

# water & land

**Workshop on Living Heritage, ecological sustainability  
and climate action**

**Leuven, 19-20 June 2025**



**Summaries of projects and papers**

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# 1 Water & Land. Intangible heritage and sustainable development

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The “Water & Land” project (2022–2025) explores the contribution of Intangible Cultural Heritage (ICH) to ecological sustainability, with a particular focus on water management, biodiversity, and soil care. A collaboration between the Centre for Agrarian History (CAG) and the Dutch Centre for Intangible Cultural Heritage (KIEN), the project aims to document, study, and promote intangible heritage practices that offer valuable knowledge for today’s environmental challenges. This summary provides key background and findings to support the upcoming presentation.

## **Project background and objectives**

How can intangible cultural heritage (ICH) contribute to climate resilience and biodiversity? This question has gained growing importance, particularly in light of escalating ecological and climate crises. These developments urge us to seek out diverse, often underrecognized sources of knowledge and resilience.

ICH can be a valuable source of knowledge when designing future climate adaptive strategies. This is why CAG and KIEN have joined forces in a three-year project called ‘Water & Land. Intangible Cultural Heritage and Sustainable Development’ which aims to inventory, research and promote ICH as lever for challenges such as water management, conservation of biodiversity and soil fertility. The project wants to make both members of the public and policy makers more aware of ICH’s strengths and opportunities. Unfortunately, the opportunities offered by ICH are still relatively unknown in wider circles and are not clearly on the minds of policymakers. In our current society, so focused on official, managerial and scientific knowledge systems, the “intimate” or “local knowledge” of ICH is at best marginalized and most often is ignored altogether. In the Netherlands and Belgium, the environmental benefits of cultural heritage are currently rarely taken into account in decision-making processes. This is unfortunate, as different knowledge systems can reinforce and complement each other.

ICH can enrich landscape and water management. It binds the past, present and future; it can strengthen the appreciation of and emotional attachment to land and nature; and it can inspire responsible and sustainability oriented attitudes. In particular, ICH contains concrete insights and knowledge tailored to local conditions.. Learning from the past is essential to address the environmental challenges of today and the future.

From this perspective, CAG and KIEN started the pilot project ‘Water & Land. Intangible Heritage and Sustainable Development’ (2022-2025). This project seeks to identify, investigate, safeguard, and promote living heritage practices that support ecological sustainability. It also aims to support heritage communities in safeguarding and to strengthen their role in local planning processes, raise awareness among policymakers and professionals, and facilitate cross-border knowledge exchange among stakeholders in Flanders and the Netherlands.

To pursue these goals, 'Water & Land' adopts an interdisciplinary and participatory methodology that combines historical and archival research with ethnographic fieldwork, semi-structured interviews, and collaborative dialogue sessions. This approach facilitates meaningful exchange between heritage practitioners, researchers, and policymakers, and highlights the role of experiential and community-based knowledge.

The project follows a thematic approach across three years, each centered around a pressing environmental issue:

- 1) Water Management (2022-2023)  
In response to increasing droughts and floods, practices such as traditional irrigation and the management of watermill landscape management were studied.
- 2) Biodiversity (2023–2024)  
As biodiversity loss accelerates, we explored practices like hedge laying and beekeeping that support ecological diversity.
- 3) Soil Fertility (2024-2025)  
This final phase focuses on practices such as composting to address soil depletion and over-fertilization.

The 'Water & Land' project aims to reach four target groups. Firstly, the various intangible heritage communities, both in Flanders and the Netherlands, are central. Secondly, sustainability experts and scientists help us to perform a sustainability check of the selected cases and discover their opportunities and possibilities. Thirdly, the project focuses on heritage professionals in Flanders, the Netherlands and beyond. Policy makers and (nature) managers form a final target group.

The project's outputs are tailored to both academic and public audiences. These include a Dutch-spoken podcast series featuring practitioners and scientists; a collection of short documentaries with English subtitles, brochures in Dutch and English offering more in-depth information and practical guidance and a dedicated website ([www.waterenland.be/en](http://www.waterenland.be/en)) serving as a central platform for sharing knowledge. In addition, academic dissemination takes place through peer-reviewed journal articles, conference presentations, and a webinar on living heritage and climate adaptation.

### **Preliminary Findings and Challenges**

The project's fieldwork and case studies highlight several opportunities, as well as critical challenges in integrating ICH into sustainability efforts. The five case studies in the 'Water and Land' showed that ICH can offer many opportunities for rewetting, carbon storage, water storage, expanding biodiversity, soil care and so on.

To move forward, several conditions are essential. First, a shift in mindset is needed: from managing landscapes solely for economic efficiency back to living with and in the landscape, and with attention to the importance of ecosystem services. Recognising ICH as both a driver and enabler of sustainability requires a shift in how such heritage is perceived: from a nostalgic view to our living heritage, to recognizing the ecoservices and cultural meanings embedded in dynamic ICH practices. Unlocking its full potential will depend on meaningful collaboration between communities, researchers, and policymakers. That is a second condition for a 'past forward'. Co-production of knowledge between heritage bearers and scientists can enrich both domains and

promote integrated policy approaches. Third, visibility matters: best practices must be shared and valorised to inspire broader uptake. Lastly, further interdisciplinary research is needed to document and understand how traditional knowledge systems shape ecological behaviour, landscape perception, and long-term resilience.

In sum, ICH can serve as a bridge: connecting past and future, cultural identity and ecological function, local experience and global sustainability agendas. By engaging seriously with the knowledge and practices of heritage communities, we open new pathways for climate adaptation that are not only technically effective, but socially and culturally grounded.

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## 2 Preserving traditional irrigation in France: between heritage projects and environmental challenges

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Traditional gravity-fed irrigation in Mediterranean areas faces major challenges related to modernization, urbanization and climate change. In France, a collaborative initiative was launched in June 2023 to inventory and promote this practice as Intangible Cultural Heritage (ICH). This effort, led to the inscription of traditional gravity-fed irrigation in the national register of ICH, following the validation by the Ethnological and Intangible Heritage Committee in June 2024. This approach echoes the inscription, in December 2023, of "Traditional irrigation: knowledge, technique, and organization" on the UNESCO Representative List of Intangible Cultural Heritage. This application was submitted by seven countries: Austria, Belgium, Italy, Switzerland, Germany, the Netherlands, Luxembourg. An association (ASAIG) has been created in France to implement the safeguarding measures provided for in the inventory file. As researchers and members of the civil society, we have supported the creation of a network of several hundred people since 2022, whose ultimate goal is to obtain the inscription on the UNESCO (international) Representative List in order to ensure increased visibility and enhanced protection for these cultural practices, particularly in European and Mediterranean countries, not included in the first wave of applications. This communication will return to this participatory research experience. The discourse on traditional irrigation as cultural heritage, although recent, is now used to draw attention to the positive contributions of this practice, both from an environmental and social point of view. The safeguarding of gravity irrigation practices articulates motivations based on economic reasons, responsibility for climate action and heritage values. Through the analysis of the data collected since June 2023 and our own position in this project, we will analyze how heritage can be used as a laboratory for the co-production of knowledge on adaptation to climate change with local communities.

The presentation will be structured as follows:

### 1. Context and objectives

In December 2022, Francesca Cominelli and Aurélie Condevaux, associate professors at Paris 1 Panthéon-Sorbonne University, with prior experience in the field of Intangible Cultural Heritage (ICH), were informed of the above-mentioned application for Traditional irrigation. We were approached by several French practitioners questioning France's absence from this UNESCO initiative. In response, we proposed a research-action approach supported by the French Ministry of Culture. This initiative aimed to unite French practitioners and stakeholders

committed to safeguarding this practice, with the goal of co-writing a document for the national inventory first, a preliminary condition to join the international nomination on the UNESCO representative list of ICH. Simultaneously, we conducted academic research to reflexively analyse the process. This communication will mainly focus on presenting the work carried out to safeguard this heritage, and will finish by presenting some elements associated with this reflexive analysis.

## 2. Methodology used in the inventory process

The initial phase focused on identifying the individuals and territories involved. With financial support from the French Ministry of Culture in 2023, renewed in 2024, we gradually built a network of several hundred participants across nearly 15 French departments. Initial contact was established primarily through emails and informational meetings conducted in hybrid formats (in-person and online) or via video conferences.

Once a core group was established - expanded to over 325 contacts nowadays and still growing - we began synthesizing existing data and co-writing a file for the National Intangible Cultural Heritage (ICH) inventory. As some inventory files had already been drafted for specific French territories (e.g., the Southern Alps and Lozère), the Ministry of Culture proposed to open to a national-level inventory file. To this end, three dedicated meetings were held in the fall of 2023, structured around the thematic sections outlined in the inventory file (e.g., description and history of the practice, transmission, safeguarding, and valorization measures). A preparatory form with targeted questions was sent out before each meeting, prompting written responses from participants. These contributions were synthesized by researchers and students from EIREST (Interdisciplinary Research Team on Tourism) and presented during video conferences for collective discussion.

In addition to these co-writing sessions, other meetings were organized to provide project updates and discuss the organization of the network. These meetings took various formats - online, hybrid, or in-person - and were hosted in locations such as L'Argentière-la-Bessée and Embrun (Hautes-Alpes), Saint Martin de Vésubie (Alpes-Maritimes), Salon-de-Provence (Bouches-du-Rhône), and Saillagouse (Pyrénées-Orientales). Around 15 meetings were held, each gathering 20 to 30 participants. The total of participants involved in this process was high. While only about 100 individuals participated in the edition of the inventory file, much more people joined in to contribute through discussions and data contribution.

## 3. Results and outcomes

The French national inventory form, co-written by IREST researchers and students with the community, was submitted in May and validated in June 2024 by the Ethnological and Intangible Heritage Committee. The file is available online:

<https://www.culture.gouv.fr/thematiques/patrimoine-culturel-immateriel/le-patrimoine-culturel-immateriel/l-inventaire-national-du-patrimoine-culturel-immateriel>.

