definition does not provide a direct reference neither to nature, nor to environment (more on ICH within EU policies see: Schreiberg 2019). However, the document encompasses a clear indication of the relevance of climate change for future existence of heritage, as well as the importance of natural environments for its use and its community-oriented management.

> "Global warming and climate change, in particular rising sea levels and the increased occurrence of extreme weather events, can put cultural heritage at risk. [...]
>
> Thanks to the attractiveness of their urban and natural environments, heritage sites often host clusters of cultural and creative industries. Much of Europe's cultural heritage is also embedded in rural areas and remote regions, often closely linked with the natural

> environment; here innovative forms of community-oriented management can greatly improve their economic and social potential. [...]
>
> Furthermore, research and innovation are carried out on strategies, methodologies and tools needed to enable a dynamic and sustainable cultural heritage in Europe in response to climate change and natural hazards and disasters."

These definitions and conceptual elaborations on ICH, and on cultural heritage more broadly, witness an overall recognition of the importance of nature and environment for the existence of ICH, and for its use as a resource and as a common good. The interaction between people and nature, environment, and places is an overall recognized component in the international conceptualization of ICH. This interaction is seen as a source for the creation and recreation of such heritage.

In addition, the interdependence between people, their heritage and nature are recognized early in the text of the UNESCO 2003 Convention, namely its preamble. There it is stated that this Convention is adopted "Considering the deep-seated interdependence between the intangible cultural heritage and the tangible cultural and natural heritage". This consideration influences the interpretation of the definition provided and constitutes the concept of ICH more broadly. Furthermore, requirements of sustainable development are integrated in the definition itself as a borderline for any international recognition of ICH. In other words, only such elements that correspond to sustainable development may be recognized as ICH.

2/ National definitions

Within the framework of the GreenHeritage project, a closer insight is further provided into mentioning and defining ICH at the national level in the four countries of project partners - Greece, Italy, Latvia, and Spain, with a focus on their national legislations. It is to be noted that additional legislative sources may be found at regional and local municipal levels; however, this will remain beyond the insights provided in the present study.

A/ Greece

In national legislation in Greece, the ICH is mentioned as part of cultural heritage, without providing further definition. In the Law on the Protection of Antiquities and Cultural Heritage, in General (2002) it is stated that:

> "The cultural heritage of the Country consists of the cultural assets located within the borders of the Greek territory, including the territorial waters, as well as within other sea zones on which Greece has relevant jurisdiction in accordance with the international law. Cultural heritage also includes intangible cultural assets." [*official translation*]

B/ Italy

In the case of Italy, the Code of Cultural Heritage and Landscape (2002) is primarily dealing with tangible cultural heritage, and provides reference to ICH under the concept of expressions of collective cultural identity. According to this Code:

> "The expressions of collective cultural identity covered by the UNESCO Conventions for the Safeguarding of the Intangible Cultural Heritage and for the Protection and Promotion of the Diversity of Cultural Expressions, adopted in Paris on 3 November 2003 and 20 October 2005, are subject to the provisions of this Code when they are represented by

> material testimonies and comply with the conditions and prerequisites for the applicability of Article 10." [*unofficial translation*]

Thereby, at the national level in Italy, no alteration is proposed to the definition provided in the UNESCO 2003 Convention (adopted in Italy in 2007), while using the reference to the Convention only in relation to and as complementary to the tangible cultural heritage (more on Italian case, see: Broccolini 2013 and Petrillo 2019).

C/ Latvia

In the case of Latvia, the definition of ICH is almost fully based on the one provided within the UNESCO 2003 Convention. According to the Intangible Cultural Heritage Law (2016):

> "Intangible cultural heritage - a part of the cultural heritage of Latvia, which represents the cultural traditions of Latvia and consists of the knowledge, skills, values and behaviour models passed down from generation to generation, defined by the surrounding environment and developed by interaction with history, nature and creativity, including oral traditions and expressions, performing arts, social practices, rituals, festive events, knowledge concerning nature and the universe, traditional craftsmanship, as well as instruments, objects, artefacts and cultural spaces associated therewith." [*official translation*]

D/ Spain

In Spain, Law on Intangible Cultural Heritage Safeguarding (2015) stipulates that:

> "The following shall be considered as intangible cultural heritage: the practices, representations, expressions, knowledge and skills that communities, groups and, in some cases, individuals recognise as part of their cultural heritage, in particular: (a) oral traditions and expressions, including linguistic modalities and particularities as a vehicle of intangible cultural heritage; as well as traditional toponymy as a tool for the concretisation of the geographical denomination of territories; b) performing arts; c) social practices, rituals and festive events; (d) knowledge and practices relating to nature and the universe; (e) traditional craft techniques; (f) gastronomy, cooking and food; (g) specific uses of natural landscapes; (h) forms of collective socialization and organizations; (i) sound manifestations, traditional music and dance." [*unofficial translation*]

In this definition, the domain of "specific uses of natural landscapes" is complementary to the list of domains identified in the UNESCO 2003 Convention. However, it is to be underlined that the list provided in the named Convention is defined as non-exhaustive, and thereby States Parties are welcome to identify complementary domains if deemed relevant (more on Spanish and Latvian cases see: Ābele 2020).

Regarding the recognition of the importance of nature and environment, and the interaction and interdependence between people and their natural surroundings, the cited national definitions follow the approach undertaken within the UNESCO 2003 Convention. When it comes to a common definition and understanding of ICH, the consensus reached in the definition provided within the UNESCO 2003 Convention, seems to be still of relevance. National variations are welcome to reflect specificities, including the differences of environments and the history of interacting with nature. Thereby, in the context of GreenHeritage project the definition of ICH provided within the UNESCO 2003 Convention is used as basis, without going into the detail of a list of domains, which may vary from one country to another, and integrating therein the notion of "a deep-seated interdependence between the intangible cultural heritage and the tangible cultural and natural heritage", recognized within the Preamble of the named Convention. Thus, the ICH means -

> **Practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts, and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. Communities and groups in response to their environment, their interaction with nature and their history constantly recreate this intangible cultural heritage, transmitted from generation to generation. It provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity, and it is rooted in a deep-seated interdependence between the intangible cultural heritage and the tangible cultural and natural heritage.**
>
> **Consideration will be given solely to such intangible cultural heritage as is compatible with existing international human rights instruments, as well as with the requirements of mutual respect among communities, groups, and individuals, and of sustainable development.**

The GreenHeritage project puts the interdependence between the intangible cultural heritage and respective natural surroundings, resources, and conditions, including climate, at the forefront of future perspectives for safeguarding intangible cultural heritage. Thereby, the recognition of the named interdependence is of utmost relevance as a significant component for building our common understanding of intangible cultural heritage.

References

Ābele, L. (2020). Translating the 2003 Convention into National Laws. In: Cornu, M., A. Vaivade, L. Martinet, C. Hance. *Intangible Cultural Heritage Under National and International Law. Going Beyond the 2003 UNESCO Convention.* Edward Elgar. Pp. 134–143. Available at: https://doi.org/10.4337/9781839100031.00019

Blake, J. (2006). *Commentary on the 2003 UNESCO Convention on the Safeguarding of the Intangible Cultural Heritage*. Institute of Art and Law.

Broccolini, A. (2013). Intangible Cultural Heritage Scenarios within the Bureaucratic Italian State. Bendix, R. F., A. Eggert, A. Peselmann (Eds.). *Heritage Regimes and the State.* Göttingen University Press. Pp. 283–301. Available at: https://books.openedition.org/gup/395

Petrillo, P. L., T. Scovazzi, and B. Ubertazzi (2019). The Legal Protection of Intangible Cultural Heritage in Italy. In: Petrillo, P. L. (Ed.). *The Legal Protection of the Intangible Cultural Heritage: A Comparative Perspective.* Springer. Available at: https://doi.org/10.1007/978-3-319-72983-1

Schreiberg, H. (2019). Intangible Cultural Heritage, Europe, and the EU: Dangerous Liaisons? Jakubowski, A., K. Hausler and F. Fiorentini (Eds.). *Cultural Heritage in the European Union. A Critical Inquiry into Law and Policy*. Brill. Pp. 324–364. Available at: https://doi.org/10.1163/9789004365346_015

Ubertazzi, B. (2020). Article 2(2): Manifesting Intangible Cultural Heritage. In: Blake, J., L. Lixinski (Eds.). *The 2003 UNESCO Intangible Heritage Convention. A Commentary*. Oxford University Press. Pp. 58–80. Available at: https://opil.ouplaw.com/display/10.1093/law/9780198824787.001.0001/law-9780198824787-chapter-5

Vaivade, A. (2020). Article 13: Other Measures for Safeguarding: Developing Intangible Cultural Heritage Policies and Legislation at the National Level. In: Blake, J., L. Lixinski (Eds.). *The 2003 UNESCO Intangible Heritage Convention. A Commentary.* Oxford University Press. Pp. 199–216. Available at: https://opil.ouplaw.com/display/10.1093/law/9780198824787.001.0001/law-9780198824787-chapter-15

Section 3: Primary and Secondary Data

This section provides a concise overview of data retrieval and analysis methodology applied in the preparation of this report. It also introduces the main sources of research, both primary and secondary. The guiding document for elaboration of the D2.2 "Primary and secondary data research findings" has been the D2.1 "Research Protocol" which presents the methodological tools used for the needs analysis and mapping exercises in a comprehensive and detailed form.

3.1. Data Retrieval Methodology and Sources

3.1.1. Structured Survey

One of the data collection methods carried out by ILFA was the structured online survey "The Impact of Climate Change on the Intangible Cultural Heritage". Its objective was to get an overview of CC effects on ICH in the EU territory. More particularly, the goal was to identify the general trends in the impact of specific CC types on ICH.

During the survey, representatives of UNESCO National Commissions and other national ICH organizations of the EU member states were asked to comment on the impact of CC on the ICH in their countries. The survey sought to ascertain the attitudes of the bearers of tradition, local communities, ICH institutions, municipalities, and the national government towards CC as well as the measures taken to improve the situation.

The survey consisted of the introductory part and consent and was continued with the following questions and queries:

1. How does CC affect the local ICH currently?
2. How will CC affect the local ICH in the future?
3. Considering the following CC impacts (rising temperatures, droughts, melting snow and glaciers, rising sea levels, biodiversity loss, etc.), which traditions (ICH forms) are affected and how?
4. How do the different stakeholders perceive the problem? Have the CC problems been noticed by the ICH bearers and practitioners? Yes/No/Not informed
5. Have the CC problems been noticed by local communities? Yes/No/Not informed
6. Have the CC problems been noticed by officials responsible for the ICH safeguarding? Yes/No/Not informed
7. Have the CC problems been noticed by others (e.g., journalists, researchers)? Yes/No/Not informed
8. Have any solutions been proposed (e.g., through practical actions, and planning documents) at the community level? Yes/No/Not informed
9. Have any solutions been proposed (e.g., through practical actions, legislation, planning documents) at the municipal (local authority) level? Yes/No/Not informed
10. Have any solutions been proposed (e.g., through practical actions, legislation, and planning documents) at the regional level? Yes/No/Not informed
11. Have any solutions been proposed (e.g., through practical actions, legislation, planning documents) at the national level? Yes/No/Not informed
12. Data collected during the GreenHeritage project will be visualized in an interactive map. If you refer to a specific tradition affected by climate change, please, provide the geographical coordinates or address that best describes the geographical distribution of the tradition (it can be either the entire country or a specific region, municipality, city, village, etc.)!

Additional requests were to provide titles and links to the respective legal acts and policy documents; relevant WEB links or other useful resources on the subject; publications on the subject; additional comments on the subject; information on the contributor's role in relation to the ICH element, institution, position, and contact details.

The summary of the survey results is presented in Section 5.

3.1.2. Semi-structured Interview

The objective of the semi-structured interview approach was to obtain qualitative data on the impact of CC on ICH, by choosing the most typical examples for in-depth analysis. GreenHeritage project partners, CNR, CUEBC, CMCC, FSMLR, ILFA, and UAEGEAN conducted the semi-structured interviews, while developing case studies in their countries, Greece, Italy, Latvia, and Spain (CS 4-11, CS 13-14). They have given a detailed understanding and insight into the context of the researched topic, allowing the interviewees to emphasize issues from their perspective and have led to a more detailed analysis of the involvement of society and government institutions at various levels in solving problems caused by CC.

Among the informants, there were the members of ICH communities (the practitioners of the tradition), officials responsible for the safeguarding of ICH, local authorities, the NGO sector, professionals in tourism, urban planning and other areas of economy, researchers with expertise in relevant fields of science, such as social and cultural anthropology, ethnology, geography, environmental sciences, ichthyology, agronomy, climatology, nutritional sciences, conservation, architecture et al. The interviews were conducted after the oral consent based on the GreenHeritage consent example (Annex 3 of the D1.7 "Privacy and Open Data policy and procedures"). The names of the experts and their professional information are used in the text of this deliverable only with the consent of the informants.

The guiding questions for the interviews with stakeholders, as suggested in the Appendix 6 of the D2.1 "Research Protocol", were the following:

1. Is CC affecting the local ICH in any way now or potentially in the future?
2. Which traditions (ICH forms) and how are affected by CC impacts (rising temperatures, droughts, melting snow and glaciers, rising sea levels, biodiversity loss, etc.)?
3. How do the different stakeholders perceive the problem? Has the CC problems been noticed by:
    (a) the ICH bearers and practitioners;
    (b) local communities;
    (c) officials responsible for the ICH safeguarding;
    (d) other (e.g., journalists, researchers)?
4. Have any solutions been proposed (e.g., through practical actions, legislation, planning documents) at:
    (a) community level;
    (b) municipal (local authority) level;
    (c) regional level;
    (d) national level?

3.1.3. UNESCO Lists and National Inventories

Along the data collection via the structured online survey and semi-structured interviews, the implementers of the tasks, ILFA, made themselves aware of the ICH elements of the potential

danger of CC impacts, using the international UNESCO lists of ICH (see Appendix 2 of the D2.1 "Research Protocol") as well as the national inventories of the ICH across the EU countries (see Appendix 3 of the D2.1 "Research Protocol"). In addition, the Periodic reporting under UNESCO's 2003 Convention was examined as a strategic source. In the submissions delivered in 2021 and in early 2022 by the Europe region stakeholders, the answers to question No. 13.2 were analysed in particular ("Have policies or legal and administrative measures for inclusive social development and environmental sustainability been established or revised to give consideration to ICH and its safeguarding?"). Other sections of the submitted reporting texts were browsed using keywords such as "climate", "climate change" et al.

The results of these studies are presented in the three subchapters of the report, Section 6 "Climate Change Awareness".

3.1.4. Public Legal and Policy Documents

Policy and legal documents of various levels have been analysed as part of this report, with a focus on 1/ national and 2/ EU policy and legal measures, which have been explored in a broader context of global policy and legal developments. National policy and legal measures were analysed with a focus on climate change mitigation and adaptation strategies in a selection of countries, with interest in explicit ICH related aspects and more broadly - heritage and culture related considerations integrated in such documents. Whereas EU policy and legal measures, as part of a broader global context, where considered from several complementary aspects: a/ climate change in cultural heritage policies; b/ ICH in climate change policies; c/climate change and ICH across sectoral policies, d/ climate change, ICH, and human rights.

Although several interrelations can thus be identified between ICH and climate change in policy and legal contexts, both climate change and ICH safeguarding are related to a great variety of sectoral policies. Therefore, a selection of policies is addressed for triggering a reflection also on other policies that are related to both climate change and ICH safeguarding.

3.1.5. Research Literature

An important source of secondary data is given by research publications. Studies on ICH and CC separately are widely available. However, in recent years, there has been also a gradual increase in the attention paid to both these areas simultaneously in research projects and subsequent scientific publications (for a comprehensive summary, see Section 2 "Background and Literature Review" and Appendix 1 of the D2.1 "Research Protocol").

Integrated into the analysis of the case studies as well as other sections of this report, the deliverable D2.2 "Primary and secondary data research findings" introduces to the most recent and relevant research publications addressing ICH in the context of CC. Alongside publications in English, studies in other languages are also included.

3.1.6. Mass Media

To find out the opinions of various stakeholders about the impact of CC on ICH (the tradition bearers, officials, scientists. and field experts), publicity monitoring was carried out in the study of specific national cases of ICH. The aim of the national media monitoring was to outline the existing media discourses on the topic of CC in a particular country. Media monitoring was

carried out using search engines and thematic keywords on the websites of local news agencies and public and regional media. In some cases, articles and stories prepared by the international media were also viewed, looking for the focus on the analysis of specific ICH cases in the context of CC.

The GreenHeritage project partners were encouraged to use these tips for national and international publicity monitoring:

- Use public media search engines for keywords related to tradition also adding keyword “climate”.
- Use press clipping databases on a national level if available.
- Ask for advice from librarians at your institutions as there could be local news archive tools available or developed.
- Approach local journalists with enquiries about the latest publications on the topic.
- Search for the keywords related to tradition on regional news portals.
- Approach local municipalities and/or local studies institutions for their news archives.
- Search for the keywords in the local language on the most popular social media.

All mass media publications and other online resources, presented in this report, have been retrieved and verified before the submission of the first draft of the deliverable to the main coordinator of the GreenHeritage project, CNR, on August 10, 2023.

3.2. Data Analysis Methodology

3.2.1. Complex Study of Data

Primary and secondary data research, as presented in this report, has been carried out through several tasks: to evaluate and compare different definitions of ICH at national (Greece, Italy, Latvia and Spain) and EU levels and provide a possible common definition; to provide an in-depth analysis of the data captured in partner countries and across the EU regarding types of threats linked to CC and provide a causal link or probability of causation between CC and ICH degradation.

This deliverable D2.2 “Primary and secondary data research findings” presents the output of the complex study of the primary and secondary data, thus providing a comprehensive overview of the overall situation. According to the indicators of the GreenHeritage project (Grant Agreement, Article 1.2), at least 10 case studies, 3 threats, 8 national policies and initiatives, 5 EU policies and initiatives and 8 existing practices were to be examined as a part of the project. The implementers of the complex study, ILFA, are pleased that, thanks to the collaborative intellectual efforts of the project partners, CNR, CUEBC, CMCC, FSMLR, and UAEGEAN, these minimum required indicators have been convincingly exceeded.

3.2.2. Case Studies

The case studies collected in the Section 4 of this report present the efforts of an in-depth examination of CC negative impacts on specific ICH elements. Via the analysis of both primary and secondary data, each of the case studies seeks to answer the following key research questions: how does CC affect the ICH element under consideration? How are the CC impacts

identified and perceived by various stakeholders? What practical steps have been taken at different levels to address CC?

The entry point for each case study has been a dataset, organised according to a unified structure, containing the following core sections:

- ICH element under the threat of the CC: title in English; title in the original language; Web address: UNESCO List of ICH and/or National Inventory of ICH; a brief description of the ICH element (including the geographical coverage and indicating the time of origin of the tradition, as far as identifiable); geographical coordinates.
- CC risks (description of the CC impacts observed or expected).
- Attitudes and recognition of problems, as demonstrated by: (a) the ICH bearers and practitioners; (b) the local community; (c) officials responsible for the ICH safeguarding; (e) others (e.g., journalists, researchers).
- Existing practices: solutions implemented, planned, or proposed at: (a) community level; (b) municipal (local authority) level; (c) regional level; (d) national level.
- Publications, web links, and other additional information.

Although designed according to a uniform model of data retrieval and interpretation outline, the case studies are different not only in subject matter, but also in the degree of detail and thus in the volume of the text. For task leaders, ILFA, it was important to respect the approach and research “voice” of each partner group.

3.2.3. Detecting and Mapping Existing Practices

The qualitative data obtained during the research (dataset and surveys) were processed, extracting from them (1) information about the most significant types of CC that have affected or may potentially affect ICH, as well as (2) existing practices for mitigating the effects of CC on ICH. The initial project data was visualized using the digital mapping method on the google.maps platform. The map visualises the geographic distribution of European traditions affected by CC. The types of CC affecting them and the existing practices for preventing the consequences of CC are marked in separate data layers.

Section 4: Case Studies

The set of 14 case studies included in the deliverable D 2.2 “Primary and secondary data research findings” has been carried out by the GreenHeritage partners, ILFA (task leader), CNR, CUEBC, CMCC, FSMLR, and UAEGEAN. The individual cases have been selected out of several possible options. These are vivid examples, and, to some extent, they serve as illustrations of the situation in each of the partner countries, Greece, Italy, Latvia, and Spain.

ICH of Greece is represented by three case studies: CS4 “Agricultural and Dietary Tradition of Carob in Crete” (UAEGEAN); CS5 “Mandras (Paddocks) of Lemnos” (UAEGEAN); CS6 “Traditional Practices of Wild Edible Plants in Crete” (UAEGEAN). Italian partners have carried out altogether four case studies: CS7 “Art of Dry-stone Walling, Knowledge and Techniques in Cinque Terre and Amalfi Coast” (CUEBC and CMCC); CS8 “Festival of the *Ceri* / Race of the *Ceri*- Gubbio” (CNR); CS9 “Madonna Avvocata Festival” (Amalfi Coast, CUEBC); CS10 “Network of Big Shoulder-borne Processional Structures” (CUEBC). There are two case studies from Spain: CS13 “Transhumance in the Cantabrian or Northern Third of Spain” (FSMLR); CS14 “Valencian Paella, “the Art of Uniting and Sharing”” (FSMLR). Latvia is represented by CS11 “Lamprey Fishing and Preparation Skills in Carnikava” (ILFA).

To get a better understanding of the ICH situation regarding CC in other European countries and regions, four additional case studies have been carried out by ILFA: CS1 “Puffin Harvesting and Hunting” (Denmark); CS2 “Alpinism” (France, Italy, Switzerland); CS3 “Wine Culture in Germany”; CS12 “Skating on Natural Ice” (The Netherlands).

It is to be noted that in the context of the European Union, the safeguarding of Sámi intangible cultural heritage and the effects of climate change in the Arctic region constitute a special case. The preservation of Sámi traditional livelihoods, including reindeer herding, and the management of natural resources in their ancestral territories are to be considered with respect to the legal status and the rights of Sámi as Indigenous peoples. This case concerns a severely affected geographical region, and it also mobilizes a special policy and legal context (see the Report of the Special Rapporteur on the rights of indigenous peoples, United Nations, 2017 - a thematic study on the impacts of climate change and climate finance on indigenous peoples’ rights). The effect of climate change on Sámi traditional cultural practices has attracted significant attention in the context of climate change studies, reports, and activism, as well as domestic and international media attention. This case will remain beyond the selection of case studies in this GreenHeritage report, however, a selection of policy and legal considerations related to the effects of climate change on Sámi ICH safeguarding is reflected in Subsections 8.3. and 8.4. of the present report, namely on national and EU, as well as broader global, policy and legal measures.

4.1. CS1 Puffin Harvesting and Hunting (Denmark)

1. ICH element under the threat of the CC

Title in English
Puffin harvesting and hunting in the Faroe Islands

Title in the original language
- Lundehøst og -jagt på Færøerne

Web address: UNESCO List of ICH and/or National Inventory of ICH

Not included in UNESCO or National Lists of ICH

A brief description of the ICH element (including the geographical coverage and indicating the time of origin of the tradition, as far as identifiable)

The Faroe Islands, a group of 18 major islands located between the Norwegian Sea and the North Atlantic Ocean and an autonomous territory of the Kingdom of Denmark, are awash in wind, fog, and saltwater: there are no trees in sight, and only a few types of rugged root vegetables can be grown locally. For centuries, the traditional cuisine of the Faroe Islands has been determined largely by its climate and remote location. Traditionally, the Faroese have turned to the sea surrounding them – no part of the Faroe Islands is more than five kilometres from the Atlantic Ocean – for fishing, whaling and seabird hunting. The use of seabirds as a resource is a distinctive aspect of the coastal culture in the North Atlantic, which is rapidly becoming history. While seabird hunting is now forbidden in many countries, it is still important in some places around the North Atlantic: it is still legal to hunt puffins in the Faroe Islands and Iceland, many bird species are caught in Greenland. Scotland only allows the traditional gannet catching on Sula Sgeir (Næss 2010: 20; The Islands and the Whales).

Harvesting seabirds has a long tradition also in the Faroe Islands. Puffin fowling has been alive and, in some places, a valued part of local life. However, the fowling has changed from a hard daily work in the colonies to a leisure-time activity and for getting old traditional food, but early in the 21st century there was a sudden drop in the hunting results due to many years of breeding failures, so fowling has stopped at least temporarily in most places (Jensen, Olsen 2020: 3).

With about 500.000 breeding pairs, the Atlantic Puffin (*Fratercula arctica*) is the most numerous bird species in the Faroe Islands, only preceded by the Fulmar. Puffins both live on the sea and create colonies on the tops of cliffs, making burrows amongst the large rocks or in the ground. Puffins have predominantly black and white plumage and large beaks that get brightly coloured during the breeding season. They are about 26–29 cm tall, weigh around 400 grams and live for around 20 years. Puffins flap their short wings rapidly while in the air and swim well under water. They eat both fish and zooplankton and can carry many fish in their uniquely shaped beaks. The puffins' mate is for life, and they are very loyal to their burrows. Young puffins choose their mates out at sea, and then find each other in the colony during breeding season. The female puffin lays a single egg, and the parents take turns keeping the egg warm and safe, and to feed the chick, once it has hatched (Birds of the Faroe Islands).

The traditional Faroese puffin fowling techniques were described already in the 17th century (Claussøn Friis 1639, Wolf 1651, Debes 1673) and systematically studied by several authors since the 19th century (Müller 1862, Williamson 1970, Bjørk 1984, Baldwin 1974, 2005, Nørrevang 1977, 1979, 1986, Jensen 2010, Olsen and Nørrevang 2005). Jens-Kjeld Jensen and

Bergur Olsen provide the following summary of the tradition with further references to previous research mentioned above (Jensen, Olsen 2020: 3–5): "The simplest way to hunt puffins was to take the breeding birds or nearly fledged chicks in their burrows. This method is called *dráttur* and the puffins were taken by hand, flushed out with a stick, preferable with a hook at the end, or they were digged out. Dogs have also been used to find and take the puffins. In 1939 Patursson interviewed fowlers on most of the islands and at that time it was still common to take breeding birds in their burrows, and about 20% of the harvested puffins were taken in this way. It was, however, realized, that *dráttur* was a devastating method and one of the reasons for the observed decline in the population at that time. *Dráttur* has therefore been banned since 1954, but dispensation may be given under certain conditions. However, only few dispensations have been given in the last decades, so *fleyg* is now the only method to take puffins on land. With this method, the birds are caught with a fowling pole (*fleygastong*), a triangular-shaped net between two arms on a long pole. The fowler is sitting in a *sessur*, a catch location, in the colony where the birds are flying along, and with his fowling pole, he deftly plucks birds out of the air. The method with the fowling pole may have been used since the 1600s or even since Viking Age. The fowling tool has been the same although improved, as better material have become available for the pole, arms, and net. According to the hunting legislation puffins may be fowled in all colonies and it is allowed to hunt all days but not Sundays and other holidays. The fowling rights are closely connected to the ownership of land, and if nothing else is agreed it is the owner of the old registered inland, that has the hunting right in the puffin colonies. The unit of land is *mørk* (*merkur* in plural) which is a combination of the extent of an area and its quality, and this unit is used in the sharing of the fowling rights. Some old fowling traditions have recently been criticised for conflicting with the principles of sustainability even if they in practice have little significance to bird populations at large and the puffin fowling in the Faroes, which occur in the breeding season, may locally have negative effects. There is no hunting statistic in the Faroes, but the number of puffins that have been fowled during the last decades has been collated on a voluntary basis. The total number hunted each year has fluctuated and reached a maximum in year 1999–2001 where about 100.000 puffins were hunted each year."

Exploitation of seabirds and their protection go hand in hand. Two good examples of practices, which secured continual access to seabird resources, were leaving a certain number of eggs in nests, and avoiding catching puffins returning to nests with herring prats in their beaks. Rural depopulation and changes in ways of making a living have caused the disappearance of old ways and loss of knowledge about how to use natural resources. Modern technology provides a means of over-exploitation. Motorboats and modern firearms make seabird hunting much more effective and increase the risk of decimating stocks. In the worst case, hunting pressure can lead to regional extinction of species (Næss 2010: 18–19).

Geographical coordinates
62.1610, -7.0208

2. CC risks

Description of the CC impacts observed or expected

The population of the Atlantic puffin in the Faroe Islands has declined by ~70% over the last 50 years. While puffin harvesting may have been a historical practice in several North Atlantic areas, the conservation focus today is primarily on protecting and preserving puffin populations in the face of various threats, including CC. Efforts are being made to monitor and

mitigate the impacts of CC on puffins and their habitats, as well as to raise awareness about the importance of their conservation.

The tradition of puffin hunting is largely related to the state of the puffin population, which has deteriorated rapidly in recent decades. Thus, the existence of the tradition is largely related to efforts of restoration of the population of the species. Puffin population decline is influenced by a combination of factors (see section Researcher attitudes). CC is included among the most serious risks; CC impact is summarized by Fredriksen 2010: "Important factor contributing to lack of food for seabirds is climate change. There is clear evidence that the abundance and distribution of many species of zooplankton are affected by warming sea temperatures. In large parts of the North Atlantic, the most important of these species is the copepod *Calanus finmarchicus*, which is extremely abundant, and the most important prey for juvenile stages of many fish species, and which has been shown to be very sensitive to changing temperatures. Several studies have shown that the breeding success and/or adult survival of seabirds are negatively correlated with sea temperatures, and it is most likely that the mechanism behind this pattern is linked to declines in availability of fish food. Complex ecological mechanisms and interactions with other factors may be involved, and the consequences of increasing temperatures are not always easy to predict. All seabirds are potentially vulnerable to effects of climate change, but so far it appears that fish-eating species are most sensitive" (Fredriksen 2010: 22).

Thus, the following CC effects generally affect the puffin hunting tradition:

- increased ocean temperatures;
- biodiversity loss.

3. Attitudes and recognition of problems, as demonstrated by:

ICH bearers and practitioners; local community

Since the decline of the puffin population has been evident since 2003, the puffin hunting regulation is well known and accepted among the hunters. There are, however, no hunting statistics in the Faroes, while reliable hunting figures combined with more accurate seabird population estimates, would give a better basis to regulate the hunting in a sustainable way.

Officials responsible for the ICH safeguarding

As the puffin harvesting and hunting tradition is not included in the ICH list of Denmark or the Faroe Islands, the heritage institutions have so far not expressed an attitude towards the impact of CC on the tradition. Nature protection institutions are more concerned about this problem due to the CC impact on the species population and reproduction.

Other: journalists

Until the late 20th century the journalists mainly focused on the ethics of puffin hunting in the modern world, which is not summarized here. Mike Day's documentary "The Islands and the Whales" (2016) provides an excellent insight into this issue, reflecting the views of different parties (The Islands and the Whales). At the beginning of the 21st century, articles devoted to puffin hunting also include references to the effect of CC on puffin population trends.

The decline of the puffin population in the Faroe Islands, Iceland, Scotland, Norway, and the United States has been widely reported by journalists (see section Press for references), perhaps because the bird's iconic appearance makes it widely recognizable, and the problems allow to communicate the risks of CC in an understandable way to the general public. Articles on this topic were especially intensively published at the beginning of the 21st century, when scientists began to observe a rapid decline in the puffin population.

Other: researchers

Among all the parties involved, the representatives of natural sciences have so far expressed their concerns most loudly about the impact of CC and other factors on the puffin population, also calling for stricter regulation of the puffin hunting tradition. While puffin harvesting has historically occurred in the North Atlantic region, the primary concerns for the conservation of puffins are related to habitat loss, changes in food availability, and climate-related factors. Jens-Kjeld Jensen and Bergur Olsen state that "Since 2003 there has been a decline in the attendance of puffins in the colonies and the production of young has been extremely low. Dead chicks were found in the colonies, and in 2010 and 2011 most of the puffins left the colonies before the eggs hatched. This has drastically affected the fowling, so it has ceased, at least temporarily, in most places. There are rough desk estimates (+-75%) from 1987 of the number of breeding pairs of puffins on each island showing that there has been a drastic decline in the puffin population since then. Counting of occupied burrows in two small colonies on Skúvoy in 1993 and 2018 indicate a 50% decline" (Jensen, Olsen 2020: 3–5).

In May 2010, a cross-sectorial workshop was held in Malmö, Sweden, which aimed at preparing a seabird action plan for Western-Nordic areas. This work received financial support from the Nordic Council of Ministers for the Environment. The workshop was preceded by a review of seabirds in the north-east Atlantic, their status and trends and the anthropogenic impacts. The group of scientists divided the threats into three groups – general, specific, and local (Fredriksen 2010: 22–24):

General threats – important to many seabird species in large parts of the study area:

- *Oil pollution*. Seabirds are extremely vulnerable to oil spills, particularly because the waterproofing of their plumage is affected by even very small amounts of oil.
- *Competition with fisheries*. Lack of food is clearly an important cause of the problems experienced by many seabird populations, and human fisheries may in some cases contribute to this. All fish-eating seabirds are potentially vulnerable to competition with fisheries.
- *Climate change* is a factor contributing to the lack of food for seabirds. The abundance and distribution of many species of zooplankton are affected by warming sea temperatures. Many species of zooplankton are very sensitive to changing temperatures. Several studies have shown that the breeding success and/or adult survival of seabirds are negatively correlated with sea temperatures, and it is most likely that the mechanism behind this pattern is linked to declines in the availability of fish food. All seabirds are potentially vulnerable to the effects of CC, but so far it appears that fish-eating species are most sensitive.

Specific threats affect fewer species and/or act more locally:

- *Bycatch*. Seabirds are regularly captured as bycatch in some fisheries, and this is one of the most important threats facing seabirds worldwide.
- *Introduced predators*. American mink and brown rats have spread to many inshore and offshore islands, with sometimes devastating effects on seabird populations.
- *Contamin*ants. Persistent and biomagnifying organic contaminants have the potential to affect many organisms, mainly through long-term sub-lethal toxic effects.

Local threats are most important in certain parts of the study area

- *Hunting*. In large parts of the study area seabird hunting has lost much of its traditional importance, and in Denmark, Sweden, Norway, and Scotland effects on seabird populations are likely to be minor. However, in the Faroes, Iceland and Greenland

seabird hunting is still important at least locally, and some species may be exposed to overharvesting. Due to the typical seabird life history where reproduction is slow and adult mortality low, killing of adult breeders is particularly problematic and may have large negative impacts on populations. For some of the most popular quarry species, including Atlantic puffin in the Faroes and Iceland, and Brünnich's guillemot in Greenland, the current harvest level may be unsustainable.

- *Disturbance*. Many human activities have the potential to create sufficient disturbance to affect seabird populations, either at the breeding colonies or at sea. The most sensitive species are probably beach-nesting terns, cliff-nesting auks and moulting concentrations of eiders. In most cases, effects of disturbance are likely to be local, and influences regional populations likely to be small. Beach-nesting terns may be an exception to this, as recreational pressure on their habitat can be intense.

For each of the threats mentioned, the working group also developed short, medium, and long-term recommendations for the recovery of seabird populations, including puffins. Regarding bird hunting, Fredriksen states: "The effects of hunting adult birds can potentially be high on seabirds because of their life history that usually includes low natural adult mortality. For this reason, the group recognized that banning hunting during the breeding season and introducing mandatory hunting proficiency tests (mandatory course and a written exam) is of great importance. This cannot be efficiently done, however, without explaining to the public why this is needed. Therefore, it is important that information about the population status of seabirds and what may affect their dynamics is communicated to the public. The group also recognized that disturbance by humans (also during hunting) can negatively affect seabird populations, and this type of impact emphasizes the need for establishing further protected areas. To monitor the effects of culling and hunting it is necessary to be able to identify and partition the causes of any population changes. This will require some specific research and monitoring activity. [..] Recreational use and tourism were also identified as factors that could potentially have a negative impact on seabirds. Identifying sensitive areas and the risks from different activities, followed by appropriate mitigating steps such as area/activity restrictions, adequate publicity, public awareness raising, code-of-conducts for more organised activities and enforcement can reduce the impact of disturbance" (Fredriksen 2010: 30–31). The report includes 11 recommendations, the implementation of which is necessary for the restoration of seabird populations, which are directly related to puffin hunting (Fredriksen 2010: 31):

Priority actions reported on seabird harvest.

High and medium priority actions	**Costs**	**Time-schedule**	**Assigned responsibility**
Hunting			
1 Introduce mandatory hunting proficiency test (mandatory course and a written exam)	Low	Medium	Public sector
2 Ban hunting during breeding season	Low	Long	Public sector
3 Collect hunting and culling statistics, with verification control	Medium	Long	Public sector
4 Prohibit lead ammunition – introduce alternative ammunition	Low	Long	Public sector
5 Increase the level of understanding among the public of introducing hunting restrictions	Medium	Short	Public sector
6 Restrict traffic by human activities during hunting	Low	Long	Public sector

7 Restrict egg collecting to an early stage during breeding season	Low	Short	Public sector
Protected areas			
8 Create more nature reserves/ conservation sites	High	Long	OSPAR; Public sector
9 Implement protection areas through action plans	Medium	Long	Public sector
Research			
10 Population dynamics (monitoring of seabird populations)	High	Long	Public sector
11 Effects of culling	Low	Short	Public sector

Some of these recommendations have been implemented (see section Existing practices). For further references to scientific research on CC impacts on Atlantic puffin population see: BirdLife Datazone.

Other: conservationists

The puffin hunting tradition is a controversial element of the ICH, where the interests of intangible cultural heritage maintainers (puffin hunting and preparation tradition practitioners and local communities), on the one hand, and nature activists, on the other hand, clash sharply. Many non-governmental organizations involved in nature conservation call for a complete ban of puffin hunting. E.g., the "Save Puffins" and "Take the Puffin off the Plate" initiatives of the Audubon Seabird Institute (based in Maine, USA) and the Puffin Preservation Society (based in California, USA) collect funds for the rehabilitation of puffins in Iceland and encourage to send an e-mail to the President of Iceland, calling for an end to puffin hunting in Iceland (Save Puffins; Puffin Preservation). On the other hand, Faroe Islands officials defend these traditions as a sustainable alternative to importing food, which requires heavy use of fossil fuels. They also note that the communal nature of the whale and seabird hunts helps to maintain social bonds within the community. Faroese hunters take pride in knowing exactly where their food comes from and killing the animals themselves, rather than relying on less sustainable and less humane factory farming (The Islands and the Whales).

4. Existing practices: solutions implemented, planned, or proposed

Considering the dramatic decline of the Atlantic puffin population in the Faroe Islands by about 70% over the last 50 years, instead of measures to protect the puffin hunting tradition, there is a greater need now to protect the essential resource for this tradition, ensuring the protection of the puffin as a biological species and the restoration of the population. Indirectly the tradition would derive from the measures taken to restore the Atlantic puffin population, although this means that during the implementation of these measures, puffin hunting may be significantly restricted or even prohibited altogether. As all parties involved are aware that sustainable puffin hunting practices will ensure the long-term conservation of the puffins, several of the measures recommended by Fredriksen 2010 have been implemented at different levels (community, regional and national).

Community level

Long before national legislation began to regulate puffin hunting in the Faroe Islands, the local community adhered to community-accepted puffin hunting regulations. The owners of the specific plots of land, who had the exclusive right to hunt on their property, play an important

role in these regulations. Nørrevang (1986: 275) summarizes the traditional hunting regulations: "For centuries sea bird fowling in the Faroe Islands has been regulated by a series of traditionally developed and adopted rules so as to keep the bird populations on a steady level while, at the same time, giving a maximum yield. [..] Ownership of certain parts of the bird colonies puts the responsibility upon the individual owner not to overexploit his part of the colony. In villages with common ownership of the bird colonies, the annual community meeting set rules. Maximum bag was regulated yearly according to observations of bird population growth or decline."

Municipal (local authority) level

Although the municipality does not take measures to prevent CC, it does act in the implementation of sustainable tourism. Because tourists can visit puffin colonies, anthropogenic pressure can negatively affect their nesting success. Thus, by limiting the number of tourists on puffin-important islands, population recovery is indirectly encouraged.

Most of the Faroese puffins breed on the island of Mykines, the westernmost island in the Faroe archipelago. It is part of the Sørvágur municipality (fo: Sørvágs Kommuna). It has a population of 11 people in a small village in the southern part of the island. Mykines is also one of the most popular tourist destinations in the Faroes. Guided tours are both on land and sea, as well as unguided tourists visit the island and undertake trekking tours. It is possible to stay overnight at a small rest house, and several houses are available for renting. Travel to the island is by ferry and helicopter (Ramsar Information Sheet: Mykines, May 2012).

The association of landowners of Mykines *Hagapartarnir Mykines* and the destination management organization *Visit Vágar* have been working together to move the tourism on the island in a more sustainable direction. This is to protect nature, bird, and animal life and not least the people who live on the island, who are affected by the many visitors. Sustainable tourism with regards to the immediate environment calls for limitations and therefore, the maximum number of visitors is set to 200 visitors and the time when one can venture into the outfield is set to 10:00 am to 17:00 pm. Outside these times, the outfield is to be considered closed and all travel in the outfields with visitors can only be done by consulting the landowners.

To protect the island's unique wildlife and nature and help maintain the walking paths out to the bird cliffs a special island protection fee of 100 DKK (around 13 EUR) has been implemented. The tour costs 400 DKK for everyone over the age of 15 years. An approved or certified Faroese guide must accompany groups of visitors that travel to Mykines with a tour operator or other supplier. Foreign guides without a work permit in the Faroe Islands are not allowed to guide on Mykines. For approval to guide on Mykines tour operators and others need to contact the association of landowners on Mykines. The association has been in contact with all the companies that sail to Mykines regarding the possibility to limit the number of trips to the island. The association of landowners on Mykines have chosen to outsource the work of placing guides and other assignments to *The Locals*, a company run by local resident Katrina Johannesen (Visit Vagar).

Regional level

Puffin hunting is basically regulated by the Bird hunting regulations adopted by the Faroese Government in 1954 (Fuglaveiðulógin), which prohibit the collection of puffin eggs and young birds from burrows without a special permit but allow pole netting (Faroese: *fleyga*) during the breeding period and hunting with a shotgun at sea during the non-breeding period. The decisions of landowners also play a role in puffin hunting legislation. Since the puffin colonies have started to diminish in recent years, regulations were implemented to maintain the population. A restricted hunting season was also implemented, but results were limited. State

funded scientists conduct various studies of puffin behaviour and population changes, including bird ringing, estimates of the number of hunted birds, etc.

National level

Along with stricter restrictions on puffin hunting, the Danish government has designated the most important puffin nesting colonies as protected areas. On June 23, 2012, The Secretariat of the Convention on Wetlands of International Importance (Ramsar Convention) announced that the Government of Denmark has designated three new Wetlands of International Importance in the Faroe Islands (). These sites are Mynkines (Ramsar Site no. 2051; area 2,300 ha; 125,000 breeding pairs of puffins), Skuvoy (Ramsar Site no. 2053; area 1,790 ha; 40,000 breeding pairs of puffins) and Nólsoy (Ramsar Site no. 2052; area 2,197 ha; 30,000 breeding pairs of puffins). "Traditional seabird hunting is still practiced to some extent." (Ramsar Sites Information Service: Mynkines, Skuvoy and Nolsoy).

5. Publications, web links and other additional information

Research bibliography

1. Frederiksen, M. (2010) *Seabirds in the North East Atlantic. Summary of status, trends, and anthropogenic impact*. Action plan for seabirds in Western-Nordic areas. Report from a workshop in Malmö, Sweden, 4–5 May 2010. Copenhagen: Kailow Express ApS, pp. 21–24. Available at: https://www.researchgate.net/publication/260338127_Appendix_1_Seabirds_in_the_North_East_Atlantic_A_review_of_status_trends_and_anthropogenic_impact

2. Jensen, J.-K., Olsen, B. (2020). *Traditions for puffin fowling in the Faroe Islands the last decades*. Imbrimil: Journal of the Nature of Faroe Islands. Vol. 1, No. 1, pp. 3–17. Available at: https://www.hav.fo/PDF/Ritgerdir/2020/Traditions_for_puffin_fowling_in_the_Faroe-Islands_the_last_decades_2020.pdf

3. Næss, I. E. (2010). *Seabirds and coastal people*. Action plan for seabirds in Western-Nordic areas. Report from a workshop in Malmö, Sweden, 4–5 May 2010. Copenhagen: Kailow Express ApS, pp. 17–20. Available at: https://www.researchgate.net/publication/260338127_Appendix_1_Seabirds_in_the_North_East_Atlantic_A_review_of_status_trends_and_anthropogenic_impact

4. Nørrevang, A. (1986). *Traditions of Sea Bird Fowling in the Faroes: An Ecological Basis for Sustained Fowling*. Ornis Scandinavica. Vol. 17, No. 3, pp. 275-281. Available at: https://www.jstor.org/stable/3676838

5. Olsen, B., Jensen J.-K. and Reinert, A. (2000). *Populations of Guillemots, Razorbills and Puffins in Faroese Waters as Documented by Ringed Birds*. GEM Report, No. C22-161-1. Available at: http://www.jenskjeld.info/artikler/Populations_of_Guillemots_Razorbills_and_Puffins_in_Faroese_waters.2000..pdf

Press

1. (2013) *Climate Change and Chance: A supplement to the 2013 Egg Rock Update Newsletter.* Audubon. Available at: https://seabirdinstitute.audubon.org/news/climate-change-and-chance

2. (2012, June 26). Denmark Designates Three Ramsar Sites in Faroe Islands. Available at: http://sdg.iisd.org/news/denmark-designates-three-ramsar-sites-in-faroe-islands/

3. Alberts, E. C. (2023, January 18). *For threatened seabirds of the NE Atlantic, climate change piles on the pressure*. Mongabay. Available at: https://news.mongabay.com/2023/01/for-threatened-seabirds-of-ne-atlantic-climate-change-piles-on-the-pressure/

4. Beament, E. (2022, December 8). *Climate change threatens almost 70% of puffins' nesting sites, researchers warn*. Evening Standard. Available at: https://www.standard.co.uk/news/environment/experts-seabirds-zoological-society-of-london-atlantic-university-of-cambridge-b1045806.html
5. Bever, F. (2021. October 12). *Climate change is causing problems for puffins*. NPR.org. Available at: https://www.npr.org/2021/10/12/1043991519/climate-change-puffins-maine
6. Jackson, D. Z. (2022, January 4). *We saved the puffins. Now a warming planet is unraveling that work*. Grist. Available at: https://grist.org/climate/we-saved-the-puffins-now-a-warming-planet-is-unraveling-that-work/
7. Logan, K. (2022, June 18) *Puffins face uncertain future as climate change hits habitats*. CGTN. Available at: https://newseu.cgtn.com/news/2022-06-18/Puffins-face-uncertain-future-as-climate-change-hits-habitats--1aUKUpSHA3e/index.html
8. Vermeulen, E. (2014, September 26). *The Other Slaughter in the Faroe Islands: The Mass Bird Killings*. Sea Shepherd. Available at: https://seashepherd.org/2014/09/26/the-other-slaughter-in-the-faroe-islands-the-mass-bird-killings/

Legal and policy sources

1. Løgting (1954). Fuglaveiðulógin (eng. Bird hunting legislation). Løgtingslóg nr. 27 frá 9. september 1954 um fuglaveiðu, sum seinast broytt við løgtingslóg nr. 66 frá 5. mai 2021. Available at: https://logir.fo/Logtingslog/27-fra-09-09-1954-um-fuglaveidu-vm-sum-seinast-broytt-vid-logtingslog-nr-34-fra

Other resources

1. *BirdLife Datazone*. Available at: http://datazone.birdlife.org/species/factsheet/atlantic-puffin-fratercula-arctica/text
2. *Birds of the Faroe Islands*: *The Puffin*. Available at: https://www.faroeislands.fo/nature-environment/fauna-flora-vegetation/bird-life/the-puffin/
3. *Puffin Preservation*. Available at: https://puffinpreservation.org/
4. *Ramsar Sites Information Service: Mykines*. Available at: https://rsis.ramsar.org/ris/2051
5. *Ramsar Sites Information Service: Nolsoy*. Available at: https://rsis.ramsar.org/ris/2052
6. *Ramsar Sites Information Service: Skuvoy*. Available at: https://rsis.ramsar.org/ris/2053
7. *Ramsar Information Sheet, Mykines*. Available at: https://rsis.ramsar.org/RISapp/files/36644016/documents/DK2051_lit161011.pdf
8. *Save Puffins*. Available at: https://savepuffins.org/
9. *Seabird Harvest in the North Atlantic: Faroe Islands*. Available at: https://www.atlanticseabirds.info/faroe-islands
10. *The Islands and the Whales*. Available at: https://pov-tc.pbs.org/pov/downloads/2017/pov-theislandsandthewhales-discussion-guide-print.pdf
11. *Visit Vagar*. Available at: https://visitvagar.fo/mykines-towards-sustainable-future/
12. *Where to see Puffins in the Faroe Islands*. Available at: https://www.quarkexpeditions.com/blog/where-to-see-puffins-in-the-faroe-islands

6. Contributor

This study was prepared by ILFA: Sandis Laime.

4.2. CS2 Alpinism (France, Italy, Switzerland)

1. ICH element

Title in English
Alpinism

Title in the original languages
L'alpinisme (French), l'Alpinismo (Italian), der Alpinismus (German)

Representative List of the Intangible Cultural Heritage of Humanity, UNESCO
https://ich.unesco.org/en/RL/alpinism-01471#identification (since 2019)

National Inventories of ICH
France: https://www.culture.gouv.fr/Thematiques/Patrimoine-culturel-immateriel/Le-Patrimoine-culturel-immateriel/L-inventaire-national-du-Patrimoine-culturel-immateriel (since 2015)

Italy: http://paci.iccd.beniculturali.it/ (since 2018)

Switzerland: https://www.lebendige-traditionen.ch/tradition/fr/home/traditions/alpinisme.html (since 2017)

A brief description

Tradition
Alpinism (mountaineering) is a social outdoor practice in a natural environment, a tradition that includes technical, physical, and cultural dimensions. Alpinism encompasses the art of ascending summits and walls in high mountains, regardless of the season or the type of terrain, be it rocky or icy. This activity requires a combination of physical, technical, and intellectual skills, including knowledge of the local climate and the environment, utilizing appropriate techniques, equipment, and specialized tools. Alpinism is deeply rooted in tradition, emphasizing a shared culture that includes knowledge of the high-mountain environment, the historical context of the practice, associated values, and specific expertise. Understanding the natural surroundings, dynamic weather conditions, and potential hazards is also crucial. Moreover, alpinism places importance on aesthetic elements, with climbers striving for graceful movements, contemplation of the surrounding landscapes, and a harmonious connection with the natural environment. Ethical principles are fundamental, emphasizing personal commitments such as leaving no lasting traces behind and providing assistance to fellow practitioners. The concept of team spirit (in French, *esprit de cordée* 'rope spirit') holds great significance in the alpinist mindset.

Beginning in 1741, the Mont Blanc massif was considered as one of the birthplaces of glacier tourism. Alpinism originated in 1760 within the Mont Blanc massif, which was then part of the Kingdom of Sardinia. Since 1860, this massif has bordered France, Italy, and Switzerland. The Mont Blanc massif is situated within the larger Alpine arc, a mountain range that extends from Slovenia and Austria to the Maritime Alps. The three countries encompass various mountainous regions, including Mont Blanc, Monte Rosa, and the Matterhorn (shared by Italy and Switzerland), the Dolomites and Gran Sasso (in Italy), the Vanoise–Gran Paradiso and the Mercantour–Maritime Alps (shared by France and Italy), the Oberland and Engadine (in Switzerland), and the Écrins (in France), which serve as primary locations for alpinism.

These regions are home to the highest peaks in Europe, with over 82 summits exceeding 4,000 meters in elevation. Alpinists also venture into other massifs such as the Pyrenees in France and the Apennines in Italy. Furthermore, alpinism is practiced in other parts of the Alps (Austria, Slovenia), as well as in various mountain ranges across Europe and outside of Europe. This study is dedicated to the case of the alpinism in the Mont Blanc massif.

Most alpinism practitioners are members of alpine clubs, which play a vital role in promoting alpine practices worldwide. The alpinist community is made up of enthusiasts, federal trainers and professionals, and mountain guides. There are about 700,000 practitioners across the three countries, France, Italy, and Switzerland. Most guides (about 5,000 persons) are also Alpine club members, and all belong to a national structure (union or association). These clubs organize collective expeditions, disseminate practical information, and contribute to various publications, acting as catalysts for alpinist culture.

Geographical coordinates
45.83290, 6.86510
The Mont Blanc massif, the Alps (mostly in France and Italy, but also in Switzerland)

2. CC risks and effects

CC is having significant impacts on alpinism traditions in the European Alps. This both threatens the immediate safety of practitioners of the alpinism tradition and makes previously accumulated knowledge on this ICH element less applicable. Among the CC effects, there are:

(1) Melting glaciers. Acceleration of melting glaciers in the Alps due to rising temperatures has resulted in reduced snow and ice coverage, making certain routes more dangerous or inaccessible. Traditional climbing routes that relied on stable ice formations may no longer be viable in thinner and flux ice conditions.

(2) Increased rockfall and landslides. Destabilization by warming permafrost: as the permafrost thaws and the ice melts, rock stability is compromised. The Alps experience more frequent rockfalls and rockslides, posing greater risks to climbers. This has altered the dynamics of alpinism routes and increased the need for additional precautions.

(3) Less predictable weather. CC has caused more frequent and severe weather events in the Alps. Unpredictable storms, heavy rainfall, and sudden temperature fluctuations make planning and executing climbing more complicated. This requires alpinists to adapt quickly to changing conditions and poses additional risks.

(4) Shifted seasons. The timing and duration of seasons in the Alps have changed due to CC. Winters are becoming shorter, and spring arrives earlier, affecting snow conditions and the availability of safe climbing windows. Traditional climbing seasons may need to be adjusted or shortened. The periods of optimal conditions have shifted toward spring and fall, because, in the summer months, the itineraries have become more dangerous and technically more challenging.

Not as a direct threat to the concerned ICH element, but in a broader context of the outdoors experience in the mountains could be seen also the problem of loss of Alpine biodiversity. CC is causing altering of the ecosystem dynamics in the Mont Blanc massif which is characterised by exceptional biodiversity in relatively small areas. These ecosystems, both flora and fauna, are extremely vulnerable to CC and to disturbances linked to human activity. Biodiversity loss may impact the overall perception of nature.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

The alpinist community in all three countries, France, Italy, and Switzerland, demonstrates a certain level of awareness and interest in the problems posed by CC in the Alps. For instance, the interviews conducted with the ICH representatives, such as the infrastructure managers, mountain guides, and public operators, revealed that the effects induced by the CC, itinerary, safety, infrastructure, management, activity, and attractivity issues, were well perceived by tourist site stakeholders. (Salim et al. 2021: 6–15) Largely, it is a question of the viability of the ICH as well as the safety of the people involved in the activity. "Warming temperatures lead to profound modifications of the high mountains, including glacier retreat, permafrost degradation and decreases in snow cover. In turn, these phenomena cause decreases in glaciated areas and increases in the frequency and size of rockfalls (..). These changes have a direct impact on trails used to access high mountain huts. In the Mont-Blanc massif, 81% of hut caretakers reported that the safety of the access routes to their huts had changed in the last 10 years. In 96% of cases, routes had to be redesigned, often at significant cost." (Cremonese et al. 2019: 77) However, the studies show that the recognition of the CC problems and the consequences caused by them, such as frequent rockfalls, is quite recent in the climbing community and, even a few years ago, did not resonate in the adaptation practices: "Despite the number of mountaineers and the high accident rate in the Goûter area, before the summer of 2020, no management measures were initiated by the actors in charge of the route, and only a few scientific studies were carried out about the occurrence of rockfalls and their triggering factors." (Mourey et al. 2022: 446)

The ICH community, alpinists, guides, and the local inhabitants, also play a significant role in raising awareness of the CC effects, such as glacier melting and ice thinning, both within the mountaineering community and in society at large. Thus, for instance, the experienced independent mountain guide Andy Perkins, in the interview in 2019, did not shy away from expressing pessimistic future scenarios: "I don't have children but if I had I wouldn't persuade them to be Mountain Guides. I'd be saying 'get your yacht sailing ticket because by the time you're grown up, there will be less work, less snow, and the work that exists is going to be more dangerous." (Stirling 2019)

In addition to the mass media, mountaineering practitioners, and other interested parties, including mountaineering clubs, produce online publications, such as blog posts, on the topics concerning the impact of CC on the Mont Blanc massif and the alpinism tradition. Among other things, these organizations cooperate with and promote the views of CC experts from various branches of science, including climatology (e. g. Marie-Antoinette Mélières, see Mélières).

Officials responsible for the ICH safeguarding

In the Periodic reporting under UNESCO's 2003 Convention in 2021, the national parties, represented by the officials in the ICH safeguarding area, to some extent, have highlighted the CC as a problem in connection with the alpinism tradition. In their report, Italy stated: "The first element is global warming, which is particularly relevant in mountain areas. The rise of temperatures is higher than in most other ecosystems and creates several problems for the future. The landslides in the mountains, the melting of glaciers and the climatic changes observed in the quality of snow and ice during the summer season determine profound changes in access to high mountains for both amateurs and professionals. (..) The CAI joined the 3rd edition of CLIMBING FOR CLIMATE, held on 14 September 2021, to raise awareness of the ongoing climate damage. The event was the ascent to the Calderone glacier on the Gran Sasso Mountain, where the changes and damage due to global warming that led to the melting of one of the largest Italian glaciers are more evident. The event was promoted by a network

of Universities and the CAI, with the aim to launch an appeal to combat the climate and ecological crisis and the loss of biodiversity."

The Swiss report offered a very thorough look at the threats of the CC to alpinism as an element of ICH. "The first element is of global scale, supersedes all our activities, and can be described as structural: it is climate change, symbolized by global warming. This worldwide phenomenon is particularly pronounced in mountainous areas. The rise in temperatures is higher there than in most other ecosystems, leading to a myriad of problems for the future. Thawing permafrost, mountain landslides, glacier melting, and significant changes observed in the quality of snow and ice during the summer season notably bring about profound alterations in access to high mountains for both enthusiasts and professionals." The report of Switzerland not only presented the serious problems that mountain climbers have encountered so far, the active solutions that already were put into practice among researchers and the mountaineering community, but also stressed the need to continue the dynamic protection of the Alps with regular monitoring in future.

France, in its turn, made no mention of the climate challenges of alpinism in its report.

Other: researchers and scientists

Research institutions in all three countries are working towards strengthening preventive monitoring of environmental threats in the Mont Blanc massif. Collaborative efforts between authorities, researchers, and alpinists have resulted in long-term research projects aimed at monitoring the impacts of CC. In France, the University of Grenoble's Laboratory of Glaciology and Environmental Geophysics, in conjunction with the National Centre for Scientific Research of Savoie Mont Blanc University, produces an annual report documenting changes in alpine glaciers. Similarly, in Italy, the Comitato Glaciologico Italiano in Turin and the Società Meteorologica Italiana operate glaciological research centers. Switzerland is also actively involved, with glaciological laboratories at the Swiss Federal Institute of Technology in Zurich and the University of Bern, along with the Institute for Snow and Avalanche Research in Davos. To address the vulnerability of changing glaciers to higher temperatures and the associated risks of collapse on routes and access points to refuges and inhabited areas (such as Taconnaz in France, Grandes Jorasses in Italy, and Trift in Switzerland), these locations are equipped with automated devices that provide real-time data for continuous monitoring purposes. The Center for Research on Altitude Ecosystems, based in France, Chamonix-Mont-Blanc, in its turn, has been running a long-term environmental monitoring program, Climate Change Impacts on Mountain Biodiversity.

The Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) research program CCAMM – Climate Change Impacts on Alpine Mass Movements – was launched in 2018 and is currently continuing in the next round. The program combines the knowledge of various research teams of the WSL, the WSL Institute for Snow and Avalanche Research, the Swiss Federal Institute of Technology in Zurich, the École Polytechnique Fédérale de Lausanne, and the Technical University of Munich. "CCAMM fosters inter- and transdisciplinary research to respond to the new challenges posed by the impacts of climate change on alpine mass movements. The WSL research program thus addresses a socially relevant question and provides an important contribution to societal adaptation to the effects of climate change." Among the activities of this group of scientists are early detection of mass movements in the Alps, analysis of the climate related hazard disposition and dynamics of snow, rock and ice avalanches, understanding the socio-economic risks in the mountain areas and exploring the adaptation strategies.

Several research publications have appeared in recent decades addressing both the nature of the current geological degradation in the Alps (Deline et al. 2012, Gruber & Haeberli 2007, Huggel et al. 2012, Ravanel & Deline 2011, Ravanel et al. 2013, Ravanel et al. 2017) and the impact of CC on the alpinism tradition (Mourey & Ravanel 2017, Mourey et al. 2019) as

well as recreational tourism in the alpine areas in a broader sense (Bürki et al. 2005, Salim et al. 2021).

Other: journalists

Mass media and journalists play a crucial role in addressing the CC risks faced by alpinism in Europe, specifically in France, Italy, and Switzerland, due to CC. At both national and international levels, mass media through news articles, visual storytelling documentaries, and interviews, raise awareness of the problems caused by the CC in the Alps. They have educated the general public about the specific threats and risks faced by climbers, such as melting glaciers, unstable weather patterns, and increased rockfall. The accidents in recent years that are being linked directly to CC factors (e. g. the tragic ice glacier collapse on Marmolada Mountain in Italy 3.07.2022.) have been widely reported in national news. Journalists also collaborate with scientists and researchers who study the impact of CC on alpine environments. By reporting on the latest findings and studies, they provide accurate information to the public and emphasize the urgency of addressing CC. In all three countries, the alpinism tradition received special attention from mass media in 2019 when the joint ICH element was included in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity.

4. Existing practices: solutions implemented, planned, or proposed

Community level

The community of alpinists is international, and the Mont Blanc massif attracts climbers from all over the world. Witnessing the impacts of CC, the alpinists try to adjust to complex and ongoing circumstances. Their adaptation strategies are primarily practical and designed to avoid danger to human safety, including the following: looking for alternatives to traditional climbing routes; safety precautions (inspecting weather forecasts more critically and making timely decisions to avoid hazardous situations); adapting their climbing schedules to the shifted seasons; using more advanced equipment and technology. Besides, raising awareness of both the fragile ecosystems of the mountains and the CC impacts is considered very important. In 2022, the British mountain guide Jon Bracey encouraged the pessimistic mood caused by CC to be turned into useful action: “We've got to act in meaningful ways to reduce climate change, even if it’s for our own sanity. The devastating scenes we are witnessing in the Alps this summer should be a stark warning to everyone of what awaits planet Earth in the very near future.” (Berry 2022)

Many members of alpinist communities residing in the ICH countries, France, Italy, and Switzerland, have engaged with scientists in their research, providing essential information from the perspective of the stakeholders as well as, through citizen science approach, have been involved in monitoring the biodiversity of the alpine ecosystems (in France, the Research Center for Alpine Ecosystems).

There are examples of purposeful efforts of knowledge transfer between the scientists studying the accidentology and geomorphological phenomena caused by CC along the classic route up Mont Blanc (this popular route is visited by 20,000 climbers per summer season and, unfortunately, also one of the deadliest summits in the world), which, undoubtedly, affect the mountaineering tradition, and the ICH communities. Scientists from EDYTEM Laboratory (France), by showing the existing risks in a form that is accurate and based on scientific measurements as well as presenting statistical information on accidents in the period from 1990 to 2017, have encouraged the mountaineering communities to develop the adaptation practices. Scientists’ recommendations included such adaptation measures as distribution of relevant information, alternative routes and an earlier morning train for

climbers and others. In the survey they conducted to get feedback from the communities, namely the mountain guides, elected officials, rescuers, amateur mountaineers, and journalists, over 200 respondents altogether in France and abroad, the most accepted were the proposals to provide better information for mountaineers to transform uses (an earlier morning schedule for the Mont Blanc train received the most favourable opinions) as well as protecting the Mont Blanc site and supporting research. However, the proposals linked to new developments, such as a tunnel or stone guards and stricter regulations were perceived as irrelevant or even rejected. (see Mont Blanc) This shows that implementing the recommendations is likely to be a slow process and may be met with some scepticism and resistance in communities. “At this point, it is impossible to know how effective our work has been in changing climber behaviour, and how effective the route management measures have been in reducing the number of accidents. However, the fact that our results have been widely downloaded, that they have received considerable attention from the press, and that the actors in charge of the management of the route have used them shows that they respond to a need for knowledge and that they promote the implementation of concrete actions for adaptation. These adaptation measures are even more important given that it has been estimated that, in the future, climate change will lead to an increased rockfall hazard in high Alpine environments.” (Mourey et al. 2022: 457)

National level

In 2019, addressing CC at national level, Italy developed and adopted the Integrated National Energy and Climate Plan. Following the directions of the Regulation on the governance of the energy union and climate action (EU)2018/1999, agreed as part of the Clean Energy for all Europeans package (entered in force in 2018) (adopted in 2019), these national plans outline the five dimensions of the energy union: decarbonisation, energy efficiency, energy security, internal energy market, research, innovation, and competitiveness. The plan would indirectly also benefit mountain regions like the Mont Blanc massif.

In 2022, Italy’s Ministry of the Environment and Energy Security published the country’s first National Plan for Adaptation to Climate Change. In the subsection 3.1 “Cryosphere and Mountains" of this national planning document, the mountains are seen as particularly sensitive areas, with special emphasis on the Alps, which are particularly vulnerable due to their high population density, significant tourist activity, and the extensive presence of glaciers and permafrost. The plan also outlines the CC challenged situation of alpinism in Italy and recommends that the agency of this traditional practice be largely left to the ICH communities: “Finally, it is essential to underline how climate change is modifying mountaineering activities. Many routes have been altered and revised. In line with the recent directives of the National Civil Protection Department, the action of responsible authorities should be directed solely towards inhabited areas and infrastructure, while mountaineering activities should be left to the assessments of individual climbers and mountain professionals such as Alpine Guides. In relation to targeted and localized closures of routes, priority should be given to risk awareness rules and self-regulation, as well as to self-regulation initiatives by Alpine Guide Societies, especially considering their greater importance and impact on other mountaineers.” (Piano Nazionale di Adattamento ai Cambiamenti Climatici 2022: 39)

Like Italy, France's Integrated National Energy and Climate Plan (2020) outlines the country's efforts relating to energy and climate in a general programmatic way, without mentioning the Alpine region and aspects of mountaineering. However, implementation of this plan can indirectly impact the Mont Blanc massif region.

In 2020, the French government established the French Biodiversity Agency. This new public institution is dedicated to the protection and restoration of biodiversity in Metropolitan France and its Overseas Territories, under the supervision of the ministries responsible for Ecology and Agriculture and Food. One of the first tasks of the French Biodiversity Agency, as

announced by the country's President Emmanuel Macron, was protection and monitoring biological diversity of Mont Blanc in the Alps. Today the Agency coordinates and supports French municipalities in various projects, including data collection for the Biodiversity Atlas. It is also a consultative forum on protected areas in France and serves in providing biodiversity related information to the general public.

International level

There is no specific international legislation solely dedicated to the protection of the Mont Blanc massif from CC. However, various international agreements, conventions, and organizations focus on CC and environmental protection of the area.

Since 1991, the representatives from France, Italy, and Switzerland work side by side within the Espace Mont-Blanc initiative. This transboundary cooperation is bringing together Savoie, Haute-Savoie, the Aosta Valley, and Valais. They commit themselves to the protection and enhancement of the emblematic territory, focusing on matters such as education, environmental protection, adapting to CC, heritage enhancement, sustainable mobility, etc. One of the current tasks of this cooperation is the preparation of the application of Mont Blanc UNESCO World Heritage Site bid, with the aim of achieving international recognition for the unique values of this cross-border space in terms of nature, landscapes, and culture. That will undoubtedly draw even more attention to the CC effects in the Mont Blanc massif.

The international territorial treaty for the sustainable development of the Alps whose focus is directly on the effects of the CC, is The Alpine Convention which entered into force in 1995. This Framework Convention involves the European Union and eight countries: Austria, France, Germany, Italy, Liechtenstein, Monaco, Slovenia, and Switzerland. Since 2016, climate-related works of the Alpine Convention are bundled under the roof of the Alpine Climate Board. It has developed many documents dedicated to climate problems in the Alps and their possible solutions, including Climate Action Plan 2.0 (in 2021). The implementation of the plan also foresees the involvement of mountaineering clubs as stakeholders, but not directly aimed at maintaining the practice of alpinism.

In 2004, PLANALP, the Platform on Natural Hazards, which involved high-level experts delegated by the contracting parties of the Alpine Convention, was established at the VIII Alpine Conference. One of the documents it developed was The Alpine strategy for adaptation to climate change in the field of natural hazards. However, mountaineering was not considered in the strategy at all, respectively, cooperation with this ICH community in the development of a strategic document did not take place.

Some of the recent international activities carried out in the area have involved in-depth studies of the climate situation in the Alpine region, including alpinism as a traditional leisure activity that is important for the region. In 2019, within the European territorial cooperation program Interreg Alcotra Italy-France, an extensive climate report, “Climate change in the Mont-Blanc Massif and its impacts on human activity”, was carried out in inter-institutional cooperation between Aosta Valley Regional Environmental Protection Agency (Italy), Center for Research on Altitude Ecosystems (France), Mountain Safety Foundation (Italy), and EDYTEM Lab, University Savoie Mont-Blanc (France). Among the many aspects covered and analysed, the report also presents the impacts of the CC on alpinism, highlighting the successive factors: warming temperatures lead to glacier retreat, permafrost degradation and decreases in snow cover, which, in turn, cause decreases in glaciated areas and increases in the frequency and size of rockfalls, it significantly alters the usual alpinism routes and also creates an unsafe environment for mountaineering. (Cremonese et al. 2019: 77-82) The findings presented in the report were concluded with a call for CC adaptation policies. Certain knowledge gaps were identified by the authors and were recommended for future studies: (1) deepen the understanding of the impacts on certain sectors, such as agriculture, water, forests, natural heritage and conservation, tourism, natural hazards, health and wellbeing; (2)

more efficiently take into account interactions between sectors; (3) incorporate the cumulative effects linked not only to CC but also to other impacts of human activity on the environment; (4) analyze the current state and develop future scenarios of the main ecosystem services; (5) improve incorporation of socio-cultural aspects in the analyses to encourage the general public, the various stakeholders and decision-makers to recognize the importance of CC adaptation actions and policies in the Mont Blanc area, and also improve the knowledge transfer from scientific studies (Cremonese et al. 2019: 88-89) The overall contribution of this AdaPT Mont-Blanc project (2018-2020) provided a strategic vision and development of tools for planning CC adaptation actions and policies that could be integrated and adopted by public institutions of the Mont Blanc Area at different levels (local, regional), through a participatory approach and a cross-sectoral approach.

At the EU level, the Mont Blanc massif can undoubtedly be seen as an area of attention for the European Green Deal initiatives. This recent EU response to the CC and environmental degradation as an existential threat to Europe and the world brings the ethos of "no person and no place left behind" in life. Preserving and restoring ecosystems and biodiversity is the most resonant of the strategic directions of the Green Deal regarding the case of the Alps.

Observations of current mountain ecosystems and problems for the human lives and diverse activities in the mountain regions have also been carried out at global level, inter alia, encouraging development of adaptation strategies and mountain-relevant policies (see Egan & Price 2017). Following the Paris Agreement, a legally binding international treaty on CC (adopted by 196 parties at the UN Climate Change Conference in 2015, it entered into force in 2016), in 2022, the Intergovernmental Panel on Climate Change (IPCC), the United Nations' body for assessing the science related to CC, published the IPCC Sixth Assessment Report, "Climate Change 2022: Impacts, Adaptation and Vulnerability". The report stated that climate- and weather-related disasters in mountain regions have increased significantly over the last three decades, however, "no clear trends are observed for the European Alps and Central Asia (medium confidence)", however, along with extreme heat conditions in the summers, the Alps have been a subject to "climate-induced hazards in mountains, such as rockfalls, negatively affect access to some climbing, mountaineering and hiking routes in summer (medium confidence)" (Adler et al. 2022: 2285, 2287). Based on a critical evaluation of a large amount of data and previous studies, the report seeks to answer such strategically important questions as "What types of adaptation options are feasible to address the impacts of climate change in mountain regions under different levels of warming, and what are their limits?" and "Why are regional cooperation and transboundary governance needed for sustainable mountain development?" (Adler et al. 2022: 2303-2304)

5. Publications and other additional information

Research bibliography

1. Adler, C., Wester, P., Bhatt, I., Huggel, C., Insarov, G. E., Morecroft, M. D., Muccione, V., Prakash, A. (2022). Cross-Chapter Paper 5: Mountains. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 2273–2318, doi:10.1017/9781009325844.022. Available at: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_CCP5.pdf

2. Braunschweiger, D., Pütz, M. (2021). Climate adaptation in practice: How mainstreaming strategies matter for policy integration. *Environmental Policy and Governance*, 31 (4), pp. 361-373. doi: 10.1002/eet.1936 Available at: https://www.dora.lib4ri.ch/wsl/islandora/object/wsl:26252
3. Bürki, R., Elsasser, H., Abegg, B. & Koenig, U. (2005). Climate Change and Tourism in the Swiss Alps. Hall, C. M., Higham, J. E. S. *Tourism, Recreation and Climate Change* (Aspects of Tourism). Bristol, Great-Britain: Channel View Publications.
4. Cremonese, E., Carlson, B., Filippa, G., Pogliotti, P., Alvarez, I., Fosson, J. P., Ravanel, L., Delestrade, A. (2019). *Climate report. Climate change in the Mont-Blanc Massif and its impacts on human activity* (AdaPT Mont-Blanc: Rapport Climat: Changements climatiques dans le massif du Mont-Blanc et impacts sur les activités humaines). Rédigé dans le cadre du projet AdaPT Mont-Blanc financé par le Programme européen de coopération territoriale Alcotra Italie-France 2014-2020. Available at: https://www.espace-mont-blanc.com/asset/rapportclimat_eng.pdf
5. Deline, P., Gardent, M., Magnin, F., Ravanel, L. (2012). The morphodynamics of the Mont-Blanc massif in a changing cryosphere: a comprehensive review. *Geografiska Annaler: Series A, Physical Geography*, 94(2), pp. 265-283.
6. Egan, P. A., Price, M. F. (eds.) (2017). *Mountain Ecosystem Services and Climate Change. A Global Overview of Potential Threats and Strategies for Adaptation Prepared for the UNESCO Programme Climate Change Impacts in Major Mountainous Regions of the World: Multidisciplinary Network for Adaptation Strategies (Africa, Asia, Latin America and Europe)*. Paris: UNESCO. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000248768/PDF/248768eng.pdf.multi
7. Gruber, S. & Haeberli, W. (2007). Permafrost in steep bedrock slopes and its temperature-related destabilization following climate change. *Journal of Geophysical Research* 112 (F02S18). doi: 10.1029/2006JF000547.
8. Huggel, C., Clague, J. J., Korup, O. (2012). Is climate change responsible for changing landslide activity in high mountains? *Earth Surface Processes and Landforms* 37, pp. 77–91.
9. Kotlarski, S., Gobiet, A., Morin, S. et al. 2023. 21st Century alpine climate change. *Climate Dynamics* 60, pp. 65–86. Available at: https://link.springer.com/article/10.1007/s00382-022-06303-3
10. Mourey, J., Lacroix, P., Duvillard, P.-A., Marsy, G., Marcer, M., Malet, E., and Ravanel, L. (2022). Multi-method monitoring of rockfall activity along the classic route up Mont Blanc (4809 m a.s.l.) to encourage adaptation by mountaineers. *Natural Hazards and Earth System Sciences*, pp. 445–460. Available at: https://doi.org/10.5194/nhess-22-445-2022
11. Mourey, J., Marcuzzi, M., Ravanel, L., Pallandre, F. (2019). Effects of climate change on high alpine mountain environments: evolution of mountaineering routes in the Mont Blanc massif (western Alps) over half a century. *Arctic, Antarctic, and Alpine Research* 51(1), pp. 176–189. doi: 10.1080/15230430.2019.1612216.
12. Mourey, J., Ravanel, L. (2017). Evolution of Access Routes to High Mountain Refuges of the Mer de Glace Basin (Mont-Blanc Massif, France). An Example of Adapting to Climate Change Effects in the Alpine High Mountains. *Journal of Alpine Research. Revue de géographie alpine*, (105-4). Available at: https://journals.openedition.org/rga/3790
13. Ravanel, L., Deline, P. (2011). Climate influence on rockfalls in high-Alpine steep rockwalls: The north side of the Aiguilles de Chamonix (Mont-Blanc massif) since the end of the 'Little Ice Age'. *The Holocene*, 21(2), pp. 357-365.

14. Ravanel, L., Deline, P., Lambiel, C., Vincent, C. (2013). Instability of a high alpine rock ridge: The lower Arête des Cosmiques, Mont-Blanc Massif, France. *Geografiska Annaler: Series A, Physical Geography*, 95(1), pp. 51-66.
15. Ravanel, L., Magnin, F., Deline, P. (2017). Impacts of the 2003 and 2015 summer heatwaves on permafrost-affected rock-walls in the Mont-Blanc massif. *Science of the Total Environment*, 609, pp. 132-143.
16. Salim, E., Ravanel, L., Bourdeau, P., Deline, P. (2021). Glacier tourism and climate change: effects, adaptations, and perspectives in the Alps. *Regional Environmental Change* 21: 120. Available at: https://link.springer.com/article/10.1007/s10113-021-01849-0

Press

1. (2022, July 4). *Climate change threatens Europe's once 'placid' Alpine glaciers*. Aljazeera.com. Available at: https://www.aljazeera.com/news/2022/7/4/climate-change-threatens-europes-once-placid-alpine-glaciers
2. (2022, July 3). *Alpine glacier collapses in Italy, killing five people: Rescuers*. Aljazeera.com. Available at: https://www.aljazeera.com/news/2022/7/3/alpine-glacier-collapses-italy-kills-several-people?traffic_source=KeepReading
3. (2019, December 12). *Unesco: alpinismo inserito nella lista dei beni immateriali* (Unesco: alpinism added to the list of intangible heritage). Repubblica.it. Available at: https://www.repubblica.it/cronaca/2019/12/12/news/unesco_alpinismo_inserito_nella_lista_dei_beni_immateriali-243271546/
4. Bonnel, O. (2022, July 6). *A study reveals the extreme instability of Italian glaciers*. LeMonde.fr. Available at: https://www.lemonde.fr/en/environment/article/2022/07/06/a-study-reveals-the-extreme-instability-of-italian-glaciers_5989263_114.html
5. Cortinovis, F. (2023, February 6). *Ecco come il cambiamento climatico ha cambiato il Monte Bianco negli ultimi 40 anni* (Here's how climate change has changed Mont Blanc over the past 40 years). Montagna.tv. Available at: https://www.montagna.tv/213015/ecco-come-il-cambiamento-climatico-ha-cambiato-il-monte-bianco-negli-ultimi-40-anni/
6. Giuffrida, A. (2019, September 28). *'You broke our glacier': the Mont Blanc resort on the climate frontline*. Theguardian.com. Available at: https://www.theguardian.com/world/2019/sep/28/courmayeur-you-broke-our-glacier-mont-blanc-resort-climate-frontline
7. Gougelot, L. (2022, June 6). *La voie du mont Blanc de plus en plus difficile à cause du réchauffement climatique* (The Mont Blanc route is becoming increasingly challenging due to climate change). Europe1.fr. Available at: https://www.europe1.fr/societe/la-voie-du-mont-blanc-de-plus-en-plus-difficile-a-cause-du-rechauffement-climatique-4115840
8. Jochum, B. (2020, August 17). *Rocked by heat and climate breakdown, the Mont Blanc valley looks into its future*. Genevasolutions.news. Available at: https://genevasolutions.news/climate-environment/rocked-by-heat-and-climate-breakdown-the-mont-blanc-valley-looks-into-its-future
9. Khadka, N. S. (2019, November 1). *Climate change 'making mountaineering riskier'*. BBC.com. Available at: https://www.bbc.com/news/science-environment-50237551
10. Orlandi, G. (2022, July 14). *Analysis: From melting glaciers to drought, the climate crisis unfolds in Italy*. Euronews.com. Available at: https://www.euronews.com/my-europe/2022/07/14/analysis-from-melting-glaciers-to-drought-the-climate-crisis-unfolds-in-italy

11. Petroni, A. (2020, October 23). *How Climate Change Is Making the Alps More Dangerous*. Outsideonline.com. Available at: https://www.outsideonline.com/outdoor-adventure/environment/how-climate-change-making-alps-more-dangerous/
12. Quaglia, S. (2023, May 4). *Melting glaciers in Alps threaten biodiversity of invertebrates, says study*. Theguardian.com. Available at: https://www.theguardian.com/environment/2023/may/04/melting-glaciers-in-alps-threaten-biodiversity-of-invertebrates-says-study
13. Schrader, M. (2023, June 22). *AP PHOTOS: To save Alpine glaciers, Swiss team monitors the escalating melt*. Apnews.com. Available at: https://apnews.com/article/glaciers-switzerland-melting-climate-change-photos-323ec9b31d72e24193f22de7ceaea992
14. Simičević, V. (2023, March 23). *How climate change is reshaping the Alps*. BBC.com. Available at: https://www.bbc.com/future/article/20230322-how-climate-change-is-melting-permafrost-in-the-alps#:~:text=In%20the%20European%20Alps%2C%20more,mountains%20it%20is%20found%20in.&text=Permafrost%20in%20the%20Alps%20tends,helping%20to%20glue%20them%20together
15. Turner, B. (2022, August 1). *Mont Blanc warning as France heatwave causes more frequent rockfalls*. Euronews.com. https://www.euronews.com/2022/08/01/mont-blanc-warning-as-france-heatwave-causes-more-frequent-rockfalls
16. Uliveri, V. (2015, September 15). *Alpi: monitorare clima e piante con la Citizen science* (Alps: monitoring climate and plants with citizen science). Corriere.it. Available at: https://www.corriere.it/scienze/15_settembre_14/alpi-monitorare-clima-piante-citizen-science-bebcf44a-5aef-11e5-8668-49f4f9e155ef.shtml
17. Willsher, K. (2022, February 13). *France to limit access to Mont Blanc to protect biodiversity.* Theguardian.com. Available at: https://www.theguardian.com/world/2020/feb/13/france-limit-access-mont-blanc-protect-biodiversity-macron

Legal and policy sources

1. Alpine Convention, Alpine Climate Board (2021). *Climate Action Plan 2.0*. Available at: https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/climate-action-plan-20/
2. Alpine Convention, Platform on Natural Hazards of the Alpine Convention PLANALP [2012]. *The Alpine strategy for adaptation to climate change in the field of natural hazards*. Available at: https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Organisation/thematic_working_bodies/Part_02/natural_hazards_platform_planalp/8_PLANALP_Alpine_strategy.pdf
3. European Commission (2019). *A European Green Deal*. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
4. European Commission (2019). *Communication from the Commission. The European Green Deal* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0640
5. European Commission (2019). *National energy and climate plans. EU countries' 10-year national energy and climate plans for 2021-2030*. Available at:

https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en

6. European Commission, Directorate-General for Energy (2019). *Clean energy for all Europeans package*. Available at: https://op.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a1/language-en
7. European Parliament, European Commission (2018). *Regulation on the governance of the energy union and climate action (EU)2018/1999*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0001.01.ENG&toc=OJ:L:2018:328:TOC
8. France (2020). *Integrated National Energy and Climate Plan for France*. Available at: https://energy.ec.europa.eu/system/files/2022-08/fr_final_necp_main_en.pdf
9. Italy (2019). *Integrated National Energy and Climate Plan*. Available at: https://energy.ec.europa.eu/system/files/2020-02/it_final_necp_main_en_0.pdf
10. Ministero dell'Ambiente e della Sicurezza Energetica (Ministry of the Environment and Energy Security), Italy (2022). *Piano Nazionale di Adattamento ai Cambiamenti Climatici* (National Plan for Adaptation to Climate Change). Available at: https://www.mase.gov.it/sites/default/files/archivio/allegati/clima/PNACC_versione_dicembre2022.pdf
11. UNESCO (in progress). *Periodic reporting: submissions and forthcoming deadlines for all States Parties*. Available at: https://ich.unesco.org/en/submissions-and-deadlines-00861
12. United Nations Framework Convention on Climate Change (2016). *The Paris Agreement*. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement
13. United Nations, Intergovernmental Panel on Climate Change (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability. IPCC Sixth Assessment Report*. Available at: https://www.ipcc.ch/report/ar6/wg2/

Other resources

1. (2022, October 18). *The Environment & The Mountains*. Seechamonix.com. Available at: https://www.seechamonix.com/environment/the-environment-in-the-mountains-mont-blanc-valley-710720
2. (2021, November 26). *Nommer/Normer. Approches pluridisciplinaires du patrimoine culturel immatériel* (Naming/Norming. Multidisciplinary approaches to intangible cultural heritage). Youtube.com. Available at: https://www.youtube.com/watch?v=AIBqneN1O-s&t=18348s&ab_channel=CarnetderechercheDroit%2Cpatrimoine%26culture (from 27:03)
3. (2020, July 6). *The death couloir*. A film by Petzl Foundation. Youtube.com. Available at: https://www.youtube.com/watch?v=EetE588qJNQ&ab_channel=PetzlSport
4. *AdaPT Mont-Blanc - Adaptation de la Planification Territoriale aux Changements Climatiques de l'espace Mont-Blanc* (AdaPT Mont-Blanc - Adapting Territorial Planning to Climate Change in the Mont-Blanc region). Available at: http://www.espaces-transfrontaliers.org/ressources/projets/projects/project/show/adapt-mont-blanc-adaptation-de-la-planification-territoriale-aux-changements-climatiques-de-lespa/
5. Berry, N. (2022, July 28). *Climbers and Guides Adapt to Changing Climate and Landscape in the Alps*. Ukclimbing.com. Available at:

https://www.ukclimbing.com/articles/features/climbers_and_guides_adapt_to_changing_climate_and_landscape_in_the_alps-14611

6. *CCAMM – Climate Change Impacts on Alpine Mass Movements*. Available at: https://ccamm.slf.ch/en/general-overview.html
7. *Chamonix Mountain Guides* (Compagnie des guides de Chamonix). Available at: https://www.chamonix-guides.com/en
8. Dawson, D. (2022, August 23). *How Climate Change Affects Mountaineering in the Alps*. Expedreview.com. Available at: https://www.expedreview.com/blog/2022/08/how-climate-change-affects-mountaineering-alps
9. Derr, A. (2023, May 5). *The Impact of Climate Change on Mountaineering: 7 Stunning Facts*. Thenextsummit.org. Available at: https://thenextsummit.org/climate-change-impact-mountaineering/
10. Elliott, D. (2019, October 22). *These chilling images expose climate change effects on a glacier*. Weforum.org. Available at: https://www.weforum.org/agenda/2019/10/climate-change-glaciers-the-alps-mont-blanc/
11. *Espace Mont-Blanc* (Mont-Blanc area). Available at: https://www.espace-mont-blanc.com/en/
12. *French Federation of Alpine and Mountain Clubs* (Fédération française des clubs alpins et de montagne, FFCAM). Available at: https://www.ffcam.fr/
13. *Italian Alpine Club* (Club Alpino Italiano, CAI) https://www.cai.it/
14. Mélières, M.-A. *Les impacts du changement climatique sur les écosystèmes montagnards* (The impacts of climate change on mountain ecosystems). Ffcam.fr. Available at: https://www.ffcam.fr/CS-climatologie.html
15. *Mont Blanc: how can we reduce accidents in the Goûter couloir?* Petzl.com. Available at: https://www.petzl.com/fondation/s/accidents-couloir-gouter?language=en_US
16. *Montagne et changement climatique. La nature déboussolée - 10 minutes pour comprendre* (Mountains and climate change. Nature in disarray - 10 minutes to understand). Atlas.creamontblanc.org. Available at: https://www.atlas.creamontblanc.org/survoler/
17. *National College of Alpine Guides* (Collegio Nazionale Guide Alpine). Available at: http://www.guidealpine.it/collegio-nazionale.html
18. *National Museum of the Mountain "Duca degli Abruzzi" – CAI Turin*. Available at: https://www.mountainmuseums.org/en/museo-nazionale-della-montagna-torino/
19. *National Union of Mountain Guides* (Syndicat national guides de montagne). Available at: https://sngm.com/
20. Riihimaki, M. (2022, October 3). *Adaptation, high mountaineering and the climate change in the Alps*. Blog.norrona.com. Available at: https://blog.norrona.com/adaptation-high-mountaineering-and-the-climate-change-in-the-alps/
21. Stirling, S. (2019, December 12). *Are the Alps falling down? An interview by Katy Dartford with IFMGA Mountain Guide Andy Perkins*. Thebmc.co.uk. Available at: https://www.thebmc.co.uk/alps-mountaineering-climate-change-rockfall-bmc
22. Stretton, J. (2019, December 20). *How Climate Change is Affecting the Alps*. Runthealps.com. Available at: https://runthealps.com/blog/how-climate-change-is-affecting-the-alps
23. *Swiss Alpine Club* (Schweizer Alpen-Club, SAC). Available at: https://www.sac-cas.ch/en/
24. *Swiss Association of Mountain Guides* (Association suisse des guides de montagne, ASGM). Available at: https://sbv-asgm.ch/

25. *The French Biodiversity Agency* (L'Office français de la biodiversité). Available at: https://www.ofb.gouv.fr/en
26. *The High Mountain Group* (Le Groupe de Haute Montagne). Available at: http://www.ghm-alpinisme.fr/
27. *The Italian Glaciological Committee* (Il Comitato Glaciologico Italiano). Available at: http://www.glaciologia.it/en/il-comitato/

6. Contributor

This study was prepared by ILFA: Rita Grīnvalde.

4.3. CS3 Wine Culture in Germany

1. ICH element

Title in English

Wine culture in Germany

Title in German

Weinkultur in Deutschland

National Inventory of ICH

https://www.unesco.de/kultur-und-natur/immaterielles-kulturerbe/immaterielles-kulturerbe-deutschland/weinkultur (since 2021)

A brief description

For centuries, wine culture has determined the rhythm of life of people in wine-growing regions in Germany. This has given rise to numerous customs, seasonal festivals, and its own vocabulary. Wine culture also encompasses the landscape in which the wines are produced, and the knowledge and skill involved in their care. Each site produces wines with different nuances of taste. Over centuries, communities have developed the knowledge of which wine thrives ideally in which site. Regional cultivation can promote the interplay between climate, soil, and people in terms of sustainable development. In addition, terraced vineyards often harbour a rich flora and fauna. Wine nature trails and hiking paths serve to pass on knowledge about winegrowing.

Historically the poem Mosella, by the Roman author Ausonius of Bordeaux in 370, is the sole reliable textual evidence for the claim that Emperor Probus (276–82) founded viticulture in Germany. The gifts of its kings, as Dagobert I (622–88), who granted vineyards at Ladenburg on the Neckar to the church of St. Peter in Worms, provide evidence of winemaking under the Merovingians. This is one of the earliest pointers to vines on the right bank of the Rhine. East of the Rhine the spread of viticulture went hand in hand with the missions of Christian monks in Bavaria. In the Middle Ages, even the wooded areas of Germany were cleared to make way for vineyards. Subsequently, grape cultivation was impacted by wars in which numerous lives were lost, leading to constraints on wine production; moreover, wine production was strictly linked to the aristocracy and the church and their needs. Deforestation was also banned, reducing the areas for viticulture. In the 19th century, winegrowers' associations, schools, and research institutions were set up in Germany, leading to the rapid development of the field. However, small growers and producers also operated alongside the state-regulated business.

This case study will mostly concern the winegrowing and production in Mosel region to analyse in more detail the intangible cultural heritage of this area and the climate change influencing it. Mosel is one of the largest wine regions in Germany, named after the Mosel River. In this region, vineyards are located on steep slopes next to the river. On the Mosel, Riesling dominates about 60% of the cultivated area. This white grape variety has high climatic requirements (especially regarding temperature) but is not very choosy about the soil. Other varieties are also grown in the flatter areas of the region – Spätburgunder (Pinot Noir), Müller-Thurgau, Elbling, Pinot Blanc and other varieties rarely cultivated here. The region's tourist information website claims that there are around 3000 winemakers in Mosel, it is estimated that 60 million vines are cultivated in the Mosel wine-growing region, resulting in a vineyard area of 8743 ha. Mosel has 3500 hectares of steep-slope vineyards and some of them are the steepest vineyards in the world.

This tradition is also important for the today production and its development. "The connection between site and flavour is strongest in Europe, where centuries of

experimentation have led to precise ideas about which grape varieties and growing techniques make the most desirable wine in each region. In many locations this knowledge has evolved from tradition into legislation, formalized by authorities called controlled appellation boards. At a minimum, these organizations define the geographic extent of the wine growing area and specify the varieties that may be grown within its borders. The mandates may go further, specifying ripeness levels for harvest or specific viticultural practices. The boards essentially define the regional wine, then tell growers and vintners how to produce bottles as close to this ideal as possible." (Pincus 2003: 87)

The election of the Mosel Wine queens is an old tradition. A new wine queen in Mosel has been crowned every year since 1949 (in Germany in general since 1931). Together with her princesses (2nd and 3rd prize winners), she represents the Mosel wine-growing region. They are modern ambassadors of the Mosel region who represent their homeland with great commitment. The queen of the region can then claim the title of Wine queen of the whole Germany. Originally, Wine queens wore traditional costumes, had to come from winemaking families and be able to waltz well, but in recent decades the rules are less strict: they must have a good reputation, know wine culture in all its forms and be at least 18 years old. The German Wine queen is chosen in a series of challenges broadcasted on television. This usually takes place at the German Wine Harvest Festival on the Friday of the second festival week in October. The winner represents German wine for the following year at events both locally and in other countries, at fairs, seminars, wine festivals and promotes the wine at a wide range of events and highlighting problems in the wine industry.

The Mosel region hosts wine festivals, both in the wider areas and in small villages. They take place mainly in August and September. They include the crowning of wine queens, singing, games, dancing, wine and food tasting, parades, performances, and other events.

Geographical coordinates
49.88197, 6.87643
Mosel, Germany

2. CC risks and effects

Grape growing, and therefore wine production, is affected by climate change, since viticulture is very sensitive to climate. Temperature changes and excessive heat are the main factors. Unforeseen hail and thunderstorms with subsequent flooding also have a significant impact on grape growing, as they can destroy crops in a short time.

So far, the rising temperatures have benefited grape-growing by providing a warmer, longer growing season, which in turn ensures that the grapes are stronger and bolder. Also, the alcohol content of the grapes is then higher. Now, however, the heat is starting to be felt more and more Areas to the north are now becoming more suitable for growing grapes than previously. The taste of grapes is influenced by the soil in which they grow so if the composition of the soil changes due to heat and moisture, the taste of the grapes changes too. The number of hours of sunshine per day also has an effect, and all these conditions affect the final result, i.e., the taste of the wine. "Grapevines hate wet feet and do best in arid areas where temperatures don't dip below 12 or 13 Celsius degrees, during the growing season, or spike above 22 ^{o}C. Sunlight is also important. As the vine leaves soak up sunshine, the light fuels photosynthesis, which fills the grapes with sugars. After fermentation, these sugars become alcohol." (Gaidos 2014: 22). Moreover, changes in temperature and humidity affect the grape defences against various diseases and microbes.

One of the future projections for the Mosel region is that "Precipitation will decrease by about 5% on average. Drier falls will become more common, although the wettest winters

will be much wetter than today's; sunshine over the growing season will increase by about 1.5%, though this will be more variable from year to year than it is now. Summers are likely to be sunnier than today. Extremely sunny or cloudy years will become somewhat more frequent, though still rare; there will be about three hundred more degree-days during the growing season. Spring and summer will be uniformly warmer and fall somewhat warmer but more variable than today; frosts of –7° C (hard enough to make Eiswein) will arrive about a week later than they do now, but they will arrive in about 25% fewer years." (Pincus 2003: 91)

German wine culture faces a significant threat from the CC and its associated weather extremes. Because of heat and drought stress, dry spells and rising temperatures can cause a decline in quality and yield in vines. Due to the early onset of the growth cycle at higher temperatures, the risk of late frost increases. The risk of diseases in the vine is further increased by high temperatures, including infestation and the rapid spread of heat-loving pests. Even more severe damage can be done by extreme weather conditions like hail or torrential rain. For example, warming temperatures may make German Riesling (a cool-climate wine) less enjoyable since heat mellows the acid's sharp flavour. (Nicholas 2015) Because grapes are so sensitive to temperature, even in well-known territory, the local expertise and skills that have been developed over many generations may become obsolete if the environment changes even a little.

Secondary impacts of CC also affect people's ability to work in hot weather in vineyards. Impacts on freshwater in the area are also expected: "Attempts to maintain wine grape productivity and quality in the face of warming may be associated with increased water use for irrigation and to cool grapes through misting or sprinkling, creating potential for freshwater conservation impacts." (Hannah et al. 2013: 6907)

It has been said that "winegrowers think of climate on three levels: the macroclimate of a region like Carneros or Burgundy; the mesoclimate of a vineyard parcel; and the microclimate of a cluster of grapes within a canopy of leaves." (Nicholas 2015: 64)

The following are examples of CC that affect the tradition of the wine culture in Germany:

1. Erosion;
2. Changed freeze/ thaw cycles;
3. Increased storm intensity and/ or frequency;
4. More extreme rainfall;
5. Drought;
6. Weather extremes.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

The attitudes of ICH practitioners vary depending on the region where the grapes are grown, and the wine is made. The southern regions of Germany are already experiencing strong climate impacts and practitioners are highlighting this. In more temperate areas, however, there has been no major threat so far, although signs can be seen. Grapes grown on the banks of the Mosel have been, so far, less affected by CC, but still there are impacts. Before harvest, the Mosel grapes are often left on the vines for longer, retaining more acidity to ripen them better. In addition, when severe frosts occur and the water in the berries begins to freeze, concentrating the sugars in the grapes, some growers take the extra risk of leaving the fruit on the vines until December or later. The fruit, which is sometimes harvested late in the night, is used to make an intensely sweet Eiswein (ice wine; except for those that cultivate vineyards not prone to hard frost, the systematic picking of Eiswein have started in the 1960s and spread to most of top estates by the 1980s).

In the case of Mosel wines, the increase in temperature will allow more successful wine production. Flooding in the Mosel is seen as the biggest risk. Already, winters are erratic, causing flooding in the valley, where there are both grape fields and community homes and wine cellars. They may have to move their centuries-old farms to the highlands where they are not at risk of flooding. (Pincus 2003: 91-92) There are also problems with erosion of steep slopes, which degrade more quickly under changing climatic conditions.

Local winemaker Selbach is worried that the warming of the Mosel's climate will have negative effects on the region's wine industry. He claims that since the grapes will lose the acidity that distinguishes Mosel wines and enables them to age so well, hot summers and early ripening would be detrimental to the cause of Mosel Riesling. (Pincus 2003: 92) The future climate estimates don't look good for Eiswein. Even with the current climate, it is risky to leave good grapes on the vine in anticipation of a severe frost as, if frost does not occur by January, the grapes will be damaged by wind, sleet and hail and may need to be tossed out. Growers may be far less willing to take the risk if there were less severe frosts in early winter. (Pincus 2003: 92)

Winegrower from the Mosel region Mark Trossen said: “We are dealing with completely new weather extremes in viticulture. We have wet and dry years. And we must adjust to that somehow. (..) For us, there's no one-size-fits-all approach.” (Altmayer 2023)

The skills of growing grapes and making wine have been passed down from generation to generation. Maintaining tradition is essential in traditional families. Wine-related festivities and celebrations are unlikely to change in the near future. But wine itself and the practices involved in making and growing it will change.

Officials responsible for the ICH safeguarding

The Committee of Experts of the German Commission for UNESCO welcomed wine culture and its forms as an open, living, and multifaceted tradition that is closely linked to society. It includes social, craft, cultural and linguistic aspects, as well as many festivals and customs. Particularly in the wine-growing regions themselves, their diverse characteristics determine the rhythms of many people's lives and often shape local identity. In terms of sustainable development, regional cultivation contributes to the interaction between climate, soil, and people. They also note that CC is having an impact on this cultural heritage. The Deutsche Weinakademie (German Wine Academy) submitted the application for the ICH list. It is an organisation dedicated to wine research, education, policy issues, information circulation, industry workers, health issues and healthy wine consumption. Presumably, it is in their interest to take a broader view of the world of wine, so that wine culture is not just associated with excessive alcohol consumption and business but it is seen more broadly. In doing so, they also raise climate issues.

Other: journalists

For several years now, journalists (both local and national) have been highlighting the problems of CC affecting viticulture. Particularly in recent years, there have been both analytical articles containing the scientist views and the experiences of winegrowers together with their solutions to mitigate the impact of climate change on their practices. There have also been television documentaries focusing on vineyards and winegrowers with their ancient traditions and families. Journalists also offer insight into tourism interest, as the cultural landscape of interest to tourists is changing due to CC and regional wine varietals are also changing in specific places.

The articles show that winegrowers are aware of the CC problem and have been dealing with it for a long time, as in the case of Mark Trossen: “The vintner sees the consequences of climate change every year on his vines which grow directly along the wine trail.” (Altmayer 2023)

"Because it is getting hotter and drier on the Mosel, winegrowers are increasingly buying vineyards in cooler side valleys. It is an opportunity, for example, for neglected steep slopes on the Ruwer. (..) The grapes could ripen one to two weeks longer on the Ruwer than on the Mosel before they are harvested: "And every day of sunshine that the vines take contributes to the taste of the wine, there is also talk of growers establishing new vineyards in cooler regions." (Altmayer 2022)

A dramatic picture is also emerging: "Long dry spells, more CO_2 in the air and frost in May: is climate change putting German viticulture at risk? In her doctoral thesis, wine cooper Yvette Wohlfahrt is researching how higher CO_2 concentrations in the air affect grapevines. (..) Many aspects of climate change have consequences for viticulture, such as: the long dry periods, the higher temperatures, unevenly distributed precipitation over the year, and the increased radiation intensity of the sun. In addition, more greenhouse gases and, more specifically, a higher carbon dioxide content in the atmosphere also affect wine. And finally, there are more devastating storms that can destroy vines." (Rödder 2020).

Other: scientists

Scientists confirm that CC is also affecting viticulture, in terms of the seedlings and their growing conditions, of the acidity of the grapes themselves and their long-term survival, of the impact of rainfall on the plant and the soil, and the environment in which the grapes grow. There is also knowledge of the lowest temperatures and how they affect the vines, but there is yet no clarity on the maximum temperatures and their effects. Now, a transitional phase is experienced, and it is difficult to predict how viticulture and wine production will change in the future. The changing climatic conditions also change the diseases that affect grape cultivation. Winegrowers, especially the large ones, work closely with biologists, chemists, and climatologists, so the community and scientists are like-minded. For example, researchers at the Hochschule Geisenheim University have been studying vines, grapes, and their care for a long time. Some of the recent research covers topics such as "Grapevine endophytic fungi and their potential to regulate pest populations under climate change", "Profitability analysis in viticulture", "Cooperations for Climate Adaptations in Winegrowing Areas Using the Example of the Rheingau", etc. They are also carrying out research on FACE (Free air carbon dioxide (CO_2) enrichment) and for special crops they are examining the effects of increased CO_2 concentration on cultivation, physiology, pest infestation and product quality of grapevines and vegetables.

4. Existing practices: solutions implemented, planned, or proposed

Community level

Existing practices are largely about adapting plants and environments to grow more successfully in new conditions. As well, changing current practices is also considered. The winegrowers themselves say that weather extremes are a problem. Heat, drought, heavy rain, and an increased risk of late frosts are creating new challenges for viticulture. Stress on the plants and the increase of CO_2 in the atmosphere also require a new approach from the winegrowers. Riesling vines are particularly hard hit, as the old vines suffer from the heat and high solar radiation. The grapes are scorched by the sun, their skin cracks and the berries dry out. Harvest time is moving forward, and the limits of grape growing are changing. The winegrowers are working together with researchers, biologists, and other natural scientists to find ways to continue growing grapes in the new climate. Climatologists and biologists are also working in large vineyards and companies to adapt in time to the changes. In Mosel, autumn weather tends to be like late summer, with cool nights. Under these conditions, Riesling grapes ripen very well. Often, a particular region is linked to the cultivation of specific grape

varieties, but this is gradually changing with climate. It represents a change in this specific intangible cultural heritage.

What growers can do is to adapt to the temperature of the day. Grapes are harvested during the day when it is not so hot. Because it's not good to pick berries in the heat. If the berries get too warm, the fermentation process starts too early. They also adjust seedlings, reduce leaf area, and otherwise modify vines to protect them from the sun.

Warm temperatures in spring are increasingly leading to early budbreak. Then night frosts can be dangerous for young shoots. Temperatures low as -1°C can become critical for vines. Winegrowers try to drive frost out of their vineyards using small windmills, fan heaters, frost candles or even helicopters. However, in many cases they are only allowed to fly after dawn. In biodynamic cultivation, valerian (*Valerianaceae*) preparations are used against frost. Although it is still not scientifically clear why and how valerian increases ambient temperatures up to 2 °C, wine producers have already good experience with it. It can also have a limited effect on already occurred frost damage.

The creation of terraces where grapes can grow is important, but even them are impacted by CC that affects their durability: in this regard, technology can help. In collaboration with scientists, winegrowers are thinking about new grape varieties, irrigation, and greening of wine hills.

Municipality level

Local authorities mainly organise wine festivals in different regions to promote wine-growing traditions. In the region of Bernkastel-Kues the Middle Mosel Wine Festival is held, right in the heartland of the Mosel. The highlights of the five-day wine festival include the coronation of the new Mosella (the town's wine queen), the wine street, the fireworks festival, wine festival parade, the Moselblümchen-meets-Winzerkittel evening (where the traditional costumes of the Mosel, characteristic of viticulture, are worn, and everyone who is in costume receives a prize), and the carnival. Also, a programme with live music and wine-tasting evening is organised.

Research projects are also carried out in cooperation with local authorities. The Mosel-AdapTiV project is a municipal project within the funding programme “Adaptation to Climate Change”. The project is funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and Consumer Protection based on a resolution of the German Bundestag. It ran from 01.05.2020 to 30.04.2023. The joint project between the University of Trier and the municipality of Traben-Trarbach was working towards bringing together, networking and communicating the scientific and practical knowledge of the actors involved to increase the future viability of the municipality. The project not only highlights tourism in relation to viticulture, but also address policy issues, evidencing key climate challenges, and raising awareness among the general public, and winegrowers.

National and local authority level: legal framework

The wine industry is governed by the German Wine Law, which is almost 100 years old but it is regularly updated. Initially a source of pride for winemakers, it is now something to be avoided as it regulates wine production too strictly. It defines the categories into which the wine is divided, how it is to be grown and at what stage of growth the grapes must be harvested. It sets quality standards, but the proportion of poor-quality products is so low that some producers question these standards. The law is not specific about CC, mentioning only that climate is important in wine production.

There is a national classification of wines, which must be indicated on the label. So, production and sale are strictly regulated, while CC is little covered. Deutscher Wein (German wine) forms the basis, followed by Landwein (Vin de pays) with a Protected Geographical

Indication (PGI in English or g.g.A. in German) and the Qualitätswein or Prädikat wines above them with a Protected Designation of Origin (PDO in English or g.U. in German).

The historic terraced vineyard is linked to the protected landscape. The State provides subsidies to preserve such vineyards.

The Parliament of the Federal Republic of Germany (Deutscher Bundestag) published a study and an opinion on the state of German vineyards in relation to CC and their future ("Effects of climate variability on viticulture in Germany"). In 2016, the issue was already on the agenda of the Parliament and the sector's relationship to CC was problematised. However, the link between ICH and CC issue has not been mentioned.

The German Wine Institute operates independently but is under the legal supervision of the Federal Ministry of Food and Agriculture. The Institute is the central communication and marketing organisation of the German wine industry. It is dedicated to the promotion of German wine, community maintenance, training, and problem-solving. The Institute also raises issues on CC.

EU level

The principal legislation for the wine sector is the Common Market Organisation (CMO) Regulation – the first piece of legislation was adopted in 1962 as part of a package of regulations that established the EU common agricultural policy (The Council of the European Economic Community 1962). The name Mosel is a Protected Designation of Origin directly linked to the wine-growing area (since 1973). Legal instrument of protection at EU level are active since 2013 (EU 2013). The same EU document also includes the Landwein der Mosel, which has been a Protected Geographical Indication since 1983. It also defines what wine is and how it is made, how grapes must be grown and made, what it must look like and other regulated details.

In 2021, a regulation was adopted at EU level setting out what wine producers and the industry must comply with to improve production, innovation, and marketing. It also mentions CC, which must be considered in all processes: "The Member States shall pursue contributing to climate change mitigation and adaptation and to the improvement of the sustainability of production systems and the reduction of the environmental impact of the Union wine sector, including by supporting winegrowers in reducing the use of inputs and implementing more environmentally sustainable methods and cultivation practices" (EU 2021). EU rules also regulate vine planting, the vineyard register, certification procedures, imports, and exports (EU 2017).

By the middle of this century, CC is expected to have a severe influence on grape development and wine quality in the traditional winemaking regions of southern Europe, according to a European Environmental Agency (EEA) report on CC adaptation in the European agriculture sector (EEA Report 2019). Grapes ripen more quickly in hotter weather, which raises their sugar and alcohol content while lowering their acidity, which gives wine its freshness. The paper claims that more and more climate-resistant grape varieties will be needed for wine production in southern Europe. To allow the use of such varietals, it will also be necessary to modify the product specifications for wines with regional indications. Implementing precision farming practices may provide a partial solution, allowing wine growers to more accurately forecast their irrigation demands and take action to ensure the harvest occurs at the ideal time. Thermal screens that block out direct sunlight, chamber-free systems that heat and cool air that is then blown over the vines to create a 10 °C temperature difference, mini-chambers outfitted with shade cloths and reflective foils that help control temperature and sunlight, polyethylene sleeves, and hail protection nets are a few examples of the physical measures that can be used to adapt vineyards to CC. The report is a good illustration of future projections and prospects, which are likely to require major investment and adaptation.

5. Publications and other additional information

Research bibliography

1. Blaich, R. (2010). Vorlesung *Biologie der Rebe* (Lecture *Biology of the Vine*). Available at: https://projekte.uni-hohenheim.de/lehre370/weinbau/biologie/
2. Deutscher Bundestag. (2016). *Sachstand – Auswirkungen der Klimavariabilität auf den Weinbau in Deutschland* (State of affairs – Impact of climate variability on viticulture in Germany). Berlin: s.n. Available at: https://www.bundestag.de/resource/blob/408234/0bf1163f9d6e1b82392498354e711471/WD-5-040-16-pdf-data.pdf
3. Faßbender, W. (2017). *Die neue Mosel: Von Weinen und Winzern* (The new Moselle: Of wines and winegrowers). Heidelberg: Mondo Heidelberg.
4. Gaidos, S. (2014). Grape expectations: Climate change is already transforming the wine industry. *Science News*, 185(3), 20–24. Available at: http://www.jstor.org/stable/23612907
5. Hannah, L., Roehrdanz, P. R., Ikegami, M., Shepard, A. V., Shaw, M. R., Tabor, G., Zhi, L., Marquet, P. A., & Hijmans, R. J. (2013). Climate change, wine, and conservation. *Proceedings of the National Academy of Sciences of the United States of America*, 110(17), 6907–6912. Available at: http://www.jstor.org/stable/42590537
6. Moriondo, M., Jones, G.V., Bois, B. et al. (2013) Projected shifts of wine regions in response to climate change. *Climatic Change* 119, 825–839. DOI: https://doi.org/10.1007/s10584-013-0739-y
7. Nicholas, K. A. (2015). Will We Still Enjoy Pinot Noir? *Scientific American*, 312(1), 60–67. Available at: https://www.jstor.org/stable/26046067
8. Niewind, J. (2021). *Vulnerabilitätsstudie: Klimawandel und Weinbau an der Mittelmosel*. Mosel-AdapTiV Ergebnisbericht 2 (Vulnerability Study: Climate Change and Viticulture in the Middle Moselle. Mosel-AdapTiV Results Report 2). Governance and Sustainability Lab. Universität Trier. Trier. Available at: https://www.researchgate.net/profile/Jens-Niewind/publication/352993320_Vulnerabilitatsstudie_Klimawandel_und_Weinbau_an_der_Mittelmosel/links/60e2cfb1299bf1ea9ee12b99/Vulnerabilitaetsstudie-Klimawandel-und-Weinbau-an-der-Mittelmosel.pdf
9. Niewind, J., Horvath, K., Wiegleb, V. (2022). *Weintourismus im Klima-wandel – Eine Chancen-Risiken-Analyse in Traben-Trarbach*. Mosel-AdapTiV Ergebnis-bericht 1 (Wine tourism in a changing climate – an opportunity-risk analysis in Traben-Trarbach. Mosel-AdapTiV Result Report 1). Governance and Sustainability Lab. Universität Trier. Trier.
10. Pigott, S. (2007). *Wein spricht deutsch: Weine, Winzer, Weinlandschaften* (Wine speaks German: wines, winegrowers, wine landscapes). Frankfurt: Fischer Scherz.
11. Pincus, R. (2003). Wine, Place, and Identity in a Changing Climate. *Gastronomica*, 3(2), 87–93. DOI: https://doi.org/10.1525/gfc.2003.3.2.87
12. Robinson, J. (2015). *Oxford Companion to Wine*. Fourth edition. Oxford University Press.
13. Universität Trier (2023). *Mosel-Adaptive – Climate change and adaptation actions of tourism and viticulture in a Mosel municipality* (Mosel-AdapTiV – Klimawandel und Anpassungshandeln von Tourismus und Weinbau in einer Mosel-kommune). Available at: https://www.uni-trier.de/universitaet/fachbereiche-faecher/fachbereich-vi/faecher/nachhaltige-raeumliche-entwicklung-governance/mosel-adaptiv

Press

1. (2022, November 18). *Riesling in Gefahr – Eine Winzerin trotzt dem Klimawandel* (Riesling in danger – A vintner defies climate change). Youtube.com. Available at: https://www.youtube.com/watch?v=KhhnE0cnMzs&ab_channel=HessischerRundfunk
2. (2021, August 16). *Warum ein Ökowinzer aus Reil mit großen Ernteausfällen leben kann* (Why an organic winegrower from Reil can live with large crop failures). Swr.de. Available at: https://www.swr.de/swraktuell/rheinland-pfalz/trier/oekowinzer-thorsten-melsheimer-von-der-mosel-in-reil-kaempft-gegen-pilzbefall-103-100-100.html
3. (2020, September 23). *So klappt die Winzerarbeit im steilsten Weinberg Europas* (This is how winemaking works in Europe's steepest vineyard). Youtube.com. Available at: https://www.youtube.com/watch?v=5M6cIdy8ASg&ab_channel=SWRLandesschauRheinland-Pfalz
4. (2020, April 21). *Weinbau im Klimawandel* (Viticulture in climate change). Youtube.com. Available at: https://www.youtube.com/watch?v=bSDPpjTCjvM&ab_channel=HessischerRundfunk
5. (2019, December 17). *Wenigstens der Wein* (At least the wine). Taz.de. Available at: https://taz.de/Folgen-des-Klimawandels/!5646019/
6. Altmayer, C. (2023, June 2). *Warum selbst Biowinzer eine neue EU-Umweltverordnung fürchten* (Why even organic winegrowers fear a new EU environmental regulation). Swr.de. Available at: https://www.swr.de/swraktuell/rheinland-pfalz/trier/winzer-an-der-mosel-kritisieren-pflanzenschutzverordnung-der-eu-100.html
7. Altmayer, C. (2023, May 31). *Warum der Klimawandel für die Mosel auch Chancen bietet* (Why climate change also offers opportunities for the Moselle). Swr.de. Available at: https://www.swr.de/swraktuell/rheinland-pfalz/trier/klimawandel-bietet-auch-chancen-fuer-weinbau-und-tourismus-an-der-mosel-100.html
8. Altmayer, C. (2022, July 28). *Weinbau: Die Wiederentdeckung der Mosel-Nebentäler* (Viticulture: The rediscovery of the Moselle side valleys. Swr.de. Available at: https://www.swr.de/swraktuell/rheinland-pfalz/trier/weinberge-an-ruwer-immer-beliebter-100.html
9. Rödder, T. (2020, October 14). *Riesling wird bald nicht mehr so schmecken wie heute* (Riesling will soon no longer taste the way it does today). Zeit.de. Available at: https://www.zeit.de/zeit-magazin/wochenmarkt/2020-10/klimawandel-weinbau-temperaturen-alkohol-trauben
10. Wahl, J. (2023, July 2). *Sind historische Rebsorten die Lösung?* (Are historic grape varieties the solution?) Tagesschau.de. Available at: https://www.tagesschau.de/wirtschaft/weinbau-klimawandel-rebsorten-100.html
11. Witting, V. (2021, July 16). *Wein im Einklang mit der Natur* (Wine in harmony with nature). Dw.com. Available at: https://www.dw.com/de/winzer-setzen-auf-klimaschutz-und-nachhaltigkeit/a-58287056

Legal and policy sources

1. The Council of the European Economic Community (1962). Regulation No 24 on the progressive establishment of a common organisation of the market in wine. *Official Journal of the European Communities*. No 989/62. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31962R0024&from=en
2. EU (1973). Mosel. Protected Designation of Origin. *EU geographical indications register*. Available at: https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/geographical-indications-register/details/EUGI00000004648
3. EU (1983). Landwein der Mosel. Protected Geographical Indication. *EU geographical indications register.* Available at: https://ec.europa.eu/info/food-farming-fisheries/food-

safety-and-quality/certification/quality-labels/geographical-indications-register/details/EUGI00000004687
4. Das Bundesamt für Justiz, Deutschland. (1994). *Weingesetz* (Wine law). Available at: https://www.gesetze-im-internet.de/weing_1994/BJNR146710994.html
5. EU (2013). *Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013*. Document 02013R1308-20230101. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013R1308-20230101
6. EU (2017). *Commission Delegated Regulation (EU) 2018/273 of 11 December 2017*. Document 02018R0273-20221230. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02018R0273-20221230
7. EEA Report (2019). *Climate change adaptation in the agriculture sector in Europe*. Luxembourg: Publications Office of the European Union. Available at: https://www.eea.europa.eu/publications/cc-adaptation-agriculture
8. EU (2021). *Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December*. Document 02021R2115-20230101. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02021R2115-20230101

Other resources

1. *Deutsches Weininstitut* (German Wine Institute). Available at: https://www.deutscheweine.de/
2. *Die Deutsche Weinakademie* (The German Wine Academy). Available at: https://www.deutscheweinakademie.de/
3. *Die Deutsche Weinkönigin (*German Wein queen*).* Available at: https://www.deutscheweinkoenigin.de/
4. *Die Deutsche Weinkönigin (*German Wein queen*).* Available at: https://vinothek.wordpress.com/2013/09/19/die-deutsche-weinkonigin/
5. *German Wine Harvest and W.I.N.E Festival*. Available: https://www.iamexpat.de/lifestyle/expat-events-festivals/german-wine-harvest-and-wine-festival
6. *Klima und Witterung* (Climate and weather). Available at: https://www.deutscheweine.de/wissen/weinbau-weinbereitung/klima-witterung/
7. *Klimafolgen Online* (Climate Impacts Online). Available at: http://kfo.pik-potsdam.de/static/countries/ger/tool.html?sector_id=1&language_id=en&p_id=wiweiz&timeframe=30&hist=0&futscen=0&season=0&diagram=0&displayed=0,1&absrel=abs&expert=0&year=2010&zoom=1&difference=false
8. *Kultur und Weinbotschafter* (Culture and wine ambassador). Available at: https://www.kultur-und-weinbotschafter.de/mosel
9. *Mosel*. Available at: https://www.visitmosel.de/wein-kulinarik
10. *Mosel.de*. Available at: https://www.mosel.de/startseite/
11. *Moselblümchen trifft Winzerkittel* (Moselle flower meets winegrower's coat). Available at: https://www.bernkastel.de/veranstaltungen/weinfest-der-mittelmosel#c137056
12. *Mosel Weinfeste* (Moselle Wine Festivals). Available at: https://www.mosel-weinfeste.de/mosel_weinfeste.htm
13. *New Origin Pyramid for Qualität and Prädikat Wines*. Available at: https://www.germanwines.de/knowledge/quality-standards/new-origin-pyramid-for-qualitaetsweine/#c33395
14. Research on viticulture at Hochschule Geisenheim University. Available at: https://hs-gm.hessenfis.de/converis/portal/list?show=All&filter=&searchkey=wine&sortOrder=true&cypher=All&page=1&items=10&showAll=&treeView=false&auxfun=&moreOrLess=&lang=en_GB
15. UNESCO. (2021). *Wine culture in Germany*. Available at: https://www.unesco.de/en/culture-and-nature/intangible-cultural-heritage/wine-culture-germany
16. *Weinbau in Rheinland-Pfalz* (Viticulture in Rhineland-Palatinate). Available at: https://www.klimawandel-rlp.de/fr/klimawandelfolgen/landwirtschaft/weinbau/

17. *Weinfest der Mittelmosel* (Middle Mosel Wine Festival). Available at: https://www.mosel-inside.de/de/mittelmosel/bernkastel-kues/186-weinfest-der-mittelmosel.html
18. *Weinfeste an Mosel, Saar und Ruwer* (Wine festivals on the Mosel, Saar and Ruwer). Available at: https://www.mosel.de/region/brauchtum/details/?tx_ttnews%5Btt_news%5D=488&cHash=40e13c757895f9c403e8a8f889cf6fdc
19. *Weinfestival* (Wine Festival). Available at: https://www.mosel.de/fileadmin/data/Bilder/aALLGEMEIN/Download/Weinfestplaner_2020_20_Seiter_V4.pdf
20. *Weinkultur in Deutschland* (Wine culture in Germany). Available at: https://kulturland.rlp.de/de/kultur-schuetzen/kulturelles-erbe/immaterielles-kulturerbe/weinkultur-in-deutschland/
21. *Weinland Mosel* (Mosel wine country). Available at: https://www.weinland-mosel.de/de/

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4.4. CS4 Agricultural and Dietary Tradition of Carob in Crete (Greece)

1. ICH element

Title in English
The agricultural and dietary tradition of Carob in Crete

Title in Greek
Η αγροδιατροφική Παράδοση του Χαρουπιού στην Κρήτη

National Inventory of ICH
https://ayla.culture.gr/el/agrodiatrofiki-paradosi-xaroupiou/ (since 2019)

A brief description
Tradition. Carob trees have been cultivated in the Mediterranean since ancient times, usually in areas with mild and dry climates and poor soil. Its value was recognized by the Greeks, who brought its cultivation from the Middle East (Syria, Palestine). In Crete, carob charcoal has been found in prehistoric (Late Minoan) layers.
According to ancient sources, the tree grew in Syria, Ionia (where it was called "keronia"), Knidos, and Rhodes. According to some researchers, the tree was introduced during Roman times. It is believed to have reached Rome through Greece, as indicated by its Latin name *Siliqua graeca* (Greek carob). Its scientific name *Ceratonia siliqua* comes from the ancient Greek word "keras" and the Latin word "siliqua", referring to the horn-shaped shape of the fruit. Dioscorides, a physician, pharmacologist, and botanist of the 1st century AD, named the fruit (pod and seeds) "keration" and the carob tree "keratea". According to Theophrastus, the Ionians of the 4th and 3rd centuries BC called it "keronia". Carob is also known as the "bread of St. John" because, according to one interpretation, the wild honey that John the Baptist ate in the desert was a syrup extracted from carob. The term "keration" is mentioned several times in the New Testament, especially in the parable of the Prodigal Son. Furthermore, the word "karati" in Greek jewellery-making is derived from the word "keration". The seeds of the carob tree have a stable weight ranging from 189 mg to 205 mg, which is why it was defined as the smallest unit of measurement for gold and precious stones (the modern "carat" has officially been defined as 200 mg). The Arabs, to whom the careful selection of carob varieties is attributed, spread it along the coasts of North Africa, Spain, and Portugal. Their contribution to the spread of carob is evident from the prevalence of the word "kharrub" throughout Europe and Greece, where it grows naturally in many island regions, especially in Crete.

Regarding the culinary use of carob in ancient times, there is no information about its use in the Greek territory, although it was possibly cooked in Mesopotamia during the 2nd millennium BC and used by the Egyptians in the production of alcoholic beverages. However, Dioscorides mentions the medicinal use of carob pods and "keratite wine". In a Cretan medical treatise from the 19th century, the seeds of carob trees and their therapeutic use are mentioned, too. Foreign travellers who visited Crete in the 19th century describe carobs as a food for both humans and animals.

Carob also belongs to the family of "syrups", Byzantine beverages that evolved from the Ottomans. The drink made from carob syrup and cold water is still popular in Egypt, Lebanon, and Syria. In fact, during the Ottoman rule, African traders living in Crete were the itinerant sellers of carob. Carob honey is prepared by boiling chopped and lightly pounded mature pods or pods and seeds. After boiling for a short time, they are left in water for twenty-four hours. Then they are strained, and the water is simmered until it reaches the desired density.

During the occupation of Nazi Germany, Crete was a major exporter of carob pods,

mainly to Northern Greece. A significant portion of the cargoes reaching the city of Thessaloniki was intended to produce carob syrup, which was used in halva production. To increase state revenues, the taxation was increased during the period of 1943-1944, including a tax on carob juice.

Today, farmers continue to collect carob using the traditional method, i.e., hitting the tree with a stick. After the trend of returning to traditional carob cultivation and the corresponding demand for carob products and by-products, there has been a significant increase in local businesses that use local carob as a raw material (to produce bread, carob honey, etc.).

Species. The carob tree, a dense evergreen shrub, typically reaches a height of 8-17 meters. It has a sturdy trunk and robust branches. The carob pod, also known as a locust bean, is an edible bean consisting of pulp (90%) and seeds (10%). When fully ripe, the pod is brownish, elongated, and compressed, with a wrinkled surface. The pulp comprises a rough outer layer called the pericarp and a soft inner layer known as the mesocarp. Inside the pod, the mesocarp separates several hard-textured, oval-shaped brown seeds, which are approximately 10 mm in length and weigh around 0.2 grams per seed. Carob seeds are obtained by breaking open the pods. They consist of a coat (30-35%), a white translucent endosperm (40-50%), and a germ or embryo (20-25%). The leaves of the carob tree are sclerophyllous and covered by a thick epidermis that is rich in phenolic compounds. Farmers traditionally employ budding and grafting techniques to enhance fruit quality and yield. This practice has resulted in the development of numerous local cultivars with distinct characteristics throughout the centuries. However, many modern cultivars have unknown origins and exhibit significant genetic variation in terms of morphology and agronomic traits.

Nowadays, the importance of carob's cultivation and the nutritional value of its fruits and derivatives are becoming increasingly known to the consumer public. Carob products, such as "paximadi" (rusk bread), "dakoi" (made from barley and carob), carob honey, carob bean, pasteli (sesame and carob bar), and raki (a traditional Cretan alcoholic beverage), characterize Cretan cuisine. In Greece carob trees are primarily self-propagated in Crete. They are also known as "xylokeratia". The community of cultivators is based on agroecology. The carob harvest takes place at the end of summer and the beginning of autumn, depending on the prevailing climatic conditions in the region. The carob harvesting period lasts from two to four weeks.

Geographical coordinates
35.24882, 24.91315
Crete, Greece

2. CC risks and effects

Carobs may be related to CC not as a species at risk but rather as a solution to environmental restructuring. They are one of the most useful trees in the Mediterranean basin, representing resilience and self-sufficiency. They have deep roots and find their own way of natural irrigation. Carob helped the villages of Crete survive the famine during the Nazi German occupation. Rich in nutrients, it is considered a superfood and has a long shelf life without requiring special storage conditions. The carob tree, a plant that withstands drought, can also provide solutions for reforestation programs in coastal areas endangered by erosion and serve as a key factor in preserving the ecosystem. It can also be utilized in fire-prone zones due to its fire resistance.

The following are examples of CC effects that may be overcome through systematic

carob cultivation and exploitation:

- Temperature rise;
- Drought;
- Climate warming and unpredictability.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

Community representatives (farmers, local inhabitants, bakers, agronomists, and other people interested in preserving this ICH) emerged in the interviews as homogeneous, representing the same views. In their application for the National Intangible Cultural Heritage List, ICH bearers mention that the community of carob cultivators in Crete is constantly adapting to the demands of new technologies in relation to carob production. While in the post-war decades, traditional carob cultivation tended to be abandoned (a point also confirmed during the interviews by all local community members), today it is gaining more and more ground because it does not require strenuous labour and risky investments. Furthermore, its economic performance is continuously rising, especially around Rethymnon but also in other parts of Crete. The recognition of the nutritional value of carob now contributes to the strengthening and promotion of its cultural identity within the framework of Crete's agro-food traditions.

Furthermore, ICH bearers argue that today, with the production of carob syrup (in small-scale workshops) as well as the preparation of bread and other carob products, there is an opportunity to enhance intra-and inter-communal relationships, opinions exchange, and organize celebrations related to carob cultivation. Every year, the interest of people in participating in these celebrations increases, especially the Greeks living abroad. The promotion of the agro-food tradition of carob is thought to operate as a means for further developing agrotourism, healthy dietary habits and consequently, local/regional economic development.

About the impact of CC, tradition practitioners and local community Think that carob cultivation can represents a solution. In fact, the alternative of cultivating carob trees can contribute to water resource conservation and to the development of Crete's flora, in addition to increase the island's agricultural production.

Officials responsible for the ICH safeguarding

The agricultural and dietary tradition of Carob in Crete has not been associated with CC risks and problematised in the context of the CC by the officials responsible for the ICH safeguarding in Greece. However, the role of ICH as a resource for the sustainable development of local communities is acknowledged, addressing, indirectly, CC issues. In particular, the promotion of the agro-dietary tradition of carob in Crete as an element of ICH (characterized by a high degree of resilience to changing climatic conditions) is said to contribute, on the one hand, to the increase in production and consumption of carob products not only in Crete but throughout Greece and abroad. On the other hand, it is taken to strengthen the collective identity of members of local communities. The ability to produce new innovative products and upgrade the Greek market compared to other Mediterranean countries, already cultivating and producing carob products, is thought to have the potential of greatly boosting the local economy. Additionally, given the medicinal and therapeutic properties of carob, the production of pharmaceutical products for the digestive system can be enhanced, including those for ulcer protection, antioxidant, antidiabetic, anti-diarrheal, antibacterial, hypocholesterolaemic, and anti-inflammatory actions.

Other: journalists

Carob has been featured in radio and television shows, as well as in the press (both local and national), but the focus was mainly on the economic aspect of the agro-dietary tradition (emphasizing how carob, as a dietary tradition may boost regional tourism as well as contemporary dietary habits of the Greek population). Its resilience to CC risks is scarcely acknowledged explicitly but it does figure in all available content (see Section Press, below).

Other: scientists

During the interviews with experts, it was strongly emphasized that carob trees demonstrate remarkable resilience to the effects of climate warming and unpredictability, as they remain unaffected by drought conditions. Moreover, the meetings with producers, cultivators, researchers, and academics at the Carob Mill building, started on November 12, 2017, and continue to this day, have resulted in the decision for close collaboration among all parties, in documentation and collection of valuable knowledge regarding the agro-dietary tradition of carob, as well as in the creation of a new entity titled "Community of Cultivation, Natural and Cultural Use of Carob in Crete". The objectives of the joint actions include the inscription of the agro-dietary tradition of carob in the National Inventory of Intangible Cultural Heritage of Greece (achieved in 2019), the establishment of a Carob Museum at the Carob Mill building in Panormos, the undertaking of initiatives for the protection, preservation, and utilization of carob in Crete, the enhancement of carob cultivation through the utilization of new expertise, as well as the design and implementation of a development plan. Thus, the awareness of the possible CC effects upon the ICH has been raised to a certain extent, at the level of the experts and is provisionally shared with a wider audience.

4. Existing practices: solutions implemented, planned or proposed

Community level

The Cultural Society of Panormos "Epimenidis" periodically organizes conferences, educational programs, seminars, and cultural activities related to the agro-dietary sector of Crete, with a focus on carob. Educational programs aim to promote the evolution of dietary tradition and the creation of innovative products, such as the virtual enterprise "X... Carob" of the 1st Vocational School of Heraklion, engaging and inspiring the new generation. Annual festivals with a theme centred on carob transmit the living agro-dietary tradition of carob to younger generations. Furthermore, cultural events primarily focused on gastronomy, increase every year.

Municipality level

In all aforementioned actions (see above Community level), there is the support of local entities in Crete and abroad, as well as scientific organizations in the country (World Council of Cretans, Museum of Natural History of Crete at the University of Crete, Regional Union of Municipalities of Crete, Department of Chemistry at the University of Crete, Municipality of Mylopotamos in Rethymno Prefecture, Municipality of Rethymno, National Center for Scientific Research "Demokritos", Technical Chamber of Greece – Crete Branch, Kazantzakis Museum, Crete Region, Department of Food Science and Nutrition at the Hellenic Mediterranean University of Crete). It is noteworthy that the Department of Chemistry at the University of Crete has repeatedly supported initiatives and public awareness events regarding the importance of carob cultivation in Crete. The Institute of Biosciences and Applications "Demokritos" has initiated research on the bioactivity of carob products. Finally, it is important to mention the 1st Mediterranean Conference on the "Revival of Carob in the Mediterranean". The conference took place in Heraklion and Panormos on April 19-21, 2019, initiated by the Cultural Society of Panormos in collaboration with the Region of Crete and the Regional Union of Municipalities of Crete, under the auspices of the Ministries of Rural

Development, Culture, and Tourism, with the support of the Institute of Subtropical Plants Olive and Vine and Elgo Demeter. Academics, researchers, and producers/cultivators from Mediterranean countries (Spain, Portugal, Egypt, and Cyprus) participated, and a Mediterranean Network was proposed and established.

National and local authority level

The Parliamentary Committee on Energy, Commerce, Industry, and Tourism Legislative proposed a law that is to amend the Carob (Ceratonia) Law to prohibit the collection, transportation, and trade of unripe carob pods.

EU level

There exists no such information.