The work carried out since 2023 has led to the creation of a network of over 325 people, whose formalization has resulted in the creation of an association under the French law of 1901: the Association pour la SAuvegarde de l'Irrigation Gravitaire et des ouvrages associés, whose

constituent assembly was held on November 19, 2024. Its Board of Directors is made up of personalities from the world of research, heritage players and irrigation practitioners. The association is preparing a number of actions to help raise the profile and safeguard gravity-fed irrigation: development of a website, participatory workcamps, advisory support for irrigators, etc.

The thematic online workshops were a third result: organized from autumn onwards, they brought together between 25 and 60 participants at each session, and were designed to disseminate knowledge about gravity-fed irrigation and examples of safeguarding practices, involving a variety of profiles. The recordings are freely available on the Université Paris 1 Panthéon-Sorbonne media library website, enabling a wider audience to be reached:

*Médiathèque de l'université Paris 1 Panthéon-Sorbonne - IREST - Institut de Recherche et d'Etudes Supérieures du Tourisme : Ateliers du Patrimoine de l'irrigation*

Last but not least, the initiative continues with an international approach to UNESCO through the association with other European countries (Spain, Portugal, Greece, Morocco), who share the objective of requesting an extension of the inscription on UNESCO's representative list.

#### 4. Discussion

This communication will end with some insights on the community's involvement in the process, as well as its limits, and on how knowledge was co-constructed and renegotiated during the process. The feedback on the participants' profile is enlightening with regard to the biases of the participatory approach. However, the participation of people with very varied profiles (researchers, associative players, irrigators, etc.), helped to validate empirical or local knowledge through triangulation and exchanges between practitioners and scientists, a recognition long expected by practitioners.

### 3 Heritage-Led Climate Adaptation: Reviving Traditional Water Management and Rethinking Colonial Transfers in a Changing Climate

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Climate change threatens both tangible and intangible cultural heritage, endangering historic landscapes, traditional practices, and knowledge systems (Simpson *et.al.*, 2022). To address these risks, climate adaptation strategies must integrate traditional ecological knowledge and community-driven approaches that balance human intervention with ecological resilience (Morel *et. al.*, 2022). Historic water management systems, such as the Dutch polder system, embody centuries of expertise in sustainable water governance. These systems offer valuable insights for modern climate solutions by demonstrating how past societies managed water in harmony with natural hydrological cycles.

The Dutch polder system represents a remarkable convergence of hydraulic ingenuity and socio-political collaboration (Schuetze & Chelleri, 2011). Physically, it refers to low-lying tracts of land reclaimed from the sea and protected by dikes, requiring constant drainage and regular maintenance. Socially and politically, it evolved into what became known as the “polder model”, a culture of consensus-based governance rooted in shared responsibility, negotiation, and inclusive decision-making (Richter, 2021). From the 13th century onward, local water boards (*waterschappen*) emerged as the cornerstone of this model. These autonomous institutions, aligned with specific polder areas, were responsible for maintaining dikes and regulating water levels. Because the safety of local communities depended on the collective performance of the system, early Dutch society developed a strong ethic of cooperation and pragmatism in environmental governance.

Waterland in Noord Holland exemplifies this tradition. Historic infrastructure like the windmill *Poldermolen De Breek*, and the historic pumping stations (*gemalen*) reflect centuries of place-specific, adaptive water management. This heritage is now being mobilized to address contemporary climate challenges, including sea-level rise, soil subsidence, and biodiversity loss. Today’s adaptation strategies in Waterland include the restoration of fish passages, use of polders for controlled water retention, and the repurposing of historic pump stations. However, the polder model’s collaborative spirit is increasingly challenged. A recent large-scale reinforcement of the *Markermeerdijken*, which protect the low-lying corridor between Hoorn and Amsterdam, has been implemented with limited community consultation. Local communities, such as those in Uitdam, voiced concerns over the loss of their historical connection to the water and the transformation of their landscape. Yet, participatory initiatives like the Living Labs under the Horizon Europe THETIDA project have shown the potential of inclusive processes. One successful outcome involved the adaptive reuse of a historic pump station in Monnickendam, *Gemaal de Poel*. After dialogue among stakeholders, residents, and experts, a consensus was reached on the future repurposing and shared use of the locally significant water heritage.

While the Dutch polder system has been widely celebrated, its transplantation to colonial contexts reveals the limitations of technocratic, decontextualized approaches to water governance (Richter, 2021). In 17th-century Batavia (now Jakarta), Dutch engineers attempted to replicate Amsterdam's canal and polder design to manage a vastly different tropical delta system. The imported infrastructure did not take into account indigenous knowledge systems, local hydrological patterns, and socio-political organization. The canals quickly became stagnant and unsanitary, triggering public health crises, while maintenance burdens fell unevenly. The governance structure remained centralized and exclusionary, severing communities from the water systems that shaped their lives. The canal and polder systems, rather than fostering inclusive urban growth, contributed to fragmentation, social inequality, and environmental degradation (Minkman et al., 2019).

This pattern continues in recent decades. The Dutch-supported *National Capital Integrated Coastal Development* (NCICD) plan—a massive coastal defence and land reclamation project in Jakarta—has again faced criticism for favoring top-down technical solutions while marginalizing local voices and lived realities. Despite its ambition to adapt Delta Programme methods to the tropics, the project has been unable to adequately address informal settlements, land rights, or the ecological complexities of the Jakarta Bay (Budiyo et al., 2017; Minkman et al., 2019). These shortcomings underscore a key lesson: technical expertise alone cannot ensure effective climate adaptation without the meaningful inclusion of local communities, heritage, and knowledge systems.

In conclusion, the Dutch polder system is not only a physical achievement but also a deeply cultural one, a legacy of collaborative water governance rooted in place and local knowledge systems. Its success lies as much in the inclusive process as in the infrastructure. The Waterland case demonstrates how living heritage can support just and effective adaptation. At the same time, Jakarta serves as a cautionary example of the risks associated with ignoring socio-ecological context and local and indigenous knowledge systems. As climate risks intensify, heritage-led adaptation offers a robust framework: not to replicate past models, but to renew them through locally grounded, community-driven processes. Only through such inclusive approaches can we build resilient landscapes that balance both historical context and future sustainability.

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## 4 Biocultural paths and governance of water in southern Italy's rural areas: the case of the Occhito Dam

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The Fortore Valley, located in the Molise region of Southern Italy, presents a compelling case for investigating the interplay between water governance, biocultural heritage, and territorial transformation. At the heart of this case study lies the Occhito Dam, a large infrastructural project completed in 1965, with its water resource managed by the interregional authority Consorzio per la Bonifica della Capitanata. The dam is one of the largest artificial reservoirs in Europe and a critical node in the centralized water governance system serving the agro-industrial sectors of Apulia and neighboring regions. While the dam represents a significant technological achievement, its impacts on the Fortore Valley's local communities, ecological systems, and cultural landscapes remain deeply controversial.

This case study draws on an anthropological framework combining political ecology, critical heritage studies, and collaborative governance theories to examine how water governance practices shape and are shaped by socio-environmental relations in the Fortore Valley. The Occhito Dam emerges not merely as a technological artifact, but as a powerful symbol and agent of territorial reconfiguration and socio-political negotiation. The centralized and technocratic management model underlying the dam's construction and operation has historically marginalized local actors, reinforcing a top-down logic of extraction and redistribution that prioritizes downstream beneficiaries at the expense of the upstream communities living near the reservoir (Krause 2013). The study is based on qualitative fieldwork conducted between 2023 and 2025, including semi-structured interviews with local residents, institutional actors, and water managers, as well as ethnographic observations and archival research. These methods have allowed the reconstruction of multiple narratives and imaginaries surrounding the dam and its perceived roles in the territory. For many inhabitants, the Occhito Dam is a "distant infrastructure," physically close yet institutionally opaque and inaccessible. Despite being a dominant presence in the landscape, the dam has not translated into tangible benefits for the local population in terms of water access, economic opportunity, or participatory governance. In contrast, local communities express strong attachments to traditional forms of water knowledge and practice, rooted in seasonal rhythms, vernacular infrastructures, and communal arrangements. These forms persist as expressions of biocultural heritage – the intertwined legacies of human and ecological cohabitation (Barthel et al. 2013). The research highlights how this heritage can serve as a resource for imagining alternative water futures, as a field of co-construction in contemporary struggles, and as a new form of active citizenship grounded in civic responsibility for the communities of the Fortore Valley. Drawing on Van Aken's work on water heritage and Vallerani's work on the poetics of the hydrographic landscape, the study interprets the Fortore Valley as a site of layered temporalities and frictions, where state-led hydraulic modernity coexists (or dominates) uneasily with local cosmologies and place-based knowledge (Van Aken 2020; Vallerani 2021). This tension is also visible in recent community initiatives aimed at revalorizing local springs, footpaths, and micro-histories that have been overshadowed by the

dam's monumental presence. Such initiatives exemplify a shift from heritage as conservation towards heritage as a mode of reappropriation, creativity, and care (Waterton and Smith 2010). The governance of Occhito thus becomes an entry point to reflect more broadly on the politics of scale, representation, and justice in water management. It invites a rethinking of participation not simply as stakeholder inclusion but as a reconfiguration of epistemologies and institutional arrangements. In this regard, the study aligns with Illich's critique of industrialized water systems that alienate people from their commons, proposing instead a vision of convivial water relations grounded in autonomy, transparency, and mutual learning (Illich 1985). In recent years, new opportunities for developing projects have emerged. One that caught our attention is the use of the *lake contract* as a tool to reimagine, together with local communities and stakeholders, the future of the territory surrounding the Occhito Dam. Those may be a concrete example of effective governance, instruments inspired by French models and the EU Water Framework Directive (2000/60/EC). These mechanisms promote an integrated and participatory management of water resources, with the potential to merge best practices with the principles of good governance. However, as Bodin (2017) points out, collaborative governance entails complex challenges: building and maintaining networks of collaboration, engaging local actors, adapting to change, and fostering mutual trust. Only a long-term approach grounded in dialogue and shared responsibility can ensure sustainable water management, transforming governance into a true tool for balancing institutions, communities, and the environment. With Durkheim, we can consider the value of a territory as measurable not only in terms of infrastructure, but also in its "moral density" - a key concept for water resource management that could prove especially valuable in this context. Best practices, in this light, offer a useful mode for shaping essential tools for participatory governance models. The biocultural heritages that characterize these territories could thus be connected to a logic of concrete action - linking water management with the role played by local communities, which should be recognized and empowered as strategic actors in the protection and stewardship of these resources.