5. Publications and other additional information

Research bibliography

1. Fountoulakis, M., Dokianakis, S., Daskalakis, G., Manios, T. (2014). *Fermentative Hydrogen Production from Carob Pod: A Typical Mediterranean Forest Fruit, Waste and Biomass Valorization*, 5: 799-805.
2. Gioxari, A., Amerikanou, C., Nestoridi, I., Gourgari, E., Pratsinis, H., Kalogeropoulos, N., Andrikopoulos, N. K., Kaliora, A. C. (2022). Carob: A Sustainable Opportunity for Metabolic Health. *Foods*. 2022 Jul 20, 11(14): 2154. DOI: 10.3390/foods11142154.
3. Issaoui, M., Flamini, G., Delgado, A. (2021). Sustainability Opportunities for Mediterranean Food Products through New Formulations Based on Carob Flour (Ceratonia siliqua L.). *Sustainability*. 13(14): 8026. DOI: https://doi.org/10.3390/su13148026
4. Kriari, A. I., (1966). *Υπουργείον Συντονισμού, Υπηρεσία Περιφερειακής Αναπτύξεως Κρήτης, Μελέτη Γεωργοοικονομική Αξιοποιήσεως των Χαρουπιών της Κρήτης* (Ministry of Coordination, Department of Regional Development of Crete, Study for the Agri-financial Use of Carobs of Crete). Heraklion.
5. Krokou, A., Stylianou, M., Agapiou, A. (2018). *Environmental Aspects of Carob Tree (Ceratonia siliqua L.*). 6th International Conference on Sustainable Solid Waste Management, 13-16 June, Naxos, Greece.
6. Pontikis, K. A. (1996). *Ειδική Δενδροκομία. Ακρόδρυα, Πυρηνόκαρπα, Λοιπά Καρποφόρα* (Special Arboriculture. Acrodrya, Stone Fruits, Other Fruit bearing trees). Athens, Piraeus: Stamoulis Publications.
7. Rodosthenous, X. (1997). *Η Χαρουπιά* (The Carob tree). Tenth edition. Department of Agriculture, Ministry of Agriculture, Natural Resources, and the Environment.
8. Rtibi, K., Selmi, S., Grami, D., Amri, M., Eto, B., El-benna, J., Sebai, H., Marzouki, L. (2017). Chemical constituents and pharmacological actions of carob pods and leaves (Ceratonia siliqua L.) on the gastrointestinal tract: A review. *Biomedicine & Pharmacotherapy*. Sep; 93: 522-528. DOI: 10.1016/j.biopha.2017.06.088.
9. Tounsi, L., Karra, S., Kechaou, H., Kechaou, N. (2017). Processing, physico-chemical and functional properties of carob molasses and powders. *Food Measure*. 11: 1440-1448.
10. Tzatzani Thiresia-Teresa, Ouzounidou G. (2023). Carob as an Agrifood Chain Product of Cultural, Agricultural and Economic Importance in the Mediterranean Region. *Journal of Innovation Economics & Management*. 2023/0 (Prepublication). Available at: https://www.cairn.info/revue-journal-of-innovation-economics-2023-0-page-I140.htm

Press

1. (2023, January 8) *Συμπόσιο Χαρουπιού "Μια Γορτή για το Θησαυρό της Κρήτης!"* (Carob Symposiums: A celebration for the treasure of Crete!) Epimenides Cultural Society of Panormo Retnhymno Crete. Epimenides.gr. Available at: https://www.epimenides.gr/Latest-news-v2/%cf%83%cf%85%ce%bc%cf%80%cf%8c%cf%83%ce%b9%ce%bf-%cf%87%ce%b1%cf%81%ce%bf%cf%85%cf%80%ce%b9%ce%bf%cf%8d-%ce%bc%ce%b9%ce%b1-%ce%b3%ce%bf%cf%81%cf%84%ce%ae-%ce%b3%ce%b9%ce%b1-%cf%84%ce%bf-%ce%b8/
2. (2022, November 9) *Ένας Ανεκμετάλλευτος Διατροφικός Θησαυρός* (An unexploited nutriotional Treasure). Epimenides Cultural Society of Panormo Retnhymno Crete. Epimenides.gr. Available at: https://www.epimenides.gr/Latest-news-v2/%ce%ad%ce%bd%ce%b1%cf%82-a%ce%bd%ce%b5%ce%ba%ce%bc%ce%b5%cf%84%ce%ac%ce%bb%ce%bb%ce%b5%cf%85%cf%84%ce%bf%cf%82-%ce%b4%ce%b9%ce%b1%cf%84%cf%81%ce%bf%cf%86%ce%b9%ce%ba%cf%8c%cf%82-%ce%b8%ce%b7%cf%83/
3. (2022, November 1) *Άυλη Πολιτιστική Κληρονομιά της Ελλάδας* (Intangible Cultural Heritage of Greece). Epimenides Cultural Society of Panormo Retnhymno Crete. Epimenides.gr. Available at: https://www.epimenides.gr/Latest-news-v2/%ce%ac%cf%85%ce%bb%ce%b7-%cf%80%ce%bf%ce%bb%ce%b9%cf%84%ce%b9%cf%83%cf%84%ce%b9%ce%ba%ce%ae-%ce%ba%ce%bb%ce%b7%cf%81%ce%bf%ce%bd%ce%bf%ce%bc%ce%b9%ce%ac-%cf%84%ce%b7%cf%82-%ce%b5%ce%bb%ce%bb%ce%ac/
4. (2019, April 17) *Πρώτο Μεσογειακό Επιστημονικό Συνέδριο* (First Mediterranean Scientific Conference). Epimenides Cultural Society of Panormo Retnhymno Crete. Epimenides.gr. Available at: https://www.epimenides.gr/Latest-news-v2/%cf%80%cf%81%cf%8e%cf%84%ce%bf-%ce%bc%ce%b5%cf%83%ce%bf%ce%b3%ce%b5%ce%b9%ce%b1%ce%ba%cf%8c-%ce%b5%cf%80%ce%b9%cf%83%cf%84%ce%b7%ce%bc%ce%bf%ce%bd%ce%b9%ce%ba%cf%8c-%cf%83%cf%85%ce%bd%ce%ad%ce%b4-2/
5. (2018, June 30). *Το κρητικό χαρούπι οδεύει προς την UNESCO* (The Cretan carob is on its way to UNESCO). Insider.gr. Available at: https://www.insider.gr/epiheiriseis/88446/kritiko-haroypi-odeyei-pros-tin-unesco-vid
6. Νικολαΐδου, Μ. (2023, May 5). *Ένθετο Γεωργία: Χαρούπι, το "αντίδοτο" στην ερημοποίηση* (Insert Agriculture: Carob: the "antidote" to desertification). Ertnews.gr. Available at: https://www.ertnews.gr/eidiseis/ellada/entheto-georgia-xaroupi-to-antidoto-stin-erimopoiisi/
7. Η αγροδιατροφική παράδοση του Χαρουπιού στην Κρήτη (The agri-nutritional tradition of carob in Crete). Skouteli.gr. Available at: https://skouteli.gr/agrodiatrofiki-paradosi-tou-xaropiou/

Legal and policy sources

1. Ο περί Χαρουπιών (Τροποποιητικός) Νόμος του 2023. Available at: https://www.nomoplatform.cy/bills/o-peri-charoypion-tropopoiitikos-nomos-toy-2023/

Other resources

1. *Carob of Crete*. Available at: https://carobofcrete.gr/

2. *Votaniki*. Available at: http://votaniki.gr/vlastisi/typoi-oikotopon/dasi-elias-kai-charoypias-kod-9320/

6. Informants, experts

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4.5. CS5 Mandras (Paddocks) of Lemnos (Greece)

1. ICH Element

Title in English
The mandras (paddocks) of Lemnos (alternative transliterations: mantres / mandres)

Title in Greek
Οι μάντρες της Λήμνου

National Inventory of ICH
https://ayla.culture.gr/oi-mantres-tis-limnou-2021/ (since 2021)

A brief description
The ICH of "mandras" (plural, singular "mandra" or "mantra") of Lemnos describes an organizational system of primary production, i.e., agriculture and livestock breeding. It refers to a production system of the island of Lemnos that brings together a series of environmental and cultural parameters, including biodiversity, climate, geology, traditional agricultural practices, and socio-economic structures. Around the "mandra" a whole system of buildings, pasturelands, agricultural productions and human relationships interacts and allows for mutual interaction allowing human survival for centuries.

The "mandra" is a complete production unit that consists of a building with its auxiliary spaces and the agricultural and pastureland that surrounds it. Although it has as its reference point the buildings that bear the name "mandra",(considered an important architectural monument as well as the traditional methodology of building know-how) this ICH consists of much more than building/s: it refers to the centre of a holistic agricultural world, spatially, financially, socially, and symbolically. In other words it represents a comprehensive system of primary organization. Its origins have been traced back to the Byzantine period and the system that it represents continues to this day to support the life and the needs of its practitioners, i.e., the "kehaghias" (singular, plural "kehaghiades"). A "kehaghias" is a livestock breeder and farmer who apart from their main professional practice they keep a small number of livestock and land that supports the income of the family. The "kehaghias" may own the mandra (in modern years) or rent it (more common in the past). Therefore, the mandra is also the point where two social-economic groups of Lemnos meet, i.e., the kehaghias and the "boss" ("afentiko", singular), i.e., the owner of the land within which the "mandra" is located and which forms the "mandra".

Having collected valuable experience from hundreds of years of practice, the "kehaghiades" apply a series of agricultural techniques that allows them to maximise the benefit of using the land available to them and produce almost everything they need to survive. It is an impressive set of skills, knowledge and techniques that offers valuable examples of management of the land and its resources.

In the past the building bearing the name "mandra", was made from stone, clay, reeds, and seaweed and represented itself as an example of indigenous building and architectural knowledge. Contemporary buildings are made of concrete and sheet metal. The buildings are usually located in the middle of the land, in a space that allows full visibility of the surrounding area, but also protection from the winds. This land is usually called a "pair" (ζευγάρι) meaning that it includes a piece of plot needing a pair of oxen to be cultivated. The size of the land is not counted in hectares or any other contemporary measurement, but in terms of the possibility to cater for two households, i.e., two families, that of kehaghias and that one of the landowner. It also consists of a flock of sheep and goats, the animals needed for plowing, and the possibility to provide enough to support taxation, export, and the barter

economy within the community of kehaghiades. Each "pair" should have the cultivated land ("tsagiria" – plural) that is sowed during the first rains of autumn, and also part of the pastureland during the period of animal bearing young's or bad weather conditions. The "pair" also consists of some mountain pasture plots, which were called "moiradia" (plural).

The land where a mandra is built must satisfy certain conditions: to receive sunlight during the day; to be on an inclined piece of land to drain the water from the rain; to be protected from the north winds.

The size of the mandra and the typology of the buildings depend very much on the location on the island: on the mountains, where the kehaghiades were/are more engaged with livestock, the mandres are less in number and are usually expanded on larger pieces of land that mainly consist of pastures. At the same time, the mandra should cover all the needs of the kehaghias and his family due to the distance from the villages. Therefore, the building is more complex, including among others a threshing floor, a built wood oven, and a small fruit and vegetable garden, as well as a small vineyard. In lower heights, and closer to the villages, but also in places where the land is more fertile, the mandras usually control smaller sizes of land and are denser in terms of numbers. They usually do not include large pastures and have "tsagiria".

In the past, the mandra was given by the landowner to a kehaghias to cultivate it; the owner would get half of what the mandra would produce and often the kehaghias would be obliged to perform a series of other tasks for the owner (like taking care of their animals). Today, mandras are usually owned by the kehaghias, or they rent them. Although the ownership situation has changed, the basic principles that the system of the mandra supports remain the same: the mandra still refers to a holistic management approach that consists of practical experience and traditional knowledge, symbolic and social relations that pass from one generation to the other; it creates a unique relationship between people and their land and supports its sustainable use as part of a complex network of local social and economic relationships.

The space of the mandra in its entirety acquires meaning through the lived experience of the kehaghias, based on traditions and performative practices. Until the middle of the 20th century, it was a hierarchical and conflicting space where each part acquired its role within a very complex social system. The mandra, the size of the "pair", lies between the social limits of the village and the non-human space of nature. It is a liminal space where a series of "magical" and religious paradoxes can be achieved: the entrance to the "mandra", usually crossed with the blood of animals, had a display of the tools of the kehaghias and was the centre of a series of celebrations, festivals and religious beliefs and practices, all related to the connection among people and their environment.

Geographical coordinates
39.91666, 25.25000
Island of Lemnos, Greece

1. CC Risks and Effects

The effects of the CC and the importance of retaining the ICH have been pursued within the "Terra Lemnia" project. This is a project launched in 2017, which ended in 2022; the MAVA Foundation funded it for Nature under the M6 Strategy "Loss of biodiversity by abandonment of cultural practices" and it was an example of an insular landscape. For this project different institutions collaborated: the leading partner was "The Mediterranean Institute for Nature and Anthropos" (MedINA). The other partners were the University of the Aegean, the Agricultural University of Athens, the Hellenic Ornithological Society, the local NGO

Anemoessa, the Society for the Protection of Prespa and the Tour Du Valat Research Institute. The team also included scientists from the Universities of Patras and Gottingen. The project has been a systematic effort for the protection and sustainability of the system of mandras, and also for the protection of the biodiversity of the island. Within its framework a systematic study of the ICH was also completed resulting to the inscription of both “mandras” and “melipasto/melichloro” (a type of cheese produced in the mandras) in the national ICH inventory. Furthermore, many indigenous plants (such as the local type of bean, “aspromytiko”) are now included in the national catalogue of local varieties of flora.

The main threats identified through the work of this project are related to the following CC elements:

1) increase of temperature;
2) increase of rainfall and destructions related to flooding;
3) loss of local biodiversity and import of foreign species of animals and plants that do not adapt well to the natural environment and require more resources than those available on the island (for instance, more water);
4) uncontrollable increase of the wild rabbit population which in turn affects both cultivations and biodiversity.

2. Attitudes and recognition of problems

ICC bearers and practitioners

The Terra Lemnia project has initiated many discussions among the bearers and practitioners about the need to protect their ICH elements from the effects of CC and environmental threats in general. In our discussion with them, during our interviews, they showed a deep understanding of the threats and of their responsibility to respond to them, too. They identified several specific threats and their direct impact on this specific ICH element. More specifically, all informants seem to have personal experience of how the rise of temperature affects both their crops and their way of working. One of the practitioners, Athena, mentioned in the interview that due to the rise of temperature, she couldn’t work in the fields as she was used to, “since the sun is now burning” and it is impossible to be outside after 11.00 am. This in turn affects not only their working practices, but also the decision of the younger generations to work on the fields. Furthermore, the rise of temperature leads to maturity of the crops much sooner. The time of maturity has now decreased and therefore there is not enough time for the collaborative practices of the past. In fact, in mandras, the kehaghias and his family would support other kehaghiades in harvest and then they would collectively celebrate with a big feast. Practitioners Christos and Raphael mentioned that today the crops mature so fast because of the heat that the kehaghiades cannot take turns in the collection of their crops as they used to. Therefore, both collaboration and social relationships are affected, as well as the celebrations that related to the collection of the crops.

The yearly calendar is also affected by the temperature rise. Many celebrations and religious practices of kehaghiades relate to the cycle of agriculture. For instance, as informant Raphael mentioned in the interview, the religious celebration of Panagia Messochoritissa used to mark the new planting at the beginning of the yearly cycle; however, due to CC the time of the celebration does not coincide any longer with the actual planting as the rise of the temperature means that the planting must happen later in the year than in the past. Therefore, the timing and meaning of religious celebrations are also affected.

The rise of temperature affects the relation with water resources. Water has been identified as a very important element in the cycle of the mandra. Rains are rarer these days and when it rains it is heavy. This affects the plants because the local plants do not need much water, so the excess in watering due to heavy rainfall affects them in a negative way. On the

other hand, the new plants and animal species (like European species of sheep), imported to the island as they are more productive and consequently financially viable, require much more water and food to survive, since they are not made for the climate of the island. The owners of these new species of animals and plants, dig deep wells to provide additional water to them and increase their production. This fact changes the balance of water resources and availability for the kehaghiades and the overall production cycle. Furthermore, it leads to dryness of natural reserves of water, which in turn means that wild animals, like migratory birds, cannot find the water they need to continue their journeys.

This in turn, relates to the uncontrolled growth of the population of wild rabbits having no natural enemies as in the past. As consequence, their number is increasing, affecting both pastureland and cultivations.

Officials responsible for ICH safeguarding

The Ministry of Culture representatives recognize the threats of CC for ICH elements, especially the ones that relate to stockbreeding and agriculture. They support the work of MedINA and other organisations that aim to create awareness among bearers and scientists regarding these threats. On the 15th of June 2022 a symposium was organized by the Hellenic Ministry of Culture and the Chinese Embassy entitled "The 3rd Experts Forum on the Protection of ICH". During this event, a series of keynotes and a round table discussion brought many ideas regarding the relation between ICH and CC. Interestingly, ICH was not discussed only as being threatened by CC, but as an element offering opportunities, as well.

The knowledge that comes from ICH provides, or can provide, responses to the threats posed by the CC, as ICH elements are both resilient and adaptable. Therefore, it was argued that ICH is a solving problems method related to CC, and should become understood as such by officials and authorities.

A similar approach was taken in another conference co-organised by the Hellenic Ministry of Culture in collaboration with UNESCO in 2022, entitled "Next 50: the future of world heritage in challenging times. Enhancing resilience and sustainability". Although this conference did not focus on ICH in particular, it focused on sustainability of cultural heritage and tourism and declared both the interest and understanding of the officials of the Ministry of the needs for the protection of heritage against CC.

Furthermore, it seems that some kind of awareness regarding CC and its effects on cultural heritage – although not complete and not focused on ICH in particular – has informed the "Regional Plan for the Adaptation to Cultural Change" that has been implemented by the Regional Authority of North Aegean, where Lemnos belongs.

However, from our interviews, it seems that the bearers/practitioners feel that there is not enough support from their local authorities or other officials in their practical efforts to protect their heritage. On the contrary, they feel that they are "left alone" to deal with the challenges and they ask for more support, financial and/or political in the sense of policies and measures that will support their sustainable efforts.

Other: journalists

The media coverage of the mandras of Lemnos is more extensive on a regional level rather than the national one. Journalists seem to follow up on the initiatives for the protection of ICH by national authorities and the Terra Lemnia project. They present a very positive approach but no solutions or ideas about the protection are offered.

In a recent press release by the Ministry of Culture, infrastructure works for 24 million euros were announced for the protection of seven heritage sites from CC effects; however, these refer to infrastructure works (anti-flood and anti-fire measures) and not to interventions

dedicated to ICH. The same is the case of reports referring to initiatives undertaken by other bodies, such as ICOMOS.

Other: scientists

There is extensive work within the framework of "Terra Lemnia" project undertaken by specialists in agriculture, stockbreeding, biology, environmental sciences etc. An extensive series of scientific reports is available online, covering topics such as**: Crop landraces, crop wild relatives and wild herbs** (December 2020); **Genetic diversity and population structure of the sheep of Lemnos, Lesvos and Agios Efstratios islands** (August 2020); **Cultural elements of the mandra system of Lemnos** (July 2019); **Report of Lemnos agro-pastoral ecosystems flora** (December 2018); **Semidetailed soil mapping of selected areas in Lemnos island** (December 2018); **The land use systems of Lemnos island** (December 2018); **Report on crop landraces, crop wild relatives and wild herbs** (July 2018); **Livestock management and local farmed animals in Lemnos** (July 2018); **Report on Lemnos wild rabbit population** (December 2018); **Report of Lemnos agro-pastoral ecosystems beneficial insects & other arthropod fauna** (December 2018); **Report of Lemnos agro-pastoral ecosystems avifauna** (December 2018); **Assessment report for the interconnections of land use practices and land abandonment with biodiversity and soil characteristics** (March 2019); **Mapping change in agricultural landscapes of Lemnos** (October 2019); **Terra Lemnia standard of practices (**September 2020).

The last of these reports provides a series of standards, a set of agricultural practices favouring the landscape and biodiversity of Lemnos and is designed to be used as the basis for operation of a voluntary network of practitioners, the Land Stewards Network, and to create an environmental, landscape label.

3. Existing practices: solutions implemented, planned, or proposed

The solutions implemented and proposed now are all related to a turn towards traditional knowledge and expertise, as well as to the identification and promotion of local biodiversity, which is resilient to extreme weather conditions and much more adaptable to the local conditions. In addition, the bearers/practitioners ask for support in raising awareness among their communities and beyond, especially with respect to local biodiversity and management of natural resources.

4. Publications and other additional information

Research bibliography

1. Ανεμόεσσα (2011). *Λήμνος: Σύγχρονα Προβατοστάσια και Παραδοσιακές Μάντρες. Μια πρόταση ολοκληρωμένης ανάπτυξης κτηνοτροφικών εγκαταστάσεων σε ένα τοπίο ιδιαίτερης πολιτιστικής αξίας.* Ανεμόεσσα, Μύρινα. (Lemnos: Contemporary Sheep-stations and traditional paddocks: a proposal for a comprehensive development of livestock infrastructure in a landscape of exceptional cultural value). Available at: https://terra-lemnia.net/wp-content/uploads/2019/07/ANEMOESSA_LEMNOS_PROVATOSTASIA.pdf
2. Μπακάλης, Β. Χρ. (2007). *Λήμνος: οργάνωση του αστικού χώρου (19ος- 20ος αιώνας) κοινωνικός μετασχηματισμός, μεταναστευτικά δίκτυα και αστικοί 'αντικατοπτρισμοί'* Διδακτορική Διατριβή, Πανεπιστήμιο Αιγαίου, Σχολή Κοινωνικών Επιστημών, Τμήμα Κοινωνιολογίας, Μυτιλήνη. (Lemnos: urban organization (19th-20th cent): social transformation, migratory networks and urban 'reflection'. PhD Thesis, University of

the Aegean, School of Social Sciences. Mytilene: Lesvos) Available at: https://www.didaktorika.gr/eadd/handle/10442/14483

3. Dimopoulos, T., Dimitropoulos G., Georgiadis N. (2018). *The Land Use Systems of Lemnos Island.* Terra Lemnia project. Updated version.
4. Αικατερινίδης, Ν. Γ. (1979). *Νεοελληνικές αιματηρές θυσίες, λειτουργία-μορφολογία-τυπολογία*. Διδακτορική Διατριβή, Λαογραφία, Δελτίον της Ελληνικής Λαογραφικής Εταιρείας, Παράρτημα 8, Αθήνα (Neo-Hellenic blood sacrifices, operation-morphology-typology. PhD Thesis, Laografia: Deltion of the Hellenic Folklore Company, Addendum, 8. Athens).
5. Γεροντούδης, Ν. Λεων. (1971). *Η νήσος Λήμνος, ιστορία- διάλεκτος- λαογραφία*. Αθήνα (The island of Lemnos, history – dialect – folklore. Athens).
6. Lemerle, D., Guillou, A., Svoronos, N., Papachryssanthou, D. (1977). *Actes de Lavra II. De 1204 à 1328* (Archives de l' Athos VIII), Paris.
7. Lyratzaki, Ir., Dodouras, St., Demetropoulos G. (2020). *The cultural elements of the Mandra System of Lemnos: a narrative approach*. MedINA. Athens. Available at: https://med-ina.org/wp-content/uploads/2020/12/Terra-Lemnia-Cultural-Elements-of-the-Mandra-System.pdf
8. Κολλερός, Χρ. (2010). *Ένα πανί μας λείπ' για να σαλπάρομ', Λαογραφικά της Λήμνου: Θρύλοι παραμύθια, διηγήσεις, ιστορίες, μύθοι, τραγούδια*. Στεφανίδη, Αθήνα. (We are missing a cloth to sail… Folklore of Lemnos: Stories, fairytales, narratives, histories, songs. Stefanidis Publications: Athens).
9. Κοντονάτσιου, Δέσπ. (1988). *Η διάλεκτος της Λήμνου – Εθνογλωσσική προσέγγιση*. Διδακτορική Διατριβή, Φιλοσοφική Σχολή ΑΠΘ, Τμήμα Φιλολογίας. Θεσσαλονίκη (The dialect of Lemnos – Ethno-linguistic approach. PhD Thesis, Aristotle University of Thessaloniki, School of Philosophical Studies. Thessaloniki).
10. Κωνσταντέλλης, Γ. (ed.) (2010). *Λήμνος, ιστορική και πολιτιστική κληρονομιά, τομ Β. Αθήνα* (Lemnos: historical and cultural heritage. Vol. II. Athens)
11. Μέγας, Α. Γ. (1940). Η Λαϊκή Οικοδομία της Λήμνου. *Λαογραφία* Β, σ. 3-29 (The folk building of Lemnos. Laographia B, pp. 3-29).
12. Μιχελής, Άγγ. (1959). *Λημνιακή Λαογραφία*. Κάστρο (Folklore of Lemnos. Kastro).
13. Σηφουνάκης, Νίκ. (1993). *Μια άγνωστη αρχιτεκτονική, οι μάντρες στη Λήμνο και στα άλλα νησιά του βορειοανατολικού Αιγαίου*. Καστανιώτης, Αθήνα (An Unknown Architecture: the paddocks of Lemnos and the other islands of the north-east Aegean Sea. Kastaniotis: Athens).
14. Σηφουνάκης, Ν. (2011). Οι μάντρες της Λήμνου. *Αρχαιολογία και Τέχνες*, σελ. 75-78. (The Mandres of Lemnos. *Archaeology and Arts*, pp. 75-78).

Pastoral practices and ICH

1. Gül, A., Lerski, M. (2021). Intangible cultural heritage: a benefit to climate-displaced and host communities. *Journal of Environmental Studies and Sciences,* 11:305–315.
2. Brooks, N., Clarke, J., Ngaruiya, G. W., Wangui, E. E. (2020). African heritage in a changing climate. *Azania: Archaeological Research in Africa*, 55:3, 297-328. DOI: 10.1080/0067270X.2020.1792177
3. Gentle, P., Thwaites, R. (2018). Transhumant Pastoralism in the Context of Socioeconomic and Climate Change in the Mountains of Nepal. *Mountain Research and Development*. 36, 2, pp. 173-182.
4. Grove, R., Evans Pim, J., Serrano, M., Cidrás, D., Viles, H., Sanmartín, P. (2020). Pastoral Stone Enclosures as Biological Cultural Heritage: Galician and Cornish Examples of Community Conservation. *Land*, 9, 9, 1-20. DOI:10.3390/land9010009

5. Higgins, N. (2022). Changing Climate; Changing Life—Climate Change and Indigenous Intangible Cultural Heritage. *Laws*, 11, 47. DOI: https://doi.org/10.3390/laws11030047
6. Namgay, K., Millar, J.E., Black, R.S., Samdup, T. (2014). Changes in Transhumant Agro-pastoralism in Bhutan: a Disappearing Livelihood? *Human Ecology,* 42:779–792. DOI 10.1007/s10745-014-9684-2
7. Shaoliang, Y., Ismail, M., Zhaoli, Y. (2012). Pastoral Communities' Perspectives on Climate Change and Their Adaptation Strategies in the Hindukush-Karakoram-Himalaya. In: Kreutzmann, H. (eds) *Pastoral practices in High Asia. Advances in Asian Human-Environmental Research*. Springer, Dordrecht. Pp. 307-322. DOI: https://doi.org/10.1007/978-94-007-3846-1_17
8. Uddin, M.E., Kebreab, E. (2020). Review: Impact of Food and Climate Change on Pastoral Industries. *Frontiers in Sustainable Food Systems*. October 2020, Volume 4, Article 543403, pp. 1-13.

Press

1. (2022, November 20). *Δελφοί: Τα επόμενα 50 χρόνια για την Προστασία της Παγκόσμιας Πολιτιστικής Κληρονομιάς* (Delphi: the next 50 years for the protection of cultural heritage). Moneyreview.gr. Available at: https://www.moneyreview.gr/society/95268/delfoi-ta-epo-mena-50-chro-nia-gia-tin-prostasi-a-tis-pagko-smias-politistiki-s-klironomia-s/
2. (2022, June 16). *Μενδώνη: Η άυλη πολιτιστική κληρονομιά αρωγός στην αντιμετώπιση της κλιματικής αλλαγής* (Mendoni: The intangible cultural heritage helps to tackle climate change). Skyrodos.gr. Available at: https://www.skyrodos.gr/μενδώνη-η-άυλη-πολιτιστική-κληρονομι/
3. (2022, April 17). *Κλιματική κρίση: 7 έργα 24 εκ. για την προστασία της πολιτιστικής κληρονομιάς* (Climate crisis: 7 projects worth €24 million to protect cultural heritage). Ecopress.gr. Available at: https://ecopress.gr/klimatiki-krisi-7-erga-24-ek-gia-tin-prostastasia-politistikis-klironomias/
4. (2022, April 17). *ICOMOS: οι επιπτώσεις της κλιματικής αλλαγής στην πολιτιστική κληρονομιά* (ICOMOS: the impact of climate change on cultural heritage). Available at: https://ecopress.gr/icomos-oi-epiptoseis-tis-klimatikis-allagis/
5. (2022, January 26). *Μάντρες Λήμνου & Πανηγύρια Ικαρίας* (Panigyria Ikarias and Mandres Lemnou). Dimokratis.gr. Available at: https://www.dimokratis.gr/index.php?article=2022-1-26_mantres_limnou___panigyria_ikarias
6. A series of presentations of different activities that relate to the protection of mandras, by the local press. Limnosxpress.gr. Available at: https://limnosxpress.gr/tag/mantres-tis-limnoy/

Legal and policy sources

1. Government Gazette (2019). *Approval of the Review of the Spatial Framework of the North Aegean Region and Environmental Approval of it*. No FEK 181/16-4-2019. 04.16.2019.
2. Regional Authority of the North Aegean (2019). *Regional Plan for the Adaptation to Climate Change: Strategic Study of Environmental Parameters*. Available at: https://www.pvaigaiou.gov.gr/dyn/newspdf/smpe_pespka_ba03102019022420103630.pdf
3. Regional Authority of the North Aegean (2019). *Regional Plan for the Adaptation to Climate Change*. Available at: https://www.pvaigaiou.gov.gr/dyn/userfiles/files/pdf-diavouleysh/PESPKA_BOREIO_AIGAIO.pdf

4. Ministry of Culture (2022). *Press Release on Third Experts Forum for the Protection of ICH*. Available at: https://www.culture.gov.gr/el/Information/SitePages/view.aspx?nID=4250
5. Ministry of Culture (n.d.). *Climate Change and Cultural Heritage*. Presentation. Available at: https://www.culture.gov.gr/DocLib/ΚΛΙΜΑΤΙΚΗ%20ΑΛΛΑΓΗ%20ΠΑΡΟΥΣΙΑΣΗ1.pdf

Other resources

1. *A documentary about the "mandra system" in Lemnos*. Available at: https://medina.org/a-documentary-about-the-mandra-system-of-lemnos/
2. *Presentations of the 3rd Experts Forum for the Safeguarding of ICH* (2022). Available at: https://www.youtube.com/watch?v=I0ZDhSYY9Ak&list=PL7Mi92DP1GGHVi3wGf7xoxKgrxh28VOU4&index=1, https://www.youtube.com/watch?v=ypKMc_SI4Vs&list=PL7Mi92DP1GGHVi3wGf7xoxKgrxh28VOU4&index=3
3. *Terra Lemnia Project*. Available at: https://terra-lemnia.net/en/the-project/
4. *Terra Lemnia Project Scientific Reports*. Available at: https://terra-lemnia.net/en/reports/
5. *Lemnoscopio: an online database of mandras of Lemnos*. Available at: https://lemnoscopio.org

5. Informants, experts, dates of interview

- Stavroula Fotopoulou, Director of Modern Cultural Heritage, Hellenic Ministry of Culture, 22.05.2023
- Irene Lyrantzaki, Researcher, Ethnologist, MedINA, 02.06.2023
- Raphael Yannelis, Ethnologist, Practitioner, MedINA, 02.06.2023
- Christos Kakarnias, Practitioner, 22.06.2023
- Athena Kavaleri, Practitioner, 23.06.2023

6. Contributors

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4.6. CS6 Traditional Practices of Wild Edible Plants in Crete (Greece)

1. ICH element

Title in English
Traditional Practices of Wild Edible Plants in Crete

Title in Greek
Εθνοβοτανικές πρακτικές των άγριων βρώσιμων χόρτων της Κρήτης

National Inventory of ICH
https://ayla.culture.gr/wp-content/uploads/2018/03/%CE%95%CE%B8%CE%BD%CE%BF%CE%B2%CE%BF%CF%84%CE%B1%CE%BD%CE%B9%CE%BA%CE%AD%CF%82_%CE%A0%CF%81%CE%B1%CE%BA%CF%84%CE%B9%CE%BA%CE%AD%CF%82_%CE%86%CE%B3%CF%81%CE%B9%CE%B1_%CE%A7%CF%8C%CF%81%CF%84%CE%B1_%CE%9A%CF%81%CE%AE%CF%84%CE%B7_2_3_2018-1.pdf
(since 2018)

A brief description
Tradition. The wild edible plants of Crete ("χόρτα"), the practices of collecting and processing them, the inventive, yet simple, way of preparing them, and their role in everyday life and activities make them a rare ICH element. Wild plants, as an integral part of the Cretan dietary system, are a cultural and social asset that continuously permeates everyday life in Crete from prehistoric times to the present day. The consumption of wild plants in difficult times of war, scarcity, and deprivation ensured food and survival, while they are particularly preferred during long fasting periods, hence their prominent role in monastic cuisine. The simplicity and moderation that characterize Cretan cuisine find expression in the nutritional utilization of wild plants. However, wild plants are also present on the festive table in Crete, as the main dish combined with meat (e.g., wild greens with lamb). Gathering of wild plants, which was previously done by women of all ages, without excluding men, served as a learning process for younger generations to find edible wild plants, and even today, it provides opportunities for social expression, as group outings to the countryside for this purpose are not uncommon. Additionally, the practice of "skouteliko", the exchange of small quantities of food among housewives, was also common in the case of wild plants. In general, the resourceful way in which Cretans use wild plants fulfils needs, balances social differences, and expresses collectively.

Species. Crete possesses a rich flora with approximately 1,800 known species and subspecies, of which more than 190 are endemic. This plant diversity is due to its geographical location (isolation resulting in speciation) as well as the presence of different ecosystems, which in turn lead to the creation of various habitats with different microclimates (coastal zone, plains, semi-mountainous and mountainous zones, gorges, wetlands). Another characteristic related to Cretan flora is that many wild plants, both endemic and non-endemic, are edible. The consumption of wild plants as main dishes, side dishes, or salads on a daily basis, is a characteristic key of the Cretan cuisine. Recent studies on the chemical composition and nutritional elements of several wild greens and vegetables consumed in Crete have demonstrated their significant nutritional value. The correlation between the exceptional health and longevity of Cretans and the nutritional components of wild greens and vegetables has been evidenced by numerous studies. In addition to vitamins, minerals, and carbohydrates, which are important nutrients known for their role in human health, wild greens and vegetables contain omega-3 fatty acids and numerous phytochemicals, products

of the secondary metabolism of plants. Researchers have focused on these metabolites in recent years, as there is increasing evidence that these substances also influence human metabolism in a health-promoting manner.
Cretan diet consists predominantly of wild edible plants. More than 150 species of wild plants are included in the Cretan diet. These plants contain vitamins, dietary fibres, proteins, and are rich in antioxidants, trace elements, and components necessary for a balanced and healthy dietary pattern. However, equally important to the quantity, variety, and properties of wild plant species are the practices of recognition, collection, processing, preservation, preparation, and consumption of wild plants in Crete, as well as the social and cultural aspects associated with this process.

Indicative examples:
[1] *Reichardia picroides* (ΑΓΑΛΑΤΣΙΔΑ)
It grows in cultivated and uncultivated soils, and it is found throughout Crete at altitudes ranging from 0 to 700 meters. The plant is considered to have stability in terms of its spread in the Mediterranean region and *is not considered threatened*. It is collected from autumn when it appears (November) until before its flowering (February). It is not rare to see the plant blooming in winter (December-January), as well as mature seeds that give rise to young plants, the harvest of which can be done late in spring.
[2] *Tetragonolobus purpureus moench* (ΚΟΠΑΝΙΔΑ)
It blooms early in spring. It grows in both cultivated and uncultivated areas, mainly at low altitudes. Its fruits are consumed as salad. In recent years, few are those who collect it and consume its fruits. In northern Europe, there has been a growing interest in the dietary use of *Tetragonolobus purpureus*, and it is cultivated in greenhouses as it does not thrive in cold climates.
[3] *Muscari comosum* (ΑΣΚΟΡΔΟΥΛΑΚΟΣ)
Its flowering period is early April. The plant thrives in sunny locations and well-drained soil. It easily multiplies through bulbs, which should be planted by mid-autumn. Its bulb is edible and is harvested before the flowering shoot appears by digging it out from a depth of 15 to 20 cm. Due to this reason, collecting the bulbs is quite challenging and time-consuming. Cultivated bulbs are sold in the market of Lasithi prefecture (eastern part of the island) and other places in Crete, often imported from Turkey. In the region, bulbs of the Ornithogalum genus are also consumed, which are smaller, whitish, and considered tastier than the bulbs of Muscari comosum.
[4] *Scandix pecten – veneris* (ΑΡΧΑΤΖΙΚΑΣ)
It grows in cultivated and uncultivated areas. The so-called “petrachartzikoi” (rocky ones) grow in rocky soils, among crevices and rocks, and they are smoother and more aromatic. The characteristic aroma of the plant has made it very popular amongst the inhabitants of eastern Crete, and it is one of the main varieties used in vegetable pies (hortopites) as well as in “tsigarolachana” (a dish with various types of fried plants and onions), which can be eaten as a main dish or served alongside other main dishes. It preserves very well when frozen raw, without losing its aroma for more than six months.
[5] *Leontodon tuberosus* (ΒΥΖΟΡΑΔΙΚΟ)
It mainly blooms in late winter to early spring, but blooming plants can be seen almost year-round (depending on rainfall). It is found in both uncultivated and cultivated soils at all altitudes. It is one of the first varieties to be collected in autumn. Its pleasant taste, without any trace of bitterness, makes it highly popular in the eastern region of Crete, as well as its *easy availability and collection*. It can be boiled and cooked alone or can be combined with other ingredients in any dish with tomato sauce or egg-lemon sauce.
[6] *Cichorium spinosum* (ΓΙΑΛΟΡΑΔΙΚΟ)
It mainly blooms in late winter to early spring, but blooming plants can be seen almost year-

round (depending on rainfall) (see also interviews section). It is found in both uncultivated and cultivated soils at all altitudes. Its leaves, with a characteristic slightly bitter taste, have made it particularly popular as a salad with oil and vinegar. It can be pickled by wilting it in equal amounts of wine and vinegar and then preserved in oil. It is also cooked with meat in an egg-lemon sauce. The scientific interest in this plant has been ongoing for over a decade, particularly regarding its nutritional components. The occasional cultivation by locals in the area has expanded into systematic cultivation in recent years in Crete and other parts of Greece.

[7] *Urospermum picroides* (ΚΟΡΚΟΛΕΚΑΝΙΔΑ)

It blooms late in spring until early June, especially during years with abundant rainfall. Its habitat thrives in moist environments, and it doesn't easily compete with other plants such as “zochos” and “agalatsida”. It is usually found on the edges of cultivated and uncultivated fields, in shadier areas along the slopes rather than on the plateaus (cultivated terraces). It is harvested in autumn and winter. The young shoots and early leaves (rothakas) are consumed. It is primarily eaten boiled with oil and lemon. It has no bitter taste. It can be combined with other greens to create dishes with meat, fish, or eggs.

Geographical coordinates

35.24882, 24.91315

Crete, Greece

2. CC risks and effects

Wild edible plants in Crete should not be considered as species at risk but rather as a solution to CC. The wide occurrence and availability of edible wild plants in Crete is related to its rich topography. The rocky landscape forced local inhabitants to rely on nature for their food supply throughout the island’s history. During the interviews, it was repeatedly stressed for instance, that during the Second World War, Crete did not “experience hunger” precisely because of the wide abundance of edible wild plants in the Cretan landscape.

Observing the annual cycle of vegetation in relation to the changing seasons, specific locations, and microclimate led local inhabitants (particularly older generations) to a deep experiential knowledge of the natural economy, the properties of a wide spectrum of edible plants, as well as the specific conditions of their growth. Today, in the wake of concerns regarding CC, this experiential knowledge may act as an impetus for overcoming climate warming and unpredictability, drought, and temperature rise. In conclusion, the use of wild edible plants may be an effective and sustainable strategy for counterbalancing/overcoming the effects of CC.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

During the interviews, local inhabitants, and farmers mentioned numerous varieties/types of wild plants, emphasizing mainly how they were consumed and cooked (raw, boiled, fried). When they were asked about the effect of CC on wild flora on the island, they mentioned that these plants are not affected by changes in weather conditions and climate. It is indicative, they argued, that regardless of when rainfall occurred (“premature/out-of-season”, “unexpected” and/or “delayed”), soon after its occurrence, wild plants would make their appearance. For them wild plants are therefore “constantly available”.

Officials responsible for the ICH safeguarding

Traditional practices of wild edible plants in Crete have not been associated with CC risks and problematised in the context of the CC by the officials responsible for the ICH safeguarding in Greece. However, many actions related to the protection of the island's biodiversity indirectly address the issue of CC. Examples of such actions include scientific research and documentation of the wild edible plants of Crete (recording, photographing, identification, properties of wild plants and vegetables), the organization of international interdisciplinary conferences by local government authorities and the Ministry of Culture on the wild edible Cretan flora and ethnobotanical practices, the recording and audiovisual representation of the recognition, collection, and preparation of the wild edible plants of Crete. In addition, the Ministry of Culture has organized a seminar in Crete to raise awareness about the ICH element focusing on the wild edible flora. Lastly, the "Lychnostatis" Museum of Traditional Life in Crete has created a collection of wild edible plants of Crete to allow visitors to recognize this aspect of the ICH of Crete. Periodically, workshops on plant recognition and collection are organized for families to raise awareness and to involve the local community.

Other: journalists

Traditional practices of wild edible plants in Crete have been featured extensively in radio and television shows, as well as in the press (both local and national) but the focus is mainly on the safeguarding of the nutritional information that concerns the possibility of consuming vegetative species of importance in the Mediterranean nutritional model. This information is in danger of being lost as the transmission of knowledge and collection of edible wild plants from older to younger people has been significantly reduced. Resilience of wild edible plants to CC risks is scarcely acknowledged (see Section Press, below).

Other: scientists

Rather than CC, the concerns raised about Cretan wild plants during the interview with scientists were related to anthropogenic practices and their consequences to the ecosystem. Many interviewees mentioned for instance that "in the past" there was a widespread fear of exhausting wild food resources (such as wild plants), especially during the Second World War and the decades after that, thus leading to the sustainable management of wild flora in the yearly cycle. Nowadays however, destructive collecting methods are employed by inexperienced collectors, and this is an alarming situation for a very specific reason: wild plants should not be uprooted because this leads to a reduction and often destruction of rare species in the Cretan flora. These plants, if cut from the right place, will produce new shoots after a few days, which can be collected later. If not, they become extinct. Moreover, it was stressed that caution is needed when collecting these species, especially in areas with cultivations (olive groves and vineyards) in early spring (March-April), as many farmers consider them mere weeds and spray them with toxic chemicals, as told by agronomist Giannis Stagias.

Very significant information was collected with agronomist and academic Antonella Psaroudaki. Psaroudaki stressed that the areas with the lowest diversity include mainly cultivated land (olive trees and intensified vegetable cultivation) and large settlements with tourism development. The low levels of diversity in agricultural land could be caused by the pressure due to the cultivation techniques (plowing, weed control) and may be associated with an increase in inbreeding as the number of plants in a population decline, since the only place where they reproduce is at the margins of cultivated land.

Furthermore, Psaroudaki stressed that modern agricultural practices have exposed autochthonous plant populations to serious survival pressure. Losses in arable plant communities have been larger than in most other human-made vegetation types, to the extent that arable plant communities now belong to the most threatened vegetation types. In contrast, regions showing greater plant biodiversity are clearly the ones less characterised by

intensified residential agriculture production (presence of perennial crops such as pome fruit and grapes, and ovine ranching).

Moreover, these areas are usually difficult to access, crossed by rugged rural dirt roads and only approached by shepherds and residents for seasonal works, with fallow land and limited ovine presence. Unfortunately, in recent years, these areas (such as Ziros plateau) are becoming more accessible (paved roads) and more residential, while the grazing sheep/goat populations have increased due to internal migration from the west of Crete.

Finally, the increased interest of consumers has already overcome the narrow base of the island and has resulted in the commercial cultivation of some species. This in turn has increased collection of edible plants from the wild for commercial purposes since collectors have a market with high retail prices. The unmonitored collection, which does not take place in the traditional way (i.e., few individuals per population for personal use), could lead to the decrease or even the extinction of a species.

The economy of collection has also shifted in other ways compared to the past, as older people could identify more plant species, thus collecting plants from several species to make their 'daily dish of greens'. Younger people recognize fewer species, collect them with persistence and consequently disturb the planta equilibrium in a region.

Another major risk for the conservation of species and their diversity is the residential development, especially in recent years. Initially, Psaroudaki argues, this has affected coastal areas but now, in combination to tourism development, leads to the extinction of many indigenous plants, due to the loss of their habitat. Agricultural practices also have an effect in the areas where edible wild plants grow. For instance, at altitudes above 600 m extensive sowing of clover and other forage plants and deep plowing of soils occur; so, there is more grass for small ruminants (sheep, goats), which in turn damages the biodiversity of the region. The condition for the examined species is considered threatening. Furthermore, Ziros (East Crete) is considered as degraded/slow degrading area, due to disturbances in the ecological balance caused by fires, tourism development and overgrazing, and must be prioritized instead, as a preserved area. Kefala and Agrilos (also in East Crete) are also designated as degraded/slow degrading.

Given the fact that the recent land use changes and residential development apparently can affect the genetic structure of the Cretan edible plant communities, , regions should be closely monitored over the coming years and develop conservation policies, Psaroudaki stressed (read more: Psaroudaki 2015).

4. Existing practices: solutions implemented, planned, or proposed

Community level

Wild flora recognition and collection began hundreds of years ago and had the constant goal of satisfying daily food needs. The entire process is based on the oral transmission of knowledge and the guidance of the apprentice in the field through experiential participation, which no theoretical approach can replace. It requires attentiveness, perception, memory, physical involvement, motor skills, activation of the senses. It has been and remains a complex process that requires frequent repetition for its complete and successful assimilation.

Like in all forms of non-formal education, the duration of learning depends on the communicability of the person who has the knowledge and experience. In the past, elderly peasant women, accompanied by their daughters, would go out at the end of November (after the autumn rains) to identify, and collect the earliest plants, such as radishes and purslanes. This practice of learning about wild plants and their differential recognition continued until spring and resulted in the transmission of relevant knowledge from generation to generation. This knowledge was essential for every woman, as with these wild plants she would prepare

a wide variety of dishes to feed her family in a simple and healthy way.

Subsequently, the process of cleaning the herbs with the participation of women from the village took on a social gathering character ("apotrypida"), often accompanied by traditional stories and jokes. Finally, the mother would demonstrate the cooking methods for various herbs, simultaneously determining the most suitable cooking methods for each one and the most suitable ingredients for making pies. Of course, some skilled women could distinguish edible plants by the smell of their roots. Moreover, the Cretans, as herbivores, often empirically recognized wild plants through on-site testing, a practice they enjoyed because they also knew empirically that fresh wild plants have a special botanical and nutritional value.

These patterns of continuity began to change during the last fifty years with the migration of people from villages to the cities and the change of their lifestyle. These changes (employment of women outside the home, insufficient free time, and higher living standards) enabled the Western nutritional model to become more prevalent and to be adopted especially by young people. The tradition of recognizing and collecting plants is declining in a large part of Greece. In Crete, however, although the Western-type diet has had a lot of influence, the tradition of collecting indigenous plants has not been abandoned. In Crete, more than one hundred species of plants are still recognized to be edible (roots, shoots, leaves, premature flowers, and fruit).

Municipality level

The intense urbanization produces the shift in dietary patterns and overall lifestyle changes, and consequently, the transmission line from parents to children has been admittedly limited. The carriers of transmission are elderly women and men but also new social groups and experts such as agriculturalists, botanists, cultural and environmental associations (i.e., the Museum of Traditional Cretan Life "Lychnostatis", the Museum of Natural History of Crete, the Agricultural Laboratory, and the School of Dietetics at the Technological Educational Institute of Crete). To strengthen transmission Cretan cuisine, competitions, excursions and field trips with on-site seminars and workshops targeting children and adult citizens of Crete, are organized.

Cultural institutions such as the Museum of Traditional Cretan Life "Lychnostatis" and the Museum of Natural History of Crete periodically organize experiential learning workshops on processes related to wild plants, typically consisting of a brief theoretical part and primarily practical activities. Various traditional cooking competitions are also held with the most prominent being the Cretan Cuisine Festivals organized by the Pan-Cretan Association, which have become an established tradition. It is important to underline that most dishes participating in this competition include wild plants. These activities take place after several rainfall events, from the end of autumn until the beginning of spring when the Cretan nature provides an abundance of plants.

National and local authority level

The need for their protection of species of the Cretan flora is anticipated by: (I) the Greek Presidential Decree 67/1981 "about the protection of the native flora and fauna…" (Greek Off. J. F.E.K.A' 23/30.1.1981, corrected by F.E.K.A' 43/18.2.1981), (II) the European Directive 92/43 ('Habitats Directive') "on the conservation of natural habitats and of wild fauna and flora" that has been adopted by the Greek legislation with the Common Ministerial Decision K.Y.A. 33318/3028/1998 (F.E.K.B' 1289/28.12.1998), (III) the Bern Convention, signed in 1979, entered into force in 1992 and ratified by Greece with the national law 1335/1983 (F.E.K.A' 32/14.3.1983) and (IV) Greek law for the protection of biodiversity (3937/11 (Governmental Gazette 60/A/31-3-2011)). For the species officially recognized as ICH, despite their singularity no protection measures are foreseen this far by any national law or international convention.

The EC funded project "The ecological services, social benefits and economic value of the Ecosystem Services in Natura 2000 sites in Crete" states that: "The main threats to the Natura 2000 network sites in Crete are the destruction of coastal habitats by further development of the tourism sector, the degradation of mountain landscape and the loss of biodiversity due to intensive agriculture, abandonment of traditional farming practices and the impact of human activities on key species. Most of these problems are intensified by inadequate law enforcement and the poor implementation of EU regulations and environmental policy. Raising awareness in local communities about the importance of species and habitat protection, in combination with the application of management measures, is often a more effective way of achieving conservation goals than implementing national or European legislation. Greater awareness among certain groups has proven to be a practical and effective conservation action. Encouraging cooperation among different groups is vital for the implementation of appropriate protection and management measures within and around Natura 2000 sites. In addition, the integration of the ecological value of Natura 2000 network to the local economy potential and social cohesion will contribute to sustainable development at the project's sites." (EC 2018). By encouraging the public to engage in pertinent decision-making processes and by emphasising the socio-economic harm that will come from Crete's loss of biodiversity, the LIFE Natura2000ValueCrete initiative intended to promote conservation efforts directed at Natura 2000 areas in Crete.

EU level

There exists no such information

5. Publications and other additional information

Research bibliography

7. Cherng. J.M., Chiang, W., Chiang, L.C. (2008). Immunomodulatory activities of common vegetables and spices of Umbelliferae and its related coumarins and flavonoids. *Food Chemistry,* 106, p. 944–950.
8. Ferraraa, L., Dosia, R., Di Maroa, A., Guidaa, V., Cefarellia, G., Pacificoa, S., Mastellonea, C., Fiorentinoa, A., Rosatib, A., Parentea, A. (2011). Nutritional values, metabolic profile and radical scavenging capacities of wild asparagus (A. acutifolius L.). *Journal of Food Composition and Analysis*. Volume 24, Issue 3, p. 326-333.
9. Fokialakis, N., Kalpoutzakis, E., Tekwani, B.L., Khan, S.I., Kobaisy, M., Skaltsounis, A.L., Duke S.O. (2007). Evaluation of the antimalarial and antileishmanial activity of plants from the Greek island of Crete. *Journal of Natural Medicines*. 61, p. 38-45.
10. Fragaki, E. (1969). *Συμβολή εις την δηλώδη ορολογίαν των φυτών. Φυτά της Κρητης Αυτοφυή, Εγκλιματισμένα, Φαρμακευτικα, βαφικα, καλλωπιστικά, εδώδιμα*. (Contributions to the vocabulary regarding plants. Plans of Crete, Native, Acclimatised, Medicinal, Dye-making, Decorative, Edible), Athens.
11. Kafatos, A., Verhagen, H., Moschandreas, J., Apostolaki, I., Van Westerop, J. (2000). Mediterranean diet of Crete: foods and nutrient content. *Journal of the American Dietetic Association*. 100:1487-1493.
12. Keys, A., Menotti, A., Karvonen, M.J., Aravanis, C., Blackburn, H., Buzina, R., et al. (1986) The diet and 15-year death rate in the seven countries study. *American Journal of epidemiology*. Dec, 124(6), p. 903-915.
13. Lambraki, M. (2000). *Τα χόρτα* (The edible plants/greens). Athens: Ελληνικά Γράμματα.
14. Manios, Y., Antonopoulou, S., Kaliora, A.C., Felliou, G., Perrea, D. (2005). Dietary Intake and Biochemical Risk Factors for Cardiovascular Disease in two Rural Regions

of Crete. *Journal of Physiology and Pharmacology*. 56, (1), p. 171-181.
15. Papadopoulos, T. (2012). Στον καιρό της σχόλης. Αναμνήσεις από την Κρήτη του 17ου αιώνα (At the time of leisure: memories from Crete of the 17th century). Heraklion: University Publications of Crete.
16. Psaroudaki, A., Dimitropoulakis, P., Constantinidis, Th., Katsiotis, A., Skaracis, G. (2012). Ten indigenous edible plants and their participation in the diet of the inhabitants of Eastern Crete nowadays. *Culture, Agriculture, Food and Environment Journal.* Vol. 34, (2), pp. 172–177.
17. Psaroudaki, A. (2012). Καταγραφή, Βοτανική Ταξινόμηση, Γενετική ποικιλότητα και Ιδιότητες των αυτοφυών εδώδιμων φυτών της Κρήτης - συμμετοχή τους στο σύγχρονο διατροφικό πρότυπο. κεφ.5 σελ.225-290. Γεωπονικό Πανεπιστήμιο Αθηνών. Διδακτορική διατριβή. (Documentation, Botanical Taxonomy, Genetic Diversity and Attributes of the native edible plants of Crete – their contribution to the contemporary dietary pattern. PhD Thesis. Chapter 5, pp. 225-290).
18. Psaroudaki, A., Nikoloudakis, N., Skaracis, G. *et al.* (2015). Genetic structure and population diversity of eleven edible herbs of Eastern Crete. *Journal of Biological Research-Thessaloniki.* 22, 7. DOI: https://doi.org/10.1186/s40709-015-0030-7
19. Psilakis, M., Psilakis, N. (2001). *Κρητική παραδοσιακή κουζίνα: το θαύμα της κρητικής διατροφής* (Cretan traditional cuisine: the miracle of Cretan diet). Heraklion: Karmanor.
20. Trichopoulou, A., Hamalidis, Ch., Petrocheilou, I., Vassilopoulou, E., Boulou, Ch., Georga, K, et.al. (2000). Άγρια Χόρτα και Παραδοσιακά Κρητικά Χορτοπιτάκια. *Ερευνώντας.* Γενική Γραμματεία Έρευνας Και Τεχνολογίας (Wild edible greens and traditional Cretan green pies. Doing Research. General Secretariat of Research and Technology), Τεύχος 4 (Vol. 4), σελ. 49-67, (1).
21. Zeghichi, S., Kallithraka, S., Simopoulos, A.P. (2003). Nutritional composition of molokhia (Corchorus olitorius) and stamnagathi (Cichorium spinosum). *World review of nutrition and dietetics*. 91:1-21. P. 91-121. DOI: 10.1159/000069924.

Press

1. (2023, March 2). *Τα άγρια χόρτα της κρητικής κουζίνας* (The wild greens of the Cretan cuisine). Lifo.gr. Available at: https://www.lifo.gr/tropos-zois/gefsi/ta-agria-horta-tis-kritikis-koyzinas
2. (2023, February 6). *Το Κεραμούτσι στηρίζει τη Βιωματική δράση για τα άγρια χόρτα της Κρήτης* (Keramoutsi supports the experiential action for the wild greens of Crete). Maleviziotis.gr. Available at: https://maleviziotis.gr/2023/02/06/%CF%84%CE%BF-%CE%BA%CE%B5%CF%81%CE%B1%CE%BC%CE%BF%CF%8D%CF%84%CF%83%CE%B9-%CF%83%CF%84%CE%B7%CF%81%CE%AF%CE%B6%CE%B5%CE%B9-%CF%84%CE%B7-%CE%B2%CE%B9%CF%89%CE%BC%CE%B1%CF%84%CE%B9%CE%BA%CE%AE-%CE%B4/
3. (2021, February 8). *Γνωριμία με τα άγρια χόρτα της Κρήτης* (Getting to know the wild greens of Crete). Youtube.com. Available at: https://www.youtube.com/watch?v=SNbDYRL1mvU
4. (2018, January 20). *Γνωριμία με τα μοναδικά άγρια χόρτα της Κρήτης* (Getting to know the unique wild greens of Crete). Hania.news. Available at: https://hania.news/2018/01/20/%CE%B3%CE%BD%CF%89%CF%81%CE%B9%CE%BC%CE%AF%CE%B1-%CE%BC%CE%B5-%CF%84%CE%B1-%CE%BC%CE%BF%CE%BD%CE%B1%CE%B4%CE%B9%CE%BA%CE%AC-%CE%AC%CE%B3%CF%81%CE%B9%CE%B1-

%CF%87%CF%8C%CF%81%CF%84%CE%B1-%CF%84%CE%B7/
5. (2017, November 23). *Ελάτε να μάθουμε μερικά απο τά άγρια μας χόρτα* (Come learn about some of our wild greens). Facebook.com. Available at: https://www.facebook.com/watch/?v=900316906794827&_rdc=1&_rdr
6. (2017, February 5). *Άγρια χόρτα (Σοκαράς Ηρακλείου)* (Wild greens (Shokaras Heraklion)). Youtube.com. Available at: https://www.youtube.com/watch?v=fIoOVthmEm0
7. (2015, April 25). *Τα Αγρια Χορτα Τησ Κρητησ στο National Geographic* (The Wild Herbs of Crete in National Geographic). Foodscross.com. Available at: https://foodscross.com/j/good-for-health/we-are-what-we-eat/
8. *Χόρτα* (Greens). Cretan-nutrition.gr. Available at: http://www.cretan-nutrition.gr/wp/?page_id=1728&lang=el
9. *Βγήκαν τα χόρτα, που είναι η αδυναμία των Κρητικών*! (The greens came out, which is the weakness of the Cretans!) Voltarakia.gr. Available at: https://www.voltarakia.gr/daily-photos/item/7343-vgikan-ta-xorta-pou-einai-i-adynamia-ton-kritikon

Legal and policy sources

1. (1981). *Official gazette of Greek legislation*. Available at: https://ypen.gov.gr/wp-content/uploads/legacy/Files/Perivallon/Diaxeirisi%20Fysikoy%20Perivallontos/Nomothesia/PD67_81-A.pdf
2. (1983). *Κύρωση Διεθνούς Σύμβασης για τη διατήρηση της άγριας ζωής και του φυσικού περιβάλλοντος της Ευρώπης* (Ratification of the International Convention on the Conservation of European Wildlife and Natural Environment). Available at: https://www.anaconda.gr/gnwsiaki-basi/nomos-1335-14-3-1983/
3. The Habitats Directive (1992). *EU measures to conserve Europe's wild flora and fauna*. Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en
4. Food and Agriculture Organization of the United Nations (1992). Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Available at: https://www.ecolex.org/details/legislation/council-directive-9243eec-on-the-conservation-of-natural-habitats-and-of-wild-fauna-and-flora-lex-faoc034772/
5. Greece (2011). *Νόμος 3937/2011: Διατήρηση της βιοποικιλότητας και άλλες διατάξεις* (Law 3937/2011: Conservation of biodiversity and other provisions). Available at: https://www.e-nomothesia.gr/kat-periballon/n-3937-2011.html
6. Legislation. Directive 92/43/EEC "*On the conservation of natural habitats and of wild fauna and flora*". Available at: https://ypen.gov.gr/perivallon/viopoikilotita/nomothesia/

Other resources

1. EC (2018). The ecological services, social benefits and economic value of the Ecosystem Services in Natura 2000 sites in Crete. Project reference: LIFE13 INF/GR/000188. Available at: https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=5086

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4.7. CS7 Art of Dry-stone Walling, Knowledge and Techniques in Cinque Terre and Amalfi Coast (Italy)

1. ICH element

Title in English
Art of dry-stone walling, knowledge and techniques in Cinque Terre and Amalfi Coast, Italy

Title in Italian
L'arte dei muretti a secco, conoscenza e tecniche Cinque Terre e Costiera Amalfitana, Italia

National Inventory of ICH
https://www.unesco.it/it/patrimonioimmateriale/detail/674 (since 2018)

A brief description
Tradition
The art of dry-stone walls is a millenary technique whose use varies from region to region based on the different morphological conditions of the land and the type of stone that is encountered. Throughout history these walls have served multiple purposes. In many rural areas they were used to delineate property boundaries, enclose livestock, and create terraces for growing crops on uneven lands. Historically, walls and terracing represent a remarkable feature of landscape and land use. This art is part of the related re-shaping of hilly or mountain slopes to create flat terraces for agricultural purposes, which is a very widespread practice worldwide too.

In the Italian context, the use of dry-stone walls for terraced landscapes have been recognized and documented since ancient times, with evidence dating back to the Neolithic period and more extensively recorded during the Middle Ages (Varotto et al., 2019). The presence of terraced areas in Italy is associated with the geomorphological territorial features, commonly recognized as a crucial component of agricultural practices for their importance in food production in hilly and mountain environments representing the 42 and 35% of total surfaces (Paliaga et al., 2016).

The dry-stone wall technique, therefore, includes something much more important: the understanding, sharing and traditional management by the local community of the peculiarities of its cultural landscape, which must be carried out precisely through the specific dry stone wall construction technique. It's an integrated system, in which material and immaterial are strongly connected, embodying the traditional knowledge, skills, and techniques passed down through generations and including specific expertise in stone selection and fitting, as well as a deep understanding of the local landscape and environment. An integrated system that includes water governance, since in this area, more than in any other part of the world, the functioning of the terraces supported by the dry-stone walls reminds us of water and of its wise management. As mentioned, the art of dry-stone walls is part of this millenary system of the traditional integrated management of the site, based on awareness processes, respect of nature, skills, ability, which have been in this community for centuries, and handed down orally and through practice from generation to generation.

Thus, the intangible heritage reflects the cultural identity and sense of place of the communities that have built and maintained these structures over time, a testament to the close relationship between humans and their natural surroundings.

Dry-stone walls and terraced systems have garnered renewed attention in recent times, attributed to their multifaceted benefits and significance, holding economic and

cultural-historical value, while also providing crucial ecosystem services (Assandri et al., 2018). Walls and terraces are increasingly acknowledged as versatile adaptation options for climate change, offering sustainable water management, flood prevention, control of landslides and avalanches, soil retention, fertility improvement, mitigation of erosion and desertification, enhancement of biodiversity, and creation of favourable microclimates for agriculture (Agnoletti et al., 2019). As a result, dry-stone walls and terraces play a pivotal role in addressing various environmental challenges and promoting sustainable practices across multiple domains.

Terraced systems in the Amalfi coast (Campania, Italy)

The Amalfi Coast represents an outstandingly valuable example of this traditional building technique. In fact, the particular slopes of the hillsides, the presence of springs and water coming from the mountain, also channelled both for agricultural use and to avoid environmental disasters in the event of heavy rains, the traditional use of high pergolas suitable for cultivation on several levels, the "strategic" location of the inhabited centres, the presence of tanks (or fishponds), immediately refer to a deep knowledge of the environments and of natural and climatic phenomena by the community, who has adopted the dry stone walls technique over the centuries to control and manage its territories.

What is peculiar of the Amalfi Coast terraces is that, in this place, the construction of the irrigation system seems to mentally precede that of the terraces, the regimentation of water marks the site, the outlines and the heights of the dry-stone walls, its kinds of cultivation and the use of the pergolas - all of that gives origin to the exceptional shape of the hills. From generation to generation, the Amalfi Coast inhabitants have shown on the one hand they have understood the natural *functioning* of the site, on the other hand they have been able to make some changes, even changeovers, using the art of dry-stone walls, preserving a relation between human needs and nature. The main springs on this site are generally located at a high level: the most important ones, in agriculture, are at an altitude of generally little more than 800 meters. The rough nature and the steep slope of the sides, without any human intervention, let the water flow to the natural deep and steep impluvia, reaching the sea very quickly from that point. By the way, water is an asset which is too precious to be wasted or to be used just in those areas near the natural impluvia, which are mostly considered dangerous in case of rainfall and floods. To use all sides, it is necessary to act in such a way that lets the water reach the areas on the hills, along all sides one wishes to cultivate, thus reversing, somehow, the natural logic and studying all possible devices that can counterbalance the modified natural system. As a result, water is canalized, right at the spring and *unnaturally* diverted almost in parallel, along the secondary ridges which follow the course of the dry-stone walls. From this point, like blood arteries which permeate from the heart to the most distant and peripheral parts of the body, some other secondary canals continuously bring water to all surfaces on the hills, directed by the dry-stone walls that contain the terraces and pergola cultivations, by simple force of gravity. From the top downwards, the dry-stone walls terraces are always conceived as based on the system of canals, following some patterns and slopes which make local use of water possible and let the water reach the other terraces and the valley floor, in a proper way. Don’t ask the farmers who is responsible for turning on and off of the taps: they will always answer “it has always been like this”, water is conveyed “at a certain time of the day to one, and later to another”, according to some rules and rights carefully registered in hereditary succession deeds and in the subdivision of landed property but first of all, coming from the oral cultural heritage, known as “the code of unwritten laws”, the community obeys by recognizing, more or less fully aware of it, that it is the basis of living together and the key element of these people’s territorial system. A system which is clearly defined by the dry-stone walls, which everyone benefits from, provided that the whole community manifests its respect, recognizability, routine maintenance, management, and

control through the art of dry-stone walls system. Indeed, local communities are usually aware of the knock-on effects on some entire portions of land of the hill sides which may derive from the loosening of just one link in the chain or from seemingly isolated events such as landslides, collapses, or hydraulic damage; however, they are also traditionally aware of the close relation between changes deriving from human action and the natural environments. That is why special attention has always been given to the prevention of exceptional atmospheric events. The paths and stairs, marked out by the dry-stone walls, go from the inhabited centres, located near the sea, to the top of the mountains, thus serving the cultivated areas. The also have a double function: on one hand, they have the covered canals, always visible and under control, guided by the dry stone walls, bringing water from the springs on the top downwards the terraces, the towns and the gardens; on the other hand, they are often deeply engraved on the rock too, drawn and planned to become themselves open canals, through which the threatening abundant rainwater can quickly reach the sea, keeping the distance from the terraces and cultivated land. Here, as everywhere, people fear the abundance of water as well as its lack being water a source of life and, as previously said, the shaper of the site - built through the dry stone walls, by supporting its existence - is also the element that, more than others, can cause the destruction of the site itself. So, while the uncontrolled water flows are conveyed into canals down there, on the upper part - the wood, which is the essential guarantee of the springs' existence - is preserved. Higher up the springs, there is no more cultivation, however the wood is no *Reign of Pan*, for sure. In this system, where human action has carefully manifested itself for centuries, a subtle strategy has been used, to prevent the wood from being destroyed, because of natural fires or shepherd-caused ones, in particular. The strategy consists in taking the wood very clean from vegetation and shrubs, which are easily inflammable, dead branches and the underbrush. Then, the farmers take and carry them downwards, on a mule, to be re-used for foddering the animals or twisting the pergolas' protective covers on the terraces. High pergolas which are, for this reason, even more susceptible to the devastating effects of the sea winds. When high enough, that water can irrigate vegetable cultivation under them protected by the shrubs of the wood. Meanwhile, the man picks up the dead branches and the volunteers in the underwood, by twisting them, according to an ancient tradition thus producing protective covers and baskets for harvesting and picking and keeps the wood safe from the fire and water safe from the springs' subsidence.

The pergolas, probably imported from the Arab world, are therefore characterizing elements, and closely connected to the terracing system, hence to the construction of the dry-stone walls. These latter reach considerable heights because they must allow the trees to develop and the vegetables to grow on the land below them, also including the canalization systems, reproducing someway the cultivation system of the oasis. Once again, we're stressing on the ability of this terraced system to participate substantially in the general management of the site, consciously responding to a logical management of soil and resources, which represents the most important identity value of shared knowledge and skills among this community. The art of dry-stone walls, if deprived of these ancient values and of the centuries-old ability to intervene in a sustainable way on the environment to create economically profitable landscapes for the local communities, would probably be reduced to a simple "construction technique" depleted of the values connected to the intangible heritage of the community.

Therefore, this work of creation is much more; it's a system based on awareness, knowledge, balances, skills, and it gives birth to this community's heritage whose precise identity emerges in tangible and intangible forms within its art of dry-stone walls system. This art - which was the common heritage of experienced masons, which was taught by the master builder to youth, and whose value, in relation to the landscape but also and especially in regard to the socio-economic well-being of the local community - was known and recognized

by all inhabitants of the Amalfi Coast for whom the "*macere*" were, and are still, part of the core of their identity and wealth.

Historical introduction
The art of dry-stone walls is a millenary technique whose use varies from region to region based on the different morphological condition of the land and the type of stone that is encountered. In the Amalfi Coast this technique was already a common practice from the Middle Ages. Further building work of the dry-stone walls system followed in subsequent centuries.

Who will be the target audience of interviews.
Local community representatives, schoolteachers, tourists, farmers.

Geographical coordinates.
40.63335, 14.60274
The Amalfi Coast

Interview Results

CC risks and effects on terraced landscapes in Amalfi Coast, Campania

The interviewed sample believes that the **abundant rains** and the **long droughts** (which impact the outcome of crops) affect the precarious balance of the dry-stone walls, causing them to swell first, and then collapse - effects that manifest themselves with landslides of stones downstream. It was given the example of the path of Avvocata, which was already impervious and nowadays it has almost disappeared. It has been noticed that the Sample finds it difficult to consider the art of dry-stone walls as something separate from the terraced system of the Amalfi Coast, despite being aware of the lack of qualified workforce and the need for this art to be preserved and passed on. The interviewees also had the impression that climate crisis is to associate with the economic crisis of the agricultural production system of the terraces: the payment of specialized workers for the restoration of rubble (or dry-stone walls) is certainly a priority due to landslides, the territory's setup, the beauty of the landscape, but it no longer has that strong motivation of being the basis of the local economy for which it was born.

The sample generally repeated what was referred to previously, further emphasizing that the landslide of the dry rubbles' downstream, due to the **sudden changes in temperatures and the devastating rains**, will soon lead to the abandonment and destruction of the lemon terraces throughout the Amalfi coast. Overall, the sample did not express opinions on the risks related to the *know-how*, skills, or anything else regarding the holders of knowledge and art.

Attitudes and recognition of problems

The sample stressed the need to help farmers with funds aimed at rebuilding the collapsed dry-stone walls to avoid the disaster of destroying of the unique landscape of the Amalfi Coast, and therefore of tourism, and the abandonment of the terraces cultivated in Limoneto, considered the only remedy to contain the hydrogeological instability of the Amalfi Coast. On the other hand, no mention was made about the marketing of agricultural products, damage to crops, etc.

Existing practices: solutions implemented, planned or proposed

The sample pointed out the need to prevent the abandonment of cultivated land and to help farmers with conspicuous subsidies to ensure that they continue to cultivate and maintain the terraces and the hydraulic system, continuing to be on sentry duty to a fragile and wonderful territory, held by a crumbly and dangerous rock. The sample did not give any suggestions on how to make the cultivation of terraces economically advantageous, limiting themselves to suggestions of welfare highlighting a disconnection between the need for preservation and the reality of a system born as economically productive.

The Sample stated that there is a strong resilient attitude among the inhabitants of the Amalfi Coast, who, unlike in the past, no longer want to leave their land. A trend reversal is taking place, i.e., emigrants are returning to their birth country because they want to live according to the traditions and habits of their happy childhood, they lived here on the Amalfi Coast. The Sample does not seem to have understood within the question the relationship between CC and resilient attitude, which should have led them to talk about the need to have suitably trained professionals, the request for integrated management systems, etc.
The interviewed sample referred to videos, photos, and information to be found on websites.

Terraced landscapes in Cinque Terre (Five Lands), Liguria

Cinque Terre ('Five Lands') is a coastal region of Liguria (northwestern Italy), which encompasses five small villages (Monterosso al Mare, Vernazza, Corniglia, Manarola and Riomaggiore) giving its name. A narrow strip of land located between the mountains and the sea characterizes the territory. The area exhibits steep slopes and high cliff coasts, with torrential streams originating from the nearby mountains. This geographical feature limits the extent of the watersheds. The landscape is marked by terracing, encompassing the altitudinal range up to 350 - 450 meters above sea level. Farming is an ancestral activity in the Cinque Terre and the terraced landscape is the result of human labour spanning over 1000 years. Through generations of work, the original shrublands and woods on the slopes were transformed into vineyards cultivated on terraces. The slopes adorned with dry-stone walls shaped the park's cultural landscape creating a visually consistent and structured pattern that now characterizes its identity (Raso et al., 2020).

The art of dry-stone walls holds a deep-rooted connection to the cultural and economic identity of the territory, embodying the intimate relationship between people and nature, and testifying to the symbiotic interaction between humans and the rugged landscape.

Terraced landscapes are infused with the memories and traditions of the people who built and maintained them over centuries, passing down knowledge to generations. Here, terraced lands and cultural landscape have connotations of both physical and psychological ownership. The land has been divided and inherited by community residents throughout family histories, becoming a key part of the collective self and ensuring continuity with the ancestors and the broader territory. To the same extent, family members reproducing the practice for land use and management have passed the art and techniques throughout generations. Therefore, the art of dry-stone walls in Cinque Terre is not only a physical manifestation of human local craftsmanship but also a symbol of a cultural identity grounded in place stewardship and agricultural traditions. It stands as a testament to the resilience and enduring spirit of the local communities who shaped the land to support agriculture and sustain their way of life. It represents the collective memory, knowledge, and identity of communities capable of modelling a rugged and difficult territory and making it productive and liveable. The walls represent the tangible sign of this interaction and the passage of people throughout history modelling the slopes.

For its cultural landscape, since 1997, Cinque Terre has been included in the World Heritage Sites UNESCO and since 1999 included within a National Park for its naturalistic value, representing one of the most outstanding examples of human integration with the natural landscape within the Mediterranean region. The Park has a surface area of 38.6 km2 and is one of the most densely populated national parks in Italy with around 4,000 inhabitants spreading over the five villages.

The territory exhibits three types of terraces, including dry stone retaining walls, stone walls bound by lime mortar, and grassy embankments made of hard court and stones. The dry-stone walls can be classified into two categories: those with the head at the same level as the terrace bed and those with the head positioned higher than the terrace bed level. The first type is widely distributed throughout the entire park area, while the terraces with raised heads are predominantly found in the eastern part of the park. These walls serve as wind protection for certain crops and act as barriers that facilitate water accumulation and infiltration into the coarse and permeable soil. Drainage is promoted by incorporating a layer of fine material behind the walls (O'Neill and Ceresoli, 2004). Water, whether from surface sources, underground reservoirs, or rainwater, is sourced from rivers or springs and stored in cisterns and pools. It is then distributed among the cultivated strips. This integrated approach prevents soil erosion, protects terrace walls, ensures irrigation water availability, and enables water storage during drought periods. To address soil erosion and protect terrace walls, an elaborate hydraulic system has been established. The terraced slopes are safeguarded by a comprehensive drainage system that directs excess water into a central collection channel. A network of channels and ditches ensures drainage for each land plot effectively managing drainage and enabling irrigation for crops.

The main local crops are vines and olives and each of these crops is recognized for its quality production through the PDO and PGI labels[1]. Due to the steepness, the small agricultural plots are very difficult to access and are served by monorails used to bring crops down the steep slopes. This territorial feature prevented the development of modern agriculture, leading to a decline in the number of farmers in the area. From the 1970s onwards, Cinque Terre has faced a drastic decline of over 70% in its agriculture and fishing sectors. Cultivated land has diminished significantly, decreasing from a maximum of 1200 hectares to approximately 100 hectares in the early 2000s (Agnoletti et al., 2019). As a result of rural depopulation and agricultural land abandonment, the construction and maintenance of terraces have gradually declined putting at risk their preservation. Moreover, since the territory is significantly impacted by severe hydrogeological issues due to the unique geological and geomorphological characteristics, the gradual abandonment of agricultural terraces affects the overall stability of entire slopes, which are progressively interested in wall crumbling and mass movements (Raso et al, 2020).

Geographical coordinates
44.10000, 9.75000
Cinque Terre National Park

CC risks and effects on terraced landscapes in Cinque Terre (Five Lands), Liguria

In Cinque Terre, CC is emerging as a threat multiplier amplifying existing risks and vulnerabilities. According to climate projections, Cinque Terre is expected to experience an increase in both the intensity of **extreme precipitation** and the **frequency of rainy days** (Regione Liguria, 2023). In addition to the issue of terrace abandonment and degradation,

[1] Labels that guarantee the products are produced in specific geographic regions and adhere to strict production methods and standards.

heavy rainfall events can significantly exacerbate the risks of **soil erosion** and collapse within abandoned terraces. This poses a considerable threat as it intensifies **geo-hydrological hazards, including landslides, mudflows, and erosion**. These hazards not only endanger nearby human settlements but also the cultural landscape and the overall sense of place (Paliaga et al., 2019; Dastgerdi et al., 2022; Cicinelli et al., 2022).

As evidenced by a rainstorm that occurred on October 25, 2011, Cinque Terre is currently facing high geomorphological risks requiring urgent adaptation measures and conservation policies. During the storm, the Levante region of Liguria (Cinque Terre) experienced extreme rainfall, with 542 millimetres of rain in just six hours.

The abandonment of terraces resulted in an increase of failure vulnerability as initial recolonization carried out by weeds and shrubs, resulted in the highest landslide frequency and with the higher amount of mobilized debris volume (Agnoletti et al., 2019). Excessive water saturation of the soil led to extensive surface runoff, subsequently triggering various landslides. This, in turn, caused pronounced erosion and debris flows, rapidly accumulating in floodplains, or flowing downstream. The consequences were tragic, resulting in the loss of 13 lives and causing extensive structural and economic damages. The steep slopes facing the sea triggered hundreds of shallow landslides, debris, and mud flows.

Therefore, CC poses a dual threat. On one hand, it directly threatens the tangible heritage assets. On the other hand, and indirectly, it can threaten the ICH. By threatening agriculture, it could jeopardize the economic sustainability of agricultural businesses and in turn the preservation of ICH. The implementation of approaches that enable cross-sectoral action across various socio-economic spheres becomes crucially important.

Attitudes and recognition of problems

The local community has become increasingly aware of the hydrogeological risks and climate-related hazards, with major concerns regarding water scarcity and abundance. The extreme rainfall experienced in 2011 has significantly influenced awareness and risk perception related to water extremes, also driven by the proximity of housing and villages to torrential watercourses and terraced systems. The growing awareness of the vulnerability posed by such exposure and the degree of terrace abandonment has spurred the community into action, leading to proactive responses focused on reducing the above-mentioned risks.

Regarding the urgent need to protect and adapt both the ICH and tangible cultural heritage related to dry-stone walls, the main concern is related to the shortage of supplies and skilled labours for their restoration and maintenance, which are deemed crucial to ensure agricultural production and site security. It is worth noting that, according to some interviewees, the transfer of the knowledge related to building dry-stone walls '*has skipped a few generations, and only few masters have remained*'.

Community residents, civil society organizations, authorities and experts agree that to restore and maintain terraced lands and adapt to CC, the land must be reconverted giving it back a productive purpose to ensure the economic sustainability of place stewardship. Community members recognize that when fields are left abandoned and uncultivated, they become vulnerable to brush encroachment, resulting in increased instability. Nevertheless, organizations dedicated to terrace restoration are facing challenges due to the excessive property fragmentation and bureaucracy, which hampers their efforts to engage landowners and obtain the required permissions for the restoration and re-use of terraces.

On the other hand, farmers have expressed significant concerns about the impact of **droughts** and **heatwaves** on water supply, particularly during peak tourist seasons. They recognize the potential threats posed by water shortages and the adverse effects it can have on crops, despite the resilience of the main traditional crops of vines and olives. Recent drought events have reinforced the importance of restoring and managing terraces and

drainage channels to preserve soil moisture and enhance effective water storage. There is also a growing recognition of the need for better maintaining and improving the irrigation systems and practices, promoting water conservation, and mitigating the impact of water scarcity.

All interviewees also emphasized the importance of striking a balance between the agricultural and tourism vocations of the region, ensuring a more sustainable approach to tourism, and promoting the co-evolution of the tourism and agro-food sectors. In addition, there has been evidenced unanimous desire for a change for the Cinque Terre, highlighting the need to address the negative impacts of over-tourism on the natural resources. In this regard, they stressed the need to reorient tourist communication, marketing, and offerings to mitigate the over-tourism in the villages.

Community representatives raised concerns about the current limited tourist offerings and communication strategies that primarily focused on the urban villages and coastal areas, neglecting the connection between agricultural activities and the cultural landscape. They emphasized the need to enhance the promotion and visibility of the agricultural traditions of the region, highlighting the significance of traditional farming practice for the terraced landscapes. A shared theme emerging throughout interviews regards the value of appropriately informing the tourist on the place's history and traditional activities, promoting slow and experiential tourism, and highlighting lesser-known place elements such as hiking routes to reduce the tourist pressure on villages. They emphasized that the current tourism trends are unsustainable and called for mitigation measures. Farmers and community residents specifically highlighted the challenges posed by the influx of tourists during the spring, summer seasons, which puts pressure on water supplies, and adversely affects the agriculture sector. Recognizing the importance of assessing tourism impacts, the National Park and UNESCO site office are actively involved in conducting analyses to better understand and address these issues.

Existing practices: solutions implemented, planned or proposed

Community level

The territory has experienced a significant increase in social capital, as evidenced by various community initiatives aimed at preserving and reviving the cultural identity and traditions of dry-stone walling and farming. Over the past 15-20 years, a growing back-to-the-land movement seems to have emerged, partially reversing previous trends of outmigration or agricultural abandonment.

Notable among these initiatives are civil society organizations and social innovations dedicated to the restoration and reconversion of terraces, including the experience of ‘Per Tramonti - Lands returned to agriculture’ association and the ‘Manarola Cinque Terre Foundation’. In particular, the latter was established in response to the 2011 flooding event with the primary objective of recovering the terraced hillside surrounding the village and promoting their cultivation by local farms. The initiative originated from a dedicated group of citizens who started to conduct extensive archival research to identify and reach out to hundreds of landowners. Their goal was to obtain permits for intervention, which they obtained through donations, land leases or free loans. As a result, a ‘community foundation’ was established with the capital generated through financial and in-kind contributions from the families in the village, including monetary funds and land located in the area. As an interviewee testified, "*they decided to make this, let's call it cultural, psychological leap: they donated the land to us to preserve the place, because that land is part of their family heritage and has been the sole source of family livelihood for centuries*".

In addition to community-led action, some farmers have taken economic initiatives to support terrace restoration. These include crowdfunding campaigns to support the “heroic

viticulture[2]" like Grape & Heroes[3], as well as the establishment of farmers' associations and partnerships between the tourism industry and agriculture sector. This initiative plays a crucial role in enhancing the visibility of local products and promoting their sale and consumption contributing to the overall growth and development of the community.

Farmers and community representatives are also aware of the challenges posed by water shortages and are actively seeking or proposing solutions to address this issue and mitigate problems arising from e.g., 'drops in water pressure when multiple taps are opened simultaneously'. Proposed solutions range from improving intake dams to installing separate junction pipes for each land. Some farmers also suggested the use of cisterns for water storage in land plots, although this approach raises concerns about potential landscape disruption.

Local authority level

The commitment of the 5 Terre National Park and UNESCO Site Office (since 2018 when it became fully operational) have been highly influential in preserving both the tangible and intangible heritage of the region. Since its foundation, the Park has been actively involved in various initiatives and projects aimed at combating the abandonment of terraced agricultural areas. One notable project is the LIFE project P.R.O.S.I.T. (Planning and restoring of Cinque Terre coastal traditional agricultural landscape 2001-2004)[4] which organized dedicated forums starting a dialogue between park managers and farmers to discuss and address farming challenges. As part of this project, farmers were encouraged to allocate a portion of their land to the Cinque Terre National Park, which initiated a systematic terraces recovery program. Pilot areas were selected for restoration, and the involvement of the park authority played a vital role in implementing these measures. After the completion of the PROSIT project, the Park Authority digitalized the intangible heritage by publishing a "Manual for the Construction of Dry-stone Walls: Guidelines for the maintenance of terracings in Cinque Terre"[5]. This manual not only serves as a practical resource for farmers, providing guidelines for wall restoration, but also preserves and disseminates traditional knowledge and techniques. Further, recognizing the dwindling number of dry-stone wall masters, local authorities such as the National Park, UNESCO Site Office, and Regional Government contributed to create a registry of certified maintenance workers for public works across the region. In addition to these efforts, both local authorities and community organizations have organized training programs and initiatives on dry-stone walling to increase the number of community practitioners and professionals. Within the framework of the Stonewalls 4 LIFE[6] project, the National Park has established a training program for dry-stone wall maintainers/builders, which involves migrant and unemployed people. The project aims to preserve approximately 6 hectares of terraced landscapes with dry-stone walls and improve their resilience against the increasingly extreme weather conditions caused by CC. It seeks to showcase the long-term effectiveness of terraced systems for adaptation and introduce innovative materials and approaches for their monitoring and conservation. Initially, the

[2] Term to designate a type of cultivation carried out under extreme conditions compared to traditional cultivation

[3] https://www.gamberorosso.it/notizie/grapes-heroes-il-crowdfunding-per-salvare-i-muretti-a-secco-delle-cinque-terre/

[4] Planning and restoring of Cinque Terre costal traditional agricultural landscape https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=1922

[5] http://db.parks.it/pdf/sitiufficiali/PN5TRdocumento-7-1.pdf

[6] https://www.stonewalls4life.eu/

project expects to create 12 new jobs in the construction phase, which should lead to 55 permanent positions dedicated to safeguarding the territory.

To achieve these goals, this initiative incorporates advanced techniques for wall construction that enhance water drainage and resistance to heavy rainfalls. This involves the use of metal nets or other elements to consolidate and strengthen walls, as well as the design of drainage channels and systems capable of withstanding extreme rainfall events. Additionally, the project focuses on soil preparation methods that increase stability, water capacity, and resistance to degradation. In terms of farming practices, the project promotes the establishment of water-resistant vineyards by introducing drought-resistant rootstocks and implementing different pruning techniques.

Furthermore, in close collaboration with community organizations, the park has initiated a digital mapping and land use categorization process to gain a comprehensive understanding of the extent of abandonment in the area. By georeferencing land parcels, the park can effectively identify and contact landowners to engage in discussions regarding possible interventions.

To support and encourage agricultural activities in the region, the park provides subsidies to farm operators. These subsidies include essential resources such as stones for rebuilding walls and poles for constructing vineyards. Additionally, the Park Authority is investing in infrastructure development - including the creation of new monorails that facilitate transportation across agricultural terraced plots – and the maintenance of the hiking trail network, in collaboration with the UNESCO Site Office, for ensuring better accessibility and recreational use of the rural areas surrounding the villages.

Some representatives from local authorities actively advocate for a coordinated governance and shared incentive policies aimed at countering the abandonment and depopulation of villages, supporting agriculture and in turn place stewardship. To incentivize the revitalization of villages and promote the continuation of agricultural practices, interviewees mentioned that financial assistance, tax incentives, and regulatory reforms should facilitate the restoration and productive use of abandoned terraces.

To create an enabling environment for agricultural and maintenance activities interviewees also stressed the need for regulatory and administrative changes tackling the bureaucratic obstacles that hinder the speed of progress for addressing the abandonment and degradation of the terraces – including e.g., the time needed for permits.

Experts, local authorities, and community representatives agree that effective coordination, knowledge integration, and policy alignment are vital for the sustainable management and reproduction of the regional cultural heritage. This involves collaboration and cooperation among various stakeholders, including the UNESCO Site Office, Park Authority, municipalities, and related community members and economic actors.

National and Regional authority level: legal framework

Recognizing the significance of terraced landscapes, national agricultural policies have included actions to preserve them. First, the National Strategic Plan for Rural Development 2007-2013 emphasized the importance of landscape preservation, with specific attention given to retaining existing features such as stone walls through agricultural and environmental conditions aimed at soil protection.

In Italy, specific regional measures have been established to support the reconstruction of dry-stone walls on cultivated terraces, which are essential for maintaining the efficiency and integrity of the rural landscape. These measures, co-financed by the European Union under certain conditions, highlight the value of terraces in the agricultural sector, landscape preservation, and hydrogeological stability. In the Liguria region, the Regional Council has approved the allocation of 12 million euros from the Liguria Rural Development Plan (RDP) to the restoration of dry-stone walls through the sub-measure

4.4 and a call for tender in 2022. This decision reflects the region's recognition of its high concentration of terraced areas, covering approximately 40,000 km.

Recently, a proposal for a regional law to preserve dry-stone walls and terraced systems in the Ligurian region has been drafted and is currently under debate[7]. The proposed law aims to assign distinct scores and funding to historic and heroic vineyards as well as creating a maintenance team dedicated to the National Park. The main objective is to provide financial support and dedicated personnel for neglected lands where walls are at risk of collapse or are already partially damaged. This initiative strives to safeguard and rejuvenate these significant cultural and agricultural areas, promoting their sustainable development and preservation.

EU level

The European Union's Common Agricultural Policy[8], supported by the European Agricultural Guarantee Fund and the European Agricultural Fund for Rural Development, includes provisions that support various aspects of agricultural activities, including those related to wine-growing holdings. These investments encompass both tangible and intangible aspects, such as infrastructure, processing facilities, marketing structures, and tools. They also extend to the protection of vineyards against climatic hazards and the adaptation of holdings to meet new legal requirements set by the Union (Amendments 349 and 1122 cp2 Proposed regulation. Article 52 – paragraph 1 – point b).

Furthermore, as part of their strategic plans, Member States are encouraged to include at least 10% of beneficial landscape features for biodiversity. These features can range from buffer strips and fallow areas to hedges, non-productive trees, terracing, and ponds. The integration of these measures not only supports carbon sequestration and climate adaptation but also helps prevent soil erosion while filtering air and water (Amendment 1127 proposed regulation Recital 22a new).

However, some concerns have been raised regarding the current EU legislation on replanting rights, particularly with respect to vineyards. The existing rules restrict the percentage of land that can be replanted, which hampers the productive reconversion of recovered and cleared terraces and hinders their conservation efforts. Farmers, community organizations, and local authorities including municipalities are advocating for a revision of this replanting rule in Italy, demanding that replanting rights for parks be set at a minimum of 10%. The current allowance of 2% of vineyard land determined by each region, is seen as disadvantageous for smaller regions like Liguria with a long-lasting and diffused decline in vineyard areas and terraces (from 1,200 hectares 70 years ago to a mere 130 hectares today).

In conclusion, CC poses a significant challenge to the preservation of both tangible and intangible heritage associated with dry-stone walls by directly threatening agriculture and its sustainability. However, it also presents an opportunity for communities to adapt and safeguard the place, the community, and its heritage. The recognition of cultural heritage as a valuable solution to adapt CC has revitalized the interest toward terraced systems and related knowledge.

Overall, the recognition of cultural heritage as a means to address environmental change brings renewed value and purpose to the preservation of the tangible and intangible elements of dry-stone walls and terraced landscapes. The growing awareness of the importance of cultural heritage has sparked numerous community and institutional initiatives aimed at transferring knowledge, preserving traditional practices, and restoring terraces that

[7] https://www.lanazione.it/la-spezia/cronaca/patrimonio-collettivo-per-i-muretti-a-secco-inizia-liter-della-legge-1.8497492

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020AP0287

have been neglected and abandoned over time. These initiatives demonstrate a renewed appreciation for the cultural and strategic value of dry-stone walls and their role in shaping the identity and resilience of local communities. By actively engaging in the restoration and maintenance of terraces, communities are not only preserving their physical structures but also reviving the intangible aspects tied to these landscapes. Furthermore, these initiatives foster a sense of ownership and pride among community members, as they actively contribute to the preservation of their heritage and the sustainable development of their territories.
"This society, this civilization, now lies submerged and abandoned, with less than a hundred hectares of land remaining. However, if we clear the bush and reclaim these additional thousand hectares, a civilization will emerge once again. The fields and woods are adorned with the remnants of walls, bearing witness to the passage of tens of thousands of people over the centuries. It is a submerged civilization, akin to Atlantis, waiting to be rediscovered and brought back to life." (Interview, community representative)

Publications and other additional information

Research bibliography

1. Agnoletti, M., Errico, A., Santoro, A., Dani, A., & Preti, F. (2019). Terraced landscapes and hydrogeological risk. Effects of land abandonment in Cinque Terre (Italy) during severe rainfall events. *Sustainability*, *11*(1), 235.
2. Assandri, G., Bogliani, G., Pedrini, P., & Brambilla, M. (2018). Beautiful agricultural landscapes promote cultural ecosystem services and biodiversity conservation. *Agriculture, Ecosystems & Environment*, 256, 200-210.
3. Besio, M. (Ed.). (2002). *Il vino del mare: il piano del paesaggio tra i tempi della tradizione e i tempi della conoscenza* (The wine of the sea: the landscape plan between the times of tradition and the times of knowledge). Marsilio: s.n.
4. Brandolini, P. (2017). The outstanding terraced landscape of the Cinque Terre coastal slopes (eastern Liguria). *Landscapes and landforms of Italy*: 235-244.
5. Cicinelli, E., Caneva, G., & Savo, V. (2021). A review on management strategies of the terraced agricultural systems and conservation actions to maintain cultural landscapes around the Mediterranean Area. *Sustainability*, *13*(8), 4475.
6. Dastgerdi, A. S., Sargolini, M., Allred, S. B., Chatrchyan, A. M., Drescher, M., & DeGeer, C. (2022). Climate change risk reduction in cultural landscapes: Insights from Cinque Terre and Waterloo. *Land Use Policy*, 123, 106359.
7. Ferrigni, F. (2019). *Verso la Costiera antica. Piano di Gestione del Sito UNESCO della Costiera Amalfitana* (Towards the Ancient Coast. Management Plan of the UNESCO Site of the Amalfi Coast). Ravello: CUEBC.
8. Fumo, M. (in progress). *Il sapere tecnico alla base della prevenzione dei rischi: l'arte dei muretti a secco per i terrazzamenti* (The technical knowledge behind risk prevention: the art of dry stone walls for terracing). CITTAM-CUEBC.
9. Giordan, D., Cignetti, M., Baldo, M., & Godone, D. (2017). Relationship between man-made environment and slope stability: the case of 2014 rainfall events in the terraced landscape of the Liguria region (northwestern Italy). *Geomatics, Natural Hazards and Risk*, *8*(2), 1833-1852.
10. Maurano, C. (2005). *La Costiera Amalfitana: il patrimonio intangibile di un paesaggio culturale.* (The Amalfi Coast: the intangibile heritage of a cultural landscape). Menabò: s.n.
11. O'Neill, C. M., & Ceresoli, M. (2004). *Rapporto sui Forum del progetto Life PROSIT*.
12. Paliaga, G., Luino, F., Turconi, L., De Graff, J. V., & Faccini, F. (2020). Terraced landscapes on portofino promontory (Italy): Identification, geo-hydrological hazard and management. *Water*, *12*(2), 435.

13. Raso, E., Mandarino, A., Pepe, G., Calcaterra, D., Cevasco, A., Confuorto, P., ... & Firpo, M. (2021). Geomorphology of Cinque Terre National Park (Italy). *Journal of Maps*, *17*(3), 171-184.
14. Tarolli, P., Preti, F., & Romano, N. (2014). Terraced landscapes: From an old best practice to a potential hazard for soil degradation due to land abandonment. *Anthropocene*, *6*, 10-25.
15. Trinchese, G., D'Angelo, G. (2022). *L'arte dei muretti a secco per i terrazzamenti: patrimonio immateriale e materiale da tutelare* (The art of dry-stone terracing walls: intangible and material heritage to be protected). Napoli: Ravello Conference.
16. Varotto, M., Ferrarese, F., & Pappalardo, S. E. (2019). Italian terraced landscapes: the shapes and the trends. *World Terraced Landscapes: History, Environment, Quality of Life*, 27-43.

Legal and policy sources

EU

EU (2021). *Common agricultural policy — support for strategic plans to be drawn up by Member States and financed by the EAGF and by the EAFRD*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020AP0287

National

Ministero delle politiche agricole, alimentari e forestali, Italia (2007). *Piano Strategico Nazionale per lo Sviluppo Rurale.* Available at: https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/342

Regional

1. Regione Liguria (2023). *Strategia Regionale di Adattamento ai Cambiamenti Climatici*. Available at: https://www.regione.liguria.it/component/publiccompetitions/document/48799.html?view=document&id=48799:sraac&Itemid=10718
2. Regione Liguria (2015). *Programma di sviluppo rurale 2014-2022.*

Local

1. Parco Nazionale delle Cinque Terre (2021). *Piano della Parco*. Available at: http://www.parconazionale5terre.it/pagina.php?id=28
2. Ufficio Sito Unesco Porto Venere, Cinque Terre e Isole (Palmaria, Tino e Tinetto) (2016). *Piano di gestione per il sito Unesco Porto Venere, Cinque Terre e Isole (Palmaria, Tino e Tinetto).* Available at: https://www.portoveneretecinqueterreisole.com/wp-content/uploads/2021/01/Revisione_PdG_2020.pdf

Other resources

1. ICCROM (2023). *From Climate Change to Climate Chance: Learning from Place-Specific Knowledge Held in Cinque Terre and Beyond.* Available at: https://www.iccrom.org/news/climate-change-climate-chance-learning-place-specific-knowledge-held-cinque-terre-and-beyond
2. Parco Nazionale delle Cinque Terre (2004). *Manuale per la costruzione dei muri a secco. Linee guida per la manutenzione dei terrazzamenti delle Cinque Terre* (Manual for the construction of dry-stone walls. Guidelines for the maintenance of terracing in the Cinque Terre). Available at: http://db.parks.it/pdf/sitiufficiali/PN5TRdocumento-7-1.pdf

3. Press review *Stonewalls 4 Life*. Available at: https://www.stonewalls4life.eu/rassegna-stampa/?lang=it
4. UNESCO site *Costiera Amalfitana*. Available at: www.unescoamalficoast.it

Informants, experts, dates of interviews

Experts and local authorities responsible for supporting ICH safeguard:

- Experts from the Cinque Terre National Park (local authority responsible for managing and preserving the environment of the park area, June 15, 2023)
- Representative of UNESCO Site office Portovenere, Cinque Terre and Islands (local authority responsible for preserving the cultural heritage site, June 27, 2023)

Local community ICH bearers and practitioners:

- Representative of Fondazione Manarola Cinque Terra (community organizations dedicated at restoring and preserving terraced systems and tradition June 26, 2023)
- Farmer from Wild farm Curnigia (June 29, 2023)

Other:

- Representative from Legambiente (environmental NGO, June 15, 2023)

Contributors

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4.8. CS8 Festival of the *Ceri* / Race of the *Ceri*- Gubbio (Italy)

1. ICH element

Title in English
Feast (festival) of the Ceri / Race of the Ceri – Gubbio (PG), Italy

Title in Italian
Festa dei Ceri / Corsa dei Ceri – Gubbio (PG), Italy

National Inventory:
http://paci.iccd.beniculturali.it/iccd/cards/ricercaPaci?p=29&data%5Bdenominazione_inventario%5D=%2A%2F%2A&data%5Belemento%5D=&data%5BricercaInventario%5D=Cerca&data%5Bdoaction%5D=cerca

Regional inventory
https://leggi.alumbria.it/mostra_atto.php?id=52755&v=FI,SA,TE,IS,VE,RA,MM&m=5

Motivation and brief description
The Italian ICH case-study proposed here is the Feast of Ceri in Gubbio (Umbria), Italy. It was chosen because this feast is probably one of the most antique [1], if possibly the *most*, folk ritual festival in Italy, reminiscent of the ancient Umbrian rituals, as testified by the "Iguvine Tablets", dating back to the III-I century B.C. These are seven bronze tablets written in the Umbrian alphabet together with the Etruscan and Latin ones and housed in the Gubbio Civic Museum, representing a rare Italic document. The Umbrians are said to be "*gens antiquissima Italiae*" (the most ancient people of Italy), and probably designated as *Ombrii* by the Greeks [2].

Furthermore, in the European H2020 project HERACLES - Heritage Resilience Against Climate Events on Site, Gubbio represented the Italian case-study. The HERACLES project was dealing with the study of Climate Change (CC) effects on TANGIBLE Cultural Heritage [3]. In Gubbio, the monuments objects of this study were the Consoli Palace and the Town Walls. They both represent iconic places also for the ICH of this place, precisely because of their role in the festival of *Ceri*.

Gubbio and its cultural heritage, therefore, represent an outstanding example, as a natural point of connection between the material and immaterial nature of cultural heritage. These two cultural heritage aspects are very often linked by indissoluble bonds with each other and with the territory and the historical context, both contributing to create the IDENTITY of a community.

Moreover, the possibility to exploit the HERACLES project results and outcomes has been considered a plus, in the framework of a holistic and multidisciplinary approach to this specific theme. The city itself is something producing "*an absolutely astounding effect and has something improbable and exciting*" to use the words that the great German writer, Herman Hesse used to refer to Gubbio, during one of his travels to Italy [4].

This festival consists in a race to the Basilica of Saint Ubaldo patron saint of Gubbio, and the "*Ceri*" and Saint Ubaldo are the protagonists of the life of the local community, playing a fundamental role. The reason for this can be fully understood on May 15th: every year on that date the "*Ceri*" are carried on the shoulders of runners in an unbridled race along the streets of the city to the Basilica of St. Ubaldo on the summit of Mount Ingino.

Further details and observations

This spectacular event takes place every year on May 15th, because it represents the eve of the death of Saint Ubaldo (May 16th, 1160), the ancient bishop and patron saint of the city. While representing only a part of the honours bestowed on him, the "Race of the *Ceri*" is certainly the culminating part, the preparation of which engages a considerable part of the citizenry, for a long period of time during the year. In fact, the *Festa dei Ceri* is never totally absent in the spirit of an authentic Gubbio inhabitant (i.e.: *eugubino*). The three teams, each representing one of the town social groups (legacy from ancient medieval corporations), carry large wooden machines called "*Ceri*", weighing up to 400Kg through the town's streets and up to the Basilica of Saint Ubaldo on Mount Ingino. As said, the event culminates in a race up to the mountain, which is a challenging and physically demanding feast. Being one of the oldest Italian folklore manifestations it has not to be confused with a historical re-enactment. In Gubbio, everyone is a *ceraiolo*. Then there are the "bearers". To be a bearer you must be young, so it is possible to be a bearer only for a limited period in life.

The *Ceri* are not made of wax, as the name literal translation (candle) might lead one to believe, but are three hollow wooden machines, about 4 meters high, formed by two octagonal prisms, which extend at the upper and lower ends in short, truncated cones. This design probably dates back to Renaissance time at the court of Federico da Montefeltro Duke [5; 6]. The two prisms are connected and held together by a rod that crosses them, along their entire length. The cusp of each *Cero* is surmounted by a wooden statue of a saint. They are the patron Saints of the ancient corporations that once were the only ones involved in the *Corsa* and owners of the *Ceri.* Saint Ubaldo is considered the protector of masons and stonemasons, Saint George on horseback, the patron of haberdashers and craftsmen (today traders), Saint Antony the Abbot patron of men who take care of donkeys and mules (later farmers) [7].

The *Ceri* are placed on religious floats, which allow them to be supported by four long beams that rest on the shoulders of the *Ceraioli*, or bearers. In the period between one feast and the other in the following year, the *Ceri* are kept in the basilica of Saint Ubaldo, almost at the top of Mount Ingino.

On the morning of the first Sunday of May, the *Ceri* are brought back to the city, posed directly on the shoulders of the *Ceraioli*, in a horizontal position, and taken to the *Arengo* hall of the Consoli Palace, in the town, where they will remain, always in a horizontal position, until the moment of the raising, on the morning of May 15th.

The entire festive complex is ritualized in every part, even if over the centuries, to some extent, some elements gradually changed for specific reasons. There are no written rules to follow, but everything is handed down orally from generation to generation. Even today this implies an imposing organizational structure which testifies its importance. A "Technical Committee", representing every component of the local community, was set up including the *Maggio Eugubino* Association (pro-loco), the University of Masons and Stonemasons of Gubbio, the Three Families of *Ceraioli*, the Diocese, the Municipality. However, it is not an authoritarian management, and each new provision is discussed democratically, with the awareness that the festival is the festival of the people, of the whole community. This event, in fact, would live regardless of who runs it. A "Captain of the *Ceri*" is nominated and is responsible for the progress of the festival, assisted by a second captain: this comes from a legacy of institutional figures from the past. Now, they are drawn among the members of the University of Masons and Stonemasons. Each *Ceraioli* family elects its own *Capodieci*, who will guide the *Cero* in the most important phases of the festival and organizes the "changes". Each *Cero* is carried by 10 *ceraioli*, who change many times during the race through the "*mute*", i.e., groups of new *Ceraioli* who swap (i.e.: changes) during the itinerary of the race.

On May 15th, the Captains and Capodieci are awakened very early in the morning, by the sound of the drummers. The Cemetery of Gubbio, located outside the town walls, is part of the festival route. At 7.00 a.m, a procession formed by the drummers, the *capodieci*, the

captains, civil and religious institutions representatives and the *ceraioli* go to the cemetery to commemorate the deceased ones. After a blessing, a crown of yellow, blue, and red flowers is placed, which bears the inscription: "The *Ceraioli* who pass to the *Ceraioli* who have passed, may your memory be eternal in songs and prayers." [9]

At 8.00 am a Holy Mass is celebrated in the little church of *San Francesco della Pace*, now also called *dei Muratori* (Masons' Church). Here the names of the captains who will come into office two years later, are drawn. The statues of the three Saints, preserved in the church, are transported in a procession along the town streets to the Consoli Palace.

After various rituals (that one of the flower bouquets, as an example) a cortege of all the *Ceraioli*, led by the *Capodieci* carrying the jugs (which will be broken during the raising), is formed and arrives in Piazza Grande. Here the festival begins: after a ceremony that recalls the key figures and roles of the past and the present, to the sound of the Consoli Palace big bell [10], the door of the Consoli Palace opens and the *Ceri* and the statues of the Saints come out in sequence and are assembled in the square among the multitude of people present. The *Ceri* always maintains a horizontal position. Once the assembly is complete, and after having poured the water contained in the jugs onto the *Cero*-religious float joint, the *Capodieci* throw the jugs into the middle of the square and lead the raising of the *Cero* who finally stand up slowly, solemnly, proudly. This is the spectacular "Alzata" (raising) of the *Ceri*. Around the central flagpole of the square, decorated with the banner of the city of Gubbio, the *Ceri* make three laps and then the so-called "*Mostra*" (i.e., displaying) begins, during which each *Cero* has an independent itinerary. This phase ends around 13.30.

Inside the Consoli Palace, one of the most audacious works of fourteenth-century architecture, and precisely in the *Arengo* hall, a banquet is set up for distinguished guests, while the *Ceraioli* also have lunch in another place in the Palace. The lunch served is strictly based on fish because May 15th is considered Eve.

Also, the food is served according to tradition: an example is the *Baccalà alla Ceraiola,* consisting in salted cod dish left to soak for at least two days after which it is coated in breadcrumbs and baked in the oven together with rosemary, salt, pepper, and white wine. It is strictly prepared by members of the University of Masons and Stonemasons.

The *Ceri* race starts around 6.00pm in the afternoon. After performing the "*alzatella*" (little raising); the *Ceri* now rest directly on the shoulders of the *Ceraioli*, at the top of Dante Street (also known as *Calata dei Neri*), waiting for the religious procession to arrive with the wooden statue of Saint Ubaldo. As soon as it arrives in front of the *Ceri*, the *Ceri* and the statue in return bow to each other, the Bishop gives the blessing to the *Ceri* and *Ceraioli* and then suddenly the race for the descent begins in the midst of a crowd of people.

The groups of *Ceraioli* will take turns for the entire route of the race, which includes three stops. The last part of the race takes place on the dirt road of Mount Ingino, which leads to the Basilica where the remains of the patron Saint Ubaldo rest and where the *Ceri* will be placed waiting to descend again in the town on the first Sunday of May, of the following year. In this ascent, the first to the finish line is, and always will be, Saint Ubaldo: in fact, the order of the *Ceri* does not vary during the race, overtaking is not foreseen. Rather than a competition, the event should be seen as a challenge to run perfectly. However, the goodness of the race is evaluated according to any falls or hangs of the *Cero* and based on the advantage between one *Cero* and another.

Competitiveness among the *Ceri* exists to some extent, but the feeling of community and brotherhood that is clearly palpable, is even more important. If a *Cero* falls, it is usual to see *ceraioli* from another *Cero* running to help and the sentiment that permeates everyone, however, is the great devotion of the Gubbio community to Saint Ubaldo. The great thing is that there is none of the classic rivalry between the three teams carrying the *Ceri* because they run in a line and cannot overtake one another: the first to arrive in the Basilica will always be the cero of Saint Ubaldo.

The event still plays a fundamental role today for the Gubbio community, from a religious, social [11] and cultural [12] point of view.

Origin

It is not easy to unequivocally establish the origin of the feast, which certainly took on its current form from 1160 (the year of the death of Saint Ubaldo). Nonetheless, aspects of it that can be traced back to rituals of the Catholic Church cannot be hardly overlooked. Studies in this regard have correlated it with rituals linked to the fertility of the earth, and to Ceres (*Ker* is found also as an Indo-European root, and in *Ceri*) the maternal goddess of harvesting and birth and also to ceremonies *lustratorie* (lustratory, purifying) dedicated to the god Çerfus (Çerfo Martio) by the ancient Umbrians and described in the Iguvine Tablets. The studies present interesting cues of reflection by borrowing and linking the pre-Indo-European beliefs and rites with those of the ancient Umbrians and then of the ancient Romans [13; 14].

More in general, it can be said that the Festival of *Ceri* falls within the sphere of the festivities celebrated in May, as propitiatory rites and characterized by a profound link with the theme of spring flowering and consequently of fertility which closely concerns the Umbrian territory rich in "Rites of Spring" such as those of the rock environment fires, raising of trees and ritual processions. It is not a coincidence that not far from Gubbio, in the neighbouring areas of San Pellegrino and Isola Fossara, spring ritual festivals are still preserved which involve the raising of a huge poplar trunk in the center of the town. This typology is a constant in the Mediterranean world of very ancient derivation, just think of the festivals of the Roman calendar, and even before [15; 16].

On these bases, it can be said that the festival embodies aspects characterizing the whole history of the people of Gubbio, from the ancient Umbrians, through the Romans [17; 18], although the current aspect (from 1160 to today) is shaped around the figure and the devotion of the people of Gubbio for the charismatic and ascetic bishop Saint Ubaldo [19]. In fact, as a tribute to his death, after the evidence of his holiness and Christian virtue, the people of Gubbio reached the top of mount Ingino, where the remains of the saint rest, in May 1160 with illuminations (candles) [20]. Other events were organized alongside the illuminations, and it can be at this time that some very ancient pagan rituals were converted into religious festivals in homage to Saint Ubaldo, in the meantime canonized with a papal seal by Pope Celestine III (1192) [21].

This religious origin of the festival is thus combined with the pre-existing pagan cults: the time of the celebration and the shape of the *Ceri* in fact recall the May tree, the phallic symbol of the fertility rites of spring.

Nevertheless, all the history of religions and comparative mythology have demonstrated the existence of a vast set of festivals that lived in Europe before Christianity, which were incorporated and also profoundly modified by Christianity itself. This cannot be denied only in Gubbio, considering it an island in which all these phenomena have not occurred while they have been throughout the rest of Europe [22].

Therefore, this festive ritual finds in the *Ceri* machines the **tangible element** of a **strongly identifying intangible heritage** that has been expressed every May 15th for centuries, if not millennia.

The festival is lived with a great attachment by all citizens and is characterized by strong passions and feelings that express values and contradictions [23].

Such is the importance and popularity of the event at the regional level, too, that since 1973 the *Ceri* became the emblem of the Umbria Region and is stylized in its banner and in the official flag [24].

Moreover, on January 17th, 2012, the Regional Council of Umbria unanimously recognized the Feast of the *Ceri* of Gubbio as a "**cultural expression of regional identity**" and refers to a "tradition" that has handed down "without interruptions since ancient times, from

generation to generation, setting historical and cultural values. **For these reasons it is recognized by the Umbria Region as founding a regional identity**". [25] To testify the importance and the ancestral roots of this event, refers also to the telecast carried out by RAI (Italian public national TV service) [26; 27].

2. Geographical coordinates

43.3555, 12.5734
City: Gubbio
Region: Umbria
Province: Perugia (PG)

3. Reflections on the theme

Immaterial heritage & identity element

The summary description provided here, about the festival certainly cannot fully express the dedication of the *Eugubini* (i.e.: Iguvini, Gubbio inhabitants), nor can transmit the measure of the ardor, permeated with joy, animating that day. The Iguvini are used to say that: "**the *Festa dei Ceri*" cannot be explained, it has to be LIVED.**"

The festivities in honor of Saint Ubaldo have a synchronic aspect, given the simultaneous presence of a totally liturgical day (May 16th) and a day that is only partially liturgical (May 15th) because elements coexist perfectly with the beliefs and the official observances of the Church and others which are totally different and beyond these limits [28]. Both pagan and religious, certainly, the *Ceri* cannot be explained only on the basis of a single theory, since they represent a complex, largely stratified social phenomenon, the result of hundreds of years of known history and at least many others, if not thousands of little or unknown history. An analysis of the documents collected so far reveals the progressive confluence of a series of new expressions, sacred and profane, around the vitality of the steadfast, older nucleus, which has continued to exert its attractive force for centuries [17; 13].

The study of the Feast reveals that the central, oldest nucleus is still today the most resistant, having even overcome the dissolution of those social organisms (i.e., the corporations during the Napoleonic era) that had been its bearers for centuries [29].

Therefore, particularly deep psychological needs, still in place today are satisfied. It is certainly true that every citizen of Gubbio, as *ceraiolo*, at home and abroad is ready to immediately recognize each other as a brother, thus also smoothing out differences of opinion or social class. Feeling part of the same human community, of the same tradition and passion, repeating of symbolic gestures intensely significant and fixed for centuries, if not millennia, and being at the center of interest of guests who flock from everywhere, undoubtedly represent a story that cannot be underestimated by any sociologist who wonders about the psycho-sociological function of the celebrations and of this one in particular.

The race of the *Ceri*, even when came out of the circle of the three corporations [14] that had organized it for centuries, far from extinction, as one could have predicted a priori, survived, and now characterizes the entire city and is almost erected as a symbol and bond of every order of citizens. The sense of belonging prevails over everything. To date, a real process of cultural cohesion of the population of Gubbio takes place around the festival: it is an opportunity to meet again, to consider oneself from Gubbio, to feel connected to a tradition which, although it has undergone various transformations, is still very much felt. Many *Eugubini* living abroad (in Italy or everywhere in the world) are used to coming back for this occasion. They return to Gubbio for this date, driven by a very strong inner bond towards their community of origin and by the need to consolidate and renew their roots. It is in the DNA of

the city and of the people, with strong religious, secular, and civil implications. It is indeed a strong IDENTITY element, as underlined by the. Gubbio Mayor.

In this sense, the festival constitutes a very important moment of social cohesion and integration and provides the texture that for centuries (or probably millennia) has overcome social barriers, age, and gender differences, connecting rituality with the historical-architectural context both urban and extra-urban.

In an era of profound social and cultural transformations, it is a fortune, a plus, being able to have an event like this, which acts as a UNITARY ELEMENT, allowing people to go forward without cultural ruptures or disintegrations even when some values are fatally overcome, leaving an empty.

Homage to the Saint Patron? Religious festivity? What is the original meaning of the act? For how many centuries has this powerful echo been renewed?

These questions certainly do not touch the authentic citizen of Gubbio: because **he "LIVES"** the Festa and wants to do it with a total transport. It is certain that the *Festa dei Ceri* is not limited to a chapter of folklore in the strict sense of the word, and even less to a historical re-enactment.

Rather, it reflects the complexity of things of the spirit through history, the values that it hands down, arousing questions of a sociological and psychological nature inherent to the function that the festival performed and still performs today, detaching the Gubbio community from the dull everyday reality.

Every manifestation is historically conditioned, and valid, in that given form, only in the precise ambits within which it has been delineating and evolving. A more universal concept that must be considered for a historical and current understanding of society is that a celebration, especially if collective and of a religious nature, also responds to a psycho-sociological function.

What is very clear today, is that the festival is the result of deep stratifications, fruit of the various historical periods and of the culture of the communities that the festival has gone through. The feast of *Ceri* is in History: regardless of time but depending on its time. For this reason, it has a high **demo-ethno-anthropological value**. [30]

The legacy of the tradition: Shared Values & their transmission to future generation

The festival is based on the sharing and transmission of ideals, of values, and this is its highest **immaterial aspect.** Moreover, even if it is characterizing a specific community, the values it conveys are ultimately high moral values, as friendship, respect (towards the elderly people), remembrance (towards the deceased people), brotherhood, solidarity, generosity, inclusiveness, running together towards the goal, the sense of closeness and proximity, in which everyone can recognize him/herself and aspire to.

It is a celebration that brings together integration, and aggregation. The *Ceri* cannot be carried alone, there can be no personalism, because if the integration is missing the *Cero* does not move. Moreover, there is no delegation, are the *eugubini* who put themselves "under the *Cero*" and carry it.

The feast is indeed a metaphor of the Life: the *Ceri* must be brought TOGETHER, a supportive attitude is essential, they can fall, but they must rise again. It is quite important to underline another aspect: the *Ceri* event has the capability to transmit its message not only to local people/community, but it has the power to deeply involve other people, also from abroad. If you attend the feast, you hardly feel like a spectator. You don't sit in the stands; you are part of the show. The feast is inclusive with everyone. The Iguvini open their houses, it is possible to eat and drink for free everywhere; in the name of their hospitality principles, those who pass are welcome. An exemplary case is that of one of the most internationally well-known American photographers Steve McCurry (Magnum Photos agency), who visited Gubbio for three days in 2014, breathing the atmosphere before and during the race. A new project

was born from this experience, entitled “Passionate of Umbria - ceraioli di Gubbio”, composed by 18 unedited shots. A photo exhibition was realized in Gubbio on that, opened by the words of the author: “I thought to see three saints and I saw three *Ceri*; I thought to see a city and I saw a community; but mostly I thought to see a feast and I saw Life” [31;32; 33;34].

The regional administration affirmed that all this assumed a profound meaning also for the Region which had chosen the *Ceri* as the emblem of Umbria as a symbol of a participatory identity”. Certainly, the legacy and the passage of this tradition between generations, has a great symbolism.

As the representative of the University of Masons and Stonemasons said, the family is the main place where the transmission of these values takes place. The University of Masons and Stonemasons has the statutory task of passing on the feast from father to son. These are unwritten rules, but based on a feeling, a belief. And the family is the most important school. Nevertheless, having the University as priority the transmission of the feast and its values to the future generations, many initiatives are organized during the year involving the young people at different extents (for instance, representatives of the University of masons went to schools to talk about the feast with the students).

The *Sant’Ubaldari* Family organises for 34 years the graphic-pictorial competition "Oderisi-da-Gubbio [38] to encourage the knowledge and participation of children in the folklore of the city, stimulating their creativity in this direction. The Competition is reserved for all pupils of the Kindergarten and Primary schools of the Municipality of Gubbio.
Being a *ceraiolo* is something that you carry inside you since birth. A *ceraiolo* said: “It is heritage. My father ran and we are trying to keep it going. As you get older, you cannot run anymore, but the fire in your heart is still there, and that is the most important thing.”

The feast of *Ceri* is lived all year round, with appointments cadenced in time. The *Ceri* completely absorb the life of the *eugubini*, but it is a pleasant absorption, because it makes them feel fully members of a community.

In this sense, the most important initiatives, since decades, are the organization of other two versions of the feast, dedicated to teenagers and to children. They are training gyms to get to carry the big Ceri, *i Ceri Grandi*.

The *Ceri Mezzani (Intermediate/medium Ceri)*

Ceri Mezzani is held on the first Sunday after May 17th [39]. Organized by the University of the Masons the Festival is repeated in the same manner and spirit of the main event, with *Ceri* of reduced size (4 meters and 180 kg approximately) brought by *ceraioli* teenagers. The first news of this festival dates back to the mid-nineteenth century. The *Ceri Mezzani* currently in use was built by the Poggi laboratory in 1966. The previous ones are now exhibited in the *Ubaldiane* Memoirs Collection.

The *Ceri Piccoli (Small Ceri)*

The *Ceri Piccoli* festival (150 cm and 40 kg approximately) takes place on June 2nd and is organized by the Association "Maggio Eugubino" for children. It also repeats the main event and carries out an important path in the education of *ceraioli*. This festival has been documented since the early 1900s. The current *Ceri Piccoli* were built by Antonio Sannipoli in 1986-87, while the previous ones were donated to the community of Jessup, Pennsylvania [39].

4. CC risks and effect

In Gubbio, it appears very clearly that in the last decades the meteorological conditions have severely changed.

Temperatures in Gubbio from 2011 to 2021 show an evident linear growth. Similarly, a linear growth in **rainfall** is also observed [40].

Extreme climate events could produce structural instabilities due to hydrogeological problems for the overall historical area, as testified by the existing and progressive slow deformations and crack patterns affecting the ancient structures. This could also produce damages to the streets where the unbridled race of the "Festa dei Ceri" is taken, and landslides on the mountain.

"Climate change, like all changes, changes people's lives. The feast of the *Ceri* is a festival of people, integrated into a social fabric, into a community and therefore is influenced by it", said the Gubbio Mayor.

The impact on the material CH asset in Gubbio was already studied in the European project HERACLES [3]. These studies have certainly contributed to increasing this awareness. The CC effects could produce direct and indirect consequences on the immaterial aspects of the *Festa dei Ceri* and its implementation, impacting on the cultural, social, and economic related values.

Monitoring and collecting data was very useful for forecast and planning mitigation measurements. **From HERACLES investigations** [3] it was clear that the structural stability behaviour of a cultural heritage asset is strongly influenced by the climatic conditions of its environment. In this respect, modelling CC related phenomena, in the near and long term, provided data very useful for predicting possible negative effects and for planning preventive actions to improve the resilience of CH assets. Long-term forecasting is particularly important to evaluate phenomena related to rising temperature, mainly due to the greenhouse effect. CC modelling also takes into consideration precipitation trends, which particularly affect the CH assets exposed to landslides and subsidence phenomena.

For what concerns the environment, potential hazards in the area are the landslides, considered to be one of the most extreme natural hazards worldwide. As assessed by the HERACLES project, **landslides hazards and collapses** were and are a major factor for the town of Gubbio, as it is located in the Apennine mountains (area also affected by seismic events). Human interventions in the landscape, geomorphologic processes and climatic phenomena can trigger landslides. Other factors that can trigger landslides include proximity to active faults, geological formations, fracture zones, degree and high curvature of slopes and water conditions, such as soil moisture and heavy rainfall and cloudbursts.

Among the actors of the festival, it was observed a widespread awareness, albeit with some distinctions, that CC can negatively affect the ICH represented by the *Ceri* festival, mainly in two ways:

1. Producing important negative impacts on the route, compromising the historical itinerary of the feast, and modifying the consolidated ritual structure, deeply based on the *genius loci* that permeates and gives meaning to the entire event.
2. Damaging the wooden machines of the *Ceri*, which represent the important tangible heritage, a symbol of the identity of the community and of the Umbria Region, and an essential tool for renewing the intangible heritage represented by the festival of the *Ceri*
3. Potentially jeopardizing the passage of this tradition between generations, in the event of suspension due to force majeure.

The most impacting factors are due to:

a. The **large temperature excursion range** that can occur in the month of May.

b. The **heavy rains, the cloudbursts, and the winds** that are recorded with increasing frequency in the last years.

Effects on the Feast route remained unchanged over the years for centuries

In Gubbio the intensity of the winds and rains increased dramatically, and particularly the heavy rains increased the hydrogeological risk, triggering movement of ground from the mountain, and the occurrence of landslides and chasms [3]. This can produce a real severe impact on the route of the *Ceri* during the race, compromising it, even envisaging a possible, but unacceptable de-contextualization.

For All the social components considered, the most critical and fragile part of the race itinerary is represented by the last path on the mountain route. Here, on the mountainous stretch, the heavy rains can induce landslides and chasms, producing a rift.

It is also evident that there cannot be an alternative route, being it the most representative part in the context of the patron devotion, brought to the basilica and used since centuries. This represents the "right path". Already in the past years, events such as chasms and small landslides occurred on this last mountain route to the Basilica. Nevertheless, these calamitous events occurred well in advance with respect to the date of the feast, and the municipality dedicated efforts and resources to restore the traditional path of the *Ceri*.

Nonetheless, there is a clear awareness of the public administration and of All the feast actors involved that this situation, if occurring close to May 15th, could certainly create important negative and probably insurmountable problems for the continuation of the race in the same way, full of meanings, as it has been reproduced for centuries. This concept of "the right path" to be maintained and respected was even present in the description of ancient Umbrian rituals in the Iguvine Tablets [13].

"Today, the route defined for centuries is a fundamental part of the rite. All factors that can create fractures in this real and ideal path towards the patron saint, would compromise the essence of the event", said the chaplain of *Ceri*, representative of the Diocese.

The mayor and the representative of the San Giorgio Ceraioli Family also stressed that all aspects of the festival are considered with due attention and with a great sense of responsibility. In 2023, for example, the "Security" plan thanks to the fire brigade and prefecture was largely improved.

Effects on the Ceri wooden machines themselves

Due to CC, in recent years the festival has been celebrated in a highly variable meteorological context that can oscillate between properly spring-like days and others that appear decidedly autumnal. The cases of May 15th, 2019, and 2022 are emblematic: while in the 2019 edition there was an average temperature of 7°C with many rains, that one of 2022 was a splendid day, almost summer, with a maximum temperature that reached 30°C.

Heavy rains, cloudbursts, and winds together with higher variability of temperature are responsible for most surface degradation of the *Ceri* as CH assets themselves. A further danger for these assets is their exposure to the continuous aggression of pollutant agents, the effects of which can be exacerbated by CC phenomena.

The analysis of this change in the environmental and climatic conditions has become a priority for the Gubbio Municipality, which is dealing with the organization and management of the *Festa dei Ceri* and with the conservation of the current *Ceri* machines dated to the last quarter of the 19th century.

In relation to this aspect, it has to be said that there is awareness about their importance and the need to safeguard them. Already in 2011, an important restoration was carried out. Since then, a strong community sentiment of safeguard has developed entrusted to professional technicians skilled in **combining the use of the object with the intangible heritage that they**

represent. The *Ceri* were no longer considered exclusively as an asset to use, only, but to be preserved and safeguarded. In 2018 the *Italian Ministry of Culture declared the Ceri and their components* **as restricted assets of demo-ethno-anthropological interest**. In particular, they have been considered as goods/assets subjected to cultural protective restriction by the Ministry of Cultural Heritage [30].
Accordingly, these machines used during the festival are subjected to preventive maintenance by a team of restorers called to use suitable materials and products according to the principle of reversibility and protection of cultural heritage assets.
Within this process it is essential to monitor the environmental context, to verify the suitability of the products used for restoration (as an example, the vinyl-based protective varnish of the three *Ceri* has undergone aesthetic alterations due to an extremely rainy environmental and climatic context with temperatures below 10°C. It involved a very analytical reflection with the competent Superintendence to particularly consider in the products testing also climatic conditions outside the "ordinary" context.

Lesson learned
It has to be underlined that the main stakeholders in charge of the feast have already undertaken important initiatives to counteract the effects of the CC with good practices of restoration and of urban and extra-urban resilience. These actions rely on the awareness and knowledge gained during the studies of the impacts of extreme climatic phenomena already carried out in the framework of previous projects and collaborations with experts and researchers.

Good practices to face CC that are currently already been considered by the stakeholders in charge of, are:

- Plan mitigation actions such as proper drainage of water in the mountain area and continuous maintenance of the area
- Check the status and plan routine check, maintenance, and restoration actions of the *Ceri* machine themselves.
- Moreover, all of them expressed the idea that the Feast could be a great opportunity for collective education, which leverages the strong feeling of protection and safeguarding of a collective heritage/legacy (immaterial and material). The festival could be a suitable tool to understand that we should be responsible. In this sense, the feast can act as a vector of new values compared to those that it already conveys, such as responsible behaviours towards the environment.

Nevertheless, there is still work towards the identification of strategies and solutions for adaptation to the main climate criticalities with an impact on urban areas: **heat waves, extreme heavy rainfalls, cloudbursts, strong winds.**

It has been considered useful to consider, as an extreme possibility, that a very critical situation induced by the effects of CC, could lead to the suspension of the collective event in situations at risk, with the consequent interruption of the collective ritual and of the consequent transmission from generation to generation.

To this aim, it has been estimated very interesting and useful to consider and analyse what happened in 2020 and 2021, during the lockdown imposed by the COVID-19 pandemic, to evaluate the reactions of the communities and their resilience attitude at the disappearance of the feast due to force majeure.

5. Lesson from the COVID 19 pandemic and related consequences: FESTIVAL SUSPENDED

Before analysing what happened during COVID-19 pandemic, and particularly during the lockdown, it is important to mention that the *Festa dei Ceri* suspensions that occurred in the

past centuries are really very few and related to times of wars [41]. There is no research that allows to open a documented debate on the relationship between the *Festa dei Ceri* and calamities, episodes or simple occurrences that may have led to its suspension or postponement to another date. The doubt is above all related to more distant eras, where the available documentation is not only rarefied and intermittent, but certainly does not concern the rituals dictated by the festivities that governed the liturgical calendars, the municipal statutes and those of the guilds of arts and crafts. It is known, for example, that the greatest pandemic of the Middle Ages, the Black Plague, developed in Gubbio only between June and September 1348, therefore after the Saint Ubaldo festivities, which continued regularly in May 1349 when the emergency ceased. The great epidemics of the last four centuries, starting with the plague of July-September 1622, and continuing with the cholera epidemic of August-October 1855, manifested themselves far from the month of May. Even the so-called Spanish flu, which caused over 300 deaths in Gubbio territory, spread between October 1918 and January 1919, thus allowing the *Festa dei Ceri* to be held in May of the same 1919, an edition that was eagerly awaited after the suspension from 1916 to 1918 due to the Great War. Many other serious crises occurred over the centuries, on which, however, there is a lack of data and elements preventing us to verify concrete repercussions on the festival. As is well known, the rites were instead suspended by the war or political riots of the twentieth century which had a greater weight for many reasons and because they closely concerned the entire community of *ceraioli*. It must be said, however, that starting from the second half of the seventeenth century, the chancellery of the Municipality, synthetically, but with constancy and precision, recorded the salient events of the Gubbio calendar. In the so-called *Riformanze*, updated almost daily, usually on May 15th, the chancellor limited himself to recalling that the *Corsa dei Ceri* took place, as usual, amid the enthusiasm of the people and the peasants. Thanks to him, it is possible to document, almost year after year, the desire to perpetuate the *Festa dei Ceri*, even in very difficult times.

Based on this and other documents, it is possible to provide the following prospectus:

1916-1918. Suspension due to the Great War.

With Royal Decree of 23 May 1915, n. 674, art. 3, due to the ongoing world conflict, public gatherings, civil and religious processions, military walks with or without weapons and gatherings in public places or places open to the public are prohibited. On 25 April 1916, the Town Council of the Municipality of Gubbio decided to cancel the *Festa dei Ceri* "bearing in mind that the serious and exceptional moment that crosses our homeland does not allow celebrations for which happy and calm souls are needed". With a subsequent deed dated 8 May, the Town Council confirmed "the resolution by which the *Ceri* festival was postponed to a more propitious moment". The suspension decree also concerned 1918 [42; 43]. So, in 1916 and 1918, because of the First World War, the Feast did not take place, since a government decree had banned public gatherings, and parades and processions, as well [42]. However, on May 15th, 1917, the race took place at the front of the war: at the foot of the Col di Lana, a few months before the scene of a bloody battle, namely in Pian di Salesei, the *Eugubini* enlisted in the Brigade "Alps" celebrated with rudimentary *Ceri*, but similar to the originals, and built specially [43; 44].

1941. Festa dei Ceri suspended.

The escalation of the Second World War does not allow the celebration of the *Festa dei Ceri*, explicitly prohibited by the Prefect who granted, for 15 May 15th, only a simple procession from the cathedral to the basilica of Saint Ubaldo.

1942-1945. The Ceri Mezzani replaced the Ceri Grandi.

During the Second World War and precisely from 1941 to 1945 the Feast was prohibited [45], but the *Ceri Mezzani* (lower and lighter *Ceri*) continued to be held. In 1942 it was deferred to

May 16th, as was also in 1943. The *Festa dei Mezzani* was also held in May 1944, during the passage of the war front in Gubbio. On that occasion the *Ceri* were transported by a very heterogeneous group of *ceraioli* that included partisans, young draft dodgers, fascists and even German soldiers, all people who the next day would find themselves again fighting on opposite fronts [29]. In 1944 and 1945, it came back to May 15th.

2020. COVID-19 Pandemic lockdown: Festival of Ceri suspended.

Being the epicenter of the pandemic in Europe, Italy suffered from one of the longest lockdowns, which significantly affected the national economy. In the coronavirus disease 2019 (COVID-19) pandemic, Italy has been hit very hard, with 110 574-documented cases and 13 155 documented deaths related to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection as of April 1, 2020. On 9 March 2020, the government of Italy imposed a national mandatory lockdown or quarantine, restricting the movement of the population except for necessity, work, and health circumstances, in response to the growing pandemic of COVID-19 in the country. Additional lockdown restrictions mandated the temporary closure of non-essential shops and businesses. [46]

According to the mandatory lockdown measures, on April 15th, 2020, the Mayor of Gubbio issued a decree to cancel the Feast of the *Ceri* for the same year. This is the first time that the event was cancelled in time of peace, for health reasons [47].

2021. COVID-19 Pandemic: Festival of Ceri suspended.

Continuing the lockdown, due to the pandemic COVID-19, on April 19th, 2021, the Mayor of Gubbio, for the second time, issued a decree to cancel the festival for the same year [48].

Lessons from the suspension of the feast during COVID-19

The Gubbio community faced 2020 with great diligence and awareness, and the devotional act was however guaranteed by the religious procession. In 2021, however, there was more ferment and management at the social level was more complex.

Nevertheless, it has to be underlined a **strong RESILIENT attitude** of the people: once the problem arrived, the people in Gubbio adjusted themselves intelligently. They tried to fill a void; for what concerns the feast, the religious part was guaranteed, with the solo procession and blessing of the Bishop and the Mayor, which moved everyone. This resilience seems to be strongly related with the awareness of the importance of their own culture and roots.

It has to be underlined that ALL the involved stakeholders that COVID has certainly had a strong impact on communities, but since the festival is based on sharing and transmitting ideals, the people stayed all close together. This "extreme" experience also served to reflect on attitudes/initiatives that perhaps had gone "beyond" the real festival spirit. Reflections on the true essence of the festival were realized and now all this is NOT to be undone.

The SUSPENSION of the feast brought out its TRUE VALUES, inner and high-breath ones. With the taverns closed the private houses opened, creating a beautiful atmosphere that made evident the joviality and hospitality typical of the Gubbio citizens. Moreover, among ALL the stakeholders there is the general feeling that all this must be treasured.

By the media representative, it was affirmed that the "absence has emphasized the importance of the presence".

According to the slogan "Distant but close" characterizing the lockdown period, people used the social network to create virtual places where to meet and create new forms of sharing. Others created beautiful and moving videos testifying the absence, the void, some of them with voices from people commenting this shocking period in their life, others only

proposing music and songs as background to significant images of the city completely empty in a day that generally is exactly the contrary. [49-55].
As a general feeling, the carelessness has disappeared with the awareness that there are external factors that can severely compromise the festival.

The **female component** was also very important to fill this gap, to elaborate this mourning, this important lack. Even during the difficult years of the 1920s, women proved to be the pillars to ensure the continuity of the feast, replacing men in fulfilling the rite and guaranteeing its perpetration in circumstances not at all easy [12]. Also at present, they represented an active component in giving meaning to this suspended festival experience, and to fill the resulting void. Women have shown to be more open than men, and among men those who have reacted best resulted to be the elderly, no longer active *ceraioli.* During the Italian lockdown, once learned of the suspension of the Feast, a social experiment was then carried out with the creation of a social square, instead of a real one: "IO CERO 2020". This is because the festival is certainly an instrument of social keeping, and a virtual one then replaced the real square. [56]

The name comes from a pun based on the Italian expression. *IO CERO* reminding to *IO C'ERO* that means "I was there". Hereafter, from the social experience a book to summarize all the experiences and to leave testimony of all this, was realized [57]. Thus, a multimedia experience of shared feelings, of mourning, and absence elaboration, was achieved. From the social experience of the Facebook group IO CERO, the book delivers to history over 5000 private stories of the Facebook group, witnessing how the Gubbio people, first communities in Italy, has faced a lack, a sorrow, caused by the suspension of the Feast. The *Eugubini* reacted to this deep trauma with an unusual reaction capacity and maturity. This trans medial experience has had philosophical, psychological, theological and storytelling components. Speaking expressly about emptiness was the only sensible answer. After all, grief is elaborated by sharing, which becomes therapy. The contributions come from 40 countries around the world and 150 different cities, testifying a worldwide dimension, from a local case history to glocal.

As said, this was a women initiative, at least in the start. Faced with the suspension of the festival, women have proved to be the most resilient: after all, women testify that the spirit of the *Festa dei Ceri* and its values are not lived and handed down only by carrying the *Ceri*, but also through the difficult role of looking after, educate and raise the children to those values and then entrust them to the father who will put them "under the beams of the *Cero*". At national level, in addition, the *Istituto Centrale Patrimonio Immateriale* (ICPI) (Central Institute for Immaterial Heritage) from MIC (Italian Ministry of Culture) was very proactive. In September 2020 an agreement was signed between Gubbio Municipality and ICPI-MIC, after the letter of intent from MIC, dealing with the organization of initiative to valorize the *Festa dei Ceri*, recognized as a high Italian immaterial value to safeguard. [58] In this context, a movie was released, "The immense fresco of the great absence" documenting the Lack, the Void. The film was projected on the Consoli Palace façade. Never as at this time the cultural heritage of Gubbio appeared immaterial, volatile, deprived of bodies and shouts, sweat and fatigue. But it was the demonstration that the feast is there even when there is not, because it is imprinted in the heart of everyone and on the walls of the stone city. [59;60; 61]

As underlined by ALL stakeholders, the greatest social impact has been on young people (*Ceri mezzani* and *Ceri piccoli*) because there have been generations who have missed this opportunity. This training ground gym of life has been missing. Some children have skipped stages of growth with the suspension of the feast that cannot be considered as just a tale.

The void, the lack, the mourning that were experienced during the COVID pandemic, causing the suspension of the festival for two years, stimulated interesting debates and reflection on the possible effects of CC that can create important problems as well. One of the

most interesting reflections expressed by ALL stakeholders, was on the new values to consider such as the respect for territory. This is an important point, showing the ability of the festival to update itself with the time being, and moreover the capability to become an effective carrier of new ideals and inspiring new behaviours, new awareness, particularly important at the time being.

During the lockdown that Italy experienced well before other countries in Europe and in the world, many demonstrations of closeness, affection, and sharing have reached the Italian people through the web from prominent personalities and artists. Among these, a particularly touching one was shared through his blog by Steve McCurry, who expressed his closeness, support, and love to Italy with a video showing representative images of the country and its way of life (Soul of Italy – A Tribute from Steve McCurry (during Italian COVID-19 Lockdown). Three of them are dedicated to the Gubbio *Ceri* festival, confirming how much this event can penetrate, stimulate strong emotions, and be fully understood even by those who are not from Gubbio: **this is the real power of the event**. [62; 63]

In conclusion, it can be said that the absence, the renunciation of the festival produced by the COVID has increased the awareness of the importance of the treasure of values and rites that history has handed down to the community over the centuries, and the need to safeguard and protect them.

Moreover, the consciousness to be a part of a community based on solid historical and cultural roots, generated a strong response in terms of resilience. The Gubbio community having already had the opportunity to discuss the subject of the CC and its influence on CH through previous important initiatives (such as that of the European H2020 project HERACLES) has proved a mature awareness of the problem, and proposing solutions in terms of mitigation actions and even that the folkloric event can become a vector of new values, Green, as a greater respect for the environment and the promotion of sustainable behavior. It proves that ICH has the great potential to motivate and convey awareness on topics of great interest and importance.

6. Attitude and recognition of problems

All interviewed community constituents' representatives underlined the social, cultural and identitarian aspect of the *Festa dei Ceri* for the Gubbio population. They all strongly believe that it represents the values and the historical memory of the entire community. The Festa is based on the sharing and transmission of ideals that have led to overcome difficult situations together also during crises such as the one produced by COVID 19.