In conclusion, the case of Occhito challenges dominant paradigms of infrastructural development and invites a more nuanced, situated, and dialogical approach to water governance. It foregrounds the importance of attending to local histories, values, and aspirations, not as residual or backward-looking elements, but as vital components of a plural and sustainable water future.

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## 5 Reviving Watermills for a Sustainable Future: Integrating Cultural Heritage, Renewable Energy, and Climate Resilience

**By Maria Carmela Grano\* and Maurizio Lazzari\***

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This research explores the potential of historic watermills as dynamic infrastructures at the intersection of cultural heritage, renewable energy, and climate resilience. Drawing on historical, geomorphological, and archival evidence, the study presents watermills not merely as remnants of pre-industrial economies but as regenerative assets in the age of ecological transition.

Watermills have historically integrated human ingenuity with riverine landscapes, their locations carefully selected based on slope, water flow, and geomorphic stability. Recent studies show that mills built before 1860 on stable rocky riverbeds have survived better than those constructed later in alluvial zones, which suffer from greater exposure to erosion and flooding.

Beyond their technological relevance, watermills are part of a rich intangible heritage. Practices like seasonal canal cleaning and the planting of riparian vegetation (e.g., willows and dogwoods) ensured mill efficiency and local ecosystem balance. In some communities, like Tito in Basilicata, these traditions are still practiced today. However, despite UNESCO's recognition of the miller's craft in the Netherlands, such links between intangible heritage and sustainability are still underrepresented in heritage frameworks.

In the early 20th century, many Italian watermills were adapted for hydroelectricity. This demonstrates the intrinsic adaptability of their design and siting. Yet, today, micro-hydropower conversion is limited by fragmented regulations, missing inventories, and bureaucratic hurdles. While projects like Restor-Hydro (2013) and Renawat (2024–2028) highlight latent potential, the path to energy integration remains largely underdeveloped.

In Basilicata, a systematic review of over 800 historic mills—via archival analysis, GIS mapping, and site surveys—revealed significant patterns. Most surviving mills are in disrepair, often overgrown or repurposed as rural homes. Restoration examples, such as those in San Martino d'Agri or Castelsaraceno, show how heritage and local development can align. The Hydrographic Map of the Kingdom of Italy (1890) has been essential for tracing original mill sites and informing the Regional Landscape Plan.

Moreover, 19th-century legal disputes preserved in the State Archive of Potenza offer valuable insight into early risk assessments, revealing historical awareness of erosion, sedimentation, and hydraulic failure. Field surveys confirm that degradation today stems from both structural vulnerabilities (e.g., unstable towers, wheel wear) and environmental neglect (e.g., sediment-filled intake channels).

Case studies such as the Scodellino Mill (RA) and Maglio Averoldi (BS) highlight the fragility of historic mills in the face of climate extremes. Flood events in 2023 and 2024 caused significant damage, but community-led restoration efforts proved essential. These episodes underline the

importance of traditional maintenance practices, now largely lost, and the risks of unmaintained concrete dams.

The Cornaleto Mill (PZ) exemplifies both heritage value and lost function. Though structurally intact and embedded in a biodiverse riparian setting, the lack of a water concession prevents reactivation. It stands as a symbolic case of “mutilated memory”—a preserved object deprived of purpose.

The study advocates for policy innovation. Participatory models inspired by the Faro Convention and AIAMS initiatives demonstrate how civic engagement and training programs (e.g., “Mill Days”) can revitalize traditional knowledge and local stewardship. A national register of historic mills—recognizing their landscape, energy, and cultural value—would help unlock funding and support integrated planning.

In conclusion, historic watermills embody a holistic approach to sustainability. They merge heritage preservation, energy potential, and community resilience. Their recovery requires shifting from passive conservation to functional regeneration, with updated legal frameworks and active community roles. As such, they are not just remnants of a bygone era but cornerstones for shaping adaptive, sustainable futures.

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## 6 Reconciling Resilience and Preservation in a Changing Climate: Lessons from Historical Water Management Practices

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*Keywords: climate change; socio-ecological systems; heritage management*

### **Introduction**

The threats to cultural heritage from climate change were formally recognized nearly two decades ago (see: UNESCO World Heritage Centre 2008). Since the Paris Agreement (2015), these discussions have accelerated. Several documents (see e.g., ICOMOS 2019; IPCC 2022; UNESCO World Heritage Centre 2023, and similar) have recognized the direct risks of climate change, through, e.g., damage to historical structures, degradation of heritage landscapes due to physical and environmental threats, and extreme weather events. They also highlighted indirect and non-economic losses like displacement and loss of traditional livelihoods. Equally, there has been an ongoing debate on the potential role of heritage in addressing climate challenges.

Due to climate change consequences, like changes to the environment, making them more hostile or uninhabitable, the communities whose lives are tied to heritage systems might modify traditional practices or the land, or abandon this type of lifestyle altogether. It needs to be noted, however, that these climate-driven challenges rarely occur in isolation and are compounded by other factors of modern change, like, e.g., changes in socio-cultural priorities, economic hardships, and governance. Nevertheless, this brings a tension between **preserving the inherited form and value of sites while adapting to shifting realities, including those driven by climate change.**

This is particularly challenging, as heritage protection has traditionally emphasized resistance to change and the preservation of site coherence. This is especially evident at the World Heritage level, where Outstanding Universal Value (OUV) serves as a key standard; the loss of OUV criteria can ultimately result in removing a site's World Heritage designation. Despite its strengths, such as encouraging State Parties to protect designated sites, World Heritage status becomes problematic in the face of climate-driven changes that many sites are now undergoing. This challenge underscores a global responsibility, rather than one limited solely to an individual State Party. Importantly, the issue is not only about retaining World Heritage status, but about recognizing that the mismatch between the institutional aversion to loss and the realities of dynamic climate change complicates heritage management. It can also create tensions between governance institutions (e.g., UNESCO) and local communities, who are directly experiencing and responding to these changes.

The changing interactions between humans and nature and the ideological and spatial separation of people from natural spaces are issues of particular importance in discussions about climate change. In this context, cultural landscapes are especially relevant—not only in terms of current management challenges and future climate considerations, but also for the

lessons they offer from the past about adaptation, change, and the transformation of socio-ecological interactions under climatic fluctuations.

Additional obstacles to adapting cultural landscapes to climate change, primarily technical, include: 1) the lack of integrated approaches to understanding climate vulnerabilities and risks, and 2) the absence of comprehensive documentation and assessment of these landscapes (Aktürk 2022). Hence, what emerges is a clear **need to understand better and document the interactions between human activities and climate change within cultural landscapes**.

### ***Climate History***

Since the late 1980s, we have entered a phase of rapid warming, with the acceleration of temperatures during this period being truly exceptional when viewed in the context of the past 2,000 years (Pfister, Wanner, and Wade 2021). However, it is widely acknowledged that, aside from anthropogenic climate change, the Earth has experienced multiple climatic fluctuations over time, each of which has contributed to shaping and reshaping socio-ecological systems—legacies that remain visible in today’s cultural landscapes.

Consequences of ongoing and future anthropogenically induced global warming have encouraged scholars to explore how past climatic changes have influenced societies throughout history (Ljungqvist, Seim, and Huhtamaa 2019) to better understand societal responses and resilience mechanisms over time. In this context, it is also interesting to ask **how this knowledge can inform the current management of heritage sites under growing climate pressure**. Following this line of thought, it is valuable to investigate the role of change, here, particularly climate-induced change, in shaping heritage sites. Rather than viewing these changes as isolated responses, we can consider them as part of a continuum of transformations. This positions climate as an active factor in the *making of* heritage: not merely as a threat to preservation, but as a historical agent that has co-produced the landscapes, practices, and meanings we now seek to protect.

### ***Example: Pyrénées–Mont Perdu World Heritage Site (France/Spain)***

To provide a preliminary illustration of the ideas presented in this work, a transboundary UNESCO cultural landscape shared between France and Spain, Mont Perdu, serves as a rich case study. People have lived in this area since the Neolithic period. It is particularly recognized for its exceptional combination of mountain landscapes, alpine meadows, glacier formations, and centuries-old transboundary pastoral traditions (UNESCO 1997) – the practice of transhumance since the 12th century (a seasonal movement of livestock between higher and lower pastures in tune with the seasons). This way of life depends on seasonal access to mountain water sources to provide water for animals, people, and meadow irrigation. Water access is closely tied to the Monte Perdido Glacier, a key landscape feature of the site. This glacier, like many others in Europe, has expanded and contracted on several occasions due to changes in temperature and precipitation since the beginning of the Holocene (11,700–9700 BCE) (García-Ruiz et al. 2014). It can be assumed that the glacier, by supplying water or reducing land availability, has affected human activities in the region. The following table (Table 1) presents historical climatic conditions linked to the glacier’s expansion, and speculates on their impacts on the landscape and their

relationship to human activity. These speculations are based on comparable contemporary cases and an initial review of archival sources. This case study illustrates the ideas presented in this work, though more in-depth research is needed to better understand these dynamics.