All interviewed community constituents' representatives agree that the *Festa dei Ceri* plays a social aggregation role for the entire Gubbio population, promoting solidarity and important moments of participation. Particularly, some *Ceri* Family representatives emphasized that the *Festa dei Ceri*'s cancellation for two years due to COVID severely impacted on the youngest generations depriving them of the unifying experience due to the passing of the baton between generations interruption.

Policy makers

In the policymaker's point of view "The *Festa dei Ceri* is in the DNA of the city of Gubbio; it is a celebration with strong religious implications, but also with secular and civil ones. Above all, it has a boundless ability to involve popular adherence, the whole community participates emotionally, the feast expressing a moment of great social cohesion. It involves the historic centre of the city in its itinerary, a lively, inhabited, and non-musealized historical centre. The *Festa dei Ceri* is a metaphor for life because the *Ceri* are brought together. It is a collective effort that requires collaboration".

The Gubbio Major emphasized, as well, that the *Festa dei Ceri* is part of History, and the history is influenced by the natural occurrences that take place, such as earthquakes and hydrogeological instability phenomena. Over the years, there have been phenomena of hydrogeological instability in the area. These phenomena have also partially affected some of the places of the *Festa dei Ceri* (particularly, the path on Mount Ingino, where the basilica of Saint Ubaldo is located). Many efforts, also economic, have been done to timely remedy those problems.

CC extreme events in days close to May 15th, may have serious repercussions on the organisation of the Feast, significantly impacting the collective and belonging feeling. For instance, the occurrence of hydrogeological problems a few days before the Feast could imply the impossibility of implementing restoration interventions in a short time, endangering the course of the feast.

Policy makers believe that "CC as cause of extreme events could influence the *Ceri* festival, as what happened with the pandemic COVID-19, resulting in the suspension of the festival for two years. This only happened in the 1900s with the First World War. Instead, the experience and history of the festival suggests that phenomena such as snow, rain, hail, cold, temperatures absolutely out of the ordinary, have never stopped the race. Only a completely unexpected and extreme phenomenon could produce the cancellation of the event. Based on these thoughts, the *Festa dei Ceri* could become a symbol of sustainability, declining in cultural, social, and economic aspects."

Diocese representative

The General Vicar of the diocese of Gubbio affirmed that CC, like every change, influences people's lives. He believes that CC can have an impact on the *Festa dei Ceri*, being it a feast of the people, of an entire community, of a social fabric that has certainly been touched by CC. Nevertheless, the feast has to be considered as an opportunity for collective education, with ethical, civic, and religious values, at which the respect for the territory has to be included: in this sense, the *Festa dei Ceri* could become a symbol of sustainability. During the *Festa dei Ceri* the race that reaches the patron Saint Ubaldo is performed. It also represents an ideal path that cannot be interrupted without consequences. The young generations have skipped stages of growth with the suspension of the festival for two years, as the festival cannot be just storytelling, it must be lived. Nevertheless, these two years have not been lost: they have been lived differently, and the reflections that this suspension has induced are certainly to be carefully considered.

Economic interests' representative

The economic interests' representative (*Confindustria Alberghi/*Hotels President) underlined the paramount importance of the event for the community of Gubbio, which is even hard to explain. All are involved at different levels, and there has always been a great attention also for the weakest members of the community, such as the sick, the disabled and the elderly who cannot participate directly. For them, for years, the local television set up a live broadcast of the festival covering 100% of the itinerary of the *Ceri*. CC has undoubtedly an influence on the event. It affects the enjoyment of the holiday, and tourist flows change greatly depending on weather forecasts. The whole itinerary must also be protected for safety (with the rain it is possible to slide on the paved road floor, holes and discontinuity can be also created on the roads by heavy rains, and the higher criticality is concerning the mountain path).

Societal actors

The representatives of the three *Ceraioli* Families, together with Maggio Eugubino Association and University of Masons and Stonemasons have shown a high degree of awareness towards CC possible effects on the feast, even if with some differences. They evidenced that CC does

not potentially affect only the *Festa dei Ceri*, but more generally the life of people. More precisely, they evidenced the hydrogeological risk of landslides on the mountain road, representing the "right path" that has to be followed, according to tradition and meaning. It was also evidenced that an unpredictable atmospheric event could create problems not only for the environment, but also for guests and tourists who come to Gubbio; however, the CC effect, if not dramatic, would not have an impact on the participation of the people of Gubbio, who would participate anyway". Nevertheless, heavy rainfalls or cloudburst could have a devastating effect on the Feast, if occurring on May15th. Most of them, though that the feast could be a vector of new values than those historically conveyed, motivating people to become aware of the risks associated with climate change and inspiring responsible behaviours towards the environment. In particular, the *San Giorgiari* Family representative to stress this potential role of the feast, affirmed that "the feast moved and goes through time, with the ability to adapt to life, to people. This is the intrinsic power of this event". In this sense, the feast is vital and continues to live in ITS time and to update. The representative of Sant'Antoniari Family underlined that they already promoted the reduction of plastic tableware use during the convivial events, and the collection of waste produced after them.

Some **social stakeholders** (**NGO** as Mason and Stonemason's University representatives and **young generation** represented by students at secondary schools) are fully confident that the *Festa dei Ceri* will be done in any case. Particularly, the young generation is aware that CC is in place in the life of everyone, but still almost half of them can hardly imagine that it can have a serious effect on the feast of Ceri. It was affirmed also based on their previous experience in the history of the event; however, they think that it is necessary to consider that CC could produce unforeseen extreme effects, never seen before. As the Maggio Eugubino Association representative highlighted, the awareness comes when you experience heavy impacts in daily life.

The **media representative** is well aware of the potential negative effects of CC on the feast itinerary and on the *Ceri* machines as well, and above all, on the repercussions of the feast as an identitarian event, being the feast a social holding tool. In the past, micro, and diversified meteorological effects have never stopped the event, but in the future extreme events can produce serious issues. She also suggested preventive mitigation actions (see below section 7).

In conclusion, the responses from each stakeholder (except for part of the students) show that they are aware of the risks and negative effects that the CC can create on the event. Instead, most of the student component (more than 50%) showed a lower awareness based on the feeling that it does not exist a real risk or that the probability of serious impact on the feast is quite remote. This highlights the importance of carrying out awareness-raising initiatives on the impact of the CC on ICH.

In this context, the idea proposed by most stakeholders interviewed that the holiday itself can be used as a vector to raise awareness about these issues is extremely important and significant.

Accordingly, it resulted quite impressive and noteworthy to verify that the feast of the *Ceri*, which marked the life of this population since millennia, had and still has the capacity to evolve through the history passing and adapting through different civilizations, to arrive vital and able to potentially adapt nowadays again to the present scenarios: this is the real power of this event and more in general of immaterial CH, based on relevant cultural and spiritual meanings and values.

7. Existing practices: solution implemented, planned, or proposed

All interviewed people said that the territory maintenance and management are key actions to reduce the CC effects.

Policy makers: the Mayor emphasizes that the territory of Gubbio has an imbalance given by a few inhabitants distributed in a large territory (in fact, it represents the seventh municipality in Italy, as extension). The CC is there, it creates and will create more and more problems, and therefore there is the need to take mitigation actions that the Municipality has already started, promoting actions supporting alternative energy sources, decarbonization processes, CO_2 abatement, etc. For example, the municipality of Gubbio has allowed the activation of two large wind turbines, one of which is the largest in Italy. The Municipality of Gubbio intends to promote this kind of policies and actions also in response to the growing problem of energy poverty. This is a social as well as an environmental sustainability problem. In addition, during COVID, the Municipality and Caritas implemented interventions to combat poverty by paying bills or assisting those who had difficulties in paying rents. The municipality has also carried out an operation to replace public lighting with LED lighting and has planted 52,000 trees on site.

In the area of interest for the Feast, the municipality of Gubbio carried out significant interventions for the maintenance of the territory particularly on the mountain path, but in general, it was underlined that the Gubbio territory maintenance and management needs huge resources, due to its much-extended area.

Journalists underlined that for the territory maintenance it could be useful to re-evaluate the action that was carried out in the past by the farmers and the action that can be carried out by the voluntary organisations, to complement the public intervention. Of considerable importance is also the monitoring action that the citizens (sentinel), in collaboration with local institutions, can do.

Therefore, creating a sustainable plan for the maintenance of the territory, and citizens' engagement can be both a chance and represent a value for the *Festa dei Ceri*, being a popular feast.

Economic interests' representative. The representative (*Confindustria Alberghi-Hotel* President) affirmed that there is the need to protect the route with preventive maintenance actions and also ensure security on the entire itinerary, both for *ceraioli* (the bearers) and for people participating. Organising more suitable parking areas (not on gravel) is also a priority.

Social stakeholders such as all the three *Ceraioli* families, the Diocese representative, and the students interviewed suggested the need to adopt, during the *Festa dei Ceri*, a sustainable behaviour, involving voluntaries in collecting and reducing the waste produced during the event, making it a plastic free event by reducing the use of plastic tableware, promoting an active cooperation in ensuring greater cleanliness of the festive places as educational activity. Engaging all the different actors in the territory safeguard is essential.

As a general observation, most of the interviewed stakeholders underlined the possible symbolic role that the Feast can play in delivering additional values to the traditional ones, such as the green values, as the respect of nature, the importance of sustainable practices and behaviours, then contributing to improve the collective awareness related to the risks of CC. In this sense, it shows how vital and current the feast is, able to update itself and to adapt to the present time and to worldwide priorities.

8. Publications and others additional information

References

[1] Menichetti, Piero Luigi, *Ceri di Gubbio dal XII secolo* (Ceri of Gubbio from XII century), Città di Castello, Rubini & Petruzzi, 1980.

[2] Plinio il Vecchio, *Naturalis Historia Libro III – Regio VI*, (Natural History, Book III, Region VI) 77-78 A.D.

[3] *HERACLES European H2020 project*. Available at: http://www.heracles-project.eu

[4] Hermann, H. (1991). *Dall'Italia e Racconti italiani* (From Italy and Italian Stories) Ed. Newton Compton.
[5] Barbi, A. (2008). *La Festa dei Ceri sotto il Ducato di Urbino: 1384-1631* (The Feast of Ceri under the Urbino Dukedom: 1384-1631). Gubbio, Ed. Ceraiole.
[6] Belardi, P. (2011). *Divinae proportiones. Il disegno euclideo dei Ceri di Gubbio* (Divine proportions. The Euclidean design of Ceri of Gubbio). Ed. Fabbri-Perugia.
[7] Cenci, P. (1906). *I Ceri di Gubbio e la loro storia* (The *Ceri* of Gubbio and their history). Città di Castello, Ed. Scuola tipografica cooperativa.
[8] Dante Alighieri in canto XI of Paradise- *La Divina Commedia* (The Divine Comedy) (1306-1321).
[9] *May 15th, Ceremony at the Cemetery.* Available at: http://www.santantoniari.it/Varie_Santantoniare/La_Festa/I_luoghi/Cimitero.aspx#
[10] Ambrogi, V., Farneti, M. (1992). *L'antica arte del suonare il Campanone della Città di Gubbio* (The ancient art of ringing the big bell of the city of Gubbio). Roma, Edigraph.
[11] Monacelli, A.M. (1993). *C'arvedemo 'l giorno dei ceri -i modi di dire e gli eventi linguistici* (We will see each other on *Ceri* day-Idioms and linguistic events). Gubbio.
[12] Gaggiotti, G. (1988). *Dove l'anno è un giorno. Un Capitano, una città, un mondo* (Where the year is a day. A Captain, a city, a world). Perugia.
[13] Devoto, G. (1948). *Le Tavole di Gubbio* (the Iguvine Tablets). Ed. G.C. Sansoni.
[14] Seppilli, A. (1972). *I Ceri di Gubbio: saggio storico-culturale su una festa folcloristica* (The *Ceri* of Gubbio: historical-cultural essay on a folk festival). Perugia, Annali della Facoltà di lettere e filosofia.
[15] Tondi, B. (1684). *L'esemplare della gloria, o vero, i fasti sacri, politici e militari dell'antichissima città di Gubbio* (The example of glory, that is, the sacred, political and military splendors of the ancient city of Gubbio). Venezia, Forni.
[16] Bower Herbert Morris, *The Elevation and Procession of the Ceri at Gubbio*, London, Nutt, 1897
[17] Seppilli, A. (2023). *Tavola Rotonda sui Ceri-1965* (Round table on Ceri-1965). Ed. EFG.
[18] (2005, January). *Italici – I Popoli pre-romanici* (Italics – the pre-romans people). National Geographic Italia, Vol. 15(1), pp. 8-27.
[19] Barbi, A. (2009). *La Festa dei Ceri nel periodo comunale: 1161-1384* (The Feast of Ceri in the Communal period: 1161-1384). Gubbio, Edizioni Ceraiole.
[20] Cenci, P. (1924). *Vita di S. Ubaldo Vescovo di Gubbio* (Life of Saint Ubaldo, Bishop of Gubbio). Scuola Tipografica Oderisi, Gubbio.
[21] Fanucci, A. M. (2007). *S. Ubaldo, il suo vero volto* (S. Ubaldo, his true nature). Edizioni Ceraiole, Gubbio.
[22] Seppilli, T. (2023). *Tavola Rotonda sui Ceri, 1965* (Round Table on Ceri, 1965); Ed. EFG, Gubbio.
[23] Del Ninno, M. (1983). *La Corsa dei Ceri a Gubbio. Stato di una ricerca* (The race of the Ceri in Gubbio. State of research). Quaderni di Antropologia e Semiotica, Urbino.
[24] *Ceri as Banner emblem on*. Available at: www.consiglio.regione.umbria.it; http://www.crumbria.it/page.asp?c=23&p=150&r=&tipor=0,#:~:text=Lo%20stemma%20della%20Regione%20dell,reca%20al%20centro%20lo%20stemma.
[25] *Regional identity element*. Available at: https://leggi.alumbria.it/mostra_atto.php?id=52755&v=FI,SA,TE,IS,VE,RA,MM&m=5
[26] *RAI telecast on the origin of the Feast*. Available at: https://www.raiplay.it/video/2021/09/Vitalia---Alle-origini-della-festa---La-festa-dei-Ceri-di-Gubbio---15092021-60a7beaa-8d68-45a1-bae5-44741c7cf4bf.html
[27] *RAI telecast press communicate*. Available at: https://www.rai.it/ufficiostampa/assets/template/us-

articolo.html?ssiPath=/articoli/2021/09/La-festa-dei-ceri-a-Vitalia-su-Rai2-341a732c-311b-472c-a854-e120a4bbb87e-ssi.html
[28] Cirese, A.M. (2023). *Tavola Rotonda sui Ceri, 1965* (Round Table on Ceri, 1965). Ed. EFG, Gubbio.
[29] Ajò, U. (1982). *Storia dei Ceri. Studio sul Folklore Eugubino* (History of Ceri. A study on Iguvine Folk). Firenze, Silvio Miano Editore.
[30] *MIBACT Ministerial Decree DDR 24/04/2013.*
[31] Available at: https://appadvice.com/app/passionate-umbria/945621042
[32] Available at: https://www.regione.umbria.it/cultura/notizia/-/asset_publisher/Pvh5OfauWoAj/content/-passionate-of-umbria-ceraioli-of-gubbio-?read_more=true
[33] Available at: https://www.umbriatourism.it/it/-/passionate-umbria-ceraioli-of-gubbio
[34] Available at: https://www.youtube.com/watch?v=hs9EQcntMeE
[35] Available at: https://www.maggioeugubino.it/2023/04/save-the-date-28-aprile-2023-silvano-nano-campeggi-i-ceri-e-hollywood/
[36] Available at: https://www.youtube.com/watch?v=zDkVbdBqP30
[37] (2023). *Silvano-Nano Campeggi – I Ceri e Hollywood, a cura del Maggio Eugubino* (Silvano-Nano Campeggi – the Ceri and Hollywood, by Maggio Eugubino) Ed. FMA
[38] Available at: https://www.comune.gubbio.pg.it/xxxiii-concorso-grafico-pittorico-oderisi-da-gubbio/
[39] Cece, F., Sannipoli, E. A., Ambrogi, V. (2013). *La Festa dei Ceri* (the Feast of Ceri). Perugia, Quattroemme.
[40] Available at: https://www.meteoblue.com/it/climate-change/gubbio_italia_3175687
[41] Cece, F., Mariucci, F. (2020, April 2). *Il Coronavirus ferma anche i ceri di Gubbio?* (Coronavirus stops also the Ceri of Gubbio). Assisimia.it. Available at: https://www.assisimia.it/2020/04/02/il-coronavirus-ferma-anche-i-ceri-di-gubbio/
[42] Barbi, A. (1999). *La Festa dei Ceri e la Grande Guerra: 1911-1920* (The Feast of Ceri and the Great War:1911-1920). Gubbio, Edizioni Ceraiole, pp. 69-72, 128-130;
[43] F. Trevisan (a cura di), *Gubbio, la grande guerra e i Ceri sul Col di Lana (1917-2017)*. Atti del Convegno di studi, Gubbio 2017.
[44] *Ceri on Col di Lana* - First World War-on. Eugubininelmondo.com. Available at: http://www.eugubininelmondo.com/CuriositaCeri.html#:~:text=Cos%C3%AC%20sabato%204%20agosto%202007,e%20sofferti%20di%20guerra%20e
[45] Barbi, A. (2002). *La Festa dei Ceri dal conflitto mondiale al dopoguerra. 1941-1959* (The Feast of Ceri from the World War to the post-war period: 1941-1959). Gubbio, Ed. Ceraiole.
[46] Stefania Boccia et al. (2020). *What Other Countries Can Learn from Italy During the COVID-19 Pandemic.* JAMA Intern Med. 2020; 180(7): 927-928. DOI:10.1001/jamainternmed.2020.1447
[47] Decree of the Gubbio Mayor N° 10 of 24/04/2020.
[48] Decree of the Gubbio Mayor N° 5 of 19/04/2021.
[49] (2020). *Inno Sant'Antoniari, orchestra a distanza*: *la primavera dei nostri cuori è sempre in fiore* (Sant'antoniari hymn, remote orchestra, the Spring in our hearts is always in bloom). Youtube.com. Available at: https://www.youtube.com/watch?v=LM1Zf7PngEE
[50] (2020, May 14). *Banda a distanza Ceri 2020 - Il Fazzoletto, Banda Comunale di Gubbio* (Remote Banda, Ceri 2020, The handkerchief, by Municipal band of Gubbio). Youtube.com. Available at: https://www.youtube.com/watch?v=ntyya_HyCZY
[51] *Banda a distanza, Nell'anno della pandemia esprimiamo (*Remote orchestra, In the year of the pandemic we express), Ettore Berettoni. Youtube.com. Available at: https://www.youtube.com/watch?v=Gy0M-OqG8-g
[52] (2020). *Il peso del coraggio* (The burden of courage), Giampaolo Pauselli. Youtube.com. Available at: https://www.youtube.com/watch?v=MttysTAnk0s

[53] (2020). *Gubbio, 15 maggio 2020 – Covid-19, la Festa dei Ceri si ferma* (Gubbio, May15th 2020 – COVID-19, The Festa dei Ceri stops). Giampaolo Pauselli. Youtube.com. Available at: https://www.youtube.com/watch?v=rzBStlgjxFY
[54] (2020). *Gubbio, 15 maggio 2020, Sottili emozioni di Fede* (Gubbio, May15th 2020, Subtle Emotions of Faith). Giampaolo Pauselli. Youtube.com. Available at: https://www.youtube.com/watch?v=rzBStlgjxFY&t=93s
[55] (2020). *Voci del silenzio* (Voices of silence). Renato Maria Rogari. Facebook.com. Available at: https://www.facebook.com/URPComuneGubbio/videos/260692411786029/
[56] (2020, July 14). *Video on the 2020 iniziative: IO CERO*. Youtube.com. Available at: https://www.youtube.com/watch?v=sHlPXjx66ZM
[57] Neri, E. (2020). "*IO CERO- 15 Maggio 2020- La Festa dei Ceri di Gubbio sospesa*" (I CERO- 15 May 2020- The Suspended Feast of Ceri). Ed. EFG.
[58] Letter of intent from *Istituto Centrale per il Patrimonio Immateriale* (ICPI) of *Ministero della Cultura* (MIC). Prot. Comune di Gubbio N° 0031142/2020 del 31/08/2020.
[59] *2020 video about the ICPI-MIC iniziative "Lucigrafie" (writing with light).* Available at: http://www.idea.mat.beniculturali.it/attivita/eventi/itemlist/date/2014/images/museo-civilta-mnatp?start=20
[60] *2020 video about the ICPI-MIC iniziative "Lucigrafie" (writing with light).* Available at: http://www.idea.mat.beniculturali.it/attivita/eventi/item/864-lucigrafie
[61] *2020 video about the ICPI-MIC iniziative "Lucigrafie" (writing with light).* Available at: https://www.agenziacult.it/cultura/corsa-dei-ceri-di-gubbio-licpi-lancia-sabato-il-progetto-lucigrafie/
[62] McCurry, S. (2020, April 14). *Soul of Italy – A Tribute from Steve McCurry (during Italian COVID-19 Lockdown).* Stevemccurry.blog. Available at: https://stevemccurry.blog/2020/04/14/soul-of-italy-a-tribute-from-steve-mccurry/
[63] (2020, April 13). *Soul of Italy – A Tribute from Steve McCurry.* Youtube.com. Available at: https://www.youtube.com/watch?v=e8xPukESw18

Legal and policy sources

Umbria Region legislative assembly (2012). *Ceri as a regional identity element*. Regional Law 25 January 2012, n.1., council acts. Available at: https://leggi.alumbria.it/mostra_atto.php?id=52755&v=FI,SA,TE,IS,VE,RA,MM&m=5

Press

1. (2021) *RAI television broadcast on the Festa dei ceri origin– "Origin of the Feast".* Raiplay.it. Available at: https://www.raiplay.it/video/2021/09/Vitalia---Alle-origini-della-festa---La-festa-dei-Ceri-di-Gubbio---15092021-60a7beaa-8d68-45a1-bae5-44741c7cf4bf.html
2. (2021) *RAI television broadcast on the Festa dei ceri origin– "Origin of the Feast" press release*. Rai.it. Available at: https://www.rai.it/ufficiostampa/assets/template/us-articolo.html?ssiPath=/articoli/2021/09/La-festa-dei-ceri-a-Vitalia-su-Rai2-341a732c-311b-472c-a854-e120a4bbb87e-ssi.html
3. (2021) *RAI Radio 3 broadcast on the Festa dei Ceri origin– "Origin of the Feast".* Raiplaysound.it. Available at: https://www.raiplaysound.it/playlist/constraordinariotrasporto
4. (2021, December 16). *The history of the ancient Umbrian people: Puplum, storie del Popolo Umbro*. Youtube.com. Available at: https://www.youtube.com/watch?v=VImP9M03Qos
5. (2023, May 2) *Tele Radio Gubbio (TRG) Broadcast "Gubbio: opening of the exhibition "Nano Campeggi i Ceri and Hollywood".* Youtube.com. Available at: https://www.youtube.com/watch?v=zDkVbdBqP30

Other resources

1. (2006). *Ceri sul Col di Lana - First World War, the "Eugubini in the world" Association proposes to remember what happened in 1917 on Col di Lana.* Available at: http://www.eugubininelmondo.com/CuriositaCeri.html#:~:text=Cos%C3%AC%20sabato%204%20agosto%202007,e%20sofferti%20di%20guerra%20e
2. (2014). *Steve Mc Curry. Video on Passionate Umbria - Ceraioli of Gubbio*. Youtube.com. Available at: https://www.youtube.com/watch?v=hs9EQcntMeE
3. (2015). *Steve Mc Curry initiatives. Passionate Umbria is equipped with the system ibeacon, the new technology that the Umbria Region is experimenting with to live a unique experience to users who visit the photo exhibition in Gubbio Passionate Umbria.* Available at: https://appadvice.com/app/passionate-umbria/945621042
4. (2015). *Steve Mc Curry initiatives. Press release on Umbria Region website on the event*. Available at: https://www.regione.umbria.it/cultura/notizia/-/asset_publisher/Pvh5OfauWoAj/content/-passionate-of-umbria-ceraioli-of-gubbio-?read_more=true
5. (2016, May). *La festa - Frammenti in movimento* (The feast - fragments in motion). Youtube.com. Available at: https://www.youtube.com/watch?v=nBS90yBOxZE
6. (2022, May 26). *Press release on Gubbio municipality webpage on "XXXIII EDITION. GRAPHIC - PICTORIAL CONTEST "ODERISI DA GUBBIO"*. Available at: https://www.comune.gubbio.pg.it/xxxiii-concorso-grafico-pittorico-oderisi-da-gubbio/
7. (2023, April 12). *Nano Campeggi artistic contribution on the event. Press release on the event, on Maggio Eugubino Ass*. Available at: https://www.maggioeugubino.it/2023/04/save-the-date-28-aprile-2023-silvano-nano-campeggi-i-ceri-e-hollywood/
8. (2023). *Influence of climate change and related Gubbio Meteo Forecast.* Available at: https://www.meteoblue.com/it/climate-change/gubbio_italia_3175687
9. *Anne Robichaud (American) blog*. Available at: https://www.annesitaly.com/2021/03/04/corsa-dei-ceri-gubbio/
10. *Anne Robichaud 20 mag 2023, Local passion explodes in Gubbio on May 15th for the astonishing Corsa dei Ceri.* Available at: https://www.youtube.com/watch?v=YKoCfF4EyLQ
11. *Anne Robichaud 20 mag 2023, I wouldn't be any place in the world on May 15th, but Gubbio, for the Corsa dei Ceri*. Available at: https://www.youtube.com/watch?v=1JCmlD8_YcQ
12. *Anne Robichaud 20 mag 2023, Don't miss la Corsa dei Ceri (Race of the Ceri) in Gubbio on May 15th*. Available at: https://www.youtube.com/watch?v=NpXGr2Uxt38
13. *Artistic images of Festa dei Ceri and other news from the Festa dei Ceri.* Available at: https://www.ceri.it/gallery/foto-artistiche/
14. *Blog Steve McCurry Curated*. Available at: https://stevemccurry.blog/2020/04/14/soul-of-italy-a-tribute-from-steve-mccurry/
15. *Ceri as Regional emblem banner (communication on Regional Council of Umbria Region webpage).* Available at: http://www.crumbria.it/page.asp?c=23&p=150&r=&tipor=0,#:~:text=Lo%20stemma%20della%20Regione%20dell,reca%20al%20centro%20lo%20stemma
16. *Cultural initiatives.* Available at: https://www.maggioeugubino.it/brocche-d-autore/
17. *Festa dei Ceri* in National Inventory. Available at: http://paci.iccd.beniculturali.it/iccd/cards/ricercaPaci?p=29&data%5Bdenominazione_inventario%5D=%2A%2F%2A&data%5Belemento%5D=&data%5BricercaInventario%5D=Cerca&data%5Bdoaction%5D=cerca

18. *Festa dei Ceri* in Regional inventory. Available at: https://leggi.alumbria.it/mostra_atto.php?id=52755&v=FI,SA,TE,IS,VE,RA,MM&m=5
19. *From the Italian Ministry of Culture, the presentation of the initiative "LUCIGRAFIE" (Writing with Light).* Available at: http://www.idea.mat.beniculturali.it/attivita/eventi/item/868-lucigrafie-l-arte-e-il-patrimonio-immateriale-a-gubbio
20. *From the Italian Ministry of Culture, the presentation of the initiative "LUCIGRAFIE".* Available at: http://www.idea.mat.beniculturali.it/attivita/eventi/item/864-lucigrafie
21. *HERACLES project.* Available at: http://www.heracles-project.eu/
22. *Iguvine Tablet.* Youtube.com. Available at: https://www.youtube.com/watch?v=-5HSFsW-Qvw
23. *May 15th, Ceraioli ceremony at Cemetery description on the Sant'Antoniari Family webpage*. Available at: http://www.santantoniari.it/Varie_Santantoniare/La_Festa/I_luoghi/Cimitero.aspx#
24. *News and images of Festa dei Ceri from the Municipality of Gubbio.* Available at: https://www.comune.gubbio.pg.it/eventi-2/un-anno-di-eventi-a-gubbio/festa-dei-ceri/
25. *News and images of Festa dei Ceri from the Maggio Eugubino Association.* Available at: https://www.maggioeugubino.it/festa-dei-ceri/
26. *Steve Mc Curry initiatives.* Info on the vent on Umbria tourism. Available at:https://www.umbriatourism.it/it/-/passionate-umbria-ceraioli-of-gubbio
27. *The film on the absence by ICPI-MIC initiative on CULT Press Agency website, Editorial Staff Rome, Culture*. Available at: https://www.agenziacult.it/cultura/corsa-dei-ceri-di-gubbio-licpi-lancia-sabato-il-progetto-lucigrafie/
28. *The Steve Mc Curry "A Tribute to Italy" video with music from "Nessun Dorma – Turandot, Giacomo Puccini".* Available at: https://www.youtube.com/watch?v=e8xPukESw18
29. *Video "E Gubbio rinasce – 15 Maggio (And Gubbio is reborn - May 15th)" by Giampaolo Pauselli.* Available at: https://www.youtube.com/watch?v=Xc-IgCTpi4Q
30. *Video promo on Gubbio by Giampaolo Pauselli.* Available at: https://www.youtube.com/watch?v=_m3mTmGjyiM
31. *Video "Il suono del Campanone, visto da vicino/The Big Bell sound, seen up close" by Francesco Pelicci, Francesco Biccheri and Luca Simon Biccheri.* Available at: https://www.youtube.com/watch?v=SrLdb-dsFnY

Other resources on citizens initiatives organized during the COVID-19 Italian lockdown, to fill the void/absence produced by the suspension/cancellation of the Feast of Ceri

1. (2020). *During COVID-19 lockdown, Feast of the Ceri suspended*. Available at: https://www.youtube.com/watch?v=LM1Zf7PngEE
2. (2020). *During COVID-19 lockdown, Feast of the Ceri suspended*. Available at: https://www.youtube.com/watch?v=ntyya_HyCZY
3. (2020). *During COVID-19 lockdown: on this link, a group of citizens of Gubbio, decided to organize a Remote orchestra to play traditional music of the Festa dei Ceri*. Available at: https://www.youtube.com/watch?v=Gy0M-OqG8-g
4. (2020). *During COVID-19 lockdown, Feast of the Ceri suspended.* Available at: https://www.youtube.com/watch?v=MttysTAnk0s
5. (2020, May 15). *During COVID-19 lockdown, Feast of Ceri suspended by Giampaolo Pauselli*. Available at: https://www.youtube.com/watch?v=rzBStlgjxFY

6. (2020, May 15). *During COVID-19 lockdown, Feast of Ceri suspended. Video: "Voci del silenzio (Voices of the silence)" by Renato Maria Rogari*. Available at: https://www.facebook.com/URPComuneGubbio/videos/260692411786029/
7. (2020, July). *During COVID-19 lockdown, video on the presentation of the book realised after the social initiative "IO CERO the Feast of Ceri suspended"*. Available at: https://www.youtube.com/watch?v=sHlPXjx66ZM

9. Informants, experts, date of the interview

A careful investigation on the history of the "*Festa dei Ceri*," its meanings, and its implications for culture, society, economy, religion, and the environment were undertaken by CNR through the interviews with a variety of stakeholder groups. With the interviews, it was possible to find out the emotions that tie people to the feast and what emotions arose when it was interrupted in 2020 and 2021 because of the COVID-19 pandemic.
Interviewees included:

- Policymakers representing local institutions (Filippo Mario Stirati, Mayor of Gubbio) (through interviews)
- Social actors with associations (through interviews) representing:
  - the three *Ceraioli* Families represented by their Presidents (Ubaldo Minelli, Patrik Salciarini, Ubaldo Gini);
  - the pro-loco Maggio-Eugubino, represented by its President (Marco Cancellotti);
  - the University of Masons and Stonemasons (represented by its President: Giuseppe Allegrucci);
- The Religious authority represented by the General Vicariate of Gubbio (Don Mirko Orsini); (through interviews)
- Educational sector, represented by students from two secondary schools (Liceo-Ginnasio G. Mazzatinti, IIS Cassata Gattapone (through questionnaires)
- Economic sector representative as the president of *Confindustria Alberghi*/Hotel (Carmela Colaiacovo)(through interviews)
- Media with the participation of a journalist who works in both print and traditional media as well as in new media (Elisa Neri) (through interviews)

The interviews were carried out on 9, 13, 20 and 22 of June 2023. The questionnaires were submitted and collected during the same period.

10. Contributors

This study was prepared by CNR: Giuseppina Padeletti, Patrizia Grifoni.

4.9. CS9 Madonna Avvocata Festival (Amalfi Coast, Italy)

1. ICH element

Title in English
The "Madonna Avvocata" Festival

Title in Italian
Festa Madonna Avvocata

Description
The "*Madonna Avvocata*" ("Our Advocate Lady "- Virgin Mary) festival is one of the liveliest, deeply felt feasts and celebrations of the Amalfi Coast intangible heritage. It is a very complex ritual consisting of a pilgrimage, a procession and a real feast accompanied by food, traditional dance, and music.

Furthermore, a research work made in 2003 by UNESCO within the Intangible Heritage Sector (under the financial contribution of Mr. Giancarlo Elia Valori, Goodwill Ambassador to UNESCO, in collaboration with the CUEBC), clearly demonstrated the link existing between the values of an already recognized Cultural Landscape World Heritage Site and those of its very rich and diversified intangible cultural heritage, represented by the "*Madonna Avvocata*" festival. As the UNESCO Assistant Director-General Mr. Mounir Bouchenaki wrote, the research was "of considerable practical use bringing a new approach to understand the intangible cultural heritage in the world and its relationship with tangible heritage".

We would like to highlight the role this festival had in the past with regards to the awareness processes of the local community in relation to the traditional cultural landscape maintenance and management of the site, here including the "dry-stone walls" system. Therefore, the "*Madonna Avvocata*" festival has to be considered a case study of outstanding value to understand the role of ICH, and to also evaluate the awareness of the local community on the impact of CC on ICH.

Once a year, on Pentecost, a pilgrimage takes place. The pilgrimage itinerary follows the water course, a kind of ritual course which represents *the appropriation* of the landscape, *the knowledge-building* of the relationships between man and his activities directed to change nature, *the identifiability* of each single member of the community (farmers, sailors, shepherds) with the common creation, *the involvement* in a shared destiny.

The periodical pilgrimage embodies, through the rite, the renewal of the awareness of all those processes, shared within the community, which are here the basis of the relation between man and nature which must be preserved in a proper way, also by the intercession of the Madonna who plays the role of "*Avvocata*", the advocate, the divine figure "who intercedes". People climb the hill sides in small groups or individually, starting from below, from the towns and villages of Maiori, Erchie, the ancient Benedictine Abbey of Cava de' Tirreni, Albori, Tramonti. Separately, they follow the various canal-paths, the course of knowledge and awareness of their territorial reality, as already evidenced. They ritually stop to pray at some "stations", situated, not by chance, on the ridges, from where the structure of the site is strategically dominated, its hydrogeological structure and functioning become clear. Places from where the system of canals is dominated and that of the reservoirs and terraces is "under control"; cultivation and farmers' skills are evaluated; the critical points are clearly evidenced. Tourists are just admiring the beauty, but in this case "beauty" is ruled by the "order" that lies behind the terraced system going from the sea to the top of the mountain. Pilgrims reach the spring, or rather the church over the spring, which represents the final stop

of this first ritual course, re-unifying, in a sense, the various courses of paths and water near their source. Then, they go through the uncultivated but not wild wood, kingdom of shepherds, through some paths "which have been traditionally kept very clean", a kind of "firewalls" for luxuriant vegetation in springtime. The passing through the wood seals the last part of a hard purification path towards the divinity. Finally, they arrive on the mountain top, at the sanctuary built over a cave, hiding a reservoir under its crypt. It seems that the sanctuary "intercedes" with the sky from where water falls down the earth, canalizes it beneath its structure, giving it, through the spring, lower down, to men and land that are taken away from nature. Following this belief, the "*Madonna Avvocata*", the Intercessor, acts to guarantee the believers confidence, health, prosperity, in one with the vital water cycle, i.e., sky-land-sea-sky, in a harmonious way, and to protect the man's divine construction from pagan forces of nature. Pilgrims pray for the well-being of their families and for the whole community. The members of the community, coming from different places, finally identify themselves with a single community whose existence depends on the same source; they gather and identify with each other, right on the physical top of the system from where water and the artificial system are sacralised. Shepherds, farmers, and sailors share the rituals, a traditional way contributing to conflict resolution. The divinity, carried by the believers, shows itself and blesses the land from over the spring, the terraced system, the houses and the villages, the sea: now the feast begins. It's a traditional feast of this country, to the sound of the "*tammorre*" (the kids' (leather) drums) and castanets; people drink wine and "limoncello", the world-famous local liqueur extracted from lemon peel, eat a meal made of products from the soil and the sea, some bread, cheese, salami as well, and the anchovies marinated in lemon juice, too. Dancing has its own peculiarity: it is characterized by the beating rhythm of the "*tammorre*" which are not accompanied by the music of other instruments, since *they are* the music, played by ten or even more men together, usually coming from the mountain/shepherd's community, in a kind of collective excitement. It's a dance primarily performed by men who "twine their legs", reminding us, in its local form, of the dances miming the wrestling, largely spread in the southern basin of the Mediterranean Sea.

Adults take part in the dance, but boys and children in particular (today also girls) are invited to dance: they are initiated to take part, learn, and become the future protagonists of the feast. It is not unusual to see the grandfather twining his leg with his grandson, with an affectionate amenability which "twines" different generations and the care of passing on these traditions to future generations. Everything here takes place without any false folklore: the dresses are those of the trip, of the hike, that is a pair of trekking shoes and jeans, old and new bandannas, underlining the vitality of the ritual. Before sunset, people go back to the valley, following again the "canal-paths"; the group divides again, like water. The celebration goes on, down the valley, near the sea. There, a scant number of groups go dancing all night long. The last stop is in the squares, near the sea, where - there too - there are the canals which convey, at the end, the water from the mountain top to the sea, hopefully waiting for the clouds to reach the sky from the sea and for the restart of the virtuous cycle of water and life.

Historical introduction

The first historical data about the existence of a pilgrimage date back to the end of the XV century. According to legend, a young shepherd called Gabriele Cinnamo was attracted by a cave where he saw the Virgin Mary, The *Madonna Avvocata*. The Virgin asked the shepherd to build an altar for her, he did it and became a hermit. The fame of the holy man spread in the neighbouring villages, and people started going to the cave to meet him and to pray. Then, other hermits arrived. A small chapel was built. In 1503 Pope Leo X authorized the construction of a church and a bell tower. The Sanctuary was occupied by the hermits until 1682, when it passed to the *Camaldolesi* monks. In 1807, when the Napoleonic laws

sanctioned the suppression of the monastic orders, the Sanctuary was abandoned, it later became a military garrison. At the end of the XIX century the Sanctuary was restored and reconstructed. In 1913 the Abbey of Cava de' Tirreni bought the Sanctuary, which is today under its authority. Despite the history of destruction and reconstruction, the pilgrimage to the *Madonna Avvocata* has always been a constant over the centuries: it embodies the values and perspectives of the entire community of the Amalfi Coast.

Target audience of interviews
Local community representatives, participants of the festival (dancers, players, faithful, tourists), city councillor, Cava de' Tirreni Abbey representatives, school teachers.

Geographical coordinates

40.65000, 14.60000
Maiori, Vietri, Cava de' Tirreni, costiera Amalfitana

Interview results

2. CC risks and effects on the "Madonna Avvocata" Festival. Amalfi Coast

The sample of interviewees answered quite uniformly to the questions. An interesting point of view was provided by Cava de' Tirreni's Abbot, who is the spokesperson for the mountain site and the *Madonna Avvocata* Festival. The Abbot pointed out that CC directly affects pilgrimages, the procession, and celebrations. This is not only due to the harmful effects of **heavy rains** that cause the paths' **landslide**, but also to the severe **droughts** which deprive us of water both from the springs where pilgrims stop to refresh themselves as they're climbing, and from the great tank located near the churches on top - which are essential for the life of the community and for the participants in the rituals. The Abbot clearly identified, within the alternation of climatic anomalies, a real risk also for the folklore moments (i.e., the roses' blossoming and the carpet of petals showing the religious path, the use of the "*tammorre*"), whose moments appear to be firmly fastened to the spring-summer seasonality.
The interviewed sample stated that the sudden changes in **hot-cold temperatures** and in **weather conditions (rain, fog, drought)** greatly influence the pilgrimages, thus the ascent of Mount *Avvocata* by the devoted. CC, combined with the desertion of fields, leads to a progressive collapse of the terraced system of dry-stone walls and destroys the ancient paths in many spots, effectively blocking the climb towards the mountain. In some points, the view highlights the degradation, and this makes people sad and concerned. It was pointed out that the elderly devotees, who take the helicopter to participate at the festival, were sometimes forced to stay and sleep at the shelter-hostel built for pilgrims because of **sudden changes in temperature** and, sometimes, due to **strong sudden winds**. The wind is typical of the site given the slope's orography and its exposure to the sea, and that is why this aspect cannot be directly related to the CC.

3. Attitudes and recognition of problems

Those interviewed were concerned about the pilgrims, who risk to no longer be able to climb up to the Shrine of the "*Avvocata*" from the Maiori slope, because all the paths leading to the top are being blocked by constant **landslides** of the dry-stone walls due to the **hot-cold impact** and of the abundant and **incessant rains** that make them collapse all the time. Also, without

qualified workforce and an overall view of the terraced system with water regimentation, it is difficult to rebuild the dry-stone walls (also because of the high costs and the transport of the materials) and to restore the functionality and resilience within the terraced system.

4. Existing practices: solutions implemented, planned, or proposed

The interviewed sample reported the need to reduce atmospheric pollution and, locally, not to alter the surface hydraulic system, to take care of the cultural landscape and crops and to carefully perform maintenance on them. It is interesting to remark that the sample does not always recognize some changes historically performed by anthropization as man-made. It is also highly significant that the answers to questions concerning the festival are connected to the cultural landscape and its risks, further proof of the value of the festival, as identified in this study.

The sample pointed out the need to find funds to restore the paths blocked by the landslide of friable rock caused by heavy rains, which are increasingly copious than before, and which no longer find the ancient canal system active in all its parts and rainwater management, including the presence of farmers on the site. It is therefore necessary to strive for environmental sustainability by making use of any possible natural remedy without resorting to elements unrelated to the rural and mountain landscape where we are. No suggestion has been made in relation to the festival itself.

The sample emphasized the devotion of the Amalfi Coast communities to the *Madonna Avvocata* and the fascination that pilgrimages and celebrations have for tourists, and that's why they believe the communities will do their utmost to restore the paths and mule tracks that lead to the top, to honour the *Madonna Avvocata*. The Municipality of Maiori is also deploying projects to raise funds for the restoration of the paths, today almost all impassable, which lead to the *Avvocata* mountain. The interviewed sample referred to videos, photos, and information to be found on websites.

Research bibliography

1. Bedini, G.B. (1980). *Le abbazie cistercensi d'Italia* (The Cistercian Abbeys of Italy). Roma: s.n.
2. D. Simeone Leone O.S.B. (1985). *Il Santuario dell'Avvocata* (The Sanctuary of the Avvocata). Badia di Cava: s.n.
3. Troiano, P. (1985). *Regina Minor trionfante. Storia della città e della diocesi di Minori*, (Regina Minor triumphant. History of the city and diocese of Minori). Maiori: s.n.
4. Apolito, P. (1995). *Il tramonto del totem, osservazioni per una etnografia delle feste* (The waning of the totem, observations for an ethnography of festivals). Franco Angeli: s.n.
5. Caffaro, A. (1996). *L'eremitismo e il monachesimo nel Salernitano. Luoghi e strutture* (Hermitism and monasticism in the Salerno area. Places and structures). Salerno: s.n.
6. Apolito, P. (2001). *La religione degli italiani* (The religion of the Italians). Editori riuniti.

5. Contributors

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4.10. CS10 Network of Big Shoulder-borne Processional Structures (Italy)

ICH element

Title in English
The network of big shoulder-borne processional structures

Title in Italian
La Rete delle Grandi Macchine a spalla

Inventory of ICH

https://ich.unesco.org/en/RL/celebrations-of-big-shoulder-borne-processional-structures-00721
(since 2013)

1. Element description and historicization: “example, model and source of inspiration”

The ICH here proposed is the Network of festivals of big shoulder-borne processional structures, which brings together in a single element four historic and important cultural festivals of the Mediterranean tradition: the *Gigli di Nola* (Lilies of Nola) (Campania region), the *Varia di Palmi* (Calabria region), the *Faradda dei Candelieri of Sassari* (Sardinia) and the Transport of the Machine of *Santa Rosa of Viterbo* (Lazio region).

The Festival Network has been a UNESCO World Heritage Site since 2013. The candidacy project was voted unanimously by all the participating States during the VIII UNESCO Intergovernmental Committee meeting in Baku; it was indicated by UNESCO as a "model, example and source of inspiration" and it is the only Italian best practice in the representative list of the Convention.

The four festive events of ancient Christian-Catholic tradition take place in the historic centres of four Italian cities of very ancient origins - Nola, Palmi, Sassari, Viterbo - located in different Italian regions, whose geographical location has greatly influenced their historic evolution. The communities, groups and individuals who are the heirs of such ICH live and operate in city centres.

The festivals take place from June to September, in some cases for almost 1,600 years (Gigli di Nola) and consist in the transportation of heavy handicraft works – even up to 30 meters high – by carriers chosen within the communities, in a pre-established route within the historical centre of the city. The use of big shoulder-borne structures is linked to the ancient tradition of the ritual procession, and it shows a profound connection among the communities, the votive structures that are transported, the movements - running or dancing - that are made during the itinerary, and the urban architecture.

The structures carried on the volunteers’ shoulders take on different characters and shapes. But the symbolic offering of sacrifice, the ritual effort, and the choral and collective participation (about thousands of people in all the events) represent a common ground of confrontation between these four Italian communities, which has lasted since 2005.

The **Feast of the Lilies of Nola** commemorates in June each year the return to the homeland of San Paolino through the procession of eight wood and papier mâché obelisks, which are transported by the "*cullatori*" representing the ancient guilds that meet in a reminiscent way "the boat” that brought the Saint back to his land. The **Varia di Palmi** is an ancient and complex machine, which has the shape of a cloud with living figures representing

the angels of the Assumption into Heaven of the Virgin Mary. The **Faradda dei Candelieri** of Sassari (Descent of the Candlesticks) consists of the votive transportation of 13 wooden obelisks that dance to the sound of pipes and drums for the Virgin of the Assumption through a long stage action, choreographic exhibition inspired by an oral tradition that is transmitted from generation to generation. The **Macchina di Santa Rosa** (Tower of Santa Rosa) in Viterbo commemorates its patron, the holy child Santa Rosa, placed on top of a huge machine that is periodically redesigned and built in an exemplary blend of tradition, innovation, and creativity.

The complexity and richness of meanings and practices underlying the festivals of big shoulder-borne processional structures let us identify different holders of the intangible cultural heritage in each of the communities. For each phase of the ceremonies, in fact, the communities make use of specific skills and abilities of citizens who place their knowledge at the service of tradition. The builders of the machines, the craftsmen who create the clothes and products useful for the smooth running of the ceremonies, the musicians and the musical authors, the keepers of the memory of the previous editions of the festivals and their oral and anecdotal tradition, the bearers of the machines as well as their leaders, by whom they are organized and guided in the phases of transportation, are emblematic figures of the community who participate in a choral way in the festive events and in their preparation.

The growing dialogue between the communities that share this ICH has led, over the years, to the construction of a network of the communities of the Festivities resulting in the agreement on common ways of safeguarding and involving artisans, artists and bearers of the four Italian cities and the institutional subjects of the territories with reference to actions for the management of festive events.

In the network of big shoulder-borne processional structures the communities live the traditions intensely within the historical centers of their cities, which are a fundamental integral part of the festivities, thus facilitating the regular transmission of the heritage from generation to generation. Thanks to the fixed periodicity of the celebrations, each element allows and depends on the transmission of skills, of a language and of a vernacular lexicon unchanged over time, a vehicle of constantly recreated practices. The festive communities rely on the oral and informal transmission of the techniques and knowledge that are applied in the construction of the Machines or in the creation of objects and artefacts linked to the ritual event, which also enter in an economic perspective when they feed artisan-type productions that are source of support for community members. The machines that are periodically rebuilt represent, in fact, elements of cultural continuity useful for the construction of a sense of identity, periodic reifications of the artisan know-how but also of the practices, representations and knowledge shared by the entire community. In each element there are ancient oral customs that pertain to the transmission of music and the performing arts that link the movements of the Machines and of the bearers within the city's cultural spaces to aesthetic canons shared by the communities.

Furthermore, each festival promotes an intense cultural activity in the area: citizens, throughout the year, get in touch with all the themes of the intangible heritage and get closer to it through courses, apprenticeships, research, and voluntary participation in the organization of ritual events. Even children are involved in the transmission initiatives and close to the festivals, events dedicated to the new generations are organized in each of the cities as well as, in some cases, festivals in which children carry small-sized shoulder machines.

Festivals are important moments of social cohesion and integration and provide the plot that, for more than a millennium, has overcome social barriers and age and gender difference. Furthermore, the rituality is strictly connected with the historical-architectural context determining, in some cases and over time, the adaptations of the town plan to the transportation needs of the large Machines, which are meant to proceed for hours through the narrow alleys of these beautiful mediaeval cities.

This important and kaleidoscopic Italian ICH has been the subject of significant recognition (Ministry of Tourism, "Heritage of Italy" Award, 2011) and enhancement projects aiming at disseminating the festivals and their territories through local, national and international activities in synergy with the Ministry of Culture-Central Institute of Intangible Heritage, with the Ministry of Culture-Central Institute of Intangible Heritage, the Ministry of Foreign Affairs and International Cooperation, the Italian National Commission for UNESCO, the Italian Embassies abroad and the Italian Cultural Institutes, research institutions and Italian universities including the European University Center for Cultural Heritage of Ravello, the Vanvitelliana University, the La Sapienza University, Federculture, international experts and working groups of the UNESCO area of Latin America and the Caribbean, the World Heritage Office of the Federal States of Mexico, the INAH- Instituto Nacional de Antropologia and History of Mexico, GRAMAS-Big Shoulder-borne Machines, thematic associations such as FICLU-National Federation of Clubs for UNESCO and Youth for UNESCO, NGOs such as the National Union of Pro Loco d'Italia, the World Heritage Sites Association, Treccani and Rai Cultura, the Municipality of Milan, the Italian and international UNESCO heritage communities: hundreds of people and a plurality of contexts who have taken and are taking part, directly and indirectly, in the processes of active safeguarding of the Network and hundreds of thousands of people involved in the festivities , enthusiasts, curious and tourists, who also participate in the mere information and dissemination of the numerous programming activities.

2. CC risks and effect

Intangible assets as "volatile" assets. The risks related to the effects of CC on the Network of festivals of big shoulder-borne processional structures.

As can be seen from the brief description of the element, the Network of festivals of big shoulder-borne processional structures is a very complex system in which different but complementary subjects constantly interact in the territories and communities of the four cities, with clear and defined roles: the network local community recognized by UNESCO – made up of 36 associations of the four cities gathered in the Network of big shoulder-borne processional structures (in Italian GRAMAS La Rete delle Grandi Macchine a Spalla), to which are added other buffer zone associations – organises the Festivals; the municipal administrations and their bodies (Foundations) have the task of managing the events in each historical-urban contexts; the technical-scientific coordination of the Network has the functions of monitoring and verifying all the actions of knowledge and scientific study, safeguarding, enhancement and promotion, transmission to the younger generations, in agreement with the ministerial subjects of competence (Ministry of Foreign Affairs, Ministry of Culture); policy makers, universities and research centres, experts, NGOs support all aforementioned actions. All these subjects work together to preserve and guard the rituals and physical contexts in which the events take place.

As the lockdown due to the Covid-19 pandemic provoking the "disappearance" of communities from urban spaces and the consequent suspension of festivities has proved, anything that intervenes to modify the consolidated social, community, ritual structure of the festivals could become a significant criticality and an obstacle to their safeguarding and vitality.

The decontextualization of festivals for various reasons, including those of a climatic nature – i.e. the staging of events in places other than those of origin for reasons related to abandonment by the communities – would undermine the identity element which is

fundamental for the vitality of the ICH, because the "spirit of the places", which pushes each individual to feel part of a whole, working together with others, would be lost.

What clearly emerges from the interviews addressed to the Network's stakeholders is that, according to experience in the field, the festivals and their regular performance could be influenced by the effects of CC: more frequent combinations of **cloudbursts** and **strong winds** with **scorching temperatures** for longer periods, seriously jeopardize performances in outdoor venues.

To date, despite the violence of the weather events which have hit the 4 cities of the Network, there have been no events close to the festival that have caused their definitive suspension, except for some significant episodes which however have produced unforeseen critical issues that have been resolved, with many difficulties, by synergistic actions implemented by local administrations together with the practicing communities:

- in Viterbo, on 24 August 2007, a few days before the transportation of the Santa Rosa machine which took place on 3 September, **a violent storm** heavily damaged the scaffolding supporting the "Ali di Luce" (light's wings) machine, 30 meters high and weighing 5 tons. The scaffolding was made safe by the Municipality, the Machine dismantled and reassembled and eventually the Transportation was held regularly;
- in Palmi, in 2013, **sudden cloudbursts** hit the city the day after the Transportation, completely melted the papier-mâché that makes up the scenic staging of the cloud. If the adverse event had occurred the day before, the Feast would have been suspended and the months-long work involving the entire festive community would have been useless, as reported by the President of the "Varia" Committee at the time, still visibly excited. Nothing like this had ever happened in 500 years of history.
- Nola, in recent years, has suffered greatly from the effects of **cloudbursts** that have put a strain on the historic centre, restored by the municipal administration, but above all, heat domes have been very frequent (even over 40 degrees) in the days of the feast, in which the 8 wooden obelisks called Gigli converge in Piazza Duomo and the historic centre is filled with hundreds of thousands of people. Rain hydrants are used very frequently by the Fire Brigade, present on the occasion of the Festival according to the Safety Plan;
- In Sassari, in 2015, a **cloudburst** violently hit the historic centre of the city during the Faradda dei Candelieri, the streets filled with rivers of water and the procession suspended for a few hours. In the memory of the community witnesses and municipal officials interviewed, there had never been an event that had forced the suspension, even if only for a few hours. The ritual was completed very late at night but the hundreds of thousands of tourists and visitors left the city much before.

During the interviews, the various stakeholders identified (community, administrators, Pro loco, tourist boards, traders) expressed three types of concern:

a. The **representatives of the community** expressed their fears regarding the risk of having to be forced, in constant adverse weather events, to suspend and decontextualize the date of the processions, which, for their realization, require a constant commitment lasting for months. The transportation of the Machines is the final act of a series of activities that converge towards the same goal and even just the possibility/necessity of having to suspend the ritual or move the date involves a significant emotional impact. The bearers of the Machines also complained about the physical difficulty to transport them in adverse conditions, such as **heat and humidity** which have worsened over the years and which determine a relatively high risk for them, despite the health checks to which they are subjected before and after the Transportation. The sample interview with the public of the Festa dei Gigli which was held on 25 June 2023, highlighted how due to the high temperatures (that were recorded) many, especially among the older people, preferred to follow the feast

on the monitors positioned in various points of the city or even from home, expressing great bitterness and disappointment for this.

b. **local administrators, as well as the political decision makers** interviewed, expressed awareness of the lack of specific plans aimed at protecting and safeguarding festivals (and intangible heritage in general) with respect to the effects of CC which can no longer be underestimated and which, in form of **global warming and the unpredictability of the climate** in particular, have definitely repercussions on the life of the historical centers in which the events take place.

Everyone has shown to be very interested in contributing to the dissemination of knowledge and problem-solving processes at local, regional, and national levels in order to promote open debates that can help to reach more incisive policies and, above all, a targeted and strategic action on intangible assets that helps safeguard their integrity. To date, each Municipality has planned the DUP – Documento Unico di Programmazione (Single Programming Document), that is the process of analysis and evaluation which, by comparing and setting policies and plans for the management of the territory coherently with each other, allows to organize in a given period of time, the activities and resources necessary for the realization of social goals and the promotion of the economic and civil development of the communities of reference. The DUPs, while declining the theme of environmental sustainability and the risks associated with CC in the territories, do not yet introduce the specific objective of the impact of the CC on the ICH and do not yet present references that connect the perspective of intervention on the contexts urban historians also to safeguard the identity and tradition events that take place there.

c. **Stakeholders in the tourist and commercial sectors (Pro Loco, tourist boards, shopkeepers, merchants**) have greatly complained about the risk associated with the likelihood of the Festivals being suspended in the event of adverse weather phenomena. Festivals, in fact, constitute elements of great interest and tourist attraction especially for small and medium-sized Italian cities, far from the large tourist flows attracted to Italy by more consolidated destinations and cities of art. The thousands of visitors to the Festivals produce undoubted benefits for all businesses and reception facilities as well as a concrete promotion of the entire territory, on a cultural, artistic, naturalistic and food and wine level. The cities of the Network, on the occasion of the Festivals, dramatically multiply the attendance and income of everyone in all sectors, thus filling the gap with the numbers and figures of much larger and better known tourist destinations.

The fear that the symbiotic relationship between the ritual and the place, the celebration and its external spaces, could be jeopardized by critical issues linked to the climate change and no longer in an episodic manner, emerged significantly during the interviews, as well as the awareness that everyone, each in their own role, must commit themselves to highlighting the problem and to participate in the search for suitable solutions. The final objective must be the protection of the right to well-being of communities and citizens and therefore also the right to be able to continue to keep alive, in safety, a centuries-old cultural heritage that has come down to us from the past and which we have a duty to protect.

The theme of the effects of CC on ICH: the scientific debate, dissemination in the media, institutional approaches. (Notes by the Network of big shoulder-borne processional structures.)

A result that clearly emerges from the interviews to experts from universities and research centers who interact with the technical-scientific coordination and with the community of the Network of festivals of big shoulder-borne processional structures is that, with reference to CC, it is very important – for the planning and management of fragile cultural resources – to

involve community members and their intangible values in the processes. If, in fact, there is a general acceptance of the inevitability of CC, the need emerges to define systemic and transversal interventions that can help to guarantee the transition of the meanings of heritage from a *tangible resource* to an *intangible value* and the one-to-one correspondence between these two elements.

The question is raised, above all, in relation to the need to counteract the effects of the CCs with good practices of urban resilience, through the study of the impacts of extreme climatic phenomena on cities and the identification of strategies and solutions for adaptation to the main climate criticalities with an impact on urban areas: **heat domes, extreme rainfalls, gusts of wind**. While all the interviewees in this category share a holistic approach to intervention that can link the issues of climate resilience to those of urban regeneration with objectives related to sociality, accessibility, liveability and safety —public space as a place for collective meeting of the local community – no one has spontaneously linked the effects of climate change to the negative impacts on the ICH.

So, the topic in question has not yet become a focal point of systematic study for scientific research. On the other hand, even the media, which normally provide narratives related to the cultural value of intangible heritage and, above all, to their ability to "attract tourist flows to the territories", do not deal with the problem of the impact of the CC on the intrinsic value of the heritage.

We find the same type of approach in the local tourism bodies and Pro Loco, which are still far from the state of alarm shared by the experts of intangible cultural heritage.

On the contrary, UNESCO has launched a global data collection campaign since 2022 which aims to identify the critical issues and impacts on the vitality of ICH. It also recently reactivated the international assistance mechanism that is at the heart of the 2003 Convention, as it allows for an effective and sustainable way of safeguarding intangible cultural heritage. This mechanism provides dedicated financial and technical resources to the States parties to the 2003 Convention for the implementation of a wide range of projects for the safeguarding of intangible cultural heritage, which could certainly be aimed at the heritages at risk because of adverse climatic conditions.

However, the problem has not yet been dealt with by the Italian institutions that deal with the protection of UNESCO intangible heritage.

It is clear that the capacity to deal with the problems caused to ICH by CC – more evident and immediate among the elements of agricultural production and, more generally, of the relationship between man and nature, as well as ritual events and festivals with reference to the material spatiality of the places in which they are created – is closely linked to processes of knowledge and awareness that should also be extended to the stakeholders of this type of heritage. The possibility of the "disappearance" of these elements in situations at risk is closely linked to the abandonment of places by communities or to the interruption of transmission from generation to generation, which leads to the possible suspension of collective festive events, rituals, of social customs due to force majeure, among which the consequences of the effects of CC must certainly be counted.

The Network of big shoulder-borne processional structures, in all its components, at the conclusion of this research, decided to include the topic among those that will be dealt with during the international conference, which will be organized at the end of 2023 in Viterbo on the occasion of the tenth anniversary of the recognition UNESCO of the celebrations of the Network and of the twentieth anniversary of the 2003 UNESCO Convention for the safeguarding of the intangible cultural heritage.

3. Publications and other additional information

Research bibliography

1. ICOMOS (2019). *Future of Our Pasts: Engaging Cultural Heritage in Climate Action.* Available at:
2. https://www.icomos.org/en/77-articles-en-francais/59522-icomos-releases-future-of-our-pasts-report-to-increase-engagement-of-cultural-heritage-in-climate-action
3. ICSM CHC (2021). *White Paper I: Intangible cultural heritage, diverse knowledge systems and climate change*. Available at: https://openarchive.icomos.org/id/eprint/2717/
4. IPCC (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability, Summary for Policymakers.* Available at: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryVolume.pdf
5. UNESCO (2022). *Operational Directives for the implementation of the Convention for the Safewarding of the Intangible Heritage*, Chapter VI *Safeguarding intangible cultural heritage and sustainable development at the national level*. Available at: https://ich.unesco.org/en/directives
6. UNESCO (2022). *Safeguarding intangible cultural heritage and climate change.* Rabat: Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage, 17th Session. Available at: https://ich.unesco.org/doc/src/LHE-22-17.COM-13-EN.docx
7. UNESCO (2022). *Surveys on thematic initiatives under the 2003 Convention.* UNESCO Intangible Cultural Heritage. Available at: https://ich.unesco.org/en/surveys-on-thematic-initiatives-01277
8. UNESCO (2021). *Medium-Term Strategy for 2022-2029 (41 C/4)*. Krakov: UNESCO 41st General Conference. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000378083
9. UNESCO (2021). *Decision of the Intergovernmental Committee: 15.COM 8, 16th Session of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage.* Available at: https://ich.unesco.org/en/Decisions/15.COM/8
10. UNESCO (2021). *Decision of the Intergovernmental Committee: 16.COM 5.b, 16th Session of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage.* Available at: https://ich.unesco.org/en/Decisions/16.COM/5.b
11. UNESCO (2020). *Operational principles and modalities for safeguarding intangible cultural heritage in emergencies*. Paris: ICH UNESCO General Assembly. Available at: https://ich.unesco.org/en/operational-principles-and-modalities-in-emergencies-01143
12. UNESCO (2019). *Annex of Operational principles and modalities for safeguarding intangible cultural heritage in emergencies*. Bogota: Decision of the Intergovernmental Committee 14.COM 13, 14th session. Available at: https://ich.unesco.org/en/14com
13. UNESCO (2019). *Expert meeting on intangible cultural heritage in emergency. Paris: UNESCO*. Available at: https://ich.unesco.org/en/events/expert-meeting-on-intangible-cultural-heritage-in-emergencies-00718
14. UNESCO (2015). *Ethical Principles for Safeguarding Intangible Cultural Heritage*. Namibia: Intergovernmental Committee for the safeguarding of intangible cultural heritage, 10th session. Available at: https://ich.unesco.org/en/ethics-and-ich-00866
15. UNESCO (2013). *Celebrations of big shoulder borne processional structures*. *Lists of Intangible Cultural Heritage and the Register of good safeguarding practices.* Available at: https://ich.unesco.org/en/RL/celebrations-of-big-shoulder-borne-processional-structures-00721

16. UNESCO (2013). *Celebrations of big shoulder borne processional structures*. Available at: https://ich.unesco.org/en/lists?multinational=3&exemplary=1&display1=inscriptionID#tabs
17. UNESCO (2013). *Celebrations of big shoulder borne processional structures*. *Report of the Subsidiary Body on its work in 2013 and examination of nominations for inscription on the Representative List of the ICH of Humanity.* Available at: https://ich.unesco.org/doc/src/ITH-13-8.COM-8+Add.2-EN.doc
18. United Nations (2017). *United Nations Security Council Resolution 2347*. Available at: https://www.un.org/securitycouncil/s/res/2347-%282017%29

Press

(2021, December 1). *UNESCO World Heritage Sites: Celebrations of big shoulder borne processional structures*. Youtube.com. Available at: https://www.youtube.com/watch?v=VZNvveJlAWg

Other resources

1. *Central Institute for Catalogue and Documentation*. Available at: http://www.iccd.beniculturali.it/it/150/archivio-news/410/le-feste-delle-grandi-macchine-a-spalla-iscritte-nella-lista-rappresentativa-del-patrimonio-immateriale-dell-umanità
2. *CNIU-Italian National Commission for UNESCO*. *Festival of celebrations of big shoulder borne processionale structures*. Available at: https://www.unesco.it/it/PatrimonioImmateriale/Detail/383
3. *Ministry of Culture, Italy*. Available at: https://www.beniculturali.it/sitiunesco

Other resources on the UNESCO Convention for the Safeguarding of the ICH

1. UNESCO (2022). *Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage Operational Guidelines.* UNESCO website.
2. UNESCO (2021). *World Heritage List Statistics.* UNESCO website.
3. UNESCO (2019). *Dive into Intangible Cultural Heritage*. UNESCO website.
4. UNESCO (2017b). *Intergovernmental Committee, Decision 12.COM 11.B.19.* UNESCO website.
5. UNESCO (2016a). *Intergovernmental Committee, 10.B.17.* UNESCO website.
6. UNESCO (2013). *Intergovernmental Committee, Decision 8.COM 8.10*. UNESCO website.
7. UNESCO (2010). *Mission and mandate.* UNESCO website.
8. UNESCO (2009). *Intergovernmental Committee, Decision 4.COM 13.70*. UNESCO website.
9. UNESCO (2008c). *Operational Directives for the Implementation of the Convention for the Safeguarding of the Intangible Cultural Heritage*. UNESCO website.
10. UNESCO (2008a). *Intergovernmental Committee for Safeguarding of the Intangible Cultural Heritage*. UNESCO website.
11. UNESCO (2007). *Traditional Craftsmanship*. UNESCO website.
12. UNESCO (2006). *Knowledge and practices concerning Nature and the Universe.* UNESCO website.
13. UNESCO (2005). *Living Human Treasure: a former programme of UNESCO.* UNESCO website.
14. UNESCO (2003c). *Second session of the Intergovernmental Meeting of Experts on the Preliminary Draft Convention for the Safeguarding of the Intangible Cultural Heritage*. UNESCO website.
15. UNESCO (2003b). *Intangible Heritage Domains in the 2003 Convention*. UNESCO website.

16. UNESCO (2003a). *Convention for the Safeguarding of the Intangible Cultural Heritage*. UNESCO website.
17. UNESCO (2002e). *International Meeting of Experts, Intangible cultural Heritage: Priority Domains for an International Convention*. UNESCO website.
18. UNESCO (2002d). *Second Meeting of the Select Drafting Group preliminary draft international convention on intangible cultural heritage, Meeting Report*. UNESCO website.
19. UNESCO (2002c). *Preparation of a preliminary draft International Convention on the Intangible Cultural Heritage, Meeting of the "Restricted Drafting Group" (RDG)*. UNESCO website.
20. UNESCO (2002b). *Select Drafting Group on the first draft of international convention for intangible cultural heritage*. UNESCO website.
21. UNESCO (2002a). *Meeting Report- Report of Sub-group 3 on General Review of the Working Draft Text, Second Meeting of the Select Drafting Group, Preliminary Draft International Convention on Intangible Cultural Heritage.* UNESCO website.
22. UNESCO (2001a). *Action Plan for the safeguarding of the ICH as approved by the international experts on the occasion of the International Round Table on 'Intangible Cultural Heritage – Working Definitions*'. UNESCO website.
23. UNESCO (1989). *Recommendation on the Safeguarding of Traditional Culture and Folklore,* UNESCO website.
24. UNESCO (1972). *Convention concerning the Protection of the World Cultural and Natural Heritage*. UNESCO website.
25. UNESCO (1966). *Declaration on the Principles of International Cultural Cooperation.* UNESCO website.
26. UNESCO (1945). *Constitution of the United Nations Educational, Scientific and Cultural Organisation.* UNESCO website.