|                              | <b>Climate Period;<br/>Climate Characteristics</b>                                                       | <b>Implications on the Landscape</b>                                                                       | <b>Impact on the Socio-ecological System</b>                                                                                                                                                                                                                                                                                                                   |
|------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>12–13th century</b>       | Medieval Climate Optimum;<br>Relatively warm climate                                                     | Retreat of the glacier                                                                                     | Expansion of the agricultural activities and pasture on the higher altitudes                                                                                                                                                                                                                                                                                   |
| <b>14th century &lt;</b>     | Little Ice Age (LIA);<br>A much colder and wetter period                                                 | Glacier expands                                                                                            | Decreased space for cultivation and grazing at the higher elevations occupied by the ice mass, and more hostile due to low temperatures, transhumance routes, and grazing schedule would have had, most likely, to be adjusted                                                                                                                                 |
|                              | Late 1600s (LIA);<br>Very cold period                                                                    | Glacier expands to its maximum thickness and length                                                        |                                                                                                                                                                                                                                                                                                                                                                |
|                              | Slight warming of the climate (~50 years) between two very cold periods                                  | ?                                                                                                          | ?                                                                                                                                                                                                                                                                                                                                                              |
|                              | Early 1800s (LIA);<br>Very cold period                                                                   | Glacier expands to its maximum thickness and length                                                        | Same as in the previous expansion (?)                                                                                                                                                                                                                                                                                                                          |
| <b>Mid–19th century &lt;</b> | Warming phase with steadily growing temperatures                                                         | Glacier retreats;<br>Glacier melt slowly decreases                                                         | Higher pastures become accessible;<br>Changes in the water availability require adjustments to the water management, like traditional irrigation systems and water channels built to support transhumance                                                                                                                                                      |
| <b>1980s &lt;</b>            | Rapid warming phase;<br>Fast and dynamic changes in climate, including temperature fluctuations globally | Glacier retreat accelerates with studies (reference) suggesting it might disappear in the next few decades | The time of grazing and animal migration needs to be adjusted;<br>Forest cover moves up in altitude, leaving less easily accessible places for pasture;<br>Melting of the permafrost is causing erosion and rockfalls, potentially blocking routes/causing damage<br><br>In addition, climate change has produced indirect effects. For example, rising summer |

|  |  |  |                                                                                                                                                                                                           |
|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | temperatures have facilitated increased tourist access to higher-altitude areas that were previously less accessible, exerting further pressure on traditional land-use practices and local biodiversity. |
|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 1. Overview of the climatic evolution of the Mont Perdu cultural landscape site and its potential impacts on human activities (Source: Author, 2025).

It is important to note that while this discussion focuses on how climate and resulting environmental changes have influenced human activity, humans have also actively shaped the landscape in response to climatic shifts. A notable, though complex, example is the Causse and Cévennes, a UNESCO cultural landscape in France characterized by fluvial erosion in a mountainous setting. In this region, chestnuts were introduced in the 11th century and expanded during the warmer conditions of the Medieval Warm Period. However, with the onset of the Little Ice Age in the 14th century, cultivation shifted to lower elevations where the trees could survive colder temperatures and continued to serve as a crucial food source during climate-driven periods of famine. This gradient in tree coverage remains visible in the landscape today. The extreme winter of 1709 devastated chestnut groves, prompting a shift toward mulberry cultivation and silk production. Although chestnuts briefly recovered in the 19th century, they declined again in the 20th century due to disease, rural depopulation, and ongoing climatic pressures. Today, they are being reconsidered for climate-resilient reforestation initiatives.

**Discussion & Conclusion**

Cultural landscapes help to capture the evolution and adaptation of human societies under the influence of physical opportunities provided by the natural environment, alongside social, economic, and cultural factors. Given the long history of climate variability, we should pay greater attention to the fact that environmental constraints and opportunities, such as those shaped by climate, have been changing even in the relatively recent past. The adaptive practices included in nomination files and descriptions of heritage sites are often presented as selected "good practices" that responded to specific historical moments and environmental challenges, including climatic ones. However, in the context of contemporary climate change, it is important to build narratives not only around these practices themselves but around the processes of change and transformation that have occurred over time in and around heritage sites. This is to say: we should not only focus on the good practices in isolation but also examine how they have evolved in response to environmental change.

Incorporating historical climate knowledge into heritage management could offer a valuable framework for climate adaptation. It would allow us to 1) ground adaptation strategies in the long-term interplay between environmental pressures and human responses, and 2) shape narratives of resilience and transformation around heritage sites. Ultimately, this approach could help us better anticipate how landscapes and communities might respond to future changes and foster more effective collaboration between institutions and the people who live within these heritage systems.

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## 7 Applied history helping to face environmental challenges and to design more sustainable landscapes: the Laboratorio Ecosocial do Barbanza

**By David Fontán Bestilleiro & Roque Sanfiz Arias**

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In recent decades, Galicia (NW Spain) has seen a significant increase in forest cover, both from intensive monoculture of pine and eucalyptus —mainly in coastal areas— and from land abandonment and lack of management —especially in the inland— (Corbelle & Tubío, 2018). The intensive forest production model based on fast-growing species and land abandonment are two sides of the same coin, and also two of the main factors contributing to the serious wildfire issues. The problem of wildfires has recently been addressed by historiography (Soto, Balboa, and Fernández 2024), which seek to understand historically a phenomenon that causes enormous costs in economic and environmental terms and even a direct threat to people's lives.

This paper is based on our work at the Barbanza Ecosocial Laboratory, a living lab that seeks to contribute to a greater resilience and sustainability of the territory and the communities of Barbanza, a coastal region strongly deagrarianized over the last decades, but not depopulated. The Laboratory was born at the beginning of 2020 from the collaboration between the University of Santiago de Compostela, through the HISTAGRA research group, and the Fundación RIA, a think tank of analysis and strategic territorial planning based on Galicia.

The aim of the project is to study the history of the communities of Barbanza to put this knowledge at their service in relation to the challenges they face today. That's why both the research and the planning of actions are processes co-constructed with the local communities. The lab was launched in 2020 with the hypothesis that solutions to socio-environmental challenges must be rooted in local knowledge and that common lands have great potential for redefining multifunctionality and fostering greater sustainability in land management. The method is based on applied agrarian history, that integrates participatory action-research: universities and other actors co-create and support community-led processes.

In this work we will focus on the experience of several communities in Barbanza that are using intangible heritage and collective memory to design strategies for the future of their lands, recovering multifunctionality and reducing fire risk.

### **A brief history of Galician common lands**

The commons play a central role in our research for two reasons: on the one hand, they provide a complete overview for understanding rural communities in the long term; on the other hand, they present an enormous potential regarding the present and the future of the territory. We must take into account that common lands make up 22% of the Galician territory owned and managed by about 3,000 commoners' organisations or *Comunidades de Montes Veciñais en Man Común* (CMVMCs), the legal figure that regulates this kind of ownership in Galicia.

When we talk about common lands we are not talking about public property, but collective private property with origins in Germanic Law. Residence confers the right to participate in the assemblies and make decisions about management, regardless of the background or the status of the family. This form of collective property legally disappeared from the first decades of the 19th century, with the establishment of the liberal state, until the 1970s. For more than a century and a half they did not exist in legal terms, being attributed to the public property of the municipalities (Balboa, 1990).

The survival of common lands covering such a large area is mainly explained by the resilience of local communities, due to the important role that common lands played in the reproduction of peasant households. They were not uncultivated and unproductive areas, but an essential element of an organic agrarian system that functioned in an integrated way. They were the support (Bouhier, 1979) and driving force (Soto, 2006) of agriculture, providing neighbours with fertiliser, food for livestock, water, stone, firewood and many other minor products.

The liberal State tried to afforest these areas, but they did not manage to impose substantial changes. During the Francoist dictatorship, the state had the coercive power to intervene, expropriating the common lands in the 1940s and 1950s (Rico Boquete, 1995). In line with its ideal of an autarchic economy, the dictatorship first planted pine trees and then eucalyptus to develop a pulp and paper industry. This altered territorial balances, generating environmental problems, promoting the adoption of the industrial agricultural model and accelerating the rural exodus.

It should be noted that in 1968, still under the dictatorship, communities succeeded in the establishment of a legal framework for the restitution of their lands, an extraordinary and meaningful achievement. Many common lands were recovered after 1975 in the context of democratic mobilisation. However, these were different lands (mainly afforested) and also different communities, shaped by progressive agrarian abandonment. Generally, they inherited the dynamics of intensive forest exploitation, which became progressively the norm also on private lands as a relatively profitable strategy for those no longer primarily engaged in agriculture. This process allows us to understand the emergence of large wildfires, an unknown phenomenon until the mid-20th century.

### **Intangible heritage as a pathway to foster sustainability in Barbanza common lands**

The proliferation of increasingly serious fires that threaten the lives of the inhabitants is leading many communities to explore new forms of multifunctionality that connect them with the local agroecological knowledge and their historical dynamics, as we will see from two case studies.

One of the CMVMCs we work with at the Barbanza Ecosocial Lab is Baroña, in the municipality of Porto do Son. The main turning point in the management came after the great fire of 2006, which burned about 40% of the common lands. That year was particularly intense in terms of wildfires, amplifying the severity of the situation.

From then on, the community began reintroducing grazing, initially with horses, and progressively with other animals like sheep, goats, and cattle, which play complementary roles in biomass control.

They also opted for diversification of land uses: creating meadows as discontinuity areas between forest masses, introducing grazing into forested areas, and developing complementary uses such as mushroom, honey, and resin production (both *old* and *new* uses).

This new management model has practically eliminated wildfires in a region particularly affected by them. The model shows very positive outcomes in terms of environmental, economic, and social sustainability, and we are currently studying its replicability.

We also work with several CMVMCs in the municipality of Rianxo, where fire has played various roles over the past two decades, showing that it can be a double-edged sword: promoting abandonment and loss of autonomy, or revitalizing communities and fostering model change.

In the summer of 2006, Rianxo suffered a major fire affecting nearly half of its common lands (and much more private lands). This led to abandonment and significant loss of autonomy in several communities, which were forced to sign agreements with large pulp-related companies to remove burned timber and replant fast-growing species.

In March 2019, an even more aggressive fire burned over half of Rianxo's common lands. This timing highlights the cyclical nature of fire in this context. Aware of the need for a new model, fire acted as a catalyst for change. The communities organized to take legal actions against the company responsible for the origin of the fire, but also to collectively build a new management model, now under development through the Barbanza Ecosocial Lab.

This living lab work reveals the key role intangible heritage and community memory can play in high socio-environmental risk contexts: the memory of multifunctional landscapes that didn't burn, of close links between common lands and agrarian activity (within integrated agroecosystems), of common lands as a source of labour and also as a place of celebration and part of local identity.

By recovering this memory and reconstructing community histories (through various sources), we are rediscovering and reviving ecological and territorial knowledge that, until recently, contributed to building more resilient and sustainable landscapes. We are also testing how awareness of this past—without idealization—can inspire the projection of more sustainable futures, less vulnerable to fire and other socio-environmental risks.

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## 8 Walking-in-soil & Designing-with-soil. Two nomadic practices for cultural landscapes in transition.

**By Leen Vansteenkiste**

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### **A matter of care.**

Soils currently suffer from human mistreatment. They are subject to different processes of degradation, such as erosion, overexploitation, compaction, pollution, and biodiversity loss, making them a matter of urgent care (Puig de la Bellacasa 2017). On the other hand, soils are crucial partners in climate adaptation. They decrease the risk of floods and droughts by absorbing water, they host a pool of biological diversity, they are the largest carbon sinks on the planet, they filter drinking water and produce food... as long as they are healthy (European Commission 2021). Because “life on earth depends on healthy soils” (European Commission 2024, 1), we need to work with them towards repairing our shared Earth. However, soils are possibly “the least comprehended and acknowledged of Earth's environments” (Mishra et al. 2023, 1).

### **The Flemish field of spatial planning and design.**

To frame the limited acknowledgement of soil as a vital environment on Earth and the mistreatment accompanying it, this paper will focus on spatial planning and design in Flanders (BE). The Flemish building scene is characterised by large-scale infrastructural works and road constructions, demanding the movement of significant amounts of soil. These, often disruptive, works impact soil quality and soil life and call for more careful approaches in designing and embedding them in the environment (Vermeulen et al. 2024). Therefore, approaching soil as a vital environment should be embedded more into regulations and procedures in public procurement (Vermeulen et al. 2024), instead of the current perception of soil as an inert or lifeless material.

### **Towards a caring and dynamic participation with the soil.**

Since spatial planning and design play an important role in designing and shaping the world we share with soils, this paper focuses on how spatial planners and designers can interact in alternative ways with soils in design processes. Therefore, we look more specifically into the role of Participatory Design (PD). PD has a rooted expertise in designing with human participants and is expanding towards designing with *more-than-human* participants (Smith 2024). Participating with soil in spatial planning and design can challenge the perception of soil as an inert or lifeless material that we can merely sculpt, transform into building materials or optimise to our human needs. However, the complexity of designing with soil lies in the time and scale accompanying this more-than-human. Soil challenges or characteristics transcend plot boundaries (Vander Elst and Rekkers 2022) and human time frames. Soil themselves are dynamic and borderless: consider rivers that sculpt the soil over time or fertile topsoils that form extremely slowly (Open Ruimte Platform 2022). Our context evolves (Latour and Yaneva 2017), as do our soils, but at a very different, much slower pace than humans.

Therefore, this paper proposes a shift from the current technical, sedentary and output-oriented relationship with soil (Puig de la Bellacasa 2017) in spatial planning and design towards a more caring, dynamic and participatory one: an approach that draws attention to the urgent need to

better understand soils by actively engaging with them in design processes on different scales in time.

### **Nomadic Practices & Perigrination.**

Therefore, the paper will firstly adopt Ron Wakkary's (2020, 117) concept of "nomadic practices" and explore it to expand the theoretical and methodological *toolboxes* of more-than-human PD. As a posthuman theory for knowing design, nomadic practices aim to expand design beyond limiting "humanist ideals and assumptions" (Wakkary 2021, 35). Secondly, to further address the soil's complexity in scale and time in large-scale infrastructural projects, the paper will adopt Ruth Little's (2021) concept of *peregrination*: "to think as a peregrine moves" (Little 2021, 283) will support the zooming in and out between soils as large-scale landscapes and situated environments. Both concepts are applied to an ongoing case study: project *Noord-Zuid Limburg* (NZL).

### **Underneath Noord-Zuid Limburg.**

NZL is a heavy-traffic road that connects the cities of Hasselt and Eindhoven while running through a chain of municipalities, among which Houthalen-Helchteren (BE). This way, NZL currently impacts the quality of life of local inhabitants, road safety, and mobility. NZL additionally runs through the water landscape of *De Wijers* (Vlaamse Landmaatschappij 2021), causing disturbances and fragmentation in a system of connected ponds, rivers and valleys. By adopting NZL as a case, this paper investigates a fragmented landscape in transition towards an alternative road trajectory.

In the cultural landscape surrounding NZL, including the water landscape *De Wijers* and the abbey of Herkenrode, soil practices shape history, present and future. The abbey's history of working with the water and the soils as *cooperation partners* (Kehnel 2023) transformed into a present of fragmentation and pavement due to large-scale and disruptive road infrastructure (Vlaamse regering 2024), impacting human and *more-than-human* lives. The future of this landscape is characterised by the construction of tunnels for the redesign of the road and the movement and reallocation of soils on top of these tunnels (Vlaamse regering 2024). Therefore, soils become a tangible, yet fragile, matter that we can engage with in designing more resilient future landscapes in the research context.

As Participatory Designers, what can we first and foremost learn from the complex matter of soil? How do we already engage with soil in our daily lives, and what are the hidden, forgotten, or often intangible and overlooked soil practices - and their entangled memories, histories, stories and situated knowledge - that already take place in the research context of NZL? What can we learn from these everyday practices by studying, questioning and redesigning them, and how can we then co-create our shared sustainable landscapes of the future?

### **The nomadic practices of walking-in-soil & working-in-soil.**

This paper introduces two *nomadic practices* - inspired by and named after Ron Wakkary's (2020) *nomadic practices*, Ruth Little's (2021) *peregrination* and the intangible heritage of the abbey of Herkenrode as a productive landscape and pilgrimage site - implemented in the field of Participatory Design: *walking-in-soil* and *working-in-soil*. Both nomadic practices explore

human-soil relationships across the width and depth of the large-scale project area of NZL and how these can contribute to the participatory design of a sustainable future landscape.

The nomadic practice of *walking-in-soil* is a research practice inspired by the act of pilgrimaging, which involves discovering, mapping, and connecting different soil practices across the research context through exploratory walks in the field. The nomadic practice of *working-in-soil* is a research practice inspired by the shaping and (re-)designing of soil that took place on different scales through time in the research context. This nomadic practice explores the discovered soil practices more in-depth through speculative design experiments on-site. Combining both practices allows for a movement between scales in time: a zooming in and out.

### **Two nomadic practices in two cases.**

The two nomadic practices of *walking-in-soil* and *working-in-soil* are preliminarily explored in two cases and applied to the research context of NZL. The first case, *in the footsteps of the pilgrim*, discusses the first walk from a series of immersive walks in which researcher Cis Schraeyen and I (UHasselt, Faculty of Architecture and Arts) explore the research context of NZL through the nomadic practice of *walking-in-soil*. These walks, inspired by the act of peregrination, had predefined starting and arriving points, while the route between these points was undefined. The paper will elaborate on three discovered soil practices along one of these walks.

The second case, *a collage for Noord-Zuid Limburg*, discusses a workshop week where seventeen bachelor students, under the guidance of researcher Cis Schraeyen, professor Liesbeth Huybrechts and doctoral students Nikolaos Kanavaris, Chioma Obasi and I (UHasselt, Faculty of Architecture and Arts), in collaboration with app-developer Stijn Scholts, explore the research context of NZL through the nomadic practices of *walking-in-soil* and *working-in-soil*. During this week, an iteration of both practices was explored to map and visualise experiences in the field and speculate about the future of NZL through design. A collective collage was used as a visual and tangible medium to (re-)present the iteration of both nomadic practices and the discovered stories, practices and insights. The paper will elaborate on three discovered soil practices and their role in situated project ideas.

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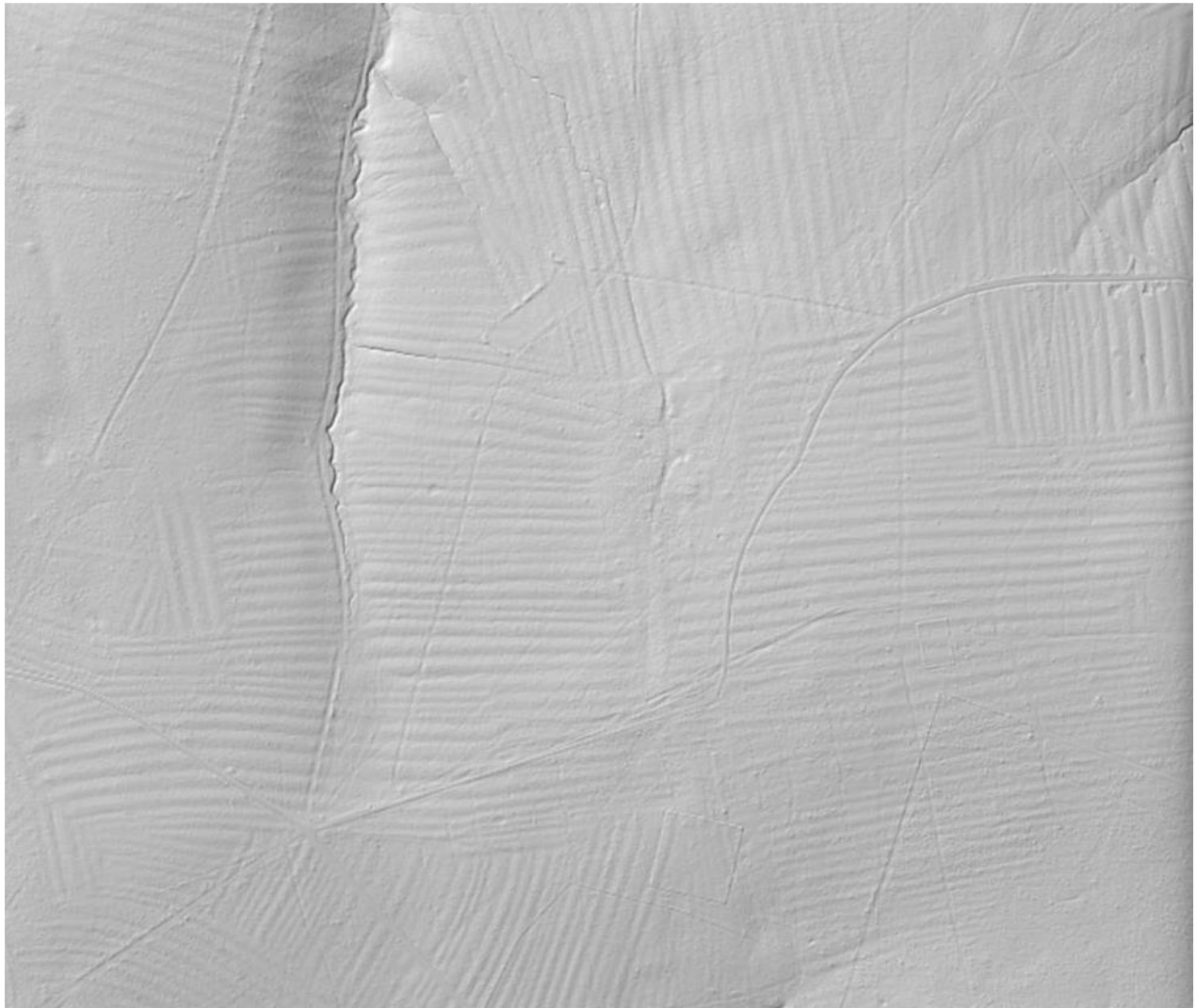
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## 9 Learning from the Past for the Future. Historic Ridge and Furrow Cultivation as effective risk minimisation strategies in agriculture