4. Informants, experts, date of interview

1. *Intangible cultural heritage bearer/practitioner for the Element. The date of your interview is 19.06.2023*
   Community of Viterbo: Massimo Mecarini, Sodalizio dei Facchini di Santa Rosa President
   Community of Sassari: Fabio Madau, Intergremio Città di Sassari President
   Community of Palmi: Marialuisa Lovecchio, Sodalizio della Varia di Palmi President
   Community of Nola: Luca De Risi, GRAMAS-Grandi Macchine a spalla President

2. *Government official/employee (date 20.06.23)*
   Municipality of Viterbo: Cristina Pallotta, Chief Press Office
   Municipality of Sassari: Anna Maria Piras, Tourism Office, Department of Culture
   Municipality of Palmi: Antonello Scarfone, Chief Technical Office, Department of Urban Planning
   Municipality of Nola: Cabinet of the Mayor

3. *University staff/researchers/experts*
   Maurizio Francesco Errigo, Department of Planning and Technology of Architecture, Sapienza University of Rome
   Saverio Carillo, Department of Architecture, University of Campania,
   Fabio Sbattella, Psychological skills and crisis management, Università Cattolica di Milano
   Pietro Petraroia, Member of ICOM, CEO of "Cultura Valore srl"
   Francisco Javier Lopez Morales, WHE UNESCO-World Heritage ICH Expert

Fabio Madau, Assistant Professor (senior) in Agricultural Economics and Policy, University of Sassari

4. *NGO*
   Gabriele Desiderio, Author at ICH NGO Forum and UNPLI-Unione Pro Loco d'Italia

5. Contributors

This study was prepared by CUEBC: Patrizia Nardi, Eugenia Apicella, Monica Valiante.

4.11. CS11 Lamprey Fishing and Preparation Skills in Carnikava (Latvia)

1. ICH element

Title in English
Lamprey Fishing and Preparation Skills in Carnikava

Title in Latvian
Nēģu ķeršanas un apstrādes prasmes Carnikavā

National Inventory of ICH
https://nematerialakultura.lv/en/Elementi/negu-kersanas-un-apstrades-prasmes-carnikava-2019/ (since 2019)

A brief description
Tradition. River lampreys populated Northern Europe soon after the end of the Ice Age. In western Latvia, a unique Late Mesolithic or Neolithic bone tool in the form of a stylized lamprey was found in the Užava River. It was probably used to clean fish and lampreys, indirectly indicating that lampreys were already being fished in Latvia 6,000-8,000 years ago (Bērziņš 2018: 5-12). Although there is no direct evidence of lamprey fishing in Latvia in prehistoric times, as the cartilage that makes up lamprey skeleton does not survive in cultural layer, archaeologists assume that at least some of the Stone Age settlements located on riverbanks were established in favourable lamprey fishing locations (Bērziņš 2018: 17). In historic times, such a location was Carnikava, a village with a centuries-old history, first mentioned in the written sources in 1211 (Heinrici Chronicon 1993). The location of the village at the mouth of the Gauja River has contributed to the village's economic development, and lamprey and salmon fishing has played a major role in this, as fishing has been one of the basic occupations of villagers for centuries. This natural resource has allowed the development of local fishing traditions (Cimermanis 1964), specific vocabulary and beliefs related to fishing (Ligers 1944) as well as lamprey processing and cooking traditions. Due to this specialization Carnikava has been considered Latvia's "lamprey capital" at least since the beginning of the 20th century. Realizing the value of these traditional skills and knowledge, as well as their potential in the tourism industry, the local community and municipality have since the beginning of the 21st century promoted the preservation and recognition of this tradition. In 2009, State Heraldry Commission approved the coat of arms of Carnikava municipality with an image of a lamprey (Ģerboņi). In 2015, *Carnikava lamprey was* added to the European Union register of "*Protected geographical indications"* (PGI Carnikavas nēģi). In 2019, Lamprey Fishing and Preparation Skills in Carnikava was included in Latvia's list of intangible cultural heritage (Nemateriālais kultūras mantojums).

Species. The European River lamprey (*Lampetra fluviatilis*) is a jawless fish-like species of agnathans (the most primitive group of extant vertebrates) found in a wide range across Europe from Finland in north-east to Ireland and Spain in west. It is an anadromous species, which means that adult lampreys, after reaching sexual maturity, migrate from the sea to rivers for spawning in autumn and winter. After spawning, which is most active in spring, they die. After hatching, the lamprey larvae spend 3–6 years in the riverbed sediment. When they grow up, they migrate to the sea, where they reach sexual maturity in 1–3 years and then return to the rivers for spawning (Putnis 2022). Unlike salmon, another anadromous fish, river lampreys do not have a homing instinct that would make them return to their native river for spawning. When migrating from the sea to rivers, lampreys follow freshwater inflows into the sea (Kaspars Abersons, interview).

Geographical coordinates
57.12850, 24.29179
Carnikava, Ādaži municipality, Latvia

2. CC risks and effects

The tradition of river lamprey fishing is directly related to the specific life cycle and the population sustainability of this agnathan. Along with various anthropogenic and environmental factors, lamprey life cycle and population sustainability are also affected (or could potentially be affected) by CC driven by rising air temperatures and changes in precipitation patterns. Wang et. al. 2021 state that "evidence supports the likelihood that climate change will affect the physiology and phenology of lampreys as well as their distribution and contributions to communities and ecosystems. However, when considering their length of time on the planet, evolutionary history resulting from that time, multitude of life history expressions and range of distribution, it is possible that lampreys may be relatively resilient to climate change." However, the question remains whether lamprey fishermen will also be able to adapt to the changes that lampreys will probably adapt to.

The following are examples of CC that affect lampreys and lamprey fisheries either now or potentially in the future:

1. Rising freshwater temperature;
2. Changed freeze / thaw cycles;
3. Loss of seasonal sea ice;
4. Changes in the distribution and behaviour of animal species.
5. Rising air temperature (secondary: extended water tourism season)

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

Community representatives link fishermen, lamprey bakers and local people interested in preserving this intangible cultural heritage to the community, including the staff of the Local History Centre. The community is based on families, also referred to as dynasties in the interviews. Their ancestors are lamprey fishermen, and the skills are passed on within the family. Therefore, both ICH bearers and practitioners and the local community are considered as a whole. This group emerged in the interviews as homogeneous, representing the same views. In their application for the National Intangible Cultural Heritage List, they mention that the greatest threat is the decline of the lamprey population. The main threats to lampreys are pollution of rivers and sea waters, dams, poachers, and climate change (hereinafter – CC). Sorted by the impact of CC, the problems indicated by tradition practitioners and local community are as follows:

1. Loss of seasonal sea ice and
2. Changes in the distribution and behaviour of animal species.

The primary issue that emerges from the community interviews is climate warming and loss of seasonal sea ice in winter which, as it has been observed by local fishermen, allows grey seals (*Halichoerus grypus*) to stay in the Gulf of Riga all year round, including the lamprey fishing period in winter. They also stress that the population of grey seals (*Halichoerus grypus*) is increasing. The seals have specialised to eat lampreys from the nets, including artificially regenerated baby lampreys. One fisherman said: "You can forget about sea fishing because if you put a riser in the sea, the seals swim there like to a restaurant." Invasive species from warmer regions are moving into Latvia, affecting the native species, and reducing their populations. Biologists generally agree with this point of view, stating that lampreys of all life history strategies have unique relationships with other species and the communities to which

they belong. At every stage, lampreys are prey for other fishes, birds, and mammals. Though many changes in species interactions due to CC have not been specifically studied for lampreys, physiological and phenological changes throughout their life cycles and shifts in distribution have the potential to greatly affect interactions with other species and community composition (Wang et. al. 2021: 194). At the same time, assessing the situation in Carnikava, local biologists do not consider this to be a serious problem. In the case of Carnikava, the changed behaviour of seals is currently affecting the lamprey fishing tradition, while it does not significantly affect the lamprey population.

3. Changed freeze / thaw cycles

The warming climate is causing frequent winter thaws, rapid temperature fluctuations and ice in rivers at unusual times, which is severely hampering or limiting lamprey fishing. The fisherman said that the seasons have changed completely. In his opinion, natural processes have deviated by about two months. It was also highlighted as a minor problem that the traditional beliefs and weather forecasting used by fishermen no longer work. There was a saying in Carnikava: "When the rye is piled, the lampreys are in the traps." However, due to CC impact, traditional knowledge no more corresponds to reality. Biologists also consider changed freeze and thaw cycles one of the most serious threats to the natural regeneration of the lamprey population, but with a different explanation. As a result of climate warming, the spring flood season begins already in winter, i.e., during the lamprey migration and spawning season. Although there are no large hydroelectric power stations in the Gauja, there are several in the Daugava, whose mouth is only 17 kilometres from the Gauja. During the flood season, the hydroelectric power stations on the Daugava operate at an increased rate, causing a greater influx of fresh water into the sea, potentially drawing migrating lampreys from the Gauja to the Daugava. The first hydroelectric power station on the Daugava is only 30 km from its mouth, and the riverbed in this section of the Daugava is not suitable for successful lamprey larvae development. Thus, lampreys spawning in the Daugava are not productive, which affects the population decline.

4. Rising air temperature (secondary: extended water tourism season)

As a result of climate warming, the number of warm days in summer increases, and the water tourism season is extended. The Gauja, where lampreys begin migration up the river, is a popular tourist destination, so swimming, rafting, or jet skiing on the river potentially disrupts lamprey migration. The Gauja is a shallow river, so it provides no place for fish to hide from tourists and their boats.

Less to do with CC, but also because there are fewer fishermen. Five years ago, there were 23 fishermen in Carnikava, now there are five. Community representatives also highlighted inappropriate legislation, which specifies the gears that can be used, but which are not the most appropriate for the current conditions. In other words, as fishing conditions change, the gears allowed should be adapted more rapidly.

In summary, the main climate problem is climate warming and unpredictability, which has a major impact on the lamprey fishery.

Officials responsible for the ICH safeguarding

The lamprey fishing and preparation tradition in Carnikava particularly has not been associated with CC risks and problematised in the context of the CC by the officials responsible for the ICH safeguarding in Latvia. However, the representatives of the Latvian National Centre for Culture are participating in the international LIVIND – Creative and living cultural heritage as a resource for the Northern Dimension region project (2021-2023) uniting partners from nine countries in the Northern Dimension area, the Nordic autonomous regions, and the Sámi. The project strengthens the role of ICH as a resource for the sustainable development of local communities addressing, among other things, the CC issues. Thus, the awareness of the

possible CC effects upon the ICH has been raised at the level of the experts and will be provisionally shared with a wider audience.

On February 15, 2023, an interdisciplinary seminar titled "Climate, Culture and Quality of Life" took place in Riga gathering Latvian and foreign experts specialising in culture and natural sciences, policy planners and cultural heritage professionals to discuss the challenges raised by CC and the role of culture in solving these challenges. The seminar was organised by the Latvian National Commission for UNESCO, the National Heritage Board of Latvia and ICOMOS Latvia together with the Education, Culture and Science Committee of the Saeima (the Parliament of the Republic of Latvia), the Social and Employment Matters Committee of the Saeima, the National Library of Latvia, the French Institute in Latvia, and the Faculty of Geography and Earth Sciences of the University of Latvia.

Other: journalists

When addressing the issue of lamprey population decline, it is mostly discursively seen as an economic loss, less often as a biodiversity risk. Carnikava is referred to *as the kingdom or capital of lampreys*, emphasising the anthropocentric view of human-nature relations, blaming nature (hot, dry summers; warm waters etc.) for making fishing conditions difficult, but not linking CC to human actions that contribute to it. Lamprey fishing is seen as a place-based tourist attraction, lampreys – as a culinary delicacy in the context of culinary heritage.

The public media mainly view lampreys in the context of the climate, putting the status of the species and its habitats at the forefront. However, regional media mostly focus on the economic aspect of lampreys as a culinary heritage and a species in the context of the family business and regional tourism.

Main spokespersons for the lamprey fishing are fisherman families raising economic aspects and tradition existence aspect, but for the lamprey as specie, researchers from environmental research and protection institutions, raising biological diversity issue.

Other: scientists

Apart from the previously described problems identified by Carnikava lamprey fishermen and community, another important CC impact is mentioned in the international scientific debate, rising (fresh)water temperature. Although this problem has not yet been observed in Carnikava, a further rise in air temperature could bring it to the fore. Rising freshwater temperature causes or could cause negative impact on lampreys in several ways: (1) The embryonic stage of lampreys is incredibly sensitive. Increased incubation temperatures may have a delayed effect after hatching, where survival to the burrowing stage appears to have a negative relationship with temperature; (2) Water temperature and flow can also influence the growth of adult lampreys. Water temperature and river discharge are generally believed to be major factors influencing the activity of sea lamprey and European river lamprey; (3) Water temperature may be particularly important to lamprey spawning, e.g., in European river lamprey, temperature was found to have a negative relationship with sperm production and also influenced ovulation (Wang et. al. 2021: 189–191).

4. Existing practices: solutions implemented, planned or proposed

Community level

The community of Carnikava is mainly involved in promoting tradition, especially through the prism of culinary heritage. Since 2001, it has held an annual Lamprey festival in August to mark the start of the lamprey fishing season. The festival includes an artisans' market, a procession, sports activities, a boat parade, a concert, a lamprey fast-eating competition, and the boiling of Carnikava's lamprey soup in a 400-litre pot. It should be mentioned here that if there is not

enough of its own lampreys for the festival, they buy them from Lithuania. Thus, keeping the tradition alive. The lamprey as a brand is widely used in Carnikava tourism. Tourist companies organise 'lamprey trips', the most active fishermen run 'Lamprey lessons' at the Local History Centre to introduce the tradition and inform about problems. Lamprey tastings are also available. Fishermen also go on exchange trips to Scandinavian countries and elsewhere to educate the local communities and local authorities here.

The community also raises the issue of declining catches, disruption to the fishing process because of CC as it affects their business and profits. Also, when artificially reared juvenile lampreys are released back into the river, fishermen are involved in the process because it is important to them that the juveniles are released as successfully as possible so that the overall population does not decline.

Municipality level: Lamprey Festival in Carnikava

Since 2001, the municipality of Carnikava has been organising the Lamprey Festival to promote the tradition of lampreys as a culinary heritage. It is celebrated annually in August to mark the opening of the lamprey fishing season. The annual Lamprey Festival is used to position the local community in the wider society as the custodians of intangible cultural heritage and the continuators of the lamprey fishing tradition. However, due to the scarcity of lampreys, fish from a neighbouring country Lithuania is sometimes served at festivals to maintain it and interest from tourists attending the event.

National and local authority level: legal framework

Industrial fishing of lamprey is regulated at the national level, in response to limited fish resources and for securing their sustainability. These regulations are revised and amended according to the needs identified through scientific monitoring of fish resources. Therefore, although industrial fishing regulations do not directly address the impact of CC, their eventual amendments can be grounded in data and considerations that reflect such present or future impact.

According to the Fishery Law (Parliament of the Republic of Latvia, 1995), its Section 11. Industrial Fishing, part (4^1), "the total limit for the amount of catch, the limit for the amount of catch for certain fish species and the limit for the number of fishing gear in distribution by water bodies in inland waters of the Republic of Latvia and the procedures for use thereof shall be determined by the Cabinet [of Ministers]". In 2014 the Cabinet of Ministers issued "Regulations on the limits of industrial fishing and their use in inland waters". According to these Regulations, point 4.1., in waters where fishing rights belong to the State, it is up to respective municipalities to distribute these limits to fishers (individuals or legal entities) and to sign contracts on the lease (Latv. *noma*) of industrial fishing rights. Municipalities are responsible for doing so according to a set of principles defined in these same Regulations, point 7. Annex 6 of these Regulations define the limits for lamprey fishing, which in river Gauja consist of altogether 122 fish pots (Latv. *murds*), with additional 2 fish pots in a distinct section of the river, on temporary basis until the end of 2024.

Furthermore, the definition and use of fish pots and other fishing tools for lamprey fishing is stipulated through "Regulations on industrial fishing in inland waters" adopted by the Cabinet of Ministers in 2007.

In the case of lamprey fishing in river Gauja, the municipality of Carnikava lately leased industrial fishing rights on 26.05.2021. (Protocol No. 9, 15.§) for a five year period. Such rights were leased to two locally operating legal entities for industrial fishing, whereas fishing rights have been refused to two individuals for private consumption purposes. The decision was based on the principle of priority to be given to commercial fishing, as far as existing limits were used. The pay for leasing fishing rights is decided at the level of the Cabinet of Ministers ("Regulations on the lease of industrial fishing rights and on the use of fishing rights" issued in

2009), delegating the functions of administration to municipal level. Following the named regulations 30% of the pay received by the municipality is transferred to the national level Fish Fund, whereas 70% remain at the disposal of the municipality, in a special account. Part of this municipality income is used for artificial regeneration of the lamprey population, in cooperation with the laboratories of the Institute of Food Safety, Animal Health and Environment "BIOR". According to an interview with local government representatives, the municipality, in turn, invests in sustaining the tradition of lamprey fishing in Carnikava through encouraging local fishers to prepare projects and apply for funding, as well as through financially supporting local annual lamprey festival (interrupted over the years of the Covid-19 pandemic) and the respective activities of local cultural institutions.

As for national policies with regard to global CC, it has been the responsibility of the Ministry of Environmental Protection and Regional Development to advance policy-making and implementation in this field. Recently, this competence is being gradually taken over by the newly established Ministry of Climate and Energy, a process still in transition. The National plan on the adaptation of Latvia to climate change till 2030 has been developed and adopted by a decree of the Cabinet of Ministers in 2019. Risks to fisheries caused by CC are stated therein, research-based monitoring of fish resources planned, and financial instruments for adaptation are envisaged. Special funding is planned for municipalities to adapt to CC, with funding planned to start with the year 2024 (Ministry of Environmental Protection and Regional Development 2023). As stated by a community representative in an interview, while awaiting the upcoming project calls, local fishers in Carnikava in cooperation with the municipality are planning to apply for funding to secure the sustainability of their traditional lamprey fishing practice.

EU level: geographical indication

Having regard to Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs, European Commission adopted a regulation (EU) 2015/269 of 13 February 2015 registering a name of a protected geographical indication "Carnikavas nēģi" (European Commission 2015). According to the application for such a registration, lamprey fishing is still based on "age-old traditions passed down from generation to generation regarding optimum fishing spots, the habits of lampreys and the influence of weather conditions on their behavior". This registration means the attribution of EU label and an exclusive right to the use the name „Carnikavas nēģi" for "river lampreys (*Lampetra fluviatilis*) caught in a specific region — the river Gauja in Carnikava municipality — and during a specific time period (from 1 August to 1 February)", both fresh lampreys and cooked lampreys in aspic (European Council 2014). It became the first such registered protected geographical indication from Latvia.

5. Publications and other additional information

Research bibliography

1. Bērziņš, V. (2018). *A Figurally Sculpted Bone Knife from the River Užava (Western Latvia) and the Invisible Lampreys of Prehistory*. Latvijas Vēstures Institūta Žurnāls. No. 2 (107). Pp. 5–25. DOI: http://doi.org/10.22364/lviz.107.01
2. Cimermanis, S. (1964). Nēģu zveja Carnikavā 19. gs. otrajā pusē un 20. gs. (Lamprey fishing in Carnikava in the second half of the 19th century and the 20th century). *Arheoloģija un etnogrāfija. Rakstu krājums VI*. Rīga: Latvijas PSR Zinātņu akadēmijas izdevniecība. 161.–178. lpp.
3. Ģerboņi (Coats of arms). Available at: http://gerboni.kulturaskarte.lv/emblem/details/1374

4. Heinrici Chronicon (1993). *Heinrici Chronicon / Indriķa hronika*. Ā. Feldhūna tulkojums. Ē. Mugurēviča priekšvārds un komentāri. Rīga: Zinātne.
5. Ligers, Z. (1944). *Latviešu tautas kultūra: etnogrāfiski pētījumi* (Latvian folk culture: ethnographic studies). II sēj. Rīga: [autora izdevums]
6. Nemateriālais kultūras mantojums (Intangible cultural heritage). Available at: https://nematerialakultura.lv/Elementi/negu-kersanas-un-apstrades-prasmes-carnikava-2019/
7. Putnis, I. (2022). Zivis Latvijā (Fish in Latvia). *Nacionālā enciklopēdija.* Available at: https://enciklopedija.lv/skirklis/7272
8. Wang, Ch., Hudson, J. M., Lassalle, G., Whitesel, T. (2021). Impacts of a changing climate on native lamprey species: From physiology to ecosystem services. *Journal of Great Lakes Research*, No. 47, pp. S186-S200. Available at: https://hal.inrae.fr/hal-03353869/document

Press

1. (2020, October 20). *Par nēģu nelikumīgu zveju – piespiedu darbs un 3480 eiro atlīdzināšana* (For illegal fishing of lampreys – forced labour and €3,480 compensation). Lsm.lv. Available at: https://www.lsm.lv/raksts/zinas/latvija/par-negu-nelikumigu-zveju--piespiedu-darbs-un-3480-eiro-atlidzinasana.a378656/
2. (2016, August 16). *Lamprey numbers shrink in Latvia's rivers*. Eng.lsm.lv. Available at: https://eng.lsm.lv/article/society/society/lamprey-numbers-shrink-in-latvias-rivers.a196534/
3. (2015, February 20). *Carnikava lampreys win EU Protected Designation*. Eng.lsm.lv. Available at: https://eng.lsm.lv/article/economy/economy/carnikava-lampreys-win-eu-protected-designation.a118712/
4. Griškeviča, U. (2018, December 6). *Carnikavas nēģu kādam laikam pietiks* (Carnikava's lampreys will last for a while). Aprinkis.lv. Available at: https://www.aprinkis.lv/index.php/sabiedriba/dzive-un-ticiba/4907-carnikavas-negu-kadam-laikam-pietiks
5. Kropa-Kaļužnaja, S. (2020, October 20). *Siltais klimats nēģus nārstā uz upēm vilina vēlāk* (Warm climate lures lampreys to rivers to spawn later). Lsm.lv. Available at: https://www.lsm.lv/raksts/dzive--stils/vide-un-dzivnieki/siltais-klimats-negus-narsta-uz-upem-vilina-velak.a378636/
6. Matisone, G. (2019, June 18). *Carnikavieši satraucas par nēģu un nēģu zvejnieku amata iznīkšanu* (Carnikavians worry about the disappearance of lampreys and lamprey fishermen). Lsm.lv. Available at: https://www.lsm.lv/raksts/zinas/latvija/carnikaviesi-satraucas-par-negu-un-negu-zvejnieku-amata-izniksanu.a322768/
7. *List of publications about lampreys in Latvia on public media* (in Latvian). Available at: https://www.lsm.lv/meklet/?search_q=nēģis#gsc.tab=0&gsc.q=nēģis&gsc.page=1
8. *The traditional "Lamprey Festival" takes place by the seaside in Carnikava village* (photos). BalticTravelNews.com. Available at: https://baltictravelnews.com/?view=view_images&g_uid=5756&img_id=131866

Legal and policy sources

International

1. EU (2015). Carnikavas nēģi. Protected Geographical Indication. *EU geographical indications register*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32015R0269#ntc1-L_2015047EN.01000701-E0001
2. European Council (2014). Regulation (EC) No 510/2006 on the protection of geographical indications and designations of origin for agricultural products and

foodstuffs 'Carnikavas nēģi'. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0926(07)&from=NL

National

1. Parliament of the Republic of Latvia, Saeima (1995). *Fishery Law*. Available at: https://likumi.lv/ta/en/en/id/34871-fishery-law
2. Ministru kabinets (Cabinet of Ministers) (2007). *Noteikumi par rūpniecisko zveju iekšējos ūdeņos* (Regulations on industrial fishing in inland waters). Available at: https://likumi.lv/ta/id/156708-noteikumi-par-rupniecisko-zveju-ieksejos-udenos
3. Ministru kabinets (Cabinet of Ministers) (2009). *Noteikumi par ūdenstilpju un rūpnieciskās zvejas tiesību nomu un zvejas tiesību izmantošanas kārtību* (Regulations on the lease of industrial fishing rights and on the use of fishing rights). Available at: https://likumi.lv/ta/id/196472-noteikumi-par-udenstilpju-un-rupnieciskas-zvejas-tiesibu-nomu-un-zvejas-tiesibu-izmantosanas-kartibu
4. Ministru kabinets (Cabinet of Ministers) (2014). *Noteikumi par rūpnieciskas zvejas limitiem un to izmantošanas kārtību iekšējos ūdeņos* (Regulations on the limits of industrial fishing and their use in inland waters). Available at: https://likumi.lv/ta/id/271238-noteikumi-par-rupnieciskas-zvejas-limitiem-un-to-izmantosanas-kartibu-ieksejos-udenos
5. Ministru kabinets (Cabinet of Ministers) (2019). *Par Latvijas pielāgošanās klimata pārmaiņām plānu laika posmam līdz 2030. gadam* (National plan on the adaptation of Latvia to climate change till 2030). Available at: https://likumi.lv/ta/id/308330-par-latvijas-pielagosanas-klimata-parmainam-planu-laika-posmam-lidz-2030-gadam
6. Vides aizsardzības un reģionālās attīstības ministrija (Ministry of Environmental Protection and Regional Development) (2023). *Pašvaldību pielāgošanās klimata pārmaiņām* (Adaptation of municipalities to climate change). Available at: https://www.varam.gov.lv/lv/pasvaldibu-pielagosanas-klimata-parmainam?utm_source=https%3A%2F%2Fwww.google.com%

Other resources

1. *Seminar "Climate, Culture and Quality of Life"* (2023, February 15): Part I-III. Available at: https://www.youtube.com/watch?v=pyrYgvwrSS8&ab_channel=unescovideo https://www.youtube.com/watch?v=fAGnmY6R0Ok&t=5s&ab_channel=unescovideo https://www.youtube.com/watch?v=c-QCRmZM3RQ&ab_channel=unescovideo
2. *Project LIVIND Creative and living cultural heritage as a resource for the Northern Dimension region* (2021-2023). Available at: https://www.aineetonkulttuuriperinto.fi/en/livind

6. Informants, experts, date of interview

- Kaspars Abersons, ichthyologist, researcher of the Institute of Food Safety, Animal Health and Environment BIOR. 24.04.2023.
- Agrita Briede, climatologist, Professor at University of Latvia, Director of the master's study programme "Geography". 24.04.2023.
- Dace Gaile, climatologist, Head of the Climate and Numerical Modelling Division of Latvian Centre for Environment, Geology and Meteorology. 26.04.2023.
- Jānis Galakrodznieks, Carnikava Tourism Information Specialist, Synoptist. 27.03.2023.
- Raimonds Garenčiks, former Executive Director of Carnikava City Council. 27.04.2023.
- Artūrs Jakobsons, Fisherman of Leste Ltd. 27.03.2023.

- Genovefa Kozlovska, Vice-Chairwoman of the Ādaži Municipality Council. 27.04.2023.
- Gita Lancere, ICH expert at the Latvian National Centre for Culture. 10.05.2023.
- Dāvis Ozoliņš, expert on freshwater flowing waters of the Nature Conservation Agency, representative of the Institute of Biology of the University of Latvia. 24.04.2023.
- Olga Rinkus, Head of Carnikava's Local History Center. 27.03.2023., 27.04.2023.

7. Contributors

This study was prepared by ILFA: Kitija Balcare, Elīna Gailīte, Rita Grīnvalde, Sandis Laime, Anita Vaivade.

4.12. CS12 Skating on Natural Ice (Netherlands)

1. ICH element

Title in English
Skating on Natural Ice

Title in the original language
Schaatsen op natuurijs

National Inventory of ICH
https://www.immaterieelerfgoed.nl/en/schaatsenopnatuurijs (since July, 2017)

A brief description

Tradition
Skating on natural ice was first described in literature in the 16th century and has been extremely popular as a winter activity since the 17th century in The Netherlands as illustrated on numerous paintings from famous Dutch painters. According to Dutch skating historian Marnix Koolhaas, the Dutch enthusiasm for skating dates back centuries, though its origins are rooted more in practicality than recreation. Even the word “skate” is derived from the Dutch word “schaats”, which some believe is linked to "shank bone" and refers to how skate blades were initially made of animal bones. As sports historian Jurryt van de Vooren points out, before the era of cars and trains, ice skating in wintertime meant a physical reduction in distance, it was mainly used as a means of transport by poorer people, starting since the late Middle Ages, for example, farmers brought their products to the market on skates, but nowadays, skating has become only recreational. “Now we have cars and trains and bicycles and that kind of stuff. In the early days, we had nothing,” says Saouka de Groot, 65, whose father, Sietze, won the 1942 edition of the Elfstedentocht. “You skate from village to village. That’s how you visit family, friends.” (Maese 2019)

The first ice associations were established in the 19th century, in 1882 the Dutch Ice Skaters Union, nowadays known as KNSB (*Koninklijke Nederlandse Schaatsenrijders Bond*). Until World War II the KNSB organised competitions, the ice unions did the skating tours and the maintenance of ice roads. The first organised skating tour was in 1900, with the Alblasserdam Ice Club.

As soon as the frost comes in and flooded tracts of land and ditches, canals and pools start to freeze over, the more than five hundred natural ice clubs in the Netherlands become active. Today the KNSB with its regions, committees, associated ice clubs (about 450, with some 150,000 members) and skating tour organisers (230), form the organisational and administrative spine of skating on natural ice. Besides there are around 200 training groups for various types of competition. The local ice clubs have a major role in skating on natural ice. They organise the tours and maintain the rinks. Due to the lack of natural ice, there are artificial ice rinks. The first one artificial ice rink in the Netherlands was opened in 1934, currently there are 21 artificial ice rinks in the country.

Despite the annual competition in which club organises the first marathon on natural ice, mutual alignment among organisers of various tours takes place. There are competitions on natural ice, short track- and marathon matches. If there is no natural ice, the championships take place on artificial ice. The ice masters of the KNSB keep a close look at the growth and the quality of the ice, also for the safety of the skaters. Tours can be linked together to extra-long distances (200 km) and even lead to the historical tour named the Elfstedentocht (The Eleven Cities Ice Skating tour).

However, due to global warming, the average winter temperature has increased during the last 50–60 years and the opportunity to skate on natural ice has become rare in The Netherlands (van Lieshout & van Manen 2010). Sometimes an ice club has a combination rink: a flooded concrete container or asphalt lane, on which a few centimetres of ice are sufficient to skate on. Skating on natural ice ensures connectedness and contributes to the health of the skaters.

Geographical coordinates
53.22290, 6.59624
Groningen, The Netherlands

2. CC risks and effects

Average temperature in the Netherlands is increasing, a trend that is expected to continue even in low emission scenarios, but precipitation scenarios are more uncertain (Chen et al. 2023).

In the Netherlands an ice thickness of 7 cm is generally considered safe for skating. As for Elfstedentocht, which is core event of skating on natural ice tradition in Netherlands, at least 15 cm thick ice is required. Therefore, tour can only take place in severe winters when temperatures drop to around -10°C. Not only the temperatures but many more factors like the wind and/or snowfall are determining factors in the tour. The chance of holding a marathon is dependent on:

- maximal ice thicknesses that are not measured routinely;
- the amount of open water due to drainage or flowing under bridges;
- organizational factors delaying the decision about whether to hold a marathon,

e.g., creating “kluning” (walking on skates) facilities, and mobilizing competitive and non-competitive skaters.

Likelihood is considered a complex indicator of CC, with many uncertainties attached to it, but with a very strong public appeal too, providing an additional Dutch motive for setting climate-policy measures.

The following are examples of CC that affect tradition of skating on natural ice in Netherlands:

(1) Loss of (inland) ice
(2) Thin ice
(3) Changed freeze, thaw cycles
(4) Weather extremes
(5) Changes in wind direction
(6) Snow

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community
Skating is a common skill in Dutch families. As soon as a child learns to walk, they learn to skate. Only unlike their parents, they do it on artificial ice. “For generations, children have grown up on a pair of thin steel blades. Many still learn to skate, but they do it almost exclusively indoors. Einte Adema brought his 18-month-old daughter to the rink a few weeks back, not long after she had mastered walking.” (Maese 2019)

Even though the famous Elfstedentocht on natural ice was last open for skating in the winter of 1997, the Dutch continue to train every year to make sure they are always ready for

this skating event. “Klaas Einte Adema lugged his ice skates from car to rink to continue his training for a race that might never come: the 36-year-old has spent the better part of his adult life doing this, showing up at the rink six days a week, skating laps, honing technique and waiting for the weather to someday cooperate.” (Maese 2019)

Residents emphasise that ice-skating is an opportunity to see the surroundings from a different perspective, it is a democratic leisure activity that is accessible to all, and it is an essential part of a healthy lifestyle.

The tradition is so important that the Dutch government did not prevent people from doing it even during the Covid-19 pandemic, recognising the historical and social importance of the tradition. However, it recommends that skaters keep a 1.5 m distance and strictly follow. As the temperature is slightly warmer in cities than in the countryside, it takes longer for ice to form on the canals in the cities. However, people often fail to consider the safety risks of stepping on ice that is too thin, worrying rescue services who rush to the aid of reckless skaters who sustain various injuries. While an ice thickness of 7 cm is generally considered safe for skating, many cannot wait and take to the ice before it is fully formed, despite government warnings.

“When late December of 2008 and the beginning of January 2009, temperatures in The Netherlands dropped below 0°C and most surface waters (ponds, lakes, and canals) froze for the first time in 10 years, allowing skating on natural ice in the entire country for over a week, this resulted in millions of people of all ages (population 16 million) putting on their skates. Even offices and schools were closed to enable people to skate. However, emergency departments were flooded with patients that sustained ice skating injuries.” (van Lieshout & van Manen 2010)

Residents are concerned about the disappearance of the community. “But as he waits for an Elfstedentocht that might never come, he also knows his daughter’s childhood will be different than his own. The canals, lakes and dikes won’t turn into impromptu community gatherings. Neighbours won’t gather on the ice and mingle with soup, hot chocolate, and warm adult beverages. Not only are the people here fearful of losing a storied race, but they sense a cherished slice of their culture is melting away.” (Maese 2019)

Researchers stress not only a warming climate, but also unpredictability. For example, in May 2023, it was snowing and freezing in Europe, so the Dutch briefly took the opportunity to skate on natural ice on urban canals, rivers and ponds. “After a significant temperature drop, the Netherlands often turns into an ice-skating paradise within a few hours. When waterways, especially the country’s iconic canals, freeze over, thousands of skating enthusiasts brave the cold and head out into nature.” (Northern Times 2023)

Officials responsible for the ICH safeguarding

The Eleven Cities Ice Skating Tour is the first and the oldest skating tour passing through eleven historical cities of the Dutch province of Fryslan. Up to now 15 tours have been held, the last one on the 4th of January in 1997. Each year the Eleven Frisian Cities association fully organizes the tour on paper. The actual tour highly depends on the weather conditions. The fact that the tour is such a rare event because it needs specific conditions like a severe winter has no doubt led to its cult status. Next to that, skating a 200 km track while fighting the elements through the Frisian countryside is not an easy thing and considered to be nothing short of a heroic act. No matter whether you participate as an amateur skater or a professional one; being able to finish this tour is quite an accomplishment.

As Dutch historian Jurryt van de Vooren, who published the book “8,070 Days,” marking the long drought since the last race, points out: “The thing is, we don’t know whether it will happen, which is what makes it very big and very special. A lot of people really think that there will never be another one.” (van Oort 2021)

The Netherlands' average surface temperature increased 2.3°C between 1901 and 2020, and its rate of warming has been higher than the world average during the 20th century. Temperatures have been rising more rapidly in the spring than in winter, and the overall mean temperature is projected to be 1.4-5°C higher at the end of the century than it was during the reference period (1995-2014). Increases in summer temperatures are expected to be stronger than for other seasons. The Netherlands is also experiencing more frequent and intense heatwaves. Projections of the Royal Netherlands Meteorological Institute (KNMI) show both average and yearly extreme temperatures increasing. The average temperature in 2050 could be 1-2.3°C higher than the 1981-2010 average.

Other: researchers and scientists

According to Peter Kuipers Munneke, a researcher and polar meteorologist at Utrecht University, in the past century the average annual temperature in the Netherlands has increased by about 3 1/2 degrees; in recent decades winters have warmed more than the other seasons, thanks in part to westerly winds coming over the North Sea, where the water temperature has warmed over the past half-century. As Geert Jan van Oldenborgh, a researcher at the Royal Netherlands Meteorological Institute who specializes in climate modelling, says that reaching the mandated 15 cm of ice typically requires two weeks of very cold weather — the type of extreme winters that are increasingly rare in the Netherlands.

Due to the large number of participants, about 30 thousand, the Elfstedentocht can only be organised when the ice is at least 15 cm thick on almost all the route. Short pieces of thinner ice can be circumvented by walking on skates (klunen in West Frisian). However, even when it is cold enough other factors can ruin the ice, like a layer of snow in 2012. (van Oldenborgh et al. 2019) The February 2012 cold spell was analysed from the perspective of its ability to generate sufficient ice thickness to organize the classic 200 km ice-skating Eleven City Tour in the Netherlands. It was also investigated whether global warming could be responsible for this (de Vries et al. 2013).

A simulation with the Royal Netherlands Meteorological Institute ice-growth model, however, points to another more important cause. Snowfall on the thin ice that had just formed is shown to limit the ice growth more strongly than the effect of warming. Interpreting the role of global warming in the cases of extreme winter European cold spells has to be carried out with care, as the natural variability in these events is large, leading to low signal-to-noise ratios and remaining question is whether future cold spells will be accompanied by increasingly frequent snowfall events (de Vries et al. 2013). Elfstedentocht might become a rare event in the future: this would imply a chance of holding a marathon to lie between 0.036 and 0.006 around the year 2050 (Visser & Petersen, 2009).

A century ago, the probability that it was cold enough to organise an Elfstedentocht was about 20% each year. This has already decreased to 8% per year. In the past the organisation only started when the ice was thick enough and took three days. For instance, in 1984 the decision to go ahead was no longer possible at that time because a thaw was forecast (van Oldenborgh et al. 2019).

The future evolution of the probability depends on the magnitude of global warming and on the circulation response, which is still uncertain. If we manage to keep the earth's temperature below 2ºC above the late 19th-century value the probability stays at about 5% per year, depending on how strong the circulation response is. However, if we let the earth warm further the probabilities decrease quickly and after one or two Tours from now it will become very unlikely that it gets cold enough (van Oldenborgh et al. 2019).

Other: journalists

Journalists in local media are actively following the weather, informing people about the possible appearance of ice on the country's water bodies.

"Considering that next weeknight temperatures will drop to -6 degrees and daytime temperatures will be 2-3 degrees at most, ice skating enthusiasts living in the Netherlands should be ready to skate "on natural ice sheets" next week." (Fox 2022)

"This afternoon, the temperature will be around freezing point, and there will be another night with a few degrees of frost, which is favourable for the ice. It can grow a bit thicker overnight in the coming days. But the temperature will rise above zero in the coming days, especially in the coastal areas." (NL Times 2022)

The media reports reckless cases of skaters who failed to assess the risks and stepped on ice that was too thin. "The ice may close in many places, but it will not be thick enough to handle large numbers of skating enthusiasts, according to the weather service. If you see someone skating, it doesn't mean it's safe." (NL Times 2022)

For example, in December 2022, despite freezing temperatures and frost, a thaw soon follows, making it unsafe to skate. Residents are informed that they may be able to skate on smaller ponds or flooded meadows, but not on larger lakes. The messages warn skaters about safety concerns, stressing that seeing a skater on the ice does not necessarily mean that it is safe. In addition, it is stressed that the current thickness of the ice is not suitable for many skaters.

The international media focuses on the 11-city route in the context of the tradition, while at the same time highlighting the aspect of CC, which makes the race less likely. The media state that "the Netherlands is no longer a romantic wintry wonderland" (Maese 2019). The media interview citizens and climate experts, and less often local club representatives. International media also offer contextual information, mentioning for example that, "..warmer temperatures have caused race organizers in Alaska to alter the Iditarod's route in recent years, and across both Canada and the United States, there are fewer frozen ponds safe enough for outdoor hockey". (Maese 2019)

4. Existing practices: solutions implemented, planned, or proposed

Community level

For 12 years chairman of the Royal Association of the Eleven Frisian Cities Wiebe Wieling has been in charge of the board that stages the Elfstedentocht. They plan year-round, spending nearly $400,000 annually on preparations and holding dozens of meetings with municipalities across the region. Equipment is stored in a barn, and procedures and protocols are reviewed, tested, and retested. "Everything has to be organized as if it's really going to happen." (Maese 2019) Sometimes ice is trans- planted to places where the natural ice layer is thin; once the marathon committee has given the green light, "klunen" (skate-walking) facilities are constructed along the vulnerable parts of the route (Visser & Petersen 2009).

Wieling is certain that CC is making it increasingly difficult to stage his event. He has thought down the road about whether it's worth all the time and effort each year, only to have the sun poke out and turn his race route into a long, winding swimming pool. "We haven't reached that point yet… We have 33,000 people that expect us to be ready if there is a chance," he says. "So how can we say we don't do it anymore? How can we say that?" (Maese 2019) However, Wieling estimates that one-third of the entrants won't finish, about 100 will be hospitalized, and one or two could even die.

Attracted by long distance routes, Dutch ice skaters are also using alternative places, as for instance, Austrian lake where a James Bond movie has been filmed representing a so-called "climate haven" for long routes for skating.

National level

When the Netherlands Environmental Assessment Agency started its research on climate impact indicators the goal was to explain impacts of CC to policy makers and the general public in the Netherlands, while searching for simple but convincing examples. For the Netherlands the changing chances of holding large outdoor skating events. As Eleven Cities Ice Skating Tour is largely a cultural phenomenon, deeply rooted in Dutch culture, by focusing on the example of the ice-skating marathon, CC is framed at the level of collective cultural experience and became an icon of CC in the Netherlands (Visser & Petersen 2009).

The Elfstedentocht indicator has appeared to be a good indicator for communicating CC aspects in the Netherlands. The indicator, included by the Netherlands Environmental Assessment Agency in its Environmental Balance of May 2005, was subsequently taken up by the media and politicians. Even the prime minister of the Netherlands. J. P. Balkenende put in his speech: "When I was born – in 1956 – the chance of realizing a Frisian Eleven City Ice Skating Marathon in the Netherlands was 1 in 4. When my daughter was born – in 1999 – this chance had diminished to 1 in 10. An enormous change in one generation!"

Winters are erratic, hence the large uncertainty. The fact that there has not been an Elfstedentocht for 22 years now does not change the probability: every year is independent of the previous ones, except for the common trend. Not every cold period gives an Elfstedentocht, so the true probability is a bit lower still (van Oldenborgh et al. 2019).

Climate adaptation policy in the Netherlands is governed by the **National Climate Adaptation Strategy and by the Delta Programme**. The Climate National Adaptation Strategy serves as the overarching policy framework that sets out the overall agenda for CC adaptation. In 2018 municipalities, district water boards, provinces, and the central government signed the **Administrative Agreement on Climate Adaptation** setting aside a total of 600 million euros by all levels of government to improve the Netherlands' resilience against the impact of CC.

The government is in the process of updating the National Adaptation Strategy, based on the 2023 KNMI climate scenarios published in 2023, which will include a CC adaptation monitoring framework that the government is currently developing. (Chen et al. 2023) However, as main risks are mentioned drought, heat, urban flooding, waterlogging, and no particular emphasis on winter and ice related to tradition of skating on natural ice.

The Delta Programme, implemented since 2010, deals with adaptation to CC with a particular focus on protecting the Netherlands from high water and flooding, freshwater availability, and spatial adaptation. The 2023 Delta Programme provides the most recent assessment of risks, adaptation measures, and budget. (Chen et al. 2023)

5. Publications and other additional information

Research bibliography

1. Chen, C., Kirabaeva, K. et al. (2023). *Assessing Recent Climate Policy Initiatives in the Netherlands: NETHERLANDS*. International Monetary Fund. Vol. 2023 (022), pp. 3-40. DOI: https://doi.org/10.5089/9798400235849.018
2. De Vries, H., van Westrhenen, R., van Oldenborgh, G.J. (2013). *The February 2012 European cold spell that didn't bring the Dutch another 11-City tour.* BAMS. 94. S26-S28.
3. Van Lieshout, A.P.W., van Manen, J.C. et al. (2010). *Peak Incidence of Distal Radius Fractures Due to Ice Skating On Natural Ice In The Netherlands.* Strategies un Traume and Limb Reconstruction. No. 5 (2). Pp. 65-9. DOI: http://dx.doi.org/10.1007/s11751-010-0087-7

4. Van Oldenborgh, G.J., Visser, H., Brandsma, T., de Vries, H. (2019). *Probability of an Elfstedentocht in a Changing Climate.* Available at: https://www.knmi.nl/kennis-en-datacentrum/achtergrond/probability-of-an-elfstedentocht-in-a-changing-climate/
5. Visser, H., Petersen, A. (2009). *The Likelihood of Holding Outdoor Skating Marathons in the Netherlands as a Policy-Relevant Indicator of Climate Change.* Climatic Change. No. 93 (1), pp. 39-54. DOI: http://dx.doi.org/10.1007/s10584-008-9498-6

Press

1. (2023, May 23). *Cold weather may attract skaters to frozen canals and lakes.* Northern Times. Northerntimes.nl. Available at:
2. https://northerntimes.nl/cold-weather-may-attract-skaters-to-frozen-canals-and-lakes/
3. (2022, December 13). *Natural ice rinks opening across the country; Skating on open water unlikely this week.* Nltimes.nl. Available at: https://nltimes.nl/2022/12/13/natural-ice-rinks-opening-across-country-skating-open-water-unlikely-week
4. (2021, February 16). *Thin ice: Europeans warned not to skate on thawing canals after spate of accidents.* TheGuardian.com. Available at: https://www.theguardian.com/world/2021/feb/16/thin-ice-europeans-warned-not-to-skate-on-thawing-canals-after-spate-of-accidents
5. (2019, February 1). *Austrian lake offers climate haven for Dutch ice skaters.* Phys.org. Available at: https://phys.org/news/2019-02-austrian-lake-climate-haven-dutch.html
6. Fox, B. (2022, December 10). *Prolonged cold weather creates opportunities for skating on natural ice in the Netherlands.* Amsterdamfox.com. Available at: https://amsterdamfox.com/news/prolonged-cold-weather-creates-opportunities-for-skating-on-natural-ice-in-the-netherlands/
7. Maese, R. (2019, March 7). *Waning Winters.* Washingtonpost.com. Available at: https://www.washingtonpost.com/news/sports/wp/2019/03/07/feature/in-the-netherlands-ice-skating-is-in-the-dna-a-warming-climate-could-change-that/
8. van Oort, B. (2021, February 26). *Why do the Dutch Love to Ice-Skate?* Bbc.com. Available at:
9. https://www.bbc.com/travel/article/20210225-why-the-dutch-love-to-ice-skate

Legal and policy sources

1. Ministry of Infrastructure and Water Management, Netherlands (2023). *National Delta Programme.* Available at: https://english.deltaprogramma.nl
2. Ministry of Infrastructure and Water Management and the National Institute for Public Health and the Environment, Netherlands (2022). *LIFE-IP Climate Adaptation programme.* Available at: https://klimaatadaptatienederland.nl/en/policy-programmes/life-ip-climate-adaptation/
3. Netherlands (2018). *Administrative Agreement on Climate Adaptation.* Available at: https://klimaatadaptatienederland.nl/en/policy-programmes/administrative-agreement-climate-adaptation-signed/
4. Netherlands (2016). *National Climate Adaptation Strategy*. Available at: https://klimaatadaptatienederland.nl/en/policy-programmes/nas/

Other sources

1. *Dutch Centre for Intangible Cultural Heritage.* Available at: https://www.immaterieelerfgoed.nl/en/schaatsenopnatuurijs
2. *Eleven Cities Ice Skating Tour.* Available at: https://www.elfstedentocht.frl/en/

3. *Netherlands Climate Resilience Policy Indicator.* Available at: https://www.iea.org/articles/netherlands-climate-resilience-policy-indicator

4. *Schaatsen op natuurijs & schoonrijden op de schaats | Kenniscentrum Immaterieel Erfgoed Nederland* (Skating on natural ice & driving clean on skates | Netherlands Intangible Heritage Knowledge Centre). Available at: https://www.youtube.com/watch?v=Xt0x-UC9IjI

6. Contributors

This study was prepared by ILFA: Kitija Balcare.

4.13. CS13 Transhumance in the Cantabrian or Northern Third of Spain (Spain)

1. ICH element

Title in English
Transhumance in the Cantabrian or northern third of Spain

Title in Spanish
La Trashumancia en el Cantábrico o tercio norte español

National Inventory of ICH
https://www.boe.es/diario_boe/txt.php?id=BOE-A-2017-4009 (since 2017)

A brief description
Tradition. Transhumance is the system of livestock grazing that consists of moving alternately and periodically throughout the year between two specific regions with different climates, with the aim of making the most of the pastures. Its origins in the Iberian Peninsula date back to the Iron Age, as archaeology shows. The Celtic shepherd peoples, such as the *Lusitanians* and the *Vetons*, fleeing from the harsh winters in the mountains of León and the cold regions of Castilla y León, moved to Extremadura for a few months.

Later, from the 1st century onwards, in Roman Hispania there was already a transhumance route in the west of the Iberian Peninsula, which was marked by a road that would become the Silver Route, linking Augusta Emerita (Mérida) with Asturica Augusta (Astorga).

During the Middle Ages, transhumance reached its peak and due to its economic importance, King Alfonso X *the Wise* created in 1273 "The Honourable Council of the Mesta", where the interests of livestock breeders and farmers were established. The temporary passage and permanence of the shepherds served as the axis for the dissemination of the so-called "shepherd culture". This culture brought together common features from different areas that would be reflected in architectural (huts, sheepfolds or corrals), musical (couplets, songs and own instruments), artisanal (utensils and tools) and culinary (calderetas and migas) manifestations, as well as producing family, social, economic, patrimonial and biological interrelationships that have shaped and contributed to the cohesion and structuring of the landscape (Junta de Castilla y León 1994).

The decline of transhumance came after the end of the Reconquest, with the abolition of *La Mesta* in 1836. In the 19th century, the cultural value and the romantic profile of transhumance was gradually lost with the introduction of the railway, with livestock being transported by freight trains, which were later replaced by transport by road in large lorries. Only the sheep farming sector, especially the Merino sheep, bred for their valuable wool, continued to move livestock on foot during the 1950s (UPA La Tierra 2009).

Today, in the 21st century the extensive communication system of 125,000 kilometres of cattle tracks has been transformed into hiking trails, eventually used by the last transhumant shepherds.

Ovine cattle. Ovine cattle make the best use of arid and semi-arid pastures, as well as fibrous agricultural by-products, which is why this species has traditionally been exploited in arid and dry areas, taking advantage of ecosystems unsuitable for cattle farming (Daza 2002). In this context Spain is particularly vulnerable to the effects of CC, which is the main threat to agriculture and livestock farming in Europe, and thus to the traditional activity of grazing or transhumance, as a connecting element of the cultural roots of the peninsula, the Mediterranean and Europe (Marsal et al. 2009).

Geographical coordinates
The territory covered by this study on "Transhumance in the Cantabrian or northern third of Spain" cannot be delimited to a specific territory, so it is of no interest to give precise coordinates.

43.229053, -4.090929
Cantabria, Spain

2. CC risks and effects

Transhumance in Spain is a living intangible heritage, but in the coming decades it could be at risk of disappearing mainly due to the low economic profitability of the shepherds and livestock farmers who engage in this traditional practice, urban pressure, and new livestock farming methods such as micro-farms, among other issues, including CC. This activity has generated in our country a rich cultural and ethnographic heritage that has been reflected in festivals and traditions, in toponymy, in gastronomy and in all the architecture related to this activity, as well as giving rise to a great oral tradition and traditional handicraft and shepherding techniques (Ministry of Agriculture, Food and Environment 2012).

It is in the area we have called the Cantabrian, or northern third of Spain, that this traditional activity has been losing strength to the point of almost disappearing in localities that once made a living from it. The disappearance of transhumance entails an inherent loss of the landscape, a huge loss of biodiversity, as well as a loss of culture in terms of exchanges and traditions. As in other parts of Spain, this activity is still surviving, even though livestock is the most vulnerable and suffers the most from the impact of CC, for which many groups have been forced to adapt their extensive livestock farming systems. In addition, local councils, and associations, such as "vivecameros", are working on systems for the recovery of traditional livestock management systems and local breeds, which in turn would help to reverse the environmental impact.

The following are examples of CC affecting extensive sheep farming at present and which may increase in the future:

1. Increasing temperatures, resulting in a lengthening of hot, dry summers;
2. Increase in extreme weather events;
3. Increase in climate-related diseases in animals;
4. Increased risk of forest fires;
5. Desertification.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community
The community's representatives create links among the political authorities of different autonomous communities, the administrations, livestock farmers, certain associations, museums, and Interpretation Centres, as well as the rest of society, interested in preserving this ICH as a sign of the identity of the northern third of Spain or the Cantabrian Sea, which covers different provinces including La Rioja and Cantabria.

In the local community there are fewer and fewer shepherds, and the tradition is fading among young people who do not want to devote themselves to the trade, as they feel

abandoned by the competent authorities, who do not value the trade, either socially or economically; moreover, the depopulation that increasingly affects rural areas and, consequently, their habits and customs must also be considered. The lack of generational replacement and the emigration of young people to the cities means that shepherding has ceased to be passed down from father to son, and nowadays associations are promoting this age-old trade and activity, which is coming to an end in villages that once made a living from it.

In the report for the dossier devoted to the declaration of Transhumance as a representative manifestation of ICH, reference is made to the need of safeguarding this phenomenon that goes beyond the geographical limits of the Autonomous Communities and for which many aspects that are the backbone of livestock activity today and which are in clear decline must be considered (Historical Heritage Council 2017).

Among the main threats to Transhumance are changes in lifestyles, migration, market competition, forest management and CC (Urzay 2018). Ranked by the impact of CC, practitioners of the tradition and the local community indicate the following:

1. Increase in the temperature of the earth's surface

The first issue extrapolated from the EU interviews is the increase in global temperatures because of continued greenhouse gas emissions, resulting in longer, hotter, and drier summers (University of Cordoba 2011). Rising temperatures as well as reduced precipitation projected by the IPCC 5th Assessment Report for the Mediterranean region describe the coming summers as longer, hotter, and drier. Likewise, the relationship between extensive farming systems and water resources is very close, as this is reflected in water consumption or in the growth of plants that are part of the feed. Both are very vulnerable factors to CC (IPCC 2014).

Jesús Garzón, president of the *Concejo de la Mesta Association for the Recovery of Transhumance in the Cañadas Reales of Spain*, points out that in the past transhumance was fixed in time, i.e., it was always carried out on the same date from May to October. Now it varies from March to November due, among other factors, to the increase in temperature, which alters the available resources. It is a clearly due to CC.

2. Most frequent extreme weather events

Extreme weather events in the form of floods, hail, and heat waves, especially severe in southern Europe and the Mediterranean region, according to the European Environment Agency will become more frequent (EEA 2012). As a result of these alterations, the yields of plants of agricultural and livestock interest will be reduced or modified. It should be noted that in Spain, the most important factor in the recent changes in vegetation has been the change of use, mainly due to the abandonment of the Spanish countryside in the last decades of the 20th century (EAA 2012).

In this sense, Felipe Agustín Monzón Peñate, Representative of TT&RR, PhD from the University of La Laguna with the thesis "Las redes camineras tradicionales como factor de desarrollo local" ("Traditional road networks as a factor of local development"), and the Doctor in Geography José Juan Cano Delgado, highlight how transhumance can help to mitigate CC, pointing out that drought and the loss of sources is one of the main problems affecting transhumance in Gran Canaria, altering the temporary movements of livestock and therefore, the annual and seasonal pattern, lengthening or reducing it.

3. Climate-related increase in animal diseases

From the point of view of the repercussions of CC on animals, a higher incidence of diseases in extensive livestock species can be highlighted, as well as a greater acceleration in the spread of serious infectious diseases transmitted by vectors (University of Cordoba 2011).

Also, indirectly, the deterioration of pastures and their quality can affect animal health, causing lower meat and milk production (FAO (n.d.)).

4. Increased risk of forest fires

CC leads to an increase in the frequency of higher hazard situations as the increase of fires. In this context, the so-called "fire regime", an ecological term referring to the frequency, size, intensity, seasonality, and type of fires, should be highlighted. Nevertheless, although CC is a key factor in the development of fires, it must be considered that more than 80% of forest fires are caused by humans, either intentionally or accidentally (WWF 2022).

One of the effects of CC is the frequency of thunderstorms, as this factor can lead to more fires because of lightning. On the other hand, prolonged drought in some regions causes fires to start more easily and to have a higher intensity. In addition, changes in the distribution of the seasons can alter the seasonality of fires, causing ecosystems that are prepared for the presence of fire at certain times of the year to face the devastation of flames at a different time than usual, and for which they are not prepared.

Forest fires affect animals, many of which die as victims of the fire. In some cases, they belong to extensive breeding. However, these animals are also affected by the fact that their food is compromised when the undergrowth is burned (Rubio et al. 2017).

The practice of transhumance is essential to keep the forests clean and well cared for. Transhumance shepherds report that each sheep eats 5 kilograms of grass per day, so a flock of 1000 sheep consumes up to 5 tonnes of grass per day.

5. Desertification

Desertification is the degradation of land in arid, semi-arid and dry sub-humid areas, which is a worrying reality, as these areas store three times more carbon than vegetation, making them the largest store of terrestrial carbon. As a result of desertification, 300 million tonnes of carbon are released each year, equivalent to 4% of global CO_2 emissions. Human activities such as overcultivation or inappropriate land use can cause desertification, but climatic variations play a crucial role (Blueberriesconsulting.com 2022). When desertification occurs because of CC, it can affect native animals as well as extensive livestock grazing in the area, affecting their food supply. The 40% of Spanish soil is threatened by desertification. Jesús Garzón and Julio Grande, specialists in rural development, cultural heritage and rural tourism and director and founding partner of Sepinum, point out the importance of transhumant livestock in tackling this problem. The consumption of 5 tons of grass for every 1000 head of livestock translates into 5 tons of very high-quality manure, whose faeces contain very different seeds that help regenerate the soil and maintain its biodiversity, which in our country is remarkably ancient, with 40 kinds of plant species per m^2. This biodiversity is the richest in the world thanks to the fact that the plant species have been mowed and fertilized by herbivores throughout history.

Officials responsible for the ICH safeguarding

At national level, Officials responsible for safeguarding the ICH in Spain have not associated with the CC risks the Transhumance and its tradition in the northern third of Spain, nor they have problematised it in the context of CC. However, at the local level several associations have emerged, and museums dedicated to transhumance have been created, awakening the interest of ethnographers in some localities such as Oncala in Soria, Malpartida de Cáceres, Guadalaviar in Teruel and Lumbreras de Cameros in La Rioja (Cendrero 2022).

At the international level, pastoralism is an essential practice for achieving the objectives of the European Green Pact, as in the Farm to Fork and Biodiversity 2030 Strategies, and in the sustainable development objectives set out in the 2030 Agenda and in the Paris Climate Agreement.

At national level, it is worth mentioning the study carried out by the World-Wide Fund for Nature (WWF 2022) on "Grazing against fires", which consists of a proposal by WWF Spain to adapt the territory to CC. This report highlights the role of extensive livestock farming in recovering a heterogeneous landscape, in which forest areas alternate with cultivated and

grazed areas, which, in addition to providing biodiversity, results more resistant to the spread of flames.

However, grazing and transhumance contribute greatly to another of the major objectives of the rural environment, which is the fight against depopulation. In this sense, the Municipality of Brieva de Cameros in La Rioja stands out, as it has worked on a system of recovery of traditional management techniques and their adaptation, through the management of a municipal flock of about 800 sheep. This project reinforces the role of PCI as a resource for the sustainable development of local communities and as a mitigation for other problems that threaten the practice, such as those related to CC. Awareness of the potential effects of CC on ICH has been raised, according to experts, and this will be passed on to a wider audience.

Other: journalists

When issues related to transhumance or pastoralism in the Cantabrian region are addressed, they are often done in the context of CC, although with reference to how this extensive livestock farming practice helps to reverse CC effects, recovering abandoned pastures that have been occupied by invasive plants, as a means of combating depopulation, as a fundamental activity for preventing fires or analysing its positive impact on the ecosystem (Cores 2016).

In this sense, fewer studies indicate how CC affects the millenary activity of grazing and transhumance and how this can have very serious consequences on a tradition that is on the verge of extinction.

Likewise, the public media see in the loss of shepherding and transhumance a loss of traditions, cultural manifestations of various kinds and trades associated with this practice. Among these, the trade of the shearer and the architectural constructions of the huts have to be mentioned (La Rioja 2018). The latter are an example of traditional rural architecture, linked to shepherding, as they served as shelter for the shepherds while the livestock was gathered at night in the sheepfolds. Moreover, these circular buildings are built with unworked masonry, a form of construction that has been declared Intangible Cultural Heritage of Humanity by UNESCO as “the art of dry-stone walling”.

Other: scientists

In addition to the above-mentioned problems posed by the local pastoralist population, there are those described by scientists, coming from CC and that are starting to influence transhumance, posing a serious threat to the practice in the future:

1. Availability of pasture

CC may alter the availability of pasture and forage in transhumance areas, making it more difficult for livestock to feed during their movements. More frequent and prolonged droughts, as well as changes in precipitation patterns, may reduce the quantity and quality of available pasture (IPCC 2014).

2. Changes in migration patterns

CC may affect the migration patterns of species including livestock used in transhumance. A study published in the journal “Science of the Total Environment” in 2018 examined how CC is affecting the migration routes of reindeer herds in the Arctic (Sinc 2018).

3. Increased incidence of disease

CC may influence the spread of diseases and pests affecting livestock during transhumance. A report published by the Food and Agriculture Organization of the United Nations highlighted that CC might increase the vulnerability of livestock to vector-borne diseases such as ticks and mosquitoes (FAO 2015). In this regard César Velandia, specialist in urban development and other related areas, pointed out that changes in temperature and humidity could increase the appearance of fungal diseases or difficulties due to the scarcity of suitable areas for grazing.

4. Impact on rural communities

Transhumance involves not only the movement of livestock, but also the rural communities that depend on this ancestral practice. CC may negatively affect the livelihoods and culture of these communities. One study explored how CC is affecting pastoralist communities in East Africa (Short et al. 2012).

4. Existing practices: solutions implemented, planned, or proposed

Community level

The Community (political authorities, scientists, shepherds, inhabitants, etc.) evidenced a series of measures to be implemented to help the practice of transhumance. Firstly, the shepherds indicate the economic support as a fundamental measure not only to cope with the CC, but also for the survival of their trade, as many are being affected and forced to abandon this age-old practice and even to slaughter their livestock because they are unable to maintain it. Furthermore, the economic benefits should be greater for it, compared to other types of activity, for it to be attractive to the new generations. In fact, these must be encouraged to face the sacrifices associated with caring for a herd of cattle. On the other hand, bureaucracy and paperwork should be carried out by administrations or specific people and not by livestock farmers and shepherds, as these tasks are incompatible with caring for livestock and transhumant activity, while bureaucratic practices become more and more numerous and need to be completed with increasing frequency.

The improvement of services and new technologies in the field of transhumant livestock farming is another aspect to be considered, as many areas are isolated, and coverage and internet access is non-existent. This means that new livestock management systems have not yet been implemented.

An inventory of livestock trails should also be carried out as soon as possible. Furthermore, although there are laws protecting transhumance, these in the words of the herders and livestock keepers “should be enforced and taken into account”.

Macro-farms are a threat to extensive livestock farming, with which they cannot compete. The price of meat and products are cheaper and production costs are lower. However, the quality of the meat is much lower and the overcrowding of cattle in sheds leads to the emergence and spread of diseases such as the “mad cow epidemic”, tuberculosis, brucellosis, or encephalopathies, among many others. Extensive livestock farming and transhumance have infinite benefits for the environment, which should be considered and should be encouraged economically and socially instead of being hindered, as this lack of measures means that there are fewer and fewer transhumant shepherds in our country. Likewise, this practice should be considered as a population fixer in rural areas, as its disappearance would lead to the abandonment of villages and pastures, a loss of native breeds, a loss of biodiversity, an increase in the risk of fires, as well as the number of insects that transmit pests and CC, far from being reversed, would increase.

Municipality level

Transhumance in Spain is currently a living heritage despite the large reduction in transhumance livestock and the changes in this activity. In various parts of Spain this activity is still practised in the traditional way with livestock moving on foot.

In some EU countries such as Austria, Greece and Italy transhumance has been declared ICH by UNESCO. In Spain, this tradition dates back to the 13th century, with the creation of “El Concejo de la Mesta de Alfonso X” created by Alfonso X the Wise, but its candidacy is waiting to be accepted by 2026. However, some pastors interviewed, together with Professor Pablo Vidal González, underline that this candidacy would not change the

current situation of breeding in our country, since it is a living heritage and as such should be encouraged so that it does not disappear. Right now, the needs of shepherds and farmers should be given priority.

National and local authority level: legal framework

It is for this reason that Law 10/2015, of 26 May, for the safeguarding of Intangible Cultural Heritage, establishes in its article 11.2, letter c), that the General State Administration, through the Ministry of Education, Culture and Sport, in collaboration with the Autonomous Communities, is responsible for safeguarding ICH through the Declaration of Representative Manifestation of ICH.

Article 12 of the aforementioned Law 10/2015 for the safeguarding of Intangible Cultural Heritage regulates the procedure for the declaration of Representative Manifestation of Intangible Cultural Heritage, stating that it shall be initiated ex officio by the Ministry of Education, Culture and Sport, either on its own initiative, at the reasoned request of one or more Autonomous Communities or at the reasoned request of an individual or legal entity.

The social, economic, and environmental importance of transhumance and livestock trails led to the creation in 1995 of the so-called National Network of Livestock Trails in Spain (Law 3/1995 of 23 March 1995), which included "all cattle trails and other livestock trails that guarantee their continuity, provided that their itinerary runs between two or more Autonomous Communities" (Law 3/1995 of 23 March 1995).

EU level

In Spain there is no direct regulation concerning transhumance as there is in other countries, such as Germany, through Commission regulation (EC) No 2143/96 amending Regulation (EEC) No 2385/91 as regards the geographical areas of Germany in which sheep meat producers practising transhumance are to be considered as producers in less-favoured areas. Thus, certain particularities of transhumance sheep meat producers in Germany are considered. This is not the case in Spain, where there is no specific European legislation. There are only a few laws that tangentially affect different aspects related to transhumance, such as Commission regulation (EC) No 1851/2006 of 14 December 2006, which amends Annex I of Council Regulation (EEC) No. 2092/91 as regards the consumption of conventional feed during periods of transhumance at European level, in which animals may graze on conventionally cultivated land when they are moved on foot from one grazing area to another. During this period the consumption of conventional feed in the form of grass or other vegetation grazed by the animals shall not exceed 10 % of the total annual feed supply. Another European regulation that affects secondarily transhumance is the Publication of an application under Article 50(2)(a) of Regulation (EU) No 1151/2012 of the European Parliament and of the Council on quality schemes for agricultural products and foodstuffs which refers to Council regulation (EC) No 510/2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs, and in this case more specifically to the characteristics that "Cordero Segureño", livestock that traditionally carried out transhumance, must have in order to obtain a declaration of Designation of Origin, but which is very distant from the subject of our report, as is transhumance in the northern third of the Iberian Peninsula.

5. Publications and other additional information

Research bibliography

1. Arteaga, L., Burbano, J. (2018). *Efectos del cambio climático: Una mirada al Campo.* (Effects of climate change: A look at the field.) *Revista de Ciencias Agrícolas*. 35 (2):

79-91. DOI: http:/ /dx.doi.org/10.22267 /rci.183502.93. Available at: https://www.researchgate.net/publication/331551330_Efectos_del_cambio_climatico_Una_mirada_al_Campo

2. Consejo de Patrimonio Histórico. (2017). *Informe para expediente de declaración de manifestación representativa del patrimonio cultural inmaterial: La trashumancia.* (Report for the dossier for the declaration of a representative manifestation of intangible cultural heritage: Transhumance). 77ª Sesión del Consejo de Patrimonio Histórico. Madrid. Available at: https://www.culturaydeporte.gob.es/dam/jcr:122e7dc8-0e25-4a7f-8bb7-e90273704b3d/informe-mrpci-trashumancia.pdf
3. Daza Andrada, A. (2002). *Mejora de la productividad y Planificación de explotaciones ovinas.* (Productivity improvement and planning of sheep farms). Editorial Agrícola Española, Madrid.
4. Delgado, J.V. (2011). *Las razas locales y el cambio climático*. (Local breeds and climatic change). En Actas Iberoamericanas de Conservación Animal, AICA 1, (pp. 20-24). Córdoba, España: Ediciones de la Universidad de Córdoba. Available at: http://www.uco.es/conbiand/aica/templatemo_110_lin_photo/articulos/2011/Delgado2011_1_20_24.pdf.
5. Hernández, L. y cols. (2022). *Pastoreo contra incendios. Propuesta de WWF España para adaptar el territorio al cambio climático.* (Grazing against fires. WWF Spain's proposal to adapt the territory to climate change). WWF España. Available at: https://wwfes.awsassets.panda.org/downloads/2022_pastoreo_contra_incendios.pdf.
6. IPCC, Pachauri. R.K., Meyer, L.A. (eds.) (2014). *Cambio climático 2014: Informe de síntesis. Contribución de los Grupos de trabajo I, II y III al Quinto Informe de Evaluación del Grupo Intergubernamental de Expertos sobre el Cambio Climático.* (Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.) IPCC, Ginebra, Suiza. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full_es.pdf.
7. Martin, P.G. (1994). *Por los caminos de la trashumancia*. (Along the paths of transhumance.) Consejería de Agricultura y Ganadería. Valladolid. Junta de Castilla y León.
8. Marsal, F., Morral, E., Palet, D. (2009). *Puesta en valor de lanas y pieles de producción nacional*. (Valorisation of nationally produced wools and furs.) MARM.
9. Ministerio de Agricultura, Alimentación y Medio Ambiente. (2012) *La trashumancia en España: Libro Blanco.* (Transhumance in Spain: White Book). Madrid. Available at: https://www.mapa.gob.es/es/desarrollo-rural/publicaciones/publicaciones-de-desarrollo-rural/LIBRO%20BLANCO%202013_tcm30-131212.pdf.
10. Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO). (s.f.). *Cambio climático y seguridad alimentaria*. (Climate change and food security). Available at: https://www.fao.org/climatechange/16615-05a3a6593f26eaf91b35b0f0a320cc22e.pdf
11. Ramírez de la Ribera, J. L., Zambrano Burgos, D. A., Campuzano, J., Verdecia Acosta, D.M., Chacón Marcheco, E., Arceo Benítez, Y., Labrada Ching, J., Uvidia Cabadiana, H. (2017). El clima y su influencia en la producción de los pastos. (Climate and its influence on pasture production.) REDVET. *Revista Electrónica de Veterinaria*, vol. 18, núm. 6, junio, pp. 1-12. Veterinaria Organización. Málaga, España.
12. Rubio, A., Roig, S. (2017). *Impactos, vulnerabilidad y adaptación al cambio climático en los sistemas extensivos de producción ganadera en España*. (Impacts, vulnerability and adaptation to climate change in Spain's extensive livestock production systems).