**By Claus Kropp**

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LIDA Scan of a historic ridge and furrow field system near Kassel, Germany. Source: Hessische Verwaltung für Bodenmanagement und Geoinformation / Datenaufbereitung und -bereitstellung: Hessisches Landesamt für Naturschutz, Umwelt und Geologie.

Ridge and Furrow (german "Wölbäcker") are a historical field form which, according to the latest research findings, were particularly widespread in Europe between the 9th/10th century and the 19th century. Ridge and Furrow are field forms up to ten metres wide, up to one metre high and sometimes over 1000 metres long. Several dozen of these vaulted beds have often preserved side by side as field monuments (although it should be noted that it is not always possible to prove that they were used at the same time). The actual formation of ridge and furrors has been the

subject of much debate. It is widely agreed that such vaulted fields can be created whenever a mouldboard plough is used to turn the clods towards the centre of the field. By tilting the clods towards each other, a recognisable curvature of the bed can be achieved after just one pass of the plough, depending on the type of soil. If you explain the formation of the ridges in this way, you can also understand their particular length. For the ploughman, having to turn the hitch very narrowly at the end of the furrow is an effort that should not be underestimated. The turning radius of a team with a front carriage and mouldboard plough is significant. It is therefore not surprising that many of the ridge and furrows that are still known today as field monuments, especially in forests, have a characteristic s-shaped end, which can be seen as indirect evidence of a turning manoeuvre with the plough. Another possibility for the formation of ridge and furrows is given through "Plaggenwirtschaft" in which earth material was intentionally applied to the arable land. In this case, the ridges were not ploughed up from the existing soil horizons, but rather by applying, for example, sods with a spade. What should not be forgotten in this context, however, is the fact that even once the curved field strips have been created by hand, further cultivation usually had to be carried out using a plough.



Ploughing with draft cattle and a (re)constructed Early Medieval mouldboard plough at the Laresham Laboratory for Experimental Archaeology. Source: Staatliche Schlösser und Gärten Hessen. A long-term experimental archaeological study at the Laresham open-air laboratory (southern Hesse, Germany) has now provided interesting insights into the possible reasons for the emergence and maintenance of this particular field system. As part of an eight year field study, it

became clear that ridge and furrows constituted several essential risk minimisation strategies for the rural population of the time:

- Increasing of field surface area
- Erosion control
- Creation of different microclimates through the alternation of slopes and ridges and the corresponding varying yields
- Possibility of a balanced yield regardless of weather extremes (drought vs. disproportionate rainfall)



Weather station with soil sensors (measuring soil humidity and moisture from 0-90cm in the ground) on the experimental ridge and furrow fields of the Open-Air Laboratory Lauresham. Source: Staatliche Schlösser und Gärten Hessen.

However, the study also revealed that the potential of these risk minimisation mechanisms depends on many factors so that a generalised conclusion does not seem possible. Rather, a distinction must be made as to whether winter or summer crops are used, whether the individual strips were cultivated with the same crop or whether fallow, summer and winter cereals alternated directly next to each other.

In conclusion, however, it can be stated that ridge and furrows and the risk minimisation strategies that can be derived from them represent important resilience mechanisms that may well be relevant to the challenges of 21st century agriculture.

## 10 From ritual behavior to agroecological sustainability. Movement as a purification method for animal and landscape welfare in mobile pastoralism

**By Ioana Baskerville\* and Júlio Sá Rêgo\*\***

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The term transhumance derives from the Latin “trans” (across) and “humus” (land); crossing the lands. Transhumance is a system of cyclical and seasonal herd mobility, guided by shepherds, between different grazing lands. It can be horizontal, between pastures at similar altitudes, or vertical, from foothills to high-altitude grazing areas. It may occur in winter and/or summer (Ruiz & Ruiz, 1986). Transhumance have played a significant role in the origin and maintenance of many European cultural landscapes, especially those in the mountains (Bunce et al., 2004).

Transhumance brings several socio-environmental benefits. It contributes to food security and community well-being, supports sustainable pasture management and promotes biodiversity (Niamir-Fuller & Huber-Sannwald, 2020). In some cases, it directly aids in fire prevention and thus helps to mitigate carbon emissions resulting from wildfires (Sa Rego, 2021).

The socio-environmental benefits and its deep historical roots in various cultures around the world (Costello & Svensson, 2020; Gooch, 2004; Scoones, 2021) have led to strong interest in its heritagisation. Many countries recognise transhumance as national intangible cultural heritage, and this growing interest has contributed to its international recognition at UNESCO level. Transhumance is inscribed in the Representative List of the Intangible Cultural Heritage of Humanity by 10 countries (Bindi, 2022). Other countries are in process of joining.

The biophysical drivers of transhumance are well known. It enables access to scattered natural resources, such as pastures and water, and helps cope with the uncertainties of environmental dynamics (Scoones, 1995). The herd, guided by shepherds, moves between grazing lands in search of available forage, in accordance with seasonal cycles, in order to avoid scarcity and resource depletion. Animal mobility to cope with uncertainty is one of the many human subsistence innovations of the Neolithic (Scott, 2017).

However, transhumance is also a cultural practice (Sa Rego et al., 2022). Its cultural drivers are less well understood, although they play a crucial role in shepherds’ decision-making processes regarding whether or not to undertake transhumance. A better understanding of these drivers can help inform policies to safeguard transhumance, addressing both its biophysical and cultural dimensions.

This text is a preliminary comparative cultural study of transhumance in Portugal and Romania, aimed at starting to identify and cross-check potential cultural drivers to understand how they influence the decision-making processes of transhumant shepherds.

## **1. Portugal**

Transhumance in Portugal is closely connected to the Serra da Estrela region. It is a historical response to climate and landscape variability. The high altitude of the Serra da Estrela forced people and their small ruminant herds to leave during winter. The ground would freeze, pastures were covered in snow, and the cold temperatures threatened survival (Dias, 1965). The main transhumance destinations were the Douro Valley, the Baixo Mondego, the plains of Idanha and Campo de Ourique. The return to the Serra da Estrela took place in spring (Martinho, 2013).

Transhumance also occurred in summer. Most lowlands were under cultivation and prohibited to livestock. Shepherds and their flocks moved to the altitude of Estrela in search of fresh grass and to avoid sown fields. These flocks were joined by herds from further afield, including the Alentejo, the Algarve mountains, and especially from Soria and Segovia in Spain (Calado Pinheiro, 2008)

Long-distance winter transhumance gradually disappeared through the 20th century, with the last route disappearing in the 1970s. The main reasons were the loss of access to pastoral trails and grazing lands, as well as a general decline in pastoral activity (Carvalho & Marques, 2020).

Short-distance summer transhumance remained and takes place today within the Serra da Estrela Natural Park. It begins from April to June with sheep pilgrimages: adorned flocks travel on foot to local religious celebrations, where they are blessed by circling the village churches three times.

The ascent happens between June and July. It takes up to two days and 40 kilometres to reach summer pastures at altitudes ranging from 1,000 to 1,900 metres. The summer season can last from 10 days to four months.

The contemporary practice of transhumance in the Serra da Estrela, however, challenges the biophysical reasons. Both winter and summer transhumance were historically a rational response to the shortage of pasture. The high number of herds and the climatic conditions forced shepherds to move in search of food for their animals. Today, climate change and rural depopulation creates a greater abundance of pasture in the lowlands. There would be no need to go up to the Serra in the summer anymore.

However, shepherds believe transhumance still benefits their animals. It provides cooler temperatures, fresher pastures, purer water, and air free from flies and dust. Animals also enjoy more freedom, as they sleep outdoors instead of in stables. This mountain environment supports animal well-being and nutrition.

In addition to benefits for the animals, transhumance is good for the lowland pastures left behind. These lands get a chance to rest and regenerate, helping conserve vegetation and maintain the health of the landscape.

## **2. Romania**

Romanian transhumance is an ecologically sustainable system of grazing based on seasonal mobility between high alpine pasture in the highest Carpathians in the summer and lowlands during winter season. Historically, transhumance was the most evolved type of animal breeding practiced on Romanian lands, specifically in rural submontane rural areas in southern

Transylvania and northern Wallachia (De Martonne, 1912). The importance of transhumance for the maintenance of Romania's rich semi-natural grasslands has been emphasized by ecologists and is reflected in rural development policy documents (Huband et al., 2010).

The long-term reclusion especially during the 3-month summer grazing, and the special conditions of managing a complex human-animal-nature connection determined transhumant shepherds' reliance on religious practices, magical rituals, and ethno-meteorological strategies as coping mechanisms. Local ethnological research showed the role of ritual practices (magic and Christian) in the shepherds' strategy of adapting to unprecedented environmental conditions and other ecosystem disruptions (such as growing numbers of wild predators 'attacks, unavailability of traditional grazing areas, biodiversity loss, etc.) which recently affect both their livelihoods and professional practices. Climate change disturbs the old pastoral calendar, the timing of herds climbing to the alpine pastures, determines drought and desertification of low winter grazing areas, and the entire agroecological system of Romanian transhumance.

As elsewhere in the global pastoral system, unpredictable weather regimen is more and more hindering the pastoral activity in the Romanian Carpathians. This transformation also influences the mountain shepherds' spiritual behavioural routine and encourages magical responses to extraordinary environmental circumstances menacing their existential security and their cultural and economic system. The direct reliance of transhumant shepherds on natural regeneration and the vital importance of ensuring animal welfare, their direct exposure to sudden climatic changes, may further explain the persistence of these ritual practices long after surrounding Romanian rural communities have undergone increasing secularisation.

### **3. Comparison and conclusion**

Transhumance rituals on both countries combine elements of magic and Christian spirituality. They reflect the shepherds' profound understanding of the dangers and challenges posed by harsh environmental conditions. Cultural drivers indicate that transhumance is thus shaped by rituals and celebrations that reflect a rationality focused on protection.

Adaptive strategies in small-scale family farming and efforts to ensure food security have long been interpreted in both historical and contemporary Romanian ethnological research through the lens of protective household magic (Cristescu, 1940/2002; Jiga Iliescu, 2020). In Romania, mobile pastoralism included these specific protective practices that are informed by broader symbolic meanings of purification vs. pollution associated with domestic animals in many traditional societies and that highlight the role of livestock in sustaining both social and cosmological order (Douglas, 1966).

In Portugal, the beginning of transhumance is marked by the organisation of sheep pilgrimages. These are religious celebrations for the blessing of the livestock, based on the Holy Trinity. The flocks are expected to circle the local chapel three times while being blessed by the priest. Similarly, in Romania, the start of the transhumance summer season is marked by purification and protective Christian blessings performed by local Orthodox priests. Furthermore, since long-distance transhumance, involving the movement of herds over hundreds of kilometres, is still active in Romanian Carpathians, the increased presence of wild predators, the unpredictable

environment and the influence of yet conservative popular religiosity determine a greater reliance on magical rituals.

The case of transhumance in the Serra da Estrela also revealed the existence of ecologically oriented rituals. They stem from the lived experience of shepherds' lifeworld, which is an integral part of the environment within a relational rural matrix. Transhumance represents there a cyclical ritual of purification of the animals and of regeneration of the soils. Both arise from the shepherds' sense of affection and respect for their animals and the landscape of the Serra da Estrela.

This comparative perspective highlights the need to holistically investigate cultural practices closely tied to grassroots economic activities, practices that remain understudied due to research paradigms that often disconnect the spiritual from the material.

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## 11 Drmun and trinkanje. Two aspects of traditional forest management on the Island of Krk and its contribution to preserving ecosystems and combating climate change

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The role of traditional forest management practices in biodiversity conservation and climate change mitigation is gaining increasing recognition. This presentation explores how traditional stewardship methods, deeply rooted in the local knowledge of the Malinska-Dubašnica community on the Island of Krk (Croatia), contribute to preserving ecosystems while combating climate change.

Let's begin with the setting. The island of Krk, located in the northern Adriatic, has been inhabited since the Neolithic but with strong maritime civilisation – the Liburnians- in Bronze Age. Its forests—rich in downy oak (*Quercus pubescens*) and oriental hornbeam—have supported local communities for centuries, offering firewood, construction material, and pasture. These uses were not random; they followed deeply embedded systems of land management that balanced human need with ecological preservation.

Oak forests, historically, ecologically, economically, and culturally extremely significant in this municipality, are central to this research. The name *Dub* from which the name of the municipality and the interpretation centre gain its name means oak in Old Slavic, thus reflecting the once vast oak woodlands that covered Krk and were a key export material sent to Venice.

Krk's forests were once carefully governed. As early as 1307, we see documented forest management regulations. During the Venetian rule, between the 15th and 18th centuries, the forests were considered a strategic resource. Wood from Krk was exported to Venice, Trieste, and Rijeka. This continued until the mid-20th century, when modern energy sources like electricity reduced dependence on wood. This also marked the decline of many traditional practices and economic instability.

One such system is *drmun*. The term comes from the Greek word *drymon*, meaning oak forest. A *drmun* is more than just a woodland—it is a forest pasture. It's a place where trees and grazing animals coexisted, where people harvested wood while letting their livestock feed under the canopy. *Drmun* was typically enclosed by drystone walls where sheep grazed. Within this same forest, people selectively pollard trees using branches suitable for shipbuilding and other everyday uses, ensuring the forest's sustainability for future generations. Drmuns were privately, public and church owned. When it was a shared good, it was jointly used by the community following specific rules and duties.

This combination of forestry and agriculture is today known as *agroforestry*.

As mentioned, trees were pollard which is another key practice, referring to a traditional method of cutting trees at about two meters above the ground. Why this height? Because it protected the young shoots from browsing livestock. Over time, this led to trees that grew slowly but lived longer, and—crucially—created habitats that supported exceptional biodiversity. One such example is the rare violet click beetle, *Limoniscus violaceus*, which thrives in the old, hollow trunks of pollard trees. Other practices were followed carefully to ensure healthy and strong material. *Trinkanje* and wood-cutting in general was performed from late Summer to Winter (End of August – March), possibly after the leaves have fallen, when the tree's sap flow is at its lowest, making the wood:

1. Less prone to rot or insect damage
2. Lighter and easier to transport
3. More durable for construction and firewood

Besides, they also followed the lunar calendar, paying attention to cutting trees during waning moon (after full moon, heading toward new moon) which was considered crucial to produce stronger, more rot-resistant wood again because the sap content is lower.

To further investigate these traditional practices and driven by the recognition that traditional knowledge holds keys to solving contemporary problems, the EU project FoRESisT (Conservation and Evaluation of Forest and Agricultural Ecosystems in the Cross-Border Area) was launched in 2024. It aims to protect forest, agricultural, and freshwater habitats, including those on Krk but also scientifically evaluate both the positive and potentially negative aspects of traditional forest management and to advocate policy change in favour of silvopasture. In this endeavour the project leaders recognised traditional knowledge as an important factor of sustainability so one goal is to also document and promote traditional forest management as intangible cultural heritage leading to the recognition of drmun as a cultural landscape strongly shaped by ICH.

As part of the project, 30 practitioners were interviewed, including 10 from the Dubašnica area of Krk. All reported the huge difference in the landscape since there are less and less sheep grazing and people pollarding trees. The forests are dense and overgrown, with little light reaching the ground, allowing only weeds to thrive. In the past, everything was well-maintained—the paths and the forests themselves—which also helped prevent fires, whereas today, they would be difficult to control. Another crucial aspect indicated by practitioners is that sustainably managed forests would keep wild animals out of direct human contact which is becoming a growing issue.

The research will guide the development of action plans that integrate this local knowledge into sustainable forest management.

In addition, in 2023 another research supporting this one was undertaken. Dendrochronological results showed that some pollard oaks on Krk are over 250 years old representing a living archive of ecological and cultural continuity.

But why does this matter today?

First, biodiversity. Forests shaped by *drmun* and *trinkanje* support diverse plant and animal life. The mosaic of open and shaded areas, coupled with the presence of old trees, makes these forests ideal for many rare species.

Second, these systems prevent the spread of invasive species and wildfires. Grazing and pruning reduce undergrowth, limiting fuel for fires and space for invasive plants to thrive.

Third, and perhaps most urgently, agroforestry enhances climate resilience. By combining tree cover with productive land use, it stabilizes soils, stores carbon, and moderates microclimates.

And finally, let's not forget the social and cultural value. These practices are woven into the identity of local communities. They sustain traditional customs, local food systems, and intergenerational knowledge. One such example is the Sensa festivity, on the Ascension of the Lord (40 days after Easter). It is traditionally a period in the calendar for the blessing of fields and livestock and prayers for fertility. For the community, sheep farming was the foundation of survival, which is why a unique custom developed—the blessing of cheese and the cheese race, which has been continuously held to this day.

## 12 4 GRADA DRAGODID: Safeguarding Dry-Stone Heritage and Traditional Knowledge

**By Duje Mikelić**

*Association 4 GRADA DRAGODID*

### **History and Heritage Mission**

4 Grada Dragodid is a Croatian NGO (founded in 2007) dedicated to preserving the traditional dry-stone masonry of Croatia. Its roots trace back to 2002, when the first international dry-stone workshop was held in the village of Dragodid on Vis Island. The association's mission is "study and preservation of the dry-stone building skill, organizing workshops, presentations and education". In practice, Dragodid unites amateurs, artisans and scholars in hands-on restoration projects. For example, volunteers of all ages take part in intensive dry-stone "action days" where collapsed stone walls and shepherds' huts are being rebuilt by hand. Dragodid works on the education and interpretation of dry-stone heritage through practical restoration workshops, research on the craft and its practitioners and expert meeting. These activities link hobbyists with professionals – from farm families and masonry novices to architects and ethnologists – all sharing an interest in this vernacular craft. The result is a lively heritage community. For instance, a 2025 Dry Stone Days festival co-organized by Dragodid on Hvar drew over 150 participants – master wallers, students and rural enthusiasts – celebrating and learning the tradition.