Oficina Española de Cambio Climático. Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente, Madrid.
13. Short, C. J., Dwyer, J. (2012). Reconciling pastoral agriculture and nature conservation: developing a co-management approach in the English uplands. *Pastoralism: Research, Policy, and Practice, 2(1), 13*. Available at: http://www.pastoralismjournal.com/content/2/1/13.
14. UPA La Tierra. (2009). *La trashumancia en España*. (Transhumance in Spain). Informe, Nº 213, 49. Available at: https://www.upa.es/_la_tierra/la_tierra_213/pag_049-056_agriymamtrashumancia.pdf.
15. Urzay Barrios, J.A. (2018). *Adiós a los pastores*. (Goodbye to the shepherds.) Available at: https://ifc.dpz.es/recursos/publicaciones/37/41/_ebook.pdf.
16. Vicente Pérez, R., Macías Cruz, U., Avendaño Reyes, L., Correa-Calderón, A., López Bacac, M. de los Á., Lara Rivera, A. L. (2020). Impacto del estrés por calor en la producción de ovinos de pelo. Revisión. (Impact of heat stress on production in hair sheep). *Revista Mexicana de Ciencias Pecuarias*, 11(1). Available at: https://cienciaspecuarias.inifap.gob.mx/index.php/Pecuarias/article/view/4923/4909.

Press

1. (2021, September 6). *La importancia de la trashumancia* (The importance of transhumance). Youtube.com. Available at: https://www.youtube.com/watch?v=cjqvW6WCzUc&ab_channel=TeveoenlaSierra.
2. (2018, Dezember 23). *Las poblaciones de reno en el Ártico se desmoronan* (Arctic reindeer populations collapse). Agenciasinc.es. Available at: https://www.agenciasinc.es/en/view/content/254383/full/1/116668. 7
3. (2016, June 26). *Entre la amenaza de la desertificación y los efectos del cambio climático* (Between the threat of desertification and the effects of climate change). Blueberriesconsulting.com. Available at: https://blueberriesconsulting.com/entre-la-amenaza-de-la-desertificacion-y-los-efectos-del-cambio-climatico/.
4. Cendrero, M. (2022, January 20). *Los pastores que protegen la tierra: "España es el país de Europa donde más presente está la trashumancia".* (The shepherds who protect the land: "Spain is the country in Europe where transhumance is most present"). Elespañol.com. Available at: https://www.elespanol.com/enclave-ods/historias/20220120/pastores-protegen-tierra-espana-europa-presente-trashumancia/643685716_0.html.
5. Cores, M. (2016, May 5). *El pastoreo tradicional pide paso en Cantabria* (Traditional pastoralism calls for a change in Cantabria). ElDiarioMontañés.es. Available at: https://www.eldiariomontanes.es/cantabria/201605/05/pastoreo-tradicional-pide-paso-20160504220954.html.
6. Epeconomía. (2022, November 3). *Escuelas de Pastores de España reivindican el oficio del pastoreo como medio para garantizar ganadería extensiva* (Shepherds' Schools in Spain claim the profession of shepherding as a means of guaranteeing extensive livestock farming). Europapress.es. Available at: https://www.europapress.es/economia/noticia-escuelas-pastores-espana-reivindican-oficio-pastoreo-medio-garantizar-ganaderia-extensiva-20221103144701.html.
7. González, A.S. (2023, March 3). *Los Beneficios del pastoreo tradicional* (The Benefits of Traditional Grazing). *Nuestro Campo*. Available at: https://nuestrocampo.elcomercio.es/los-beneficios-del-pastoreo-tradicional/?ref=https%3A%2F%2Fwww.google.com%2F.

8. Hidalgo, P. (2018, October 1). *Piedras que vuelven a dar cobijo* (Stones that once again provide shelter). LaRioja.com. Available at: https://www.larioja.com/la-rioja/piedras-vuelven-cobijo-20181001002716-ntvo.html
9. WWF (2022, July 17). *El pastoreo es una actividad fundamental para prevenir incendios forestales* (Grazing is a key activity to prevent forest fires). Consumer.es. Available at: https://www.consumer.es/medio-ambiente/pastoreo-vs-incendios-forestales.

Legal and policy sources

International

1. European Commission (1996). *Commission Regulation (EC) No 2143/96 of 7 November 1996 amending Regulation (EEC) No 2385/91 as regards the geographical areas of Germany where sheepmeat producers practising transhumance are regarded as producers in less-favoured areas*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31996R2143&qid=1687887738120
2. European Commission (2006). *Commission regulation (EC) No 1851/2006 of 14 December 2006 amending Annex I to Council Regulation (EEC) No 2092/91 as regards uptake of conventional feed during periods of transhumance*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1851&qid=1687887635882
3. European Environment Agency. (2012). *Climate change, impacts and vulnerability in Europe. EEA Report*. Available at: https://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012.
4. European Commission (2013). Cordero Segureño. *Regulation (EC) No 510/2006 of the Council on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. (2013/C 180/11)*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013XC0626(05)&qid=1687886706246

National

1. Head of State of the Spanish Government (1995). *Law 10/2015, of 26 May, for the safeguarding of Intangible Cultural Heritage*. Available at: https://www.boe.es/buscar/act.php?id=BOE-A-1995-7241
2. Head of State of the Spanish Government (2015). *Law 3/1995, of 23 March 1995, on Livestock Trails*. Available at: https://www.boe.es/buscar/act.php?id=BOE-A-2015-5794

6. Informants, experts, date of interview

- Julio Grande, specialist in rural development, cultural heritage and rural tourism and director and founding partner of Sepinum. 28.06.2023.
- Pablo Vidal González, Professor of Cultural Anthropology, Catholic University of Valencia. President of the International Research Group "Social Sciences" of the FIUC. He is director of the University Institute of Anthropology and was Vice-Rector of International Relations at the same university. Author of numerous publications, books and articles in high impact journals. 30.06.2023 and 03.06.2023.

- Julián Hernández, member of the Cultural Association of Valdeavellano de Tera. 22.06.2023.
- Felipe Agustín Monzón Peñate, TT&RR Representative, PhD from the University of La Laguna with the thesis "Traditional Road networks as a factor in local development. Methodological proposal for intervention in the recovery of the old road of Candelaria on the island of Tenerife" ("*Las redes camineras tradicionales como factor de desarrollo local. Propuesta metodológica de intervención en torno a la recuperación del camino viejo de Candelaria en la isla de Tenerife").* (2017). 30.06.2023.
- César Velandia, specialist in Urban Development, Housing, Real Estate Development, Urban Planning, Spatial Planning, Geographic Information Systems, Urban and Sustainable Mobility, Geography. Risk management. Cultural heritage-cultural landscapes. 21.06.2023.
- José Juan Cano Delgado, PhD in Geography with International Mention. Lecturer at the Escuela Universitaria de Turismo de S/C Tenerife. Centre attached to the University of La Laguna and coordinator for Latin America of the Association Transhumance Trails and Rural Roads.
- Fidel Gerardo Fernándo.
- Maripi, shepherdess.
- Jesús Garzón, president of the Association Concejo de la Mesta for the recovery of Transhumance in the Cañadas Reales de España. 03.07.2023.

7. Contributors

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4.14. CS14 Valencian Paella, “the Art of Uniting and Sharing” (Spain)

1. ICH element

Title in English
Valencian Paella “the art of uniting and sharing”

Title in Spanish
La Paella Valenciana “el arte de unir y compartir”

National Inventory of ICH
https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-4133#:~:text=Mediante%20resoluci%C3%B3n%20de%2023%20de,arte%20de%20unir%20y%20compartir%C2%BB (since 2022)

A brief description
Tradition. The first documented references to paella date back to 330 BC, when Alexander the Great made his first forays into India, bringing rice to Europe. After long voyages, the cereal began to become popular, and its cultivation was established on the eastern coasts of the peninsula. However, it was not until the arrival of the Arabs, who were responsible for introducing improvements in cultivation techniques and irrigation systems, that rice was sown in large quantities on the coasts of eastern Spain, to which was added, just two centuries later, during the Andalusian period, the cultivation and trade of saffron. When James I arrived in Valencia, the cultivation of this cereal was limited to the coastal lagoon of *La Albufera* and in the following centuries, there is evidence of rice consumption by the peasants, as it could be cooked with other foods, although it was not a highly valued ingredient. It was in the 16th century that its use began to be documented and the playwright Francisco de Paula Martí spoke of its bleaching and cleaning, and of the fact that it gave Valencians a unique "art" of cooking and seasoning this ingredient. In this way, for the first time the “arroz a la valenciana” was mentioned, which the other provinces then tried to imitate (Herrera 1513).It was not until the 18th century that the recipe was first recorded in a 'manuscript of recipes', in which the preparation technique was described under the title “paella” or “arroz a la valenciana” (Valencian rice) stressing that the rice had to be dry. It also spread internationally, even reaching Belgium, where it was called “Riz a la Valencienne”. It was in the 19th century that paella became part of the customs of all social classes, becoming a symbol of family reunion and social gathering. Its increased popularity led to divergences with the traditional paella recipe, spreading at the beginning of the 20th century to large international cities such as New York, where it was versioned with "rice with chicken", later reaching Parisian and London restaurants. José Guardiola Ortiz in his monograph talks about “rice with rabbit” and explains the importance of this “paella” on St. James’ Day and the custom of sharing it on the beach on St. John's Day (Guardiola 1936). With the tourist boom of the 1960s in Spain, foreign tourists began to appreciate this delicacy in Valencia and throughout Spain, and it became the country's internationally recognized brand name. It is therefore, the history, the tradition, the uses, the techniques handed down from generation to generation, as well as the role played by this dish in the social cohesion, in the cultural spaces, in the fiestas and celebrations of the Valencian Community, which have brought paella to be the symbol of the "art of uniting and sharing", and to declare it as ICH in 2021 (Consell de la Comunidad Valenciana 2021). Nowadays, *paella* is not only a star dish in Valencian and Spanish gastronomy, but it is the process of making it and the art of preparing and tasting it that makes *paella* an authentic social phenomenon, which has ended up influencing part of the Valencian landscape and ecosystem through the cultivation and production of the foods with which it is produced.

Components. *Paella* is part of the Mediterranean Diet, which is included in the Representative List of Intangible Cultural Heritage of Humanity (UNESCO). The main ingredient of this dish is rice, which according to tradition has to be added to the broth in a cross pattern so that it is distributed correctly in a very thin layer that must not be stirred in order to thicken the starch. Due to its humble origins, the tradition of eating the paella itself with a spoon spread out, which in turn allowed it to maintain its temperature (Consell de la Comunidad Valenciana 2021). The ingredients must include ten main ingredients such as extra virgin olive oil, salt, water, tomato, garlic, paprika, black pepper, beans, saffron and chicken, as well as eight other ingredients that vary depending on the area or region of the Valencian community. These secondary ingredients include: rabbit, vaquetas (snails), garrofón (broad beans), ferradura (flat green beans), ñora (a variety of pepper), artichokes, squid and pork ribs, as the president of the Wikipaella Association Guillermo Navarro Tallada points out. In addition, fire is of great importance, as it is typical in Valencian lands that it comes from orange tree wood (García 2011), ideal not only for its characteristic aroma, but also for being an easy-to-handle firewood that does not cause much smoke, as pointed out in a study carried out by the Catholic University of Valencia (Pérez 2022).

Geographical coordinates

The territory covered by this study dedicated to the Intangible Cultural Asset of "La Paella Valenciana "the art of uniting and sharing"" is based on the whole of the Valencian Community, and cannot be limited to the city of Valencia, so giving precise coordinates is of no interest.

39.461767, -0.394454
Valencia, Spain

2. CC risks and effects

CC represents one of the greatest environmental challenges in the current scenario in which Spain is a country particularly vulnerable to its effects due to two factors: its geographical location and its socio-economic characteristics (Medina 2015).

In this context, the internationalization of paella sometimes entails a loss of its essence and origins, but it is CC itself that directly affects two of its key ingredients: rice and beans.

One of the economic activities that will suffer most from the effects of global CC is agriculture. The main effects include: changes in crops due to an atmospheric increase in CO_2 concentration (IPCC WGII 5AR 2014). In the area of food security and food production systems, CC projections for wheat, rice and maize crops in tropical and temperate regions point to a negative impact on production with local temperature increases of 2°C or more above late 20th century levels, increasing the risk of more severe yield impacts from 2050 onwards depending on the level of warming (Medina 2015).

The following examples of CC may affect rice and locust bean crops in Spain now and potentially in the future:

1. Increase in air and water temperature (heat and water stress);
2. Shortening of the growing season and yield variability;
3. Increase in pests and diseases;
4. Water availability;
5. Salinisation of water and soil.

3. Attitudes and recognition of problems

ICH bearers and practitioners, local community

The representatives of the community involve the political authorities, farmers, hotel, catering, and tourism sectors, as well as the Valencian people interested in preserving this ICH as a sign of identity of the Valencian Community and as a gastronomic symbol at national level. This community is based on different associations linked to the preparation of this gastronomic dish, as well as local authorities, scientists, technicians from the agricultural sector and the Valencian people themselves. In this way, both the bearers and practitioners of PCI and the local community are considered as a whole. This homogeneous group has been obtained because of the research process and the different interviews carried out.

The Valencian paella, "the art of uniting and sharing" was declared as ICH Interest by the Decree 176/2021 of 29 October, issued by the Valencian Regional Council.

Its main protection and safeguarding measures include the following:

a) Carry out identification, description, research, investigation, study, and documentation with scientific criteria.

b) Incorporate available testimonies into material supports that guarantee their protection and preservation.

c) To ensure the normal development and survival of this cultural manifestation, as well as to protect the conservation of its traditional values and its transmission to future generations.

Reference is also made to the fact that "any change that exceeds the normal development of the elements that make up this cultural manifestation must be communicated to the competent directorate general for cultural heritage so that it can issue, if necessary, its administrative authorisation and consequent modification of the present declaration" (Consell de la Comunidad Valenciana 2021).

The main threats that may arise affect the local crops that produce some of the key ingredients used to make paella grown in the Valencian community (20minutos.es 2022). These crops have conditioned the landscape and the ecosystem of the community, and their millenary tradition is what gave rise to the dish that we are now familiar with, paella. It is therefore important to point out that, even if these crops were to disappear in the Valencian Community due to the CC, the typical dish of paella would not disappear, as they would be imported from other parts of Spain or from abroad, if necessary. It is already the case with duck, which comes from France. However, its cultivation in the community and tradition has led to the origin of this key dish in Valencian gastronomy and to declare it as ICH in our country.

The main negative impact on the lagoon area caused the turning of the water into a turbid, oily, and foul-smelling liquid. To this has to be added the poor treatment of wastewater, industrial discharges, the use of chemical fertilisers and insecticides used in the rice fields, the excess of fertiliser used on crops, the reduction in the renewal water brought to the lake by the Júcar and Turia rivers, due to the diversion of water by the growing population, as well as the pressure of more than one and a half million people living around La Albufera and, as if that were not enough, the impacts of CC also began to intervene (Soria et al. 2021).

In the following, the problems identified by traditional practitioners and the local community as well as by researchers in the field are classified according to the impact of CC:

1. Rising temperatures and irregular rainfall patterns

The common point that emerges from the common interviews is global warming and, consequently, a notable rise in temperatures that is manifesting itself in the Mediterranean region, together with irregular rainfall, which leads to long periods of drought alternating with other episodes of torrential rainfall at "inappropriate" times of the year.

In 2022, Miguel Viñas witnessed an extraordinary rainfall episode at the beginning of May in which some districts of the city of Valencia accumulated huge amounts of water, exceeding 200 mm in 24 hours (Vázquez 2022). On this occasion, the Albufera had a very atypical recharge of rainwater in spring, causing the flooding of the rice fields out of date. This led to a delay in the labelling work and the subsequent sowing of rice until the water level dropped, for which local farmers had to use pumps.

These periods of rainfall are interspersed with long periods of drought or when it hardly rains at all, directly affecting the reduced flow of the main rivers from the Júcar and the Turia to the Albufera. Likewise, the small streams and "ullals", the name given to the small freshwater springs that supply the irrigation ditches surrounding the rice fields and which allow rice cultivation to be properly managed, depend on the availability of water and the quality of the water to ensure that the Albufera de Valencia enjoys a good state of health.

2. Extreme sea storms in the Western Mediterranean

Effects of CC, visible in the Albufera area and affecting rice cultivation are the extreme sea storms that are occurring more and more frequently in the Western Mediterranean. In 2020 the *Gloria squall* hit the Mediterranean side of the peninsula, breaking all records for wind intensity, snowfall, and wave heights, causing considerable and important damage (Medina 2004). The dune belt that separates the Albufera from the open sea is vulnerable to an increasing incidence of this calibre, which is closely linked to storms of this calibre.

3. Salinisation due to sea level rise

Global warming is causing the poles to melt, which in turn is leading to an increase in coastal erosion and causing storm surges to rise as the warming of the air and sea leads to more frequent and intense coastal storms. In addition to these effects of CC, there has been a lack of contributions from the River Júcar in recent decades and a reduction in the dune system due to a lack of sediment from the river Turia and the barrier effect of the Port of Valencia, all of which has led to a salinisation effect in the Albufera.

The Universitat Politécnica de València already warned in a study carried out in 2015 by Héctor Moreno-Ramón and Sara Ibáñez-Asensio of the alterations that could occur in a foreseeable scenario of CC due to an increase in salinity over the last 10 years (Navarro 2021). This study concluded that the soils of the Albufera de Valencia are salinized due to marine intrusion, as the permanent sheet of water in the wetland is essential to move the saline water table towards deeper positions, preventing the salinisation of the soil surface and thus, as well as warning that summer is the period of greatest risk of salinisation (Moreno et. al. 2015).

Likewise, the salinity factor determines the type of ecosystem inhabiting the different areas of the estuary and consequently if the regimes are modified the current ecosystems will be displaced (Medina 2002).

On the other hand, it is the farmers' own testimonies that warn of the need to take urgent measures, since otherwise, within thirty years, this salinity excess will make rice cultivation unviable in this area.

4. Shortening of the growing season

One of the effects of CC that directly affects agriculture is the shortening of the growing season in favour of longer and hotter summers, which means that the fruit does not fatten due to the lack of rain and heat causing the quality of the crop to worsen considerably. Likewise, sowing has been delayed by up to two months, a direct consequence of the CC.

A team of researchers from the Universitat Politècnica de València (UPV), (among whom we have interviewed Mario X Ruiz-González, from the University Institute for the Conservation and Improvement of Valencian Agrodiversity (COMAV), and from the Universidad Técnica Particular de Loja (Ecuador)) has evaluated the effects that climatic conditions can have on local and commercial varieties of beans and green beans traditionally sown under cold or hot conditions (Acosta et al. 2022).

The study concludes that the *garrofón*, a bean that gives flavour to paella in its original recipe, could face problems in the coming years due to global warming, thus altering the recipe and the original flavour of this dish, which is a flagship of Valencian gastronomy.

On the other hand, farmers in Valencia point out that "the Valencian bean is an increasingly scarce gem in the Valencia Region, having lost 75% of its cultivation area in recent years due to competition from third countries". Although outside the national territory this bean is quite unknown, Valencians appreciate it, especially for its close link with paella going back centuries, the cultivation of which is part of the landscape and heritage of the Valencian people (Martínez 2022).

5. Ecotoxicity of the soils of the Albufera Natural Park

Most of the land in the Albufera de Valencia Natural Park is devoted to rice cultivation (14,000 ha of the 21,000 ha it owns), and rice cultivation is a key element of the ecosystem that contributes to the environmental quality of this area. It is also continually subjected to anthropogenic impacts such as flooding with water from irrigation ditches laden with urban and/or industrial waste and the use of agrochemicals and pesticides derived from agricultural activity.

In this sense, there are areas within the rice fields whose soil contamination is directly related to the urban and industrial density of the surrounding areas. Pharmaceutical residues have recently been detected in the soils and waters of the Albufera and although chemical tests have been carried out, these are of limited value as indicators of ecotoxicity. In fact, although the concentration of a chemical compound is high, its bioavailability can be low or, conversely, a mixture of toxins can be responsible for high toxicity even if each of them is present in low concentrations. This is why, in the Albufera Park, it is important to evaluate and take into consideration the effects that the pollutants present in a given matrix can develop together (Boluda et al. 2014).

Furthermore, Andreu Escrivá, environmentalist and sustainability consultant, points out that rice cultivation is the main affected by CC, as it collects a large amount of methane. Furthermore, climatic conditions influence the amount of starch in rice and therefore its flavour, causing greenhouse gases to contribute to making plants less nutritious.

6. Impact of agricultural activity on the contribution of heavy metals in the soils of the Albufera Natural Park.

Recent studies have verified the content of heavy metals in samples of fertilisers and pesticides used in agricultural practices, demonstrating the existence of Cd, Co, Cu, Xn, Fe and Mn in fertilisers and Cd, Co, Cu, Ni, Pb, Zn, Fe and Mn in pesticides. Likewise, the metals contributed to the soil are Fe, Cu and Zn in quantities varying between 1 and 15 kg/ha/year and Cd, Co and Ni in quantities of 150 and 450 km/ha/year, thus affecting crops and rice production in the Albufera (Boluda et al. 2001).

Officials responsible for the ICH safeguarding

At national level, the officials responsible for safeguarding the ICH in Spain have not associated Paella Valenciana and its tradition in the community with the risks of CC, nor have they problematised it in the context of CC. Likewise, in Decree 176/2021, of 29 October, of the Conseil, declaring La Paella Valenciana, as "the art of uniting and sharing", and as an Intangible Asset of Cultural Interest, with the category of Intangible Asset, there is no reference to the fact that CC may influence this ICH. However, several studies have been carried out and reports produced by the Ministry of Agriculture, Fisheries and Food by the Spanish Government in which the crops of the Valencian Community and the Albufera are evaluated.

In this context, it is worth highlighting "Impacts, vulnerability, and adaptation to CC in the agricultural sector. An approach to knowledge and management practices in Spain". This report attempts to address a National Climate Change Adaptation Plan that is affecting the

primary sector at the first order, consequently affecting the rest of the sectors and the intangible heritage related to gastronomy, as in this case the Valencian Paella (Medina 2016).

The Spanish State, as well as other Member States belonging to the United Nations, is required by the Convention on Climate Change to implement concrete measures to adapt to sea level rise and other effects of CC on the coast. For this reason, the Directorate General for Environmental Quality and Assessment of the Ministry of the Environment, through the Spanish Office of CC, is in charge of taking the necessary measures to develop an adequate policy. In 2002, this Directorate requested the collaboration of the University of Cantabria for the development of a Collaboration Agreement to develop scientific studies to provide scientific and technical support for policies and strategies for action on the Spanish coasts in the face of CC, with the Albufera being one of the points addressed by this study (Fernández 2013).

Other: journalists

When issues related to Paella Valenciana are discussed, it is often in the context of tourism as a tourist attraction in Spain and abroad with the emphasis on how a variation of the traditional recipe can affect this sector. Valencia is known all over the world for its paella and the paella for Valencia, resulting the two forms as an indissoluble association. However, on many occasions its ingredients come from outside the community and even from outside the country, when traditionally all of them were grown in the community, hence the emergence of this dish, being a compendium of local products (Radio Valencia 2020).

The media announce that paella and its traditional recipe may be endangered in the next few years due to the lack of some of its ingredients, such as the garrofón or the rice cultivated in the Albufera. They blame nature but do not link it directly to CC and consequently to the human actions that contribute to it. Likewise, no reference is made to how these traditional crops have conditioned the community's own landscape, customs, and tradition (Neurice project 2020).

It is the local farmers who raise the economic aspects and the importance of the centuries-old tradition of cultivation in the area, but in terms of the species of beans grown and the rice fields, it is the researchers in various studies who raise questions about the environment and the ecosystem.

Other: scientists

In addition to the problems mentioned above and identified by farmers and by the inhabitants of the Valencian community themselves, national and international scientists highlight how, beyond the environment, CC in the 1980s had an impact on the life and culture of the people of Albufeira. The number of fishermen in the area was drastically reduced, the traditional trade of calafate almost died out and the farmers dedicated to the cultivation of rice were threatened, thus affecting the culture, gastronomy and customs of a territory strongly rooted in the territory. These resources have for centuries promoted the development of a unique lifestyle in this singular place.

Thus, informant Andreu Escrivá points out that the rice fields of the Albufera of Valencia are replacing the natural marshland of which there are very few original areas left to serve as a refuge for the fauna. In recent years, we have witnessed how many birds, including flamingos, have not migrated, and have settled in the rice fields, destroying part of the rice crop.

A study carried out by the Ecotoxicology Group of the IMDEA Water Institute in collaboration with the Norwegian Water Research Institute and the IE Business School has evaluated and projected the ecological risk in the rice fields of the Natural Park, considering different climatic and pesticide application scenarios, which are another major problem facing the cultivation of this cereal. Using computer tools, the scientists have made predictions of the impacts of CC for the years 2050 and 2100 (Centro de Estudios Hidrográficos 2017). The

main factors considered in the study were the influence of precipitation and temperature. Thus, a large part of the results showed that the most important negative impacts of CC are conditioned by extreme precipitation events, rather than by the increase in temperature itself.

Thus, using different prediction models it was observed that by 2050 and 2100 precipitation will decrease considerably, but will be concentrated in shorter periods of time. This in turn will affect exposure to pesticides and increase the ecological risk of many compounds, as physic-chemical processes take place when it rains (Centro de Estudios Hidrográficos 2017). These processes are involved in the degradation of pesticides such as reduced evaporation or increased resuspension of compounds that were in the sediment, in addition to the actual washing from the plants into the water.

4. Existing practices: solutions implemented, planned, or proposed

Community level

The Valencian Community (political authorities, farmers, inhabitants, etc.) is dedicated to promoting this tradition especially through its culinary heritage, having paella as an internationally recognised sign of identity, of which its “essence” must be preserved without forgetting its origins. In this sense, any dish with rice and various ingredients cannot be called “paella”.

Guillermo Navarro Tallada, Co-Founder & Managing Director Speaker, member of the Wikipaella Association highlights the importance of eradicating the food colouring tartrazine and promoting instead the cultivation and consumption of saffron, an essential ingredient in traditional Valencian paella, whose cultivation takes place in Valencia. The entire society of the Valencian territory is related to the tradition of this dish, being the protagonist of paella competitions, in family events, in festivities, celebrations and popular festivities, in weekend leisure activities, even closing events, institutional visits or in various acts, encompassing each one of the collectives and societies of the Community, even of the vast Spanish territory (Vidal et al. 2022).

Likewise, paella is essential in many of the popular festivals and celebrations of the Valencian Community, including Las Fallas (UNESCO 2016), where each country house typically cooks its own paella, or Les Fohueres de Sant Juan or in the Romería de la Magdalena in Castelló, where paella becomes an act of eating together, constituting a sign of cultural identity specific to the Mediterranean. This backbone character of paella extends throughout the Valencian Community through events such as the International Paella Competition in Sueca, special days that commemorate this dish such as World Paella Day or University Paella, where thousands of students gather around a paella, in addition to the community's patron saint festivals, almost all of which include a day dedicated to paella (Consell de la Comunidad Valenciana 2021).

The festival of El Tastarròs stands out. This is a great festival dedicated to Valencian rice, in which over the course of a weekend various gastronomic proposals related to rice and its origins take place (Vidal et al. 2022).

The Community also stresses the importance of the CC among other factors, which directly affect agriculture and consequently the ingredients used to make traditional Valencian paella, including rice and beans, directly affecting production and consumption costs and, consequently, tourism. In this respect, the pests affecting both crops should be tackled, and the competent authorities should encourage research to tackle CC.

Municipality level: Tradiciones locales de la Comunidad Valenciana

Both in Valencia and in almost all the municipalities of the Region, the tradition of paella is promoted as a gastronomic heritage. Likewise, for its traditional preparation, the use of local

products is considered, valuing the economic and environmental benefits that this entails (Consell de la Comunidad Valenciana 2021).

National and local authority level: legal framework

There is no legal framework for the cultivation of locust beans or 'garrofó' in Valencia, where it is a traditional crop. However, the cultivation of rice is legislated in Decree 259/2004, of 19 November, of the Consell de la Generalitat, which approves the Plan Rector de Uso y Gestión del Parque Natural de l'Albufera. (2004/11941).

The Albufera Natural Park is the oldest protected natural area in the Valencian Community, declared in July 1986, and is currently considered one of the most important wetlands in Europe for its naturalistic values, such as birdlife, as well as for the historical coexistence between the natural environment and human activity, characterised by a use of natural resources that has been meticulously regulated for centuries. This situation has given rise to a unique environment, where the criteria for the sustainable use of wetlands advocated on a global scale by the Convention on Wetlands (Ramsar 1971) are implemented.

The Valencian Community and the Albufera Natural Park and its surroundings make it advisable to define a management model for the park in which a sustainable development strategy based on the conservation and rational management of environmental resources plays a leading role, where the objectives of socio-economic development and those of conservation of environmental and cultural values are considered complementary.

EU level: geographical indication

There are no European regulations that directly concern Valencian paella as a gastronomic dish. We have to refer to the legislation that applies to some of the ingredients that make up this traditional dish and that fundamentally affect rice. Thus, Regulation (EU) No. 1169/2011 of the European Parliament and of the Council of 25 October 2011 seeks to ensure that consumers are adequately informed about the foods they consume, which is extremely important in the case of paella, which in order to have the authentic traditional denomination, must be composed of certain ingredients such as rice, garrofón, etc.. This law allows consumers of the dish that bears the denomination paella to know the origin of the ingredients from which it is made. Another European regulation contained in Commission implementing regulation (EU) 2019/67 of 16 January 2019, imposes safeguard measures on imports of rice originating in Cambodia and Myanmar/Burma. One of the fundamental elements in the development of a dish such as paella is rice from rice fields in the Community of Valencia. This regulation aims to protect this ingredient from competition from other rice from Asia, which could undermine one of the fundamental elements of this dish. Closely related to the above, Commission Regulation (EC) No 1971/2001 of 9 October 2001 entered 'Arroz de Valencia' in the Register of Protected Designations of Origin and Protected Geographical Indications established by Council Regulation (EEC) No 2081/92. This is a fundamental ingredient in the development of the paella dish and is a step towards its protection. Subsequently, different variants of rice have been added to this declaration as a Protected Designation of Origin, as can be seen in the different legal documents of the European Commission included in the bibliography.

5. Publications and other additional information

Research bibliography

1. Acosta-Quezada, P.G., Valladolid-Salinas, E.H., Murquincho-Chuncho, J.M. et al. (2022). Heterogeneous effects of climatic conditions on Andean bean landraces and cowpeas highlight alternatives for crop management and conservation. *Scientific*

Reports 12, 6586. Available at: https://www.nature.com/articles/s41598-022-10277-x. DOI: https://doi.org/10.1038/s41598-022-10277-x

2. Boluda, R., Gimeno, E., Andreu, V. (2001). Impacto de la actividad agrícola sobre el aporte de metales pesados en suelos del Parque Natural de la Albufera de València (Impact of agricultural activity on the contribution of heavy metals in the soils of the Albufera de València Natural Park). *Dossiers agraris*. Núm. 7, p. 177-186. Available at: https://raco.cat/index.php/DossiersAgraris/article/view/150840.
3. Boluda, R., Rodríguez Martín, J.A., Ramos-Miras, J.J., Gil, C. (2014). *Ecotoxicidad de suelos del Parque Natural de la Albufera de Valencia* (Ecotoxicity of soils of the Albufera de Valencia Natural Park). Dept. Biología Vegetal, Facultat de Farmàcia. Universitat de València.
4. Centro de Estudios Hidrográficos (2017). *Estudio de la afección del cultivo del arroz en la calidad de agua de la Albufera de Valencia* (Study of the effect of rice cultivation on water quality in the Albufera de Valencia). Available at: https://www.chj.es/es-es/medioambiente/albufera/Documents/Estudio_de_la_afeccion_del_cultivo_del_arroz_en_la_calidad_de_agua_de_la_Albufera_de_Valencia.pdf.
5. Fernández, M. E. (2013). *Efectos del cambio climático en el rendimiento de tres cultivos mediante el uso del Modelo AquaCrop*. (Effects of climate change on yields of three crops using the AquaCrop Model). Evaluación del riesgo agroclimático por sectores. Junio de 2013. Fondo Financiero de Proyectos de Desarrollo – FONADE e Instituto de Hidrología, Meteorología y Estudios Ambientales – IDEAM. Banco Interamericano de Desarrollo – BID. Available at: http://www.ideam.gov.co/documents/21021/21138/Informe+Final_+Efectos+del+CC+en+el+rendimiento+de+cultivos+agr%C3%ADcolas.pdf/77713cce-eef6-4eb9-9ad6-02985c72b76b.
6. Guardiola Ortiz, J. (1936). *Gastronomía Alicantina.* (Alicantina Gastronomy). Alicante. Imprenta Sucesor de Such, Serra y Compañía.
7. Herrera, G. A. de. (1513). *Agricultura General* (General Agriculture). Available at: https://bibdigital.rjb.csic.es/idurl/1/9699.
8. IPCC, Pachauri. R.K., Meyer, L.A. (eds.) (2014). Cambio climático 2014: Informe de síntesis. Contribución de los Grupos de trabajo I, II y III al Quinto Informe de Evaluación del Grupo Intergubernamental de Expertos sobre el Cambio Climático (Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.) IPCC, Ginebra, Suiza. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full_es.pdf
9. Medina Martín, F. (2015). *Impactos, vulnerabilidad y adaptación al cambio climático en el sector agrario: Aproximación al conocimiento y prácticas de gestión en España* (Impacts, vulnerability, and adaptation to climate change in the agricultural sector: An approach to knowledge and management practices in Spain). Oficina Española de Cambio Climático. Ministerio de Agricultura, Alimentación y Medio Ambiente, Madrid.
10. Medina Santamaría, R. (2004). *Impactos en la costa española por efecto del cambio climático. Fase III. Estrategias frente al cambio climático en la costa*. (Impacts of climate change on the Spanish coast. Phase III. Strategies to tackle climate change on the coast).
11. Moreno-Ramón, H., Ibáñez-Asensio, S. (2015). *Salinización de suelos en zonas húmedas: el caso de la Albufera de València* (Soil salinisation in wetlands: the case of the Albufera de València). Universidad Politécnica.

12. Neurice Project. (2020). *Nuevo arroz europeo comercial (Oryza sativa) que alberga alelos de tolerancia a la sal para proteger el sector del arroz contra el cambio climático y la invasión del caracol manzana (Pomacea insularum)*. (New commercial European rice (Oryza sativa) harbouring salt tolerance alleles to protect the rice sector against climate change and apple snail (*Pomacea insularum*) invasion). Available at: https://cordis.europa.eu/project/id/678168.
13. Ramsar (1971). *Convención relativa a los Humedales de Importancia Internacional Especialmente como Hábitat de aves acuáticas*. (Convention on Wetlands of International Importance Especially as Waterfowl Habitat). UNESCO. Available at: https://www.miteco.gob.es/es/biodiversidad/temas/ecosistemas-y-conectividad/leg_texto_convenio_ramsar_tcm30-196467.pdf.
14. Soria, J., Romo, S., Vera-Herrera, L., Calvo, S., Sòria-Perpinyà, X., Pérez, J. (2021). Evolución de la conductividad en la Albufera de Valencia entre 1985 y 2018. (Evolution of conductivity in the Albufera de Valencia between 1985 and 2018). *Limnetica*, 40(1), 223-232. DOI: 10.23818/limn.40.15.
15. Vidal-González, P., Medrano-Ábalos, P., Sáez Álvarez, E. J. (2022). *Una discusión glocal de pesadilla* (A nightmarish glocal discussion). Revista Internacional de Gastronomía y Ciencia de los Alimentos, [27]. Elsevier. Available at: https://www.sciencedirect.com/science/article/abs/pii/S1878450X21001293?via%3Dihub. DOI: https://doi.org/10.1016/j.ijgfs.2021.100430.

Press

1. (2022, May 30). *Por qué la auténtica receta de la paella valenciana está en peligro: el ingrediente que podría desaparecer*. (Why the authentic Valencian paella recipe is in danger: the ingredient that could disappear.) Gastronomía. 20minutos.es. Available at: https://www.20minutos.es/gastronomia/recetas/por-que-la-autentica-receta-de-la-paella-valenciana-esta-en-peligro-5007398/.
2. (2020, September 14). Andreu Escrivá. *El cambio climático afecta más a la paella que al oso polar*. (Climate change affects paella more than the polar bear). Radio Valencia. Cadenaser.com. Available at: https://cadenaser.com/emisora/2020/09/14/radio_valencia/1600078344_060808.html.
3. (2016, October 27). *Comando Actualidad la Paella Valenciana*. (Comando Actualidad: the Valencian Paella). RTVE. Youtube.com. Available at: https://www.youtube.com/watch?v=ummSuq6nau4.
4. García Valencia, J.L. (2011, October 17). *La paella tradicional valenciana ya tiene su Denominación de Origen*. El Mercantil Valenciano. (Traditional Valencian paella now has its own Denomination of Origin). Levante-emv.com. Available at: https://www.levante-emv.com/comunitat-valenciana/2011/10/17/paella-tradicional-valenciana-denominacion-origen-13030827.html.
5. Martínez, A. (2022, May 30). *El ingrediente de la paella que podría desaparecer en los próximos años*. (The paella ingredient that could disappear in the next few years). Larazón.es. Available at: https://www.larazon.es/comunidad-valenciana/20220528/mdxj7yuj6zhh3ghzvvsz33siym.html#:~:text=Seg%C3%BAn%20una%20investigaci%C3%B3n%20de%20la,por%20culpa%20del%20calentamiento%20global.
6. Navarro Castelló, C. (2021, February 22). *Valencia alerta de un incremento de salinidad en la Albufera por la falta de agua del Júcar, el efecto barrera del Puerto y el cambio climático* (Valencia warns of an increase in salinity in the Albufera due to the lack of water from the Júcar, the barrier effect of the port and climate change). Eldiario.es. Comunitat Valenciana. Available at: https://www.eldiario.es/comunitat-

valenciana/valencia/valencia-alerta-incremento-salinidad-albufera-falta-aportaciones-jucar-efecto-barrera-puerto-cambio-climatico_1_7242175.html#:~:text=El%20estudio%20concluye%20que%20los,la%20superficie%20del%20suelo%20y.

7. Pérez, I. (2022, March 16). *La paella valenciana tiene 10 ingredientes, ni más ni menos, y así lo acredita este nuevo estudio científico*. (Valencian paella has 10 ingredients, no more and no less, and this is what this new scientific study proves). Businessinsider.es. Available at: https://www.businessinsider.es/10-ingredientes-paella-valenciana-estudio-cientifico-1028849.
8. Vázquez, M. (2022, May 4). *En qué barrios de València llovió más y dónde lo hizo de modo torrencial*. (In which neighbourhoods of Valencia did it rain the most and where was it torrential?). El Mercantil Valenciano. Levante-emv.com. Available at: https://www.levante-emv.com/valencia/2022/05/04/lluvias-torrenciales-valencia-barrios-65697942.html.

Legal and policy sources*

International

1. European Commission (2001). *Commission Regulation (EC) No 1971/2001 on the entry of certain names in the Register of protected designations of origin and protected geographical indications provided for in Council Regulation (EEC).* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32001R1971&qid=1687949212305
2. European Parliament, Council of the European Union (2011). *Regulation (EU) No 1169/2011 on the provision of food information to consumers*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R1169&qid=1687886204555
3. European Commission (2015). "Arroz de Valencia" / "Arròs de València". Protected Designation of Origin. *EU geographical indications register*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R0099
4. European Commission (2019). *Commission implementing regulation (EU) 2019/67 of 16 January 2019 imposing safeguard measures with regard to imports of Indica rice originating in Cambodia and Myanmar/Burma*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0067&qid=1687880759881
5. European Commission (2022). "Arroz de Valencia" / "Arròs de València. Protected Geographical Indication. *EU geographical indications register*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOC_2022_386_R_0012

National

1. Consell de la Comunidad Valenciana. (2021). *Decreto 176/2021, de 29 de octubre, del Consell, de declaración de bien de interés cultural, con categoría de bien inmaterial, de la paella Valenciana, "el arte de unir y compartir"* (Decree 176/2021, of 29 October, of the Consell, on the declaration of the Valencian paella, "the art of uniting and sharing", as an asset of cultural interest, with the category of intangible asset). Available at: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-4133#:~:text=Mediante%20resoluci%C3%B3n%20de%2023%20de,arte%20de%20unir%20y%20compartir%C2%BB

6. Informants, experts, dates of interviews

- Mario X. Ruiz-González, researcher at María Zambrano of the Polytechnic University of Valencia at the University Institute for the Conservation and Improvement of Valencian Agrodiversity (COMAV). 27.06.2023.
- Pablo Vidal González, Professor of Social and Cultural Anthropology at the Catholic University of Valencia and President of the International Research Group "Social Sciences" of FIUC. He is director of the University Institute of Anthropology and was Vice-Rector of International Relations at the same university. Author of numerous publications, books and articles in high impact journals. 30.06.2023.
- Guillermo Navarro Tallada, Co-Founder & Managing Director Speaker, member of the Wikipaella Association (Valencia). 5.07.2023.
- Andreu Escrivà, environmentalist and sustainability consultant. Graduate in Environmental Sciences at the University of Valencia, Master's degree in Biodiversity, Conservation and Evolution and also PhD in Biodiversity. He has worked as a researcher at the Centre for Desertification Research (CIDE) and at the Cavanilles Institute of Biodiversity and Evolutionary Biology (ICBiBE). 3.07.2023.

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Section 5: Summary of Survey "The Impact of Climate Change on the Intangible Cultural Heritage"

1/ Process

The online survey on the impact of CC risks on intangible cultural heritage, prepared by the research team, consisted of **12 thematic questions**, eliciting the views of stakeholders and specific national ICH nominations.

The questionnaire was sent individually to representatives of the 27 Member States of the European Union: firstly, to the representative of the national inventory focal point that had prepared the country's periodic report on the implementation of the UNESCO 2003 Convention; secondly, to the National Commission for UNESCO of each EU Member State. The first invitation to complete the questionnaire was sent on 22 May 2023. For those contacts who did not complete the questionnaire within the deadline, a second invitation was sent on 19 June 2023, and, in some cases, a third invitation was sent to the experts individually responsible for the ICH field in a particular country.

By 4th of August 2023, 14 respondents from different fields representing **ten EU countries** had completed the survey, including **Austria, Bulgaria, Croatia, Greece, Italy, Ireland** (3 respondents)**, Latvia, Lithuania** (2 respondents)**, Spain and Sweden**. Representative of **Belgium** responded individually that she did not see an impact of CC on ICH and, therefore, will not complete the survey. The lack of responses from representatives of other EU countries may indicate a lack of relevance of the topic in specific countries or a lack of competence to describe the impact of CC on ICH.

2/ Results

"Those living by and close to nature
are those who know where the limits for nature are."
(Susanne Idivuoma, Sametinget, Sweden)

A large proportion of respondents indicate that ICH is not yet being addressed at national level in terms of CC impacts. In cases where the impact of CC on ICH has been identified, those who **express concern are the tradition bearers** themselves. This is most evident in northern Europe in the case of Sweden and in southern Europe in the case of Spain. In Spain, for example, **ICH is even proposed by the tradition-keepers as a solution to CC**, where, for instance, the use of a timber-rafting approach to reduce CO_2 emissions is encouraged.

The examples of ICH offered by respondents concern traditions that involve **contact with nature** (boating, bird catching, outdoor activities in designated CC-affected areas) or where the **raw material is found in nature** (wooden crafts, pottery, fishing). All together 14 respondents provided **33 ICH national examples as potential case studies** for further research about CC risks for sustainability of these traditions.

Respondents mostly mention CC risks such as **extreme weather conditions (heavy rainfalls, strong winds, high temperatures etc.), floods, drought, sudden change in temperatures, lack of ice, thaw cycles, ground erosion.**

The CC theme appears **in strategic documents at national level, but in general,** without being linked to specific ICH themes. Exceptions are those cases, such as the Sami in the North, who also promote the topic at the political level. In official public discourse, for example in Bulgaria and Croatia, the CC theme also appears in the context of cultural heritage, but mostly as a **possibility for the future, not as a present situation**.

When describing journalists' interest in the impact of CC on ICH, respondents point out that the topic of CC is frequently covered by the media, with calls to action, but without direct link to the ICH future. However, international media rather than local media mostly cover the impact of CC on ICH traditions.

When identifying the perceptions of different influencers on the impact of CC on ICH, respondents mention **academia** (especially anthropologists) **as the most knowledgeable** audience, but such perceptions are not yet present in society at large.

3/ National examples of ICH proposed by respondents for further research

Austria

1. Alpine transhumance in Austria
2. Alpinistic knowledge of mountain and ski guides in Austria
3. "Odlatzbia Oröwen" in Austria
4. Traditional Irrigation in Austria
5. The Bellringers of Patsch in Austria
6. Local Healing Knowledge in the Pinzgau Region in Austria
7. Avalanche Risk Management in Austria

Bulgaria

8. Traditional fishing in Bulgaria
9. Mat weaving from aquatic plant in Bulgaria
10. Traditional clay pottery in Bulgaria

Croatia

11. Mediterranean Diet in Croatia

Italy

12. Heroic vines Valdobbiadene in Italy
13. Floral decorations for the Feast of Corpus Christi in Italy
14. Transhumance in Italy

Ireland

15. Holly Wells in County Clare in Ireland
16. Hawking Falconry in Ireland
17. Boyne Currach in Ireland

Latvia

18. Timber-rafting on Gauja river in Latvia

Lithuania

19. Cross crafting and it's symbolism in Lithuania
20. Hollow tree beekeeping tradition, Varėna region, Musteika village, in Lithuania
21. Verbos Easter palms, Vilnius region, Čekoniškės village, in Lithuania
22. Fishing smelts and vendance by rotating bobos, Molėtai region, Mindūnai village, in Lithuania
23. Mushroom picking, Dzūkija National Park, Varėna region, in Lithuania
24. Smelt fishing, Lūšiai laike, Ignalinos region, in Lithuania
25. Ice knocking fishery of smelts, Curonian Spit, in Lithuania

Spain

26. Mediterranean Diet in Spain
27. Patios de Córdoba, Córdoba, Andalucía
28. Timber-rafting in Spain
29. Dry stone wall building in Spain
30. Irrigators' tribunals, Mediterranean Coast
31. Esparto grass culture, South of Spain
32. Lime-making in Morón de la Frontera, Sevilla-Andalucía

Sweden

33. Reindeer Herding in Sweden

Section 6: Climate Change Awareness

6.1. UNESCO Lists of Intangible Cultural Heritage

With the aim to identify CC and related risks in nominations on UNESCO Lists of ICH and the Register of good safeguarding practices (https://ich.unesco.org/en/lists), a corpus of full texts of the nominations representing EU Member States on UNESCO Lists of ICH and the Register of good safeguarding practices, published on UNESCO official webpage https://ich.unesco.org were browsed and searched. Specifically, the search for mentions of the word "climate" and the phrases "climate change", "climatic conditions", "climate risks" was done. Additionally, the interactive tool of UNESCO "Dive into ICH" was used, which demonstrated the thematic interconnectedness between all the elements inscribed and their relation to nature or to threats, including CC.

In total, five ICH elements from the EU Member States were identified whose descriptions presented CC risks. These elements are Truffle hunting and extraction in Italy, traditional knowledge and practice (**Italy**, inscribed in 2021), Transhumance, the seasonal driving of livestock along migratory routes in the Mediterranean and in the Alps (**Austria, Greece, Italy**, inscribed in 2019), Art of dry stone walling, knowledge and techniques (**Croatia, Cyprus, France, Greece, Italy, Slovenia, Spain, Switzerland**, inscribed in 2018), Craft of the miller operating windmills and watermills (**the Netherlands**, inscribed in 2017) and Traditional agricultural practice of cultivating the 'vite ad alberello' (head-trained bush vines) of the community of Pantelleria (**Italy**, inscribed in 2014). Four elements are related to Italy: in two cases those are individual nominations but in another two – multinational nominations with other European countries, representing the same threats among tradition bearers in several EU countries. Although **CC is mentioned in the UNESCO lists, it is not addressed in detail**. **Traditional skills and practices can be useful in maintaining modern economies, farming and reducing today's undesirable environmental impacts** (Craft of the miller operating windmills and watermills; Transhumance, the seasonal driving of livestock along migratory routes in the Mediterranean and in the Alps; Art of dry stone walling, knowledge and techniques).

The interactive tool of UNESCO "Dive into ICH" did not identify any EU Member States cases in relation to environmental degradation, including CC as one of the threats of ICH. All such cases, in total six, including Cultural practices and expressions linked to the 'M'Bolon', a traditional musical percussion instrument (**Mali**, inscribed in 2021), Carolinian wayfinding and canoe making (**Micronesia**, inscribed in 2021), Traditional knowledge and techniques associated with Pasto Varnish mopa-mopa of Putumayo and Nariño (**Colombia**, inscribed in 2020), Coaxing ritual for camels (**Mongolia**, inscribed in 2015), Secret society of the Kôrêdugaw, the rite of wisdom in Mali (**Mali**, inscribed in 2011), Sanké mon, collective fishing rite of the Sanké (**Mali**, inscribed in 2009), were identified outside Europe – in Africa, South America, East Asia and Oceania.

6.2. National Inventories of Intangible Cultural Heritage

To identify CC and related risks in the national inventories of ICH of the 27 EU Member States, all the national inventories were analysed. Every inscription on national lists published on ICH focal point webpages was searched for mentions of the word "climate" and the combinations of words "climate change", "climatic conditions", "climate risks". If descriptions of the elements on the list were not available in English, the search was carried out by translating the words and word combinations into the language of the country concerned.

Altogether, 11 of the 27 national inventories do not mention climate change in the ICH element descriptions. Climate keywords **appear most** in the element descriptions of **Germany, Italy, the Netherlands, Estonia**. Climate keywords in the context of climate risks appear most frequently in **traditions related to food culture**, such as plant growing (Mediterranean Diet in Italy and in Spain), animal husbandry (Transhumant livestock farming in Greece), fishing (Snap net fishing in Ireland; Lamprey fishing and preparation skills in Carnikava in Latvia), where certain conditions are also necessary for the preparation of specific examples of **national gastronomy**, such as wind for drying fish, meat or cheese (Traditional production of Pag cheese in Croatia). For several traditions, **humidity** is presented as a risk, both for **food crops** such as cereals (Knowledge about traditional seed cultivation and seed production in Austria) and wine culture (Wine culture in Germany), and for **traditional building practices** using local natural materials (Construction of a stone garden in Kihnu island in Estonia; Dry stone construction in Ireland). Climate change risks are also reflected in the descriptions of **traditions directly related to snow and ice**, including mountaineering (Alpinistic knowledge and skills of the mountain & ski guides in Austria; Mountain carrying in Slovakia), playing in snow (Playing in snow in Finland), ice-skating (Skating on natural ice in Netherlands). Climate is often mentioned in descriptions of traditions where it has a **direct link to the practice of the tradition** itself, e.g. cold seasons for knitting traditions (Knitting large shawls in Saaremaa in Estonia; Making patterned, double-knit mittens in Mazsalaca in Latvia). In general, climate risks are more likely to be reflected in ICH practices **related to highlands or islands and to farming practices**.

6.3. Periodic Reporting under UNESCO's 2003 Convention for the Safeguarding of the Intangible Cultural Heritage

Following the task to identify CC and related risks in the UNESCO periodic reporting of intangible cultural heritage of the 27 EU Member States, the approach was to determine whether the UNESCO periodic reports of the EU Member States mention climate change risks. The reports of the 27 EU Member States were analysed by looking at reports for all available years. All country reports published on the UNESCO website were searched for mentions of "climate", "climate change" and other variations of "climate".

Nine country reports do not mention climate at all. Only the **2012 Spanish report mentions CC as a potential risk in the future** to be considered. All other information is from the 2021 reports. It is evident that climate and its impact on ICH are receiving more attention in the **northern and southern European countries** (Sweden, Finland, Spain, Italy, Greece). Seven reports mention CC in general terms, as one of the aspects to be considered in the future that affect and will affect ICH.

Reports from Finland, Sweden, and Denmark (**Sámi cultural space** and the **Arctic region, environment, and culture**) show how regions and their cultures are changing because of CC. **Heavy rainfall** and **flooding** are among the threats affecting ICH in the regions, as mentioned in reports from **Luxembourg** and **the Netherlands**. However, there is no specific reference to specific ICH practices affected. One of the problems that emerges in the reports is **the change in snow and ice thickness and the lack of stability** (avalanche risk management, traditional hunting practices, dog sledges for travel and hunting in Austria; landslides, glacial melt, snow, and ice quality affecting the tradition of mountain climbing in Italy). **Traditional livestock breeding and farming** are on the list of endangered practices (transhumance in Greece and Spain; growing vines in Italy; traditional grassland irrigation in the Netherlands; reindeer husbandry in Sweden).

Traditions linked to **food culture** are also highlighted (traditional viticulture in Santorini in Greece, the truffle hunting and extraction in Italy; Mediterranean Diet in Italy and Cyprus; Sámi food system in Finland).

The reports also highlight the importance of education to further improve the CC mitigation. Both formal and informal education are important. Much has been done in this field in the context of **avalanche risk management** in Austria, both by training schoolchildren on what to do if caught in an avalanche and by promoting tree planting at municipal and national level to reduce avalanche risks. In Greenland and Sweden, museums and projects are also focusing on ICH in the face of CC. Seminars, symposia, boot camps are organised to highlight the broad importance of ICH (Greece, Italy, Spain, Ireland, and Sámi culture). The reports also show that ICH has been used to reduce the impacts of CC on **nature and the environment**, as traditional knowledge and practices offer many opportunities (in the Netherlands, Slovenia, Finland, Spain). There is little in the reports on legislation so far and in the near future, but some country reports provide information on climate policy frameworks that include cultural heritage (Greece, Slovenia, Finland).

Section 7: Climate Change Threats to Intangible Cultural Heritage

Climate change affects or can potentially affect traditional practices and skills that are intertwined with local ecosystems and weather patterns. CC can lead to the loss of natural resources that are essential for certain traditions, thus impacting, among other things, traditional cuisines, and dietary practices. CC can also disrupt the timing and conditions of traditional festivities that are closely linked to seasonal changes. Events like agricultural festivals or religious ceremonies that depend on specific weather patterns may be affected. As CC can alter the cultural landscape through several factors (like sea-level rise or desertification), it can threaten the continuity of practices that rely on them. The most characteristic CC types affecting ICH are listed below.

CHANGING CLIMATE CONDITIONS

Shifted seasons and changed freeze/thaw cycles

Higher temperatures cause a shift in the geographical distribution of climate zones and shifted seasons. Low-temperature extremes (cold spells, frosty days) could become less frequent in Europe while high-temperature extremes (heatwaves) will become more frequent. These changes are altering the distribution and abundance of many plant and animal species, which are already under pressure from habitat loss and pollution. This effect of CC affects traditions characterized by seasonality.

More specifically, climate warming has changed the freeze and thaw cycle in countries where such a phenomenon was not regularly observed until now. For example, Carnikava lamprey fishing in Latvia is often disturbed nowadays, because in winter there can even be several thaws, which cause flooding in the rivers, which in turn prevents the practice of lamprey fishing during the most active fishing season (CS11). Seasonal shifts also affect the performance of traditional practices and celebration of festivals, as they no longer coincide with harvest time or other natural events. For instance, the time of crop maturity in Lemnos, Greece has now decreased and therefore there is not enough time for collaborative practices of the past: in *mandras*, the *kehaghias* and his family would support other *kehaghiades* in harvesting and then they would collectively celebrate a big feast. Today the crops mature much faster because of the heat and the *kehaghiades* cannot take turns in the collection of their crops as they used to. Therefore, both collaboration and social relationships are affected. The annual calendar is also affected by the temperature rise: many celebrations and religious practices of *kehaghiades* relate to the cycle of agriculture. For instance, the religious celebration of *Panagia Messochoritissa* used to mark the new planting at the beginning of the annual cycle; however, due to CC, the time of the celebration does not coincide any longer with the actual planting as the rise of temperature means that the planting has to happen later in the year than in the past. Therefore, the meaning of religious celebrations is also affected (CS5). Also, the timing and duration of alpinism seasons in the Alps have changed due to CC. Winters are becoming shorter, and spring arrives earlier, affecting snow conditions and the availability of safe climbing windows. Traditional climbing seasons may need to be adjusted or shortened. The periods of optimal conditions have shifted toward spring and fall, because, in the summer months, the itineraries have become more dangerous and technically

more challenging (CS2). Seasonal shifts also affect the tradition of transhumance in Spain (transhumance is a livestock grazing system that consists of moving alternately and periodically throughout the year between two specific regions with different climates, with the aim of making the most of the pastures). In the past, transhumance was fixed to the same dates from May to October. Now, it varies from March to November, due, among other things, to the increase of temperature, which alters the available resources (CS13).

Less predictable weather conditions

Global warming affects the predictability of events and therefore capacity to respond effectively. CC cause more frequent and severe weather events. In the Alps, unpredictable storms, heavy rainfall, and sudden temperature fluctuations make planning and executing climbing more complicated. This requires alpinists to adapt quickly to changing conditions and poses additional risks (CS2).

WEATHER EXTREMES

Increased air temperatures

The CC has increased the average global temperature and underlies almost all other climate change types. It is leading to more frequent high-temperature extremes, such as heatwaves. Meanwhile, the yields and viability of agriculture and livestock, or the capacity of ecosystems to provide important services and goods (such as the supply of clean water or cool and clean air) could be diminished (consequences of Climate Change).

In a direct way, CC causes various negative consequences for ICH mainly related to agriculture. On the one hand, warmer weather affects earlier crop ripening and, in the case of heat-loving crops, higher quality production, which are positive effects. Until now, the increasing temperatures have conferred advantages to grape cultivation in Germany by extending the warmer growing seasons, ultimately resulting in stronger and bolder grapes. This, in turn, elevates the alcohol content of the grapes. Also, Northern regions of Germany are now becoming more suitable to grape cultivation than before (CS3). The description of the Lemnos *mandra* tradition (Greece) mentions that the hot weather allows the harvest to ripen earlier (CS5). On the other hand, the escalating heat is beginning to pose challenges and can have a negative impact on the old traditions. The flavour profile of grapes is intricately tied to the soil in which they thrive. Consequently, alterations in soil composition due to heightened heat and moisture can lead to corresponding changes in grape and wine taste. For example, warming temperatures may make German Riesling (a cool-climate wine) less enjoyable since heat mellows the acid's sharp flavour (CS3). As demonstrated by the example of Spain's iconic dish paella, extreme heat, combined with other CC effects, can affect the availability of certain traditional food ingredients, thus threatening the cooking traditions themselves (CS14). The hot weather conditions also make the farmers' work physically difficult, as noted in the descriptions of the German wine culture (CS3) and the *mandras* tradition of Lemnos (Greece; CS5). The latter also points out that hot weather is a threat to the inheritance of the *mandra* tradition, as representatives of the younger generations do not want to do physical work in hot weather (CS5). Extreme weather conditions, including heat waves, could also have a negative impact on various festivals. For instance, more frequent combinations of cloudbursts and strong winds with scorching temperatures could influence the network of festivals of big shoulder-borne processional structures and their regular performance for longer periods – this would seriously jeopardize performances in outdoor venues (CS10).

Extreme rainfall and floods

CC leads to an increase of precipitation across many regions of Europe. Increased rainfall over extended periods mainly leads to fluvial (river) flooding, while short, intense cloudbursts can cause pluvial floods, where extreme rainfall causes flooding without any water body overflowing. CC is likely to increase the frequency of flooding across Europe in the coming years. Heavy rainstorms are foreseen to become more common and more intense due to higher temperatures, with flash floods expected to become more frequent across Europe. In some regions, certain risks such as early spring floods could decrease in the short term with less winter snowfall, but the increased risk of flash flooding in mountain areas overloading the river system may offset those effects in the medium term (Consequences of climate change).

In Cinque Terre, Italy, CC is emerging as a threat multiplier amplifying existing risks and vulnerabilities. According to climate projections, Cinque Terre is expected to experience an increase in both the intensity of extreme precipitation and the frequency of rainy days. In addition to the issue of dry-stone wall terrace abandonment and degradation, heavy rainfall events can significantly exacerbate the risks of soil erosion and collapse in the abandoned terraces. This poses a considerable threat as it intensifies geo-hydrological hazards, including landslides, mudflows, and erosions. These hazards not only endanger nearby human settlements but also the cultural landscape and the overall sense of place. Climate change has raised the issue of preserving the vanishing skill of dry-stone walling (CS7). Unforeseen hail and thunderstorms with subsequent flooding have a significant impact on agricultural traditions, as they can destroy crops in a short time (e.g., CS3).

In Gubbio, Italy, the Gubbio community at large strongly underlined that extreme rainfall also have the potential of damaging the wooden machines of the Ceri, which represent the important tangible heritage, symbol of the identity of the community and of the Umbria Region, and the essential tool for renewing the intangible heritage represented by the festival of the Ceri (CS8).

Extreme drought

Many European regions are already facing more frequent, severe, and longer lasting droughts. A drought is an unusual and temporary deficit in water availability caused by the combination of lack of precipitation and more evaporation due to high temperatures. Droughts often have knock-on effects, for example on transport infrastructure, agriculture, forestry, water, and biodiversity. They reduce water levels in rivers and ground water, stunt tree and crop growth, increase pest attacks and fuel wildfires. With a global average temperature increase of 3°C, it is projected that droughts would happen twice as often, with the most severe impacts in the Mediterranean and Atlantic regions (Consequences of climate change).

CC may alter the availability of pasture and forage in transhumance areas in northern Spain, making it more difficult for livestock to feed during their movements. More frequent and prolonged droughts, as well as changes in precipitation patterns, may reduce the quantity and quality of available pasture (CS13). Prolonged drought can cause certain elements of the cultural landscape to disappear – for example, the spring important for pilgrims of the *Madonna Avvocata* festival at the Benedictine Abbey of Cava de' Tirreni in Italy is drying up due to extreme drought, which affects the course of a centuries-long tradition (CS9).

FOREST FIRES AND DESERTIFICATION

Forest fires

More frequent and severe droughts increase the length and severity of the wildfire season, particularly in the Mediterranean region. CC is also expanding the area at risk from wildfires. Regions that are not currently prone to fires could become risk areas.

Forest fires affect cattle, with many of them dying as victims of fire, in some cases belonging to extensive livestock farming. Forest fire also causes the shortage of food. The practice of transhumance in northern Spain is essential to keep the forests clean and cared for. Transhumance shepherds report that each sheep eats 5 kilograms of grass per day, so a flock of 1000 sheep consumes up to 5 tonnes of grass per day. Thus, transhumance can help prevent forest fires, thereby helping to overcome the consequences of climate change (CS13).

Desertification

Desertification is the process of land degradation in arid, semi-arid, and dry sub-humid areas, often resulting in the transformation of once-productive land into desert-like conditions. In Europe, some areas are experiencing desertification due to factors such as CC, overgrazing, deforestation, improper agricultural practices, and unsustainable water management. Mediterranean regions, including parts of Spain, Italy, Greece, and Portugal, are particularly susceptible to desertification due to their naturally arid and semi-arid climates, combined with human activities that exacerbate land degradation. The expansion of arid areas and the loss of fertile soil can have serious consequences for local ecosystems, agriculture, and communities. Efforts to combat desertification in Europe include implementing sustainable land management practices, reforestation, water conservation, and promoting awareness about the impacts of land degradation.

Like the forest fires example, the transhumance tradition of northern Spain is, on the one hand, threatened by desertification, while, on the other hand, it can help mitigate this risk. Case study gives an example: the consumption of 5 tons of grass per 1000 head of cattle translates into 5 tons of manure of the highest quality, whose faeces contain very diverse seeds that help regenerate the soil and maintain its biodiversity, like it has been mowed and manured by herbivores throughout history (CS13).

LOSS OF ICE AND GLACIERS

Global warming has significant impact on (seasonally) ice-covered areas. Rising temperatures contribute to the loss of sea and freshwater ice, as well as the melting of glaciers. The loss of ice and melting glaciers have far-reaching implications, including rising sea levels, altered ocean currents, disruptions to ecosystems and biodiversity, and increased risks of extreme weather events.

Loss of inland ice

Increased air temperature causes both the melting of ice in mountain regions and the non-formation of natural ice cover in seas and freshwaters in those regions where it normally would form. One of the most well-known traditions affected by this climate change is skating on natural ice in the Netherlands (CS12).

Melting glaciers

Acceleration of melting glaciers in the Alps due to rising temperatures has resulted in reduced snow and ice coverage. This CC effect has a serious impact on alpinism, making certain alpinist routes more dangerous or inaccessible. Traditional climbing routes that relied on stable ice formations may no longer be viable in thinner and flux ice conditions (CS2).

LANDSLIDES AND EROSION

Landslides and erosion are caused by various factors of CC – in alpine regions they are caused by melting permafrost and melting glaciers, in Central and Northern Europe – by an increase in the number of rainy days that replace frost periods in winter, as well as by an increase of extreme rainfalls. These effects of CC impact ICH in different ways. For instance, as the permafrost thaws and the ice melts, rock stability is compromised and the Alps experience more frequent rockfalls and rockslides, posing greater risks to alpinists. This has altered the dynamics of alpinism routes and increased the need for additional precautions (CS2). In Germany, challenges arise from the erosion of steep slopes within grape fields, as these areas are more susceptible to degradation under shifting climatic conditions (CS3), while in Italy, extreme rainfall causes erosion that alters the ancient cultural landscape: progressive erosion of the terraced system of dry-stone walls destroys the ancient paths to the Benedictine Abbey of Cava de' Tirreni, which is an important part of the pilgrimage infrastructure of the *Madonna Avvocata* festival (CS9, see also CS7). Similarly, landslides could produce direct and indirect consequences on the immaterial aspects of the *Festa dei Ceri* in Gubbio, Italy, and its implementation, impacting on the cultural, social, and economic related values. It could have negative impacts on the route, compromising the historical itinerary of the feast, and modifying the consolidated ritual structure, deeply based on the genius loci that permeates and gives meaning to the entire event (CS8).

BIODIVERSITY

Biodiversity loss

CC is happening so fast that many plants and animal species are struggling to cope. There is clear evidence to show that biodiversity is already responding to climate change and will continue to do so. Direct impacts include changes in phenology (the behaviour and lifecycles of animal and plant species), species abundance and distribution, community composition, habitat structure and ecosystem processes. CC is also leading to indirect impacts on biodiversity through changes in the use of land and other resources. These may be more damaging than the direct impacts due to their scale, scope, and speed. The indirect impacts include habitat fragmentation and loss; over-exploitation; pollution of air, water and soil; and the spread of invasive species. They will further reduce the resilience of ecosystems to CC and their capacity to deliver essential services, such as climate regulation, food, clean air and water, and the control of floods or erosion (Consequences of climate change).

The loss of biodiversity greatly affects traditions that use natural resources. The example of the puffin hunting tradition of the Faroe Islands shows that the puffin population is declining due to the warming of the ocean water, the disappearance of the typical North Atlantic fish and plankton species that form the basis of the puffin's diet, which in turn threatens the puffin hunting tradition (CS1). The loss of biodiversity has a secondary impact also in other traditions, e.g., alpinism. CC is causing altering of the ecosystem dynamics in the Mont Blanc massif which is characterised by exceptional biodiversity in relatively small areas. These ecosystems, both flora and fauna, are extremely vulnerable to CC and to disturbances linked to human activity. Biodiversity loss may impact the overall alpinism experience (CS2).

Invasive species

Temperature rises are likely to influence phenology – the behaviour and lifecycles of animal and plant species. This could in turn lead to increased numbers of pests and invasive species (Consequences of climate change). As a result of different CC effects in Lemnos (Greece) the population of wild rabbits is experiencing an uncontrolled growth. Without natural enemies as in the past, their numbers are increasing, and this affects both pastureland and cultivations (CS5).

Section 8: Addressing Climate Change Threats

8.1. Overview of Existing Practices

CC has different impacts on ICH. Some of the ICH elements are not affected by CC because they are either not related to the local environment or are able to successfully adapt to CC. However, part of the ICH is vulnerable to CC. To prevent the negative impact of CC on ICH at various levels, a combination of community, municipal, national, and international measures are being taken.

1) Adaptation

Considering the gradual onset of adverse CC effects, the core strategy of tradition bearers involves adapting to the evolving circumstances. However, as the impacts of CC become more pronounced, the effectiveness of adaptation might prove insufficient. Adapting to the effects of CC manifests in diverse ways depending on the tradition. However, at its core, it entails introducing subtle modifications to traditional practices while upholding the essence of the tradition.

For instance, in the context of wine production in Mosel valley, where the climate is becoming warmer and drier, vintners are progressively acquiring vineyards in cooler adjacent valleys. This presents an opportunity, such as revitalizing overlooked steep slopes along the Ruwer River. In collaboration with scientists, winegrowers are thinking about new grape varieties, irrigation, and greening of wine hills (CS3). In the case of alpinism, the primary focus of the adaptation strategy is rooted in practicality, aiming to ensure human safety. This involves exploring alternatives to conventional climbing routes, implementing safety measures such as meticulous scrutiny of weather forecasts, and making timely choices to evade perilous situations. Additionally, adapting climbing schedules to accommodate shifted seasons and incorporating more advanced equipment and technology are integral components of adaptation (CS2).

2) ICH inventories

Recognizing, promoting, and safeguarding intangible cultural heritage values occur on both the international stage, exemplified by the UNESCO Representative List of the Intangible Cultural Heritage of Humanity (CS2 since 2019), and at the national level through ICH national lists (CS3 since 2021). ICH elements also find their way onto various other inventories, including the European Union's Protected Designation of Origin list (CS3) etc. Incorporating traditions into these mentioned inventories serves as a means of not only popularizing specific ICH values but also directing public attention toward the CC factors that pose a threat to these values. Additionally, it engages both national and international societies in activities related to risk assessment and prevention. Although local communities cooperate with national cultural agencies to develop comprehensive inventories of ICH, assessing vulnerabilities and implementing strategies to ensure that CC impacts are mitigated effectively should be intensified.

3) Public awareness

In the face of the negative impacts of CC on ICH, the importance of public awareness becomes essential in tackling this issue. Public awareness is achieved through various activities. It is raised by: (1) tradition practitioners, (2) scientists informing general public about the potential or existing effects of CC on ICH, (3) lectures, seminars, and conferences supported by regional and national governments. Mass media play a vital role in spreading the respective information. At one of these levels, public awareness takes place in all the analysed case studies. Although it is often pointed out that informing the general public about the dangers of CC does not always mean practical action by the parties involved in preventing these dangers, awareness of the problem is nevertheless an essential step for taking further actions. A deeper comprehension of the matter holds the capacity to engage the wider public in endeavours related to climate change mitigation and more.

CC impacts on specific, iconic examples of ICH are used to communicate CC issues to the general public. For example, to illustrate the rapid progress of CC in the Netherlands, both mass media and politicians use the example of ice skating, which is very popular in the Netherlands (CS12). Similarly, the case of the iconic bird species – the puffin – is widely used to raise the issue of CC in the international press (CS1).

4) Community involvement in CC affect mitigation

In addition to adapting to the new circumstances, local communities are implementing various measures to mitigate the effects of CC on ICH. For example, the community of Cinque Terre is actively taking action to restore the dry-stone walls of their surroundings. The initiative originated from a dedicated group of citizens who started to conduct extensive archival research to identify and reach out to hundreds of landowners. Their goal was to obtain permits for intervention, which they obtained through donations, land leases or free loans. As a result, a 'community foundation' was established with the capital generated through financial and in-kind contributions from the families in the village, including monetary funds and land located in the area. In addition to community-led action, some farmers have taken economic initiatives to support terrace restoration. These include crowdfunding campaigns to support the "heroic viticulture" like Grape & Heroes, as well as the establishment of farmers' associations and partnerships between the tourism industry and agriculture sector. This initiative plays a crucial role in enhancing the visibility of local products and promoting their sale and consumption contributing to the overall growth and development of the community (CS7). In several cases, the local community is actively involved in the collection of monitoring data, which is necessary for the accurate assessment of the effects of CC and the search for solutions. For instance, many members of alpinist communities residing in France, Italy, and Switzerland have engaged with scientists in their research, providing essential information from the perspective of the stakeholders as well as, through citizen science approach, have been involved in monitoring the biodiversity of the alpine ecosystems (CS2).

The Community involvement in Gubbio was solicited and activated during the HERACLES European H2020 project lifetime. In this case, the citizens have been engaged as "human sensors" to monitor the status of CH assets, having the role to report damages and criticalities in particular areas of the city. It is realised sending messages using the Municipality website. It particularly concerns the Town Walls area on the mountain, that is very representative also for the present CS8 case study, as part of the *Festa dei Ceri* path.

5) Research and monitoring

The sustainability of intangible cultural heritage today is largely related to the research of natural and climate scientists. One of the ways to ensure the sustainability and protection of traditions, as well as the prevention of negative consequences caused by CC, is the collection of data on the state of resources important to the tradition. This practice is carried out by scientists, collecting and analysing data, however, both the tradition community and the general public can often get involved in data collection using the principles of citizen science as mentioned previously. Monitoring is especially important in cases where the ICH element is somehow related to the preservation of natural species or biodiversity, as demonstrated by Carnikava lamprey fishing tradition in Latvia (CS11), puffin hunting in the Faroe Islands (CS1), also alpinism in the French, Italian and Swiss Alps (CS2).

6) Sustainable resource management

Monitoring and scientific research is instrumental to implement sustainable resource management practices that align with local cultural traditions and protect the ecosystems on which these practices rely. Such practices regarding traditions that use natural resources for food production are implemented both at the national and European Union level, on the one hand, balancing the interests of preserving environmental diversity with economic interests, and, on the other hand, establishing research-based principles of sustainable use of natural resources.

The European Union or national governments determine the principles for the use of protected species found in their territory either by prohibiting or by setting restrictions on their use. As the case study of puffin hunting shows, when the condition of the population of the species deteriorates, its hunting is restricted (CS1). River lamprey fishing in Latvia will also likely be regulated in the future, based on the newly started lamprey population monitoring data (CS11).

7) National legislation

The protection of ICH against the effects of CC is directly or indirectly regulated by both national legislation and budget funding, which is allocated both for promoting its ICH values, monitoring the consequences of CC effects on ICH (by financing scientific institutions), and raising the issue (by financing public media). In an indirect way, the mitigation of CC impacts on ICH is related to the national climate policy, which can be defined in national planning documents – climate change prevention strategies, etc. At the same time, there is a pressing need to incorporate the safeguarding of ICH into national climate change policies in more detail. This would ensure a cohesive approach to safeguarding both cultural diversity and the environment.

8) International cooperation

The impact of CC on ICH is a global problem, so international cooperation and internationally coordinated action by various organizations and international treaties play an increasingly important role in mitigating these impacts. International networks and partnerships are established to facilitate the exchange of best practices and innovative solutions for preserving ICH. International organizations such as UNESCO collaborate with member states to develop strategies for safeguarding intangible cultural heritage in the context of climate change, offering technical assistance, capacity-building, and networking opportunities.

8.2. Map of Existing Practices

The current picture demonstrates a preliminary mapping exercise. Herein, the existing practices identified during the development of the deliverable D2.2 “Primary and secondary data research findings” are grouped together on a single map. Along with that, in cooperation with GreenHeritage project partners, ReadLab, ILFA have contributed to planning the data structure and design of the forthcoming interactive map aiming to show examples of the most endangered areas and regions in Europe where CC has started to negatively impact different types of ICH. The interactive map will be developed by ReadLab within the WP3 “GreenHeritage ICT tools” as the Task 3.1: “Design and development of an interactive map”.

Fig. 1. Existing practices described in case studies: a screenshot of preliminary mapping results. The full working version map is available at the online link: https://www.google.com/maps/d/edit?mid=1ndPkG95ph5e3sw6roVzPZUED4y895VM&usp=sharing The map features eight layers of data, with a separate layer for each existing practice to mitigate the effects of CC on ICH: (1) adaptation (green marker), (2) ICH inventories (blue), (3) public awareness (yellow), (4) community involvement (dark red), (5) research and monitoring (gray), (6) sustainable resource management (dark blue), (7) national legislation (pink), (8) international cooperation (violet). The data used in the map will be utilized for a more detailed mapping of CC and existing practices to mitigate the effects of CC within, and this will be one of the important next steps of the GreenHeritage project. (Task 3.1).

8.3. National Policy and Legal Measures

Identifying national policy measures that address the interconnection between cultural heritage, including ICH, and CC, have already been part of interest from the side of the EU. Namely, a report has been published recently by the EU on "Strengthening cultural heritage resilience for climate change. Where the European Green Deal meets cultural heritage" (2022). This report summarises the work of the EU Open Method of Coordination (OMC) group of Member States' experts on 'Strengthening cultural heritage resilience for climate change'. It provides an insight into the state of play in Europe at the national level with regard to cultural heritage / climate change in policies, including an overview of national CC policies that mention cultural heritage (pp. 15-16). Such an overview does not provide, however, an elaboration on the extent to which ICH is explicitly or implicitly covered by such mentions. Instead, this study has set the ground for a further need in deeper analysis when it comes to the linkage between CC and ICH safeguarding, as it recognized that:

> A very low level of knowledge regarding the impacts of climate change on intangible heritage was revealed [...]. Rituals, oral traditions and performing arts were named, but the low number of responses, together with the fact that most participants selected the 'no answer' option, clearly showed a significant lack of knowledge of the intangible aspects of the heritage at risk. (P. 18)

The secondary and primary data accumulated within the GreenHeritage project and analyzed hereinabove (a/ the analysis of periodic reports, b/ questionnaire, and c/ case studies), have included various references to domestic and international policy and legal measures that address climate change threats, and elaborate on approaches to mitigate climate change impacts and adapt to novel climate conditions. This section of the report draws upon such identified references, which reflect altogether nine European countries and their domestic - national or regional - experiences.

To have a more comparable set of identified policies and laws, these initial references have been complemented with a selection of complementary secondary sources - laws and policy documents. Such complementary selection was focused on measures that directly address climate change, whether these cover the impact of climate change on culture and heritage, and ICH, in particular. Thus, this section of the report is structured as an accumulation of insights. Instead of being an exhaustive and rigidly systematic comparative analysis, it may serve as an illustration of heritage related aspects addressed in policy and legal measures developed at the national level about CC.

Furthermore, it is important to highlight that this preliminary content analysis of domestic policy and legal sources is focused on eventual direct references to culture and heritage, including ICH, in respective CC related documents, without considering indirect connections. Regarding ICH practices, such indirect connections are numerous, diverse, and dispersed in various sectoral policies and legislations. These will remain though beyond the scope of this section of the report.

About explicit mentions of culture and heritage in CC related policies and legal regulations, it may be preliminarily observed that (1) only some policy measures speak explicitly of addressing the impact of climate change on ICH, or living culture, depending on the terminology used, for instance as part of policies on cultural landscapes and spatial planning. (2) In some cases, a clear direct interest in preserving tangible and built heritage is mentioned, for instance in the case of floods. This nevertheless may serve as a starting point for expanding the heritage component in CC policies, to integrate heritage more broadly, including ICH. Another aspect can be identified hereinafter, and that is (3) the respect towards the rights of Indigenous peoples and more broadly towards the interests and needs of

different groups to sustain their livelihoods and practices. (4) Overall, the most common practice is to express a more general concern about CC impact on cultural heritage.

The selected policy documents and laws in the field of CC mitigation and adaptation refer to cultural heritage mostly in general terms, without going into the detail of the types of heritage eventually concerned. Some of these references may presumably be meant to address the tangible cultural heritage. However, it can also be seen as a matter of interpretation. Due to the impact of international ICH definition within the UNESCO 2003 Convention, the meaning of the term of cultural heritage has been evolving over the last decades, integrating ICH as its component, and this can have its impact also on the interpretation of this legal term at the national level.

1/ Bulgaria

As recognized within a recent Periodic Report of Bulgaria on the implementation of the UNESCO 2003 Convention, "Climate change poses risks that can have a negative effect on the intangible cultural heritage as well as on the communities that practice it. The legal measure of the state aimed at taking measures related to the potential threat of climate change is the Climate Change [Mitigation] Act [2014]." In its Article 4, as amended in 2015, a need for a cross-sectoral integration of policies is acknowledged, including policies in the field of cultural heritage protection, and with a respective involvement of the Minister of Culture. The law stipulates that:

> "The government policy on climate change mitigation shall be integrated with the respective sectoral and integrated policies in the fields of transport, energy, construction, agriculture and forestry, tourism, industry, regional development, health care and cultural heritage protection, education and science, finance and EU funds, labour and social policy, defence, internal and foreign affairs and shall be implemented sectorally by the Minister of Energy, the Minister of Economy, the Minister of Regional Development and Public Works, the Minister of Transport, Information Technology and Communications, the Minister of Agriculture and Food, the Minister of Interior, the Minister of Finance, the Minister of Foreign Affairs, the Minister of Health and the Minister of Culture in accordance with their powers granted under this Act and the relevant special legislation." [*official translation*]

This call for a cross-sectoral cooperation may demand further efforts and time for its implementation in this regard and be a process in progress. For instance, the Report for Implementation of the Third National Action Plan on Climate Change 2013-2020 published by the Ministry of Environment and Water in 2022, does not directly address the field of culture, and neither heritage.

2/ Finland

The Climate Change Act was adopted in Finland in 2022, with the aim "1) to enhance and coordinate the planning and monitoring of the implementation of measures to mitigate and adapt to climate change; 2) to strengthen the possibilities for Parliament and the public to participate in and influence climate policy planning" (Art. 1, *unofficial translation*). Furthermore, "the planning system for climate policy under the Act and its implementing legislation shall aim to: 1) to contribute to ensuring the equity and sustainability of climate action; 2) to contribute to safeguarding the ability of the Sámi people to maintain and develop their language and culture" (Art. 2, *unofficial translation*). The Act establishes a climate policy planning system (Art. 7).

According to the Act, a National Adaptation Plan to Climate Change is envisaged to be developed (Art. 10) and has to include a "cross-sectoral and regional approach to adaptation".

Furthermore, climate policy plans are to be elaborated in consultation with the Finnish Climate Panel - an independent body of scientific experts from different scientific disciplines - and the Sámi Climate Council that would include holders of Sámi traditional knowledge and representation from the main scientific disciplines; and the Sámi Parliament and the Skolt Sami Siida Council shall also be consulted (Art. 13, 20, 21).

The Medium-term Climate Change Policy Plan: Towards a carbon-neutral society in 2035, adopted in 2022, describes the hearings and negotiations with the Sámi, and reflects some concrete impacts that CC adaptation might have on traditional Sámi livelihoods:

> "Negotiations held with the indigenous Sámi people pursuant to the Act on the Sámi Parliament raised the issue that the Sámi use snowmobiles, ATVs and possibly other non-road mobile machinery for practicing their traditional livelihoods, such as reindeer herding. The transformation to low-carbon fuels and energy-efficient alternatives in these pieces of machinery might result in extra costs for practitioners of the traditional livelihoods" (p. 195).

The recent Periodic Report of Finland on the implementation of the UNESCO 2003 Convention puts an emphasis on Finland's Strategy for Arctic Policy published in 2021. As explained in the report, "the policy strategy sets out Finland's key objectives in the Arctic region. According to the policy, all activities in the Arctic region must be based on ecological carrying capacity, climate protection, principles of sustainable development, and respect for the rights of indigenous peoples. The strategy extends to the year 2030."

Climate change mitigation and adaptation is among the four priorities of this Strategy. Furthermore, it puts a substantial emphasis on the protection of the rights of indigenous peoples in the region, in the context of the conditions of change. As stated in this Strategy:

> "Good living conditions and possibilities for participation in cooperation and decision-making on the Arctic must be safeguarded for the people living in this region. In particular, cross-border cooperation and dialogue between people and NGOs should be facilitated and promoted. The indigenous peoples living in the Arctic should be able to preserve and develop the vitality of their cultures, languages and traditions and obtain the necessary capabilities for adapting to the challenges created by the changes affecting the region. In all Arctic cooperation, Finland promotes gender equality and non-discrimination." (P. 15)

The Strategy, in its section on climate change mitigation and adaptation, states clearly the close connection between CC and the livelihoods of local populations, which are linked to local culture and traditional knowledge:

> "The Sámi culture and the traditional knowledge of the Sámi will be considered in line with the Constitution. The Arctic population, particularly indigenous peoples, are the first to experience climate change and its effects on their lives and cultures. Traditional Sámi knowledge will be included in the knowledge base of development and climate change work in the Arctic." (P. 31) [*official translation*]

These considerations are followed by a set of strategic measures that encompasses, among other, that "the proposal on preparing a climate change adaptation plan for the Sámi will be examined as part of the Climate Change Act and the update process of the National Climate Change Adaptation Plan" (p. 32), and "establishing a Sámi Climate Council to promote the recognition of traditional Sámi knowledge and its inclusion in information production that supports decision-making" (p. 33).

3/ Germany

In Germany, CC mitigation and adaptation is dealt with at both federal and lands' level. The Federal Climate Change Act was adopted in 2019, with a purpose "to provide protection from the effects of worldwide climate change by ensuring achievement of the national climate targets and compliance with the European targets. The ecological, social, and economic impacts shall be taken into consideration" (Art. 1). The social impact of CC is emphasized, without a separate mention of the cultural impact. The Act sets national CC targets, and elaborates in particular on the land use, land-use change and forestry sectors, defines climate action planning and establishes a Council of Experts on Climate Change. Based on the Act (Art. 10), a Climate Protection Report 2022 was adopted by the Federal Government, which accordingly does not provide any direct reference to the impact of CC on culture.

As a more specific example of a federal law legislation can be mentioned - the Federal Water Act adopted in 2009. Its Section 6 on flood protection addresses the evaluation of flood risks, which needs to also consider the potential risks for cultural heritage. As stated in Article 73 of this law:

> "The competent authorities assess the flood risk and then determine the areas with a significant flood risk (risk areas). Flood risk is the combination of the likelihood of a flood event occurring and the potential adverse flood effects on human health, the environment, cultural heritage, economic activities, and significant property." [*unofficial translation*]

According to a recent Periodic Report of Germany on the implementation of the UNESCO 2003 Convention, "numerous measures have been taken at Land level, for example, to safeguard intangible cultural heritage in general. These include Land legislation on equality, climate protection laws, nature conservation laws and legislation on individual forms of culture." As an example of such efforts, Hessian Climate Law, with full title - Hessian Law on the Promotion of Climate Protection and Adaptation to the Consequences of Climate Change, was adopted in 2023 within the federal state of Hesse. The purpose of this law includes the following concerns:

> "to contribute to mitigating the unavoidable consequences of climate change and, in particular, to develop and implement adaptation measures to protect human health, biological diversity, water, soil, the natural environment, cultural heritage, infrastructure and other material assets, as well as to mitigate the social consequences and maintain the performance and competitiveness of the Hessian economy."

4/ Greece

As reported by Greece in its Periodic Report on the implementation of the UNESCO 2003 Convention "in 2016, the National Adaptation Strategy to Climate Change [...] was published, in which the Cultural Heritage sector was integrated as a distinct sectoral policy." Furthermore, "the Hellenic Ministry of Culture and Sports participates in the preparation of a National Action Plan to Manage Climate Change. The Plan highlights the properties of dry-stone construction, which coincide with the principles of bioclimatic architecture." The same periodic report puts an emphasis on legislative measures that are taken at regional level.

> "Law 4759/2020 "Modernization of Spatial and Urban Planning Legislation and other provisions" [...] constitutes the national framework for the establishment of the individual Regional Spatial Frameworks developed by each of the thirteen Regions of Greece, stipulates that the directions of spatial development and organization at regional level must consider, inter alia, "the protection of the cultural and natural landscape" (art. 5). The same Law in art. 18 stipulates that: "the rational and integrated spatial development of activities in the maritime area, considers the maritime cultural heritage

> in general. In this context, the harmonious coexistence of all relevant activities and uses is sought and the resilience to the effects of climate change is ensured".
>
> [...] Provisions of the Law 4759/2020 enable the Regional Administrations of the country to develop plans for the protection of natural areas/ landscapes that are associated with the practicing of an ICH element. For example, the Regional Spatial Framework of the Region of Central Macedonia (art. 11) discourages "spatial planning of activities in areas with extensive vineyards, in order to protect these areas from fragmentation". This provision is a prerequisite for the safeguarding of ICH associated with traditional viticulture in areas located in some of the most historic vineyards/ wine terroirs of Greece (Naoussa Imathia, Goumenissa Kilkis, Epanomi etc.)."

In Greece, National Energy and Climate Plan, adopted in 2019 by the Ministry of the Environment and Energy, includes indicative actions and adjustment measures for 15 sectoral policies, including cultural heritage. As stated in this document,

> "With regard to the impact of climate change on cultural heritage, Greece has undertaken an international initiative in cooperation with UNESCO and the World Meteorological Organisation (WMO) in order to identify state-of-the-art solutions for monitoring and protecting the world cultural and natural heritage and strengthening its resilience by the use of new technologies." (P. 101).

5/ Ireland

In Ireland, its Climate Action Plan 2023 pays particular attention to heritage sites near the coast and on estuaries. The Plan acknowledges that "climate change is also posing risks to food security, worsening existing social inequalities, and threatening cultural heritage." Among Potential Impacts of Climate Change in Ireland it mentions that "Projected increases in sea levels and storm surge will result in increased frequency of coastal flooding and erosion, with significant impacts for coastal and heritage sites situated in proximity to the coast and on estuaries", which thus needs to be addressed. This policy addresses primarily built (historic/traditional buildings) and archaeological heritage but could lead to a broader outreach in the heritage sector.

Adaptation measures decided include, among other, to "develop a coordinated approach to vulnerability assessment of heritage sites to support Local Authorities and other sectors" and to "compile statistics relating to climate change impacts on heritage sites". Envisaged actions include also to "develop and publish guidelines/ recommendations on increasing the resilience of heritage resources to current and future climate conditions, for use by Local Authorities" and to "assess existing communication gaps and strategy for public engagement together with a report published on public engagement activities initiated/ facilitated by the heritage sector".

6/ Italy

In Italy, the National Plan for Adaptation to Climate Change adopted in 2022 has a separate section on cultural heritage. It mostly puts an emphasis on tangible heritage, such as historic landscapes and buildings, as well as archaeological heritage and historic settlements. For instance, according to this document, flood hazards and landslide risks are also estimated as well as the following issues, among other:

> "Increasingly frequent extreme events such as intense rainfall up to floods and storms, are responsible for structural damage in historic buildings"; "the decohesion of porous building materials is expected to increase due to increased crystallization/ solubilisation cycles of salts throughout Europe, including Italy. On the other hand, there will be a

> general reduction in damage caused by freeze-thaw cycles"; "the cultural heritage located on Italian coasts is and will be subject to the increased incidence of extreme events, rising sea levels and coastal erosion phenomena with probable loss of archaeological and monumental coastal sites. The increase in extreme events could cause flooding, especially of underground sites and historic centers." (Pp. 66, 67)

With a broader regional perspective, while with direct reference to the territory in Italy, the Alpine strategy for adaptation to climate change in the field of natural hazards was developed by the Platform on Natural Hazards of the Alpine Convention (PLANALP). The document includes several recommendations, which directly concern alpinism as ICH. These include, among other, to improve the knowledge base and transfer to practice (p. 18), which is a transnational initiative in the region.

7/ Luxemburg

As for the Periodic Report of Luxemburg on the implementation of the UNESCO 2003 Convention, it is explained that there are administrative policies with regard to living heritage that are linked to nature, and connected to CC. Acknowledging that with the effects of CC, many activities will be more exposed and vulnerable to natural hazards such as floods and droughts, there is a flood risk management plan that takes account of cultural heritage, and puts in place measures to reduce the negative consequences of CC.

According to the Water Law adopted in 2008, flood risk management programme includes drafting "management plans aimed at reducing the adverse impact of flooding on people, property and the environment, taking into account economic aspects and the impact of climate change" [*unofficial translation*] (Art. 38), which includes concerns about cultural heritage, even if not explicitly mentioned.

8/ The Netherlands

According to the National Climate Adaptation Strategy adopted in 2016, "the Ministry of Education, Culture and Science has included climate adaptation in its Vision Document on Cultural Heritage, 2017-2018". Furthermore, it is recognized in the Strategy that "[...] it is important to formulate the climate adaptation process in a broader context, to include consideration of the consequences of climate change for nature, health, the food supply chain, spatial design, cultural heritage, housing, urban transformation, and so forth", named as a broad-based action (p. 31).

About the operationalization of the concept of climate-adaptive action, the Strategy envisages that "where appropriate, activities will be aligned with those of the City Deals programme and ongoing cultural heritage projects, since climate-adaptive action will often be undertaken in areas which represent historic cultural values." (p. 32)

In another policy document, National Delta Programme 2023, a clear linkage between water management and heritage management issues is made, including with regard to CC. It is stated regarding resources from the national government that "the Ministry of Education, Culture and Science (OCW) is also providing financing through matching for water projects in the Heritage Deal (budget from the 'Heritage Counts' policy)."

9/ Sweden

In Sweden, a Climate Act and a climate policy framework were adopted in 2017. The focus was on reaching national and global climate targets and emission reduction, and on regularly adapting climate policy action plans. The Climate Policy Council was established as an independent, interdisciplinary expert body. The Climate Act did not elaborate on the domains affected by climate change, and thereby no direct reference to cultural heritage was mentioned. However, such a mention has become part of further policy developments.

In 2020, Sweden's Integrated National Energy and Climate Plan was adopted by the Government, which recognizes the dispersed nature of climate change adaptation policies, the issues of CC being integrated in a number of policy fields, including with regard to cultural heritage, and preventive actions are elaborated within respective sectoral policies:

> "Many Swedish authorities have an important role to play in climate adaptation work through their respective sectoral responsibilities. They work preventively by building knowledge and improving resilience. [...] Several national authorities had already developed action plans for their sector. Some were developed with the support of national funding, such as action plans for forestry, human health, cultural heritage, sustainable land use planning, and Sámi industries and culture." [*unofficial translation*] (P. 80)

Furthermore, as observed in the 2023 Report of the Swedish Climate Policy Council, "culture and tradition can also play a role" in tailoring climate policies to national contexts (p. 57), which has been recognized among lessons learned from the global climate transition and other countries' climate policies. The Report elaborates on a just transition or transformation and its meaning in practice for policy. According to the Report, this means, among other issues, "the importance of recognising the culture, knowledge and needs of different groups", which does include Indigenous peoples' rights (*Ibid*.).

Already earlier, a regional initiative about CC adaptation has been developed - a Strategy of climate of Sámi parliament was adopted in 2019. Regarding its vision it explains that:

> "The climate strategy's vision aims at a viable and sustainable Sámi habitat where we wish to live in a viable Sápmi which is rooted in both a sustainable nature and a living Sámi culture. Man and nature must have a long-term ability to innovate and sustainably develop further even in times of change. Both nature and culture in Sápmi should be experienced as enriching for the outside world." [*unofficial translation*]

In addition to such policy vision, there is a complementary vision adopted by the younger generation, namely the Sami youth declaration on climate change adopted by the Nordic Sámi Youth Conference in 2021. According to this declaration:

> "We Sámi youth acknowledge the recent IPCC (Intergovernmental Panel on Climate Change) reports, especially the Special Reports on 1.5°C Degrees Warming and SROCC, as well as the 2021 IPCC WG1 AR6 report published in August 2021. The results draw an image of the Northern Indigenous homelands. Species critical to our survival and cultural preservation, such as reindeer, Arctic char and other salmonid fish, the Arctic fox and northern flora will become under extreme stress, potentially extinct in the next decades if the present course continues."

> "We highlight that traditional Sámi livelihoods are a crucial part of our culture. It is important for us to have access to these lands and waters as a huge part of our culture and identity is connected to them. [...] We recognise that duodji* is dependent on our other livelihoods as some of the materials are collected from reindeer and fish. As the climate is changing, also the ways and the amount of time in a year to use duodji change. This means that parts of the duodji are disappearing". [**traditional crafts*]

References

Apart from the first reference, policy and legal sources are structured according to the countries mentioned in this section of the report, and in a chronological order, starting with the most recent ones.

European Union (2022). *Strengthening cultural heritage resilience for climate change. Where the European Green Deal meets cultural heritage.* Available at: https://op.europa.eu/en/publication-detail/-/publication/4bfcf605-2741-11ed-8fa0-01aa75ed71a1/language-en

1/ Bulgaria

Ministry of Environment and Water (2022). *Report for Implementation of the Third National Action Plan on Climate Change 2013-2020*. Available at: https://www.moew.government.bg/static/media/ups/articles/attachments/Final_Report_TNAPCC_EN-1db5162910dd7c9c479e5f2a27619cd79.pdf

Bulgaria (2021). Periodic report on the Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/download.php?versionID=65309

National Assembly (2014). Закон за ограничаване изменението на климата (Climate Change Mitigation Act). *Bulgarian State Gazette*, No. 22/11.03.2014 (2014). Available at: https://www.moew.government.bg/static/media/ups/articles/attachments/Climate_Change_Mitigation_Actb79ac7271ff39de8cf1d9459a418e3f0.pdf

2/ Finland

Ministry of the Environment of Finland (2022). *Medium-term Climate Change Policy Plan: Towards a carbon-neutral society in 2035*. Available at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/164274/YM_2022_20.pdf?sequence=1&isAllowed=y

Eduskunta (Parliament) (2022). *Ilmastolaki* (Climate Change Act). Available at: https://ym.fi/documents/1410903/0/Ilmastolaki+s%C3%A4%C3%A4d%C3%B6skokoelma+(5).pdf/a495ffd2-fe82-c8fd-62d0-877ffd1fe02b/Ilmastolaki+s%C3%A4%C3%A4d%C3%B6skokoelma+(5).pdf?t=1659943761635

Finland (2022). Periodic report on the Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/download.php?versionID=65314

Finnish Government (2021). *Finland's Strategy for Arctic Policy*. Available at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/163247/VN_2021_55.pdf?sequence=1&isAllowed=y

3/ Germany

Bürgerservice Hessenrecht (2023). *Hessisches Gesetz zur Förderung des Klimaschutzes und zur Anpassung an die Folgen des Klimawandels* (Hessian Climate Law). Available at: https://www.rv.hessenrecht.hessen.de/bshe/document/jlr-KlimaSchGHErahmen/part/R

Bundesregierung (Federal Government) (2022). *Klimaschutzbericht 2022* (Climate Protection Report 2022). Available at: https://www.bmwk.de/Redaktion/DE/Downloads/Energie/klimaschutzbericht.pdf?__blob=publicationFile&v=1

Germany (2022). Periodic report on the Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/download.php?versionID=65317

German Bundestag (Parliament) (2019). *Federal Climate Change Act* (Bundes-Klimaschutzgesetz). Available at: https://www.gesetze-im-internet.de/englisch_ksg/englisch_ksg.pdf.

Bundestag (2009). *Gesetz zur Ordnung des Wasserhaushalts* (Federal Water Act). Available at: https://www.gesetze-im-internet.de/whg_2009/WHG.pdf

4/ Greece

Greece (2022). Periodic report on the Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/download.php?versionID=65319

Ministry of the Environment and Energy (2019). *National Energy and Climate Plan*. Available at: https://energy.ec.europa.eu/system/files/2020-03/el_final_necp_main_en_0.pdf

5/ Ireland

Department of the Environment, Climate and Communications (2023). *Climate Action Plan*. Available at: https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/

6/ Italy

Italy (2022). *Piano Nazionale di Adattamento ai Cambiamenti Climatici* (National Plan for Adaptation to Climate Change). Available at: https://www.mase.gov.it/sites/default/files/archivio/allegati/clima/PNACC_versione_dicembre2022.pdf

Platform on Natural Hazards of the Alpine Convention (2013). *Alpine strategy for adaptation to climate change in the field of natural hazards*. Available at: https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Organisation/thematic_working_bodies/Part_02/natural_hazards_platform_planalp/8_PLANALP_Alpine_strategy.pdf

7/ Luxemburg

Luxembourg (2022). *Rapport périodique de la Convention pour la sauvegarde du patrimoine culturel immatériel*. Accessible à : https://ich.unesco.org/doc/download.php?versionID=65327

Henri, Grand-Duc de Luxembourg, Duc de Nassau, la Chambre des Députés (2008). *Loi relative à l'eau*. Accessible à : https://data.legilux.public.lu/filestore/eli/etat/leg/loi/2008/12/19/n17/jo/fr/html/eli-etat-leg-loi-2008-12-19-n17-jo-fr-html.html

8/ The Netherlands

Ministry of Infrastructure and Water Management, Ministry of Agriculture, Nature and Food Quality, Ministry of the Interior and Kingdom Relations (2023). *National Delta Programme*. Available at: https://english.deltaprogramma.nl/binaries/delta-commissioner/documenten/publications/2022/09/20/delta-programme-2023-english---print-version/8397+Interactieve+DP+2023_DEF+ENG.pdf

Ministry of Infrastructure and the Environment (2016). *National climate adaptation strategy*. Available at: https://klimaatadaptatienederland.nl/en/policy-programmes/nas/

The Netherlands. (n.d.). *De Erfgoed Deal* (Heritage Deal). Available at: https://www.erfgoeddeal.nl/projecten

9/ Sweden

Swedish Climate Policy Council (2023). *Report of the Swedish Climate Policy Council*. Available at: https://www.klimatpolitiskaradet.se/wp-content/uploads/2023/05/krrapport2023english11maj.pdf

Nordic Sámi Youth Conference (2021). *Sami youth declaration on climate change*. Available at: https://www.sametinget.se/162623

Regeringen (Government) (2020). *Sveriges integrerade nationella energi- och klimatplan* (Sweden's Integrated National Energy and Climate Plan). Availabe at: https://climate-laws.org/documents/integrated-national-energy-and-climate-plan_87bd?q=Sweden+climate+act

Sametinget (Sámi Parliament) (2019). *Klimatstrategin – Sametingets politiska ställningstagande* (Strategy of climate of Sámi parliament). Available at: https://www.sametinget.se/130410

Sveriges Riksdag (Parliament) (2017). *Klimatlag* (Climate Act). Available at: https://rkrattsbaser.gov.se/sfst?bet=2017:720.

8.4. EU Policy and Legal Measures

In the context of the GreenHeritage project, a selection of policy and legal measures is being explored, with interest in the interconnections between climate change related EU policy and legal measures and ICH safeguard. EU policy and legal measures that address **climate change** threats, include concerns about safeguarding **intangible cultural heritage** to some extent, including when impact mitigation and adaptation strategies are developed. These are illustrated further in this section. Since intergovernmental discussions and international decisions on these issues have an important interconnection between the global, and European level, some global international policies, and legal measures, as well as those adopted by another European organisation, the Council of Europe, are also mentioned below.

A/ Climate change in cultural heritage policies

Climate change is identified as a significant threat when directly discussing ICH safeguarding at the European level, or cultural heritage preservation and safeguarding more broadly. For instance, the European Commission in its communication Towards an integrated approach to cultural heritage for Europe adopted in 2014, acknowledges that:

> Global warming and climate change, in particular rising sea levels and the increased occurrence of extreme weather events, can put cultural heritage at risk. [...] Furthermore, research and innovation is carried out on strategies, methodologies and tools needed to enable a dynamic and sustainable cultural heritage in Europe in response to climate change and natural hazards and disasters.

The European Parliament, in its resolution with an identical title adopted in 2015, expresses concerns on the effects of CC on heritage. Therein the European Parliament -

> Draws attention to the environmental threats affecting an important number of heritage sites within the EU, and urges that the consequences of climate change and human pressure should be takes into account by Member States in their long-term funding strategies for heritage preservation and restoration methods; recommends, in addition, that the Member States and the EU should promote research to a greater extent in this area, inter alia in order to investigate the multiple effects of climate change on cultural heritage in greater detail and to develop counter-measures" (point 66);

Furthermore, regarding the European level, the recommendation Safeguarding and enhancing intangible cultural heritage in Europe adopted in 2019 by the Parliamentary Assembly of the Council of Europe, emphasizes its cooperation with the European Union, thereby inviting for more coordinated policies and action within the European region:

> The Assembly calls for greater coherency of action between the Council of Europe, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the European Union in this area. Accordingly, it recommends that the Committee of Ministers instruct the relevant bodies of the Council of Europe to: [...] acknowledge that ICH safeguarding targets and competences are covered implicitly by the terms of reference of the Steering Committee for Culture, Heritage, and Landscape (CDCPP) and consider close co-operation with UNESCO and the European Union in this institutional framework.

In addition, respective national engagements are being encouraged. The named Steering Committee for Culture, Heritage and Landscape (CDCPP) explores CC as a special file,

featuring national contributions by a number of European countries, as well as by some international fora, and additional publications focused on this issue. It references, among other, the Recommendation CM/Rec(2018)3 of the Committee of Ministers to member States on cultural heritage facing climate change: increasing resilience and promoting adaptation, adopted by the Committee of Ministers of the Council of Europe in 2018. In its Recommendation, the governments of member States are recommended to "a) ensure the inclusion of cultural heritage in their policies and strategies for adaptation to climate change; b) assess the economic value of cultural heritage lost to climate change".

Lately, European intergovernmental policy initiatives have been complemented also by positions adopted from the European non-governmental sector. In March 2021, to integrate the European Green Deal in the work of heritage professionals, the European Cultural Heritage Green Paper was produced by the non-governmental organization "Europa Nostra" in close cooperation with the International Council on Monuments and Sites (ICOMOS) and the Climate Heritage Network, with the input of other members of the European Heritage Alliance. It is supported by the European Investment Bank Institute and the Creative Europe programme of the European Union aiming at Putting Europe's shared heritage at the heart of the European Green Deal. The Green Paper explores and correlates the contribution of cultural heritage to all key areas of the European Green Deal, including Clean Energy, Circular Economy, the Renovation Wave, Smart Mobility, Farm to Fork, Green Finance and a Just Transition, Research and Innovation, Education and Training, as well as Green Deal Diplomacy. It proposes a series of concrete recommendations both for policymakers and for cultural heritage stakeholders. Potential conflicts, real or perceived, between heritage safeguarding and European Green Deal action are also identified, as well as win-win strategies for overcoming these conflicts.

> Leveraging the potential of craft, creative industries and cultural heritage can support just outcomes and help deliver both a green transition and strengthened social inclusion, as highlighted by the ambition of the New European Bauhaus. That is why Europe's cultural heritage needs the European Green Deal to succeed. This is why cultural heritage is essential to the success of the European Green Deal. (P. 71)

These European initiatives aimed at developing and streamlining cultural policy, including ICH, are taking place in parallel with policy development processes globally, in particular at UNESCO level. The interest is aimed in particular at the impacts of the CC and at possible mitigation and adaptation actions for the protection of the ICH.

- Firstly, the Operational Directives for the Implementation of the Convention for the Safeguarding of the Intangible Cultural Heritage (latest amendments adopted in 2022; the Convention was adopted in 2003, entered into force in 2006, 182 States parties); in their Chapter VI Safeguarding intangible cultural heritage and sustainable development at the national level, introduced in 2016, devotes a separate chapter to CC issues - VI.3.3 Community-based resilience to natural disasters and climate change. It puts a particular emphasis on traditional knowledge and practices concerning geoscience, and their potential to contribute to the reduction of risk, recovery from natural disasters, mitigation of CC impacts, and climate adaptation.

- Secondly, in 2017 a UNESCO commissioned desk study was published on "Safeguarding and Mobilising Intangible Cultural Heritage in the Context of Natural and Human-induced Hazards". As acknowledged in the report, as a starting point for further analysis: "Natural hazards can be "related to climate change (sea level rise; melting permafrost; rainfall pattern change; increased severity or frequency of

meteorological or hydrological hazards; desertification)"and "can be the trigger for disasters" (p. 6). The study explains, among other, the role of local knowledge in disaster risk management and reduction, including in preparedness, response, and recovery, and concludes with recommendations, among which:

> the effects of global warming and associated climate change introduce both a potentially transformative factor in every dimension under consideration in this report, and an urgency to the need for action on the safeguarding and mobilising of ICH in the context of natural hazards (p. 23).

- Thirdly, Operational Principles and Modalities for Safeguarding Intangible Cultural Heritage in Emergencies have been adopted by the General Assembly of the States Parties to the Convention in 2020. As recognized therein:

> The safeguarding of intangible cultural heritage has a dual role to play in the context of emergencies: on the one hand, intangible cultural heritage can be directly threatened by emergencies, and on the other hand, it can effectively help communities to prepare for, respond to and recover from emergencies.

These Operational Principles elaborate the modalities of preparedness, response and recovery concerning ICH in emergency situations and emphasize the overall dynamic and adaptive nature of ICH, including in emergency situations (which may be caused by climate change effects) -

> Intangible cultural heritage is dynamic and adaptive in nature, constantly being recreated by communities in response to their environment, their interaction with nature and their history, including emergencies. In all situations, efforts to safeguard or engage intangible cultural heritage should take into account and respect this dynamic and adaptive nature.

- Finally, the Secretariat of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage launched three online surveys on thematic initiatives under the 2003 Convention in response to the decisions taken by the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage (Decisions 15.COM 8 and 16.COM 5.b) and to develop a comprehensive approach to ICH safeguarding and sustainable development, namely, 1/ on economic dimensions of safeguarding ICH, 2/ on safeguarding ICH in urban contexts, and also 3/ on safeguarding intangible cultural heritage and climate change. This survey was carried out from 31 October to 20 November 2022, and its results and further eventual policy initiatives are awaited.

B/ Intangible cultural heritage in climate change policies

At the global level, climate change issues are being addressed at multiple policy formats and regarding gradually divergent legal measures. Some of these measures address CC directly, such as the United Nations Framework Convention on Climate Change (adopted in 1992, entered into force in 1994, 198 States parties); Kyoto Protocol (adopted in 1997, entered into

force in 2005, 192 States parties) and Paris Agreement (adopted in 2015, entered into force in 2016, 195 States parties).

To assess CC impact worldwide and the knowledge accumulating in this regard, an Intergovernmental Panel on Climate Change (IPCC) was established as a United Nations (UN) body for assessing the science related to CC. Its Climate Change 2023: Synthesis Report draws attention of policy makers to conditions that enable individual and collective actions to enable climate resilient development, including diverse knowledge and values. According to the report, these include "cultural values, Indigenous Knowledge, local knowledge, and scientific knowledge" (p. 25), in other words, knowledge that can be part of ICH of local communities and Indigenous peoples. About responses in the near term, and governance and policies in particular, the report acknowledges, with high confidence that:

> Drawing on diverse knowledges and cultural values, meaningful participation, and inclusive engagement processes— including Indigenous Knowledge, local knowledge, and scientific knowledge—facilitates climate resilient development, builds capacity, and allows locally appropriate and socially acceptable solutions. (P. 32, point C.6.5.)

The Report also elaborates in more detail on the aspects that concern ICH. In its section on observed climate system changes and impacts to date, the Report highlights the following:

> **Climate change has caused widespread adverse impacts and related losses and damages to nature and people (high confidence).** Losses and damages are unequally distributed across systems, regions, and sectors (high confidence). Cultural losses, related to tangible and intangible heritage, threaten adaptive capacity, and may result in irrevocable losses of sense of belonging, valued cultural practices, identity, and home, particularly for Indigenous Peoples and those more directly reliant on the environment for subsistence (medium confidence). For example, changes in snow cover, lake and river ice, and permafrost in many Arctic regions, are harming the livelihoods and cultural identity of Arctic residents including Indigenous populations (high confidence). Infrastructure, including transportation, water, sanitation, and energy systems have been compromised by extreme and slow-onset events, with resulting economic losses, disruptions of services and impacts to well-being (high confidence). (P. 51)

When it comes to the European level, and European Union in particular, there are currently 6 EU Commission's priorities, defined within the Political Guidelines for the Next European Commission 2019-2024, and **A European Green Deal** is one of those. The European Green Deal presented in 2019, aims at transforming the EU's economy for a sustainable future and mainstreaming sustainability in all EU policies, while envisioning a just transition, to leave no one behind; and it streamlines CC concerns as one of its core issues. The named overarching commitments of the EU have been translated into several policy elements and thereafter in policy and legal measures. Some transformative policy elements, as formulated within The European Green Deal, among others, serve as an entry point for identifying the junction points between climate change mitigation and adaptation and ICH safeguarding, and these are, *inter alia*:

> Increasing the EU's climate ambition for 2030 and 2050; From 'Farm to Fork': designing a fair, healthy, and environmentally friendly food system; Preserving and restoring ecosystems and biodiversity; Mobilising research and fostering innovation; A green oath: 'do no harm'.

As previously mentioned above, in March 2021, to integrate the European Green Deal, the European Cultural Heritage Green Paper was produced by the non-governmental organization "Europa Nostra" in close cooperation with the International Council on Monuments and Sites (ICOMOS) and the Climate Heritage Network, with the input of other members of the European Heritage Alliance. The aim was to clearly point out the importance and contribution that cultural heritage should have in the European Green Deal framework. The following subsection with a selection of sectorial policies and examples on how the European Green Deal relate to ICH safeguarding, serves as a preliminary introduction to trigger a substantially broader reflection on the ways the European Green Deal and related policy and legal measures (both the ones adopted and the ones in progress of being debated) concern the impact of climate change on ICH safeguarding.

C/ Climate change and intangible cultural heritage across sectoral policies

As ICH is affected by a diverse range of sectoral policies, so are CC mitigation and adaptation efforts. On the one hand, there is a living heritage, livelihoods, daily social practices etc., on the other hand, there is a concern of CC that affects human existence in many respects; and both are subject to diverging policy measures and legal regulations. CC concerns have been integrated across diverse policies and are part of numerous policy and legal measures at all levels, including within the EU policies. The following selection is thereby an arbitrary choice of some insights, partly based on the aspects of ICH practices that have been identified within primary and secondary data analysis of GreenHeritage.

Although diverse policies may affect the practices of ICH safeguarding, the concept of ICH is mostly absent in respective sources, and to be identified through interpretation. Several insights into policies, and respective policy and legal measures, with some examples will be provided here: 1/ renewable energy policy, 2/ flood risk management, 3/ common agricultural policy, 4/ common fisheries policy, 5/ preserving and restoring biodiversity, 6/ research, and innovation policy.

1/ Renewable energy policy

The Renewable Energy Directive adopted in 2018 sets a binding overall Union target for 2030: "Member States shall collectively ensure that the share of energy from renewable sources in the Union's gross final consumption of energy in 2030 is at least 32 %" (Article 3). This influences the development of renewable energy projects that may have an impact on territories concerned, local communities, their practices and livelihoods. Thereby, the considerations of the consent of local communities are of relevance.

For instance, as it has been emphasized by the Saami Council, a pan-Sámi non-governmental organization established in 1956 as a coalition of Sámi national organizations in the various countries, in a factsheet on Renewable Energy Projects on Sámi Territory published in 2022, stated: "European energy policies and investments in renewable energy projects on Sámi territory must be developed in understanding with and participation of the Sámi people". In other words, as reminded by the Saami Council, the implementation of the European Green Deal must rely on free, prior, and informed consent of local communities concerned.

Growing potential of offshore renewable energy is being considered, which can diminish eventual effect on the traditional use of land but would also need thorough impact analysis.

2/ Flood risk management

Flood risk is among the risks considered regarding tangible heritage, both immovable, such as heritage sites and monuments, as well as movable, including collections preserved within memory institutions. However, this risk may also concern cultural spaces significant for the practice of ICH elements, and it may affect the transmission of traditional cultural practices in case the displacement of people is needed because of floods. Furthermore, local knowledge can be a resource where former experiences of floods in a particular territory have been accumulated in local adaptation knowledge, strategies, and practices.

Flood risk management plans at the national level are connected to the European Union level legal framework, namely the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Text with EEA relevance), according to which:

> "Flood risk management plans should focus on prevention, protection, and preparedness. With a view to giving rivers more space, they should consider where possible the maintenance and/or restoration of floodplains, as well as measures to prevent and reduce damage to human health, the environment, cultural heritage, and economic activity. The elements of flood risk management plans should be periodically reviewed and if necessary updated, taking into account the likely impacts of climate change on the occurrence of floods." (Preamble, Point 14)

> "The purpose of this Directive is to establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community." (Art. 1)

The aforementioned legal measure does not address ICH directly, but the concern about preventing and reducing damage to cultural heritage can be interpreted in its broadest sense, including ICH, and these aspects can be brought to the attention of policy makers at further revisions of existing flood risk management plans, and the elaboration of new ones.

3/ Common agricultural policy

Common agricultural policy (CAP) 2023-2027 has entered into force, and it contributes to the European Green Deal targets, and climate change action is among CAP policy objectives. CAP is a policy framework that supports farmers and rural stakeholders, and thereby directly affects those ICH practices that are related to agriculture, and among other examples, viticulture is one such practice that can be recognized as ICH, being recognized by respective practitioners as their ICH.

4/ Common fisheries policy

The Common fisheries policy (CFP) was originally part of the Common agricultural policy (CAP) and is currently a separate policy sector that aims towards climate neutral fisheries and aquaculture sector, which is in line with one of the ambitions of the European Green Deal to reach climate neutrality in the EU by 2050. This sector also aims to ensure decent living for fishermen and their families, while taking measures against illegal, unreported, and unregulated fishing. This sectoral policy is in direct connection to traditional fishing practices as ICH, and the legal regulations in their regard.

5/ Preserving and restoring biodiversity

According to the European Green Deal, EU policies should contribute to preserving and restoring Europe's natural capital. With regard to its preservation and restoration, the EU

Biodiversity strategy for 2030 aims to build society's resilience to future threats, including the impacts of climate change. It envisages, among other, to establish a larger EU-wide network of protected areas on land and at sea, enlarging the existing Natura 2000 areas, "with strict protection for areas of very high biodiversity and climate value".

It also includes the Commission's Proposal for a regulation on nature restoration, published in 2022, which has not yet been adopted. As explained by the Commission, "the proposal includes an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas, with binding restoration targets for specific habitats and species". This can have a multifaceted impact on diverse ICH elements, both the ones directly linked to the management of natural resources, and also to the ones related to the use of natural spaces.

6/ Research and innovation policy

It has been stated by the EU, that fostering research and innovation is critical to achieve the objectives of the European Green Deal. In that regard, a range of instruments are planned to be made available under the Horizon Europe programme, to support the research and innovation efforts needed. EU Missions in Horizon Europe programme have been defined to help deliver large-scale changes in areas such as adaptation to CC, oceans, cities, and soil. Four out of altogether five EU Missions concern sustainable development goals, and two of these goals directly address CC mitigation and adaptation. These four are:

> Adaptation to Climate Change: support at least 150 European regions and communities to become climate resilient by 2030; Restore our Ocean and Waters by 2030; 100 Climate-Neutral and Smart Cities by 2030; A Soil Deal for Europe: 100 living labs and lighthouses to lead the transition towards healthy soils by 2030.

Investments in the research and innovation sector is used as a measure to address CC mitigation and adaptation needs. The efforts to reach climate resilience and climate-neutrality also concern the practices of ICH. An example of a Horizon Europe programme's calls can be mentioned here. The announced and forthcoming call "Participation and empowerment of Arctic coastal, local, and indigenous communities in environmental decision-making", concerns CC and ICH and addresses traditional environmental knowledge:

> The research should explore and document traditional environmental knowledge (TEK) of Arctic coastal, local, and indigenous peoples, contributing thus to safeguarding and valuing the cultural identity of the Arctic; explore interactions between local and indigenous knowledge holders and scientists and develop innovative ways to mobilise this knowledge for climate change adaptation, ecosystem restoration and socio-economic goals.

Finally, the implementation of the European Green Deal is striving to follow the principle '**do no harm**', which include the commitment to develop and implement policies based on public consultations and on a thorough identification of the environmental, social and economic impacts. This leads to addressing another crucial aspect regarding ICH and CC, and that is the junction with human rights.

D/ Climate change, intangible cultural heritage and human rights

Some legal measures at the global level (and similarly at the European level) are concerned by the effects of CC on a broad set of policy and legal issues. For instance, respecting, protecting and fulfilling human rights, including cultural rights, are affected by CC, and thereby the Universal Declaration of Human Rights is a relevant reference, among others on human rights.

In 2020, the UN Special Rapporteur in the field of cultural rights issued a Report on climate change, culture and cultural rights, which recognizes that ICH is an underexplored issue with regard to CC impact on heritage. The report highlights that:

> A holistic assessment of heritage impacts is essential. Not only tangible and natural heritage but also "practice and transmission of a host of rich intangible cultural heritage practices – from oral traditions, to performing arts, social practices, rituals, festive events, traditional craftsmanship, and interactions and relationships with nature" are at risk. [See contribution by UNESCO.] (P. 10, point 33)

It elaborates more specifically on the effects of climate change on ICH:

> For instance, the changing availability of plant and animal species will lead to the loss of ecological knowledge and related language vital for the transmission of living heritage concerning food and medicinal plants [...]. Indigenous peoples and others living in vulnerable environments, such as small islands, high-altitude zones, desert margins, the Sahel, and the circumpolar Arctic, are often disproportionately affected. [...] Losses reported include the ability to live on ancestral lands; guardianship of sacred sites; folklore, song, and dance; traditional medicine; religious rites; and cultural knowledge (including indigenous knowledge and practice). [See contribution by Climate TOK project.] Less documentation, monitoring and analysis of intangible heritage impacts have been undertaken; these are urgently needed. "Identifying knowledge and belief systems at risk must become a priority." [See contribution by International Council on Monuments and Sites.] Popular engagement, citizen science and appropriate use of traditional and indigenous knowledge in monitoring processes should be encouraged. [Ibid.] (Pp. 10, 11, point 34)

The Report also emphasizes the positive potential of heritage, including ICH, to enhance responses to CC. The Report explains, among other, that:

> Endogenous, local ways of low-impact resource use connected with tangible heritage and intangible practices include: agriculture (semi-natural habitats, cultural landscapes), traditional fishing, forest use, traditional soil management (no-till farming, mulching, cover cropping, crop rotation), use of native plants, traditional livestock management and animal husbandry approaches that contribute to decarbonization. Examples include traditional fishing and semi-natural habitats management. [See contribution by International Council on Monuments and Sites.] (P. 18, point 70)

As it has been recognized in the aforementioned Report, the rights and interests of local populations and communities are affected. This aspect is being explored, for instance, as part of the work of the United Nations Permanent Forum on Indigenous Issues. Its seventh session in 2008 was devoted to the theme "Climate change, bio-cultural diversity and livelihoods: the stewardship role of indigenous peoples and new challenges". In its background paper Climate change and indigenous peoples, some considerations directly concern the European region:

> Indigenous peoples in the Arctic region depend on hunting for polar bears, walrus, seals and caribou, herding reindeer, fishing and gathering, not only for food to support the local economy, but also as the basis for their cultural and social identity. Some of the concerns facing indigenous peoples there include the change in species and availability of traditional food sources, perceived reduction in weather predictions and the safety of traveling in changing ice and weather conditions, posing serious challenges to human health and food security.

> In Finland, Norway and Sweden, rain and mild weather during the winter season often prevents reindeer from accessing lichen, which is a vital food source. This has caused massive loss of reindeer, which are vital to the culture, subsistence, and economy of Saami communities. Reindeer herders must, as a result, feed their herds with fodder, which is expensive and not economically viable in the long term.

Regarding the impact of CC on Indigenous peoples, Local Communities and Indigenous Peoples Platform was launched under the aforementioned United Nations Framework Convention on Climate Change (UNFCCC), and a Facilitative Working Group established. It functions with the support, among others, provided by some EU Member States: Finland, Germany and Sweden. In 2021, the named Facilitative Working Group proposed a set of Recommendations to the Subsidiary Body for Scientific and Technological Advice on the engagement and input of indigenous peoples and local communities across the UNFCCC process, where it recognizes that the "engagement of local communities and indigenous peoples in policies, actions and communications under the Convention has not yet reached its full potential" and recommends, among other, that Parties to the UNFCCC:

> Increase engagement and collaboration with indigenous peoples and local communities at the national level, including through formal ongoing participation in the development and implementation of NDCs [nationally determined contributions], NAPs [national adaptation plans] and all types of climate action, programmes, and policies.

References

A/ Global international sources

UNESCO (2017). *Safeguarding and Mobilising Intangible Cultural Heritage in the Context of Natural and Human-induced Hazards.* Desk Study. Prepared for UNESCO's Intangible Cultural Heritage Section by Meredith Wilson and Chris Ballard. Available at: https://ich.unesco.org/doc/src/38266-EN.pdf

UNESCO (2020). *Operational Principles and Modalities for Safeguarding Intangible Cultural Heritage in Emergencies.* General Assembly of the States Parties to the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts-_2022_version-EN_.pdf

UNESCO (2022). *Operational Directives for the Implementation of the Convention for the Safeguarding of the Intangible Cultural Heritage*. General Assembly of the States Parties to the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage. Available at: https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts-_2022_version-EN_.pdf

UNESCO (2022). *Safeguarding intangible cultural heritage and climate change*. Online survey. Available at: https://forms.office.com/Pages/ResponsePage.aspx?id=Uq5PHbM5-kuwswIpVrERlGccvxRphSROhX2vRhgtwVtUNElSQzVMUVhNOEZBSVdFOU01RjRGTUNNSS4u&wdLOR=cB9B166E1-0407-4B33-82CA-659C77FA73A3

United Nations (1948). *Universal Declaration of Human Rights*. Available at: https://www.un.org/en/about-us/universal-declaration-of-human-rights

United Nations (1992). *United Nations Framework Convention on Climate Change*. Available at: https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

United Nations (1997). *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Available at:

https://treaties.un.org/doc/Treaties/1998/09/19980921%2004-41%20PM/Ch_XXVII_07_ap.pdf

United Nations (2015). *Paris Agreement to the United Nations Framework Convention on Climate Change*. Available at: https://treaties.un.org/doc/Treaties/2016/02/20160215%2006-03%20PM/Ch_XXVII-7-d.pdf

United Nations, Framework Convention on Climate Change, Local Communities and Indigenous Peoples Platform, Facilitative Working Group (2021). *Recommendations of the Facilitative Working Group to the Subsidiary Body for Scientific and Technological Advice on the engagement and input of indigenous peoples and local communities across the UNFCCC process*. Available at: https://unfccc.int/sites/default/files/resource/sbsta2021_01E.pdf

United Nations Intergovernmental Panel on Climate Change (2023). *Climate Change 2023: Synthesis Report*. Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf

United Nations Permanent Forum on Indigenous Issues (2008). *Climate change and indigenous peoples.* Available at: https://www.un.org/esa/socdev/unpfii/documents/backgrounder%20climate%20change_FINAL.pdf

United Nations Special Rapporteur in the field of cultural rights (2020). *Report on climate change, culture and cultural rights*. Available at: https://documents-dds-ny.un.org/doc/UNDOC/GEN/N20/207/39/PDF/N2020739.pdf?OpenElement

B/ European regional sources

Committee of Ministers, Council of Europe (2018). *Recommendation CM/Rec(2018)3 of the Committee of Ministers to member States on cultural heritage facing climate change: increasing resilience and promoting adaptation*. Available at: https://search.coe.int/cm/Pages/result_details.aspx?ObjectId=0900001680791160

Europa Nostra (2021) in partnership with ICOMOS and EIB: *European Cultural Heritage Green Paper.* Available at: https://issuu.com/europanostra/docs/20210322-european_cultural_heritage_green_paper_fu

European Commission (2014). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Towards an integrated approach to cultural heritage for Europe*. Available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52014DC0477

European Commission (2019). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal.* COM/2019/640 final. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX%3A52019DC0640

European Commission (2021). EU Missions in Horizon Europe. Available at: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe_en

European Commission (2022). *Proposal for a Regulation of the European Parliament and of the Council on nature restoration.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0304

European Commission (2023). *Common agricultural policy (CAP) 2023-2027.* Available at: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27

European Commission (2023). *Common Fisheries Policy.* Available at: https://oceans-and-fisheries.ec.europa.eu/policy/common-fisheries-policy-cfp_en

European Commission (2023). *Biodiversity strategy for 2030.* Available at: https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

European Commission (2023). *Participation and empowerment of Arctic coastal, local, and indigenous communities in environmental decision-making*, TOPIC ID: HORIZON-CL6-2024-COMMUNITIES-01-3. Forthcoming. Available at:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl6-2024-communities-01-3

European Parliament (2015). Resolution. Towards an integrated approach to cultural heritage for Europe (2014/2149(INI)). Available at: https://www.europarl.europa.eu/doceo/document/TA-8-2015-0293_EN.html

European Union (2007). *Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32007L0060

European Union (2018). *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (Text with EEA relevance.)* PE/48/2018/REV/1. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC

Parliamentary Assembly of the Council of Europe (2019). Safeguarding and enhancing intangible cultural heritage in Europe. Recommendation. Available at: https://pace.coe.int/pdf/794166842553f719f2cbf1a7990287a17524b629ec3ba414f77e1c41b96441c9/rec.%202148.pdf

Saami Council (2022). *Renewable Energy Projects on Sámi Territory.* Available at: https://lcipp.unfccc.int/sites/default/files/2022-06/Factsheet%20-%20Renewable%20Energy%20Projects%20on%20Sa%CC%81mi%20Territory.pdf

von der Leyen, Ursula (2019). *Political Guidelines for the Next European Commission 2019-2024.* Available at: https://commission.europa.eu/system/files/2020-04/political-guidelines-next-commission_en_0.pdf

Section 9: Conclusions

This report presents an analysis of the primary and secondary data that so far have been identified and that led to reveal the impact and effects that climate change has on intangible cultural heritage in Europe. Using a complex data analysis and retrieval methodology, CC and its impact on ICH degradation have been examined throughout the core sections of the document. The study has also sought to understand CC awareness among the various stakeholders, from ICH communities or practitioners of tradition to the officials responsible for ICH safeguarding both at the national and international levels. Conceptualisation and definition of ICH in different national and international frameworks as well as CC mitigation efforts, the existing practices, national and EU policy and legal measures, have been addressed through in-depth source and documentary studies. The focus of this deliverable, D2.2 "Primary and secondary data research findings", is on Greece, Italy, Latvia and Spain, the countries represented by the partners of the project "The Impact of Climate Change on the Intangible Cultural Heritage" (GreenHeritage, ERASMUS-EDU-2022-PI-FORWARD-LOT1, No. 101087596). However, the study goes beyond that, it also covers other European countries, thus drawing a general picture and shedding light on the CC issues regarding ICH in the EU context.

Unlike the tangible cultural heritage, the direct and indirect impact of CC on ICH is more difficult to detect and probably for this reason has received almost no attention in academic and applied research until recently. The GreenHeritage project can be definitely considered among the pioneers of this research direction. The current deliverable is intended to serve as one of the building blocks for further GreenHeritage project activities. In fact, it can useful contribute to the following project objectives: 1-developing methodology; 2-representation of the identified CC threats, such as changing climate conditions, weather extremes, biodiversity and ice loss, and the existing practices, via an up-to-date online map; 3-bringing preservation and protection of ICH at the heart of the public debate as well as the national & EU policy making; 4- empowering awareness and active citizenship regarding environmental issues, sustainability and the importance of preserving tangible cultural heritage along with ICH; 5-developing a culture of sustainability and innovation among researchers, practitioners of ICH and empowering them by providing a set of cutting-edge training resources freely available in digital and open media; 6-supporting the development and approach of micro-learning and online education by promoting effective use of digital learning practices and capabilities.

As it can be observed from the selected insights into **European** and **national CC mitigation and adaptation strategies**, culture and heritage are mentioned in some of these, whereas the concept of **ICH is seldom mentioned**. On the one hand, it is an exercise of interpretation, as ICH practices can be named in numerous and terminologically diverse ways and can be seen also as part of the broader concepts of heritage and culture. On the other hand, this may also witness a lack of common understanding of the significance of the effects that CC has and may have in the future on ICH safeguarding, and thereby on the wellbeing of culturally diverse societies.

Therefore, in order to have awareness raised among policy makers in various sectors that CC does have effects on ICH safeguarding, and for **streamlining the common concept of ICH** used in the field of heritage nearly globally, domestic administrations responsible for and engaged in the implementation of the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage could be particularly encouraged to engage in and contribute to developing domestic CC mitigation and adaptation plans, to integrate therein the acknowledgement of a direct connection between CC and ICH safeguarding practices, and to envisage policy measures for respective adaptation.

Furthermore, the **awareness about the effects of CC on ICH practices** could be raised within ICH safeguarding policy development, and this aspect could be streamlined in respective policies. This would build, first, a solid common understanding within this policy sector, and in the cultural sector more broadly, on such effects, and on the communities and groups of society affected. This implies the need to engage the different stakeholders of the quadruple helix in a collaborative process, which will enable to build a common path and resilient behaviour to CC, as already experimented in some areas and projects.

These steps altogether would also contribute positively to **achieving an effective transition** about CC mitigation measures and to financing CC adaptation, namely through recognizing that diverse communities and groups of society, including Indigenous peoples, are affected by CC in various ways, including through effects on the continuity of their ICH practices, which may also be related to securing their livelihoods.

Regarding international policy and legal measures and their implementation, the **awareness about the connection between ICH safeguarding and CC** is more present in the field of ICH, than it is in the field of CC mitigation and adaptation. Awareness raising about the named connection (through research, case studies, exchange of experiences *etc.*) would be needed in both fields, and there is **a need for further advocacy** about its relevance in policy making on CC mitigation and adaptation strategies. Furthermore, **local knowledge for CC adaptation** is to be valued in CC adaptation strategies, which thereby witnesses the role of ICH not only as being affected by CC, but also as a means for addressing CC threats.

There is a diverse range of EU sectoral policies and respective legal regulations that are related to both CC effects and their mitigation and adaptation strategies, and ICH safeguarding, although mostly indirectly and without using the concept of ICH. Given the scope of such diversity, there is a need to continue **mapping EU sectoral policies that concern CC and ICH**. That would contribute to building knowledge about the diverse impacts of sectoral policy making on ICH practices, and thereby inform about policies that eventually are to be changed in the future to better integrate ICH safeguarding concerns. Furthermore, such a mapping might strengthen awareness about and clearly demonstrate the **need for cross-sectoral cooperation** for ICH safeguarding.

Policy development in the field of CC mitigation and adaptation strategies, including, for instance, the field of renewable energy, and the management of the territory in a sustainable way among others, need to be developed at international and at domestic levels as well, with a clear understanding that the **safeguard** of **ICH** and of the concerned communities and groups **is a human rights issue**. That might mean finding a proper and just balance between common societal concerns and CC mitigation and adaptation needs, together with the human rights of communities and groups of society directly affected by CC and concerned by its mitigation strategies.

For an optimistic perspective, it was noticed that ICH and its safeguarding against CC effects is considered by communities as an effective means to inspire more sustainable behaviour and, in this perspective, this can be used as a powerful tool to drive the Green transition. With our study, it was observed that previous interactions with the local civil society on issues related to CC, have produced positive effects, since the audience showed a quite high level of awareness (as from interviews). In fact, the communities (referring to CS8, in this case) which have had the opportunity to discuss the subject of the CC and its influence on CH through previous important initiatives (such as that of the European H2020 project HERACLES) have shown a more mature awareness of the problem and have even proposed solutions in terms of mitigation actions. Moreover, they proposed that the folkloric event can become a vector of new values, Green, as a greater respect for the environment and the promotion of sustainable behaviour.

The fact that most stakeholder think that the ICH elements and practices can act as a vector for updated values/ideals, means that the role that ICH can play in educating

communities and wider societies is of paramount importance. In this framework, GreenHeritage can play and has the duty to play an important role. This proves that **Intangible Cultural Heritage** has a significant potential to motivate and convey awareness on topics of great interest and importance for our common future.

Surely, it is more difficult to relate and imagine the effects of the CC on the ICH: in this sense a great work of education and awareness is needed, and in this context, the GreenHeritage project is undoubtedly pioneering. The relationship between CC and ICH that emerges from the case studies presented in this document highlights how extreme climatic events and CC related phenomena, can influence the habits, the traditions, and the behaviours of entire communities. However, it is the human behaviour that influences CC. Therefore, the active involvement of the various stakeholders in activities aimed at raising awareness and education is of primary importance.

As a general conclusion to this report, it can be affirmed that, despite our careful attention, we have covered only a relatively small part of a problematic picture. We know that there are far more cases of ICH affected by CC than we have been able to cover and examined in a detailed way here. Our hope is that this research will inspire, be useful and incentivize further study on the interrelationships between CC and ICH.