In addition to fieldwork, Dragodid inventories and documents dry-stone sites (walls, huts, wells) and the living knowledge of local builders. It convenes symposia and publishes materials to promote the craft (including a series of books and instructional brochures). The association is even an accredited UNESCO NGO for intangible heritage – reflecting its emphasis on "identification, documentation, research, preservation and transmission" of this craft tradition. By networking institutions (museums, universities, parks) with civil society, Dragodid has helped place dry-stone on both national and European heritage agendas (e.g. partnering in EU-funded cultural projects on rural skills).

Crucially, Dragodid has long emphasized that dry-stone heritage is not only cultural but environmental. Modern studies confirm that drystone terraces and walls deliver important ecosystem services. For example, Tarolli et al. observe that dry-stone terraces "increase water infiltration ... controlling overland flow... thereby leading to a reduction in soil erosion". In other words, repairing a broken stone terrace lets more rain soak into the ground and prevents hillside washouts. Likewise, dry stone walls are highly porous (often 15–25% void space), creating mini-ecosystems. Ecologists note that these walls "provide habitat for many endangered species" and serve as linear "stepping stones" that connect fragmented habitats. The walls' microclimate – with varied moisture and temperature regimes – particularly benefits ectothermic wildlife: studies show frogs, lizards and other amphibians frequently shelter in wall crevices, and many small mammals, birds and insects use the gaps as nesting sites. In sum, scholars conclude that dry-stone structures "create habitats and increase biological diversity". Dragodid therefore argues that every rebuilt wall or restored pond helps stabilize soil, hold water and support biodiversity, bridging intangible tradition with tangible ecological resilience.

### **Role in the Still Water Revival Project (2022–2025)**

From 2022 to 2025, 4 Grada Dragodid was a partner in the Still Water Revival project, aimed at rehabilitating small ponds and wells in Croatia's karstic mountains (Dinara, Učka, Biokovo and Northern Velebit). These man-made waterholes – vital to past pastoral life – had fallen into ruin through decades of rural depopulation. As project leaders explained, the initiative would “restore ponds and wells on Biokovo, Dinara, northern Velebit and Učka, in order to support the preservation of biodiversity, as well as human activities in these areas”. The consortium (led by NGO Biom with Dragodid, Croatian Forestry and park management institutions) began in April 2022 and ran for three years. Its work plan included mapping all surviving small water bodies, assessing their condition, setting restoration priorities, and rebuilding at least ten ponds on Dinara (and one on each of the other mountains). The project also produced adaptive management plans and a “caretaker” program to ensure the sites’ long-term maintenance. Within this framework, Dragodid’s contribution was to bring traditional stonecraft and heritage scholarship into the restoration process. As Biom noted, Dragodid “ensures that all aspects of cultural heritage preservation are taken into account during the restoration of dry stone walls” and even provides expertise in mapping the sites.

In practice, Dragodid teams surveyed each pond and well, recording its original stone layout (using GPS and photogrammetry) and documenting local history or folklore. They then applied authentic dry-stone techniques: volunteers hand-cleared collapsed stonework and silt, and masons re-laid the walls, culverts or pond linings using only local limestone – replicating the traditional form. In every case the rebuilt structure is physically identical to the historic version, built without mortar so it can flex and drain like the original. In this way, Dragodid ensured that the restored ponds would not only hold water but also remain part of the cultural landscape.

For example, Dragodid field reports list these completed restorations: two sites on Dinara in 2023 – the Varvodića lokva (pond) and a livestock well in Čubrice – and in 2024 the Gospin Dol pond (Učka), Kaljuža, Mala and Velika pond's (Biokovo) and Krstača pond (Northern Velebit). In each case, the new stone containment wall captures rainfall and runoff that would otherwise disappear into fissures, re-establishing these sites as reliable seasonal pools. During the same period, Dragodid also helped publish project guides – a “Pond Conservation Handbook” and “Guidelines for Traditional Pond and Well Restoration” (in Croatian and English) – to share methods with park staff and community groups. Equally important was Dragodid’s work with people. The project implemented a caretaker program in which local volunteers committed to care for each pond after restoration. Dragodid and park partners held training sessions: school classes, scout groups, hiking clubs and cattlemen learned how to maintain the stonework and monitor water levels. As described in project documents, “students, mountaineers, hunters and other stakeholders” were invited to join the teams that rebuild and then oversee the ponds. In this way the restored waterholes became community projects, not just scientific endeavors. Local media and public lectures emphasized the cultural story: the same stone-building craft that produced centuries-old shepherd huts was now literally rebuilding the mountain’s lifeblood.

By the project’s end, Dragodid’s integrated approach had clear ecological and social payoffs. The association itself noted that each rehabilitated pond “supported specific species of amphibians, aquatic insects and other fauna” that had declined when the ponds dried up. At the same time

the waterholes continued to serve as watering points for livestock and wildlife, sustaining traditional grazing and rural ways of life. In the words of the project report, the revived ponds provided “ecological and cultural benefits,” bridging past and present.

In summary, the Still Water Revival project allowed 4 Grada Dragodid to extend its heritage mission into active conservation. By applying time-honored dry-stone techniques to hydrate the karst mountains, Dragodid advanced its vision of linking intangible tradition with ecosystem resilience. The project thus not only conserved biodiversity, but also helped re-ignite local appreciation for the stone-masonry heritage as a living, practical part of landscape stewardship.

## 13 The Head-trained Bush Vine of the Community of Pantelleria: a Model of Sustainability, Resilience and Biodiversity

**By Pier Luigi Petrillo and Jasmin Jalil**

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Unitelma Sapienza, Italy)*

The island of Pantelleria, situated between Sicily and Tunisia in the Mediterranean Sea, presents a compelling case study of how traditional agricultural knowledge can serve as a powerful tool for environmental sustainability and climate resilience. The head-trained bush vine cultivation technique practiced on this island represents centuries of accumulated wisdom, adapted specifically to address the unique environmental challenges of the region. Recognized by UNESCO as an intangible cultural heritage in 2014, this practice demonstrates how living heritage can provide concrete and innovative solutions to climate challenges: by studying its impact and promoting its practices in integrated policy frameworks, this example illustrates how tradition and innovation can work together to build a more resilient future.

### **Historical context and key elements of the practice**

Pantelleria's distinctive environment is characterized by arid conditions, strong winds (particularly the *scirocco*), volcanic soils, steep terrain, and increasingly frequent extreme weather events. In response, local communities developed the head-trained bush vine technique (*alberello pantesco*) over centuries. This cultivation method involves pruning vines to grow close to the ground in a radial pattern, creating a basket-like structure that protects grapes from harsh winds while maximizing exposure to morning dew.

The traditional viticulture system comprises interconnected elements: distinctive vine training techniques, dry-stone terracing (*muretti a secco*), traditional water management systems, communal knowledge transfer, and sustainable land management practices including manual harvesting and biodiversity preservation.

### **How can intangible cultural heritage contribute to mitigating the impacts of climate change?**

The practice incorporates multiple climate adaptation mechanisms, such as microclimate management, water conservation via dew collection, soil protection against erosion, biodiversity preservation, and natural disaster resistance through flexible agricultural structures. Recent extreme weather events provide compelling evidence of how this intangible cultural heritage actively contributed to climate change mitigation in the past few years:

1. **When a severe tornado struck Pantelleria in September 2021**, modern trellised vineyards suffered catastrophic damage with up to 80% vine loss. In contrast, vineyards maintained using the traditional head-trained technique experienced minimal damage, with losses below 10%.<sup>1</sup> The low profile of the vines and the protective function of terraced landscapes significantly reduced wind impact.
2. **During the extensive wildfire that affected the island in summer 2022**, traditionally managed vineyards demonstrated remarkable resistance compared to conventional plantations. The combination of low vine structure, strategic terracing that creates natural

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<sup>1</sup> The data used for the purpose of this presentation was kindly provided by the Pantelleria Island National Park.

firebreaks, and traditional land management practices limited fire spread and facilitated faster recovery.

These events highlight how this cultural practice serves a dual function: it not only preserves a unique viticultural heritage but also provides tangible protection against increasingly frequent climate-related disasters.

### **Which elements of Pantelleria's head-trained bush vine practice can be adapted to other vulnerable contexts?**

It is possible to identify some features of this practice that may be transferable to other vulnerable contexts, grouping them into the following categories:

- **Structural adaptations:** i.e. low-profile cultivation reducing wind exposure, radial pruning creating protective microclimates, terraced landscape management
- **Water management:** i.e. dew harvesting for arid regions, strategic landscape contouring, drought-resistant cultivation patterns
- **Ecosystem integration:** i.e. biodiversity-friendly farming, soil conservation, carbon sequestration, fire-resistant landscape design
- **Knowledge transfer:** i.e. community-based learning systems, practical apprenticeship models, participatory documentation methods

### **The 2025-2035 Safeguarding Program**

2024 marked the tenth anniversary of the UNESCO ICH recognition of the element, making it an opportune moment to reflect on past safeguarding efforts and develop a comprehensive strategy for the next decade. The Pantelleria Island National Park, in collaboration with the UNESCO Chair on Intangible Cultural Heritage and Comparative Law at Unitelma Sapienza University, has undertaken a participatory process to develop the 2025-2035 Safeguarding Program. Based on extensive community engagement and comparative analysis, the program proposes 15 integrated measures across four categories:

- a. **Conservation and Protection:** practitioner training, economic valorization, and farmers' cooperative addressing representation gaps in the already existing Consortium.<sup>2</sup>
- b. **Research and Documentation:** Living Laboratory for interdisciplinary research, Chemical Analysis Laboratory combating corporate appropriation.<sup>3</sup>
- c. **Knowledge Transmission:** educational programs in local schools, seminar cycles to raise awareness among both the local community and tourists, permanent forum to foster dialogue between the community of practitioners and the scientific community operating on the island.
- d. **Promotion and Enhancement:** establishment of a sustainable tourism task force, regular updates to the virtual museum, media campaigns, the reclamation and expansion of agricultural land.

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<sup>2</sup> The current "Consorzio Vini Pantelleria" only includes wine producers, regardless of whether they are traditional farmers as well. This results in an underrepresentation (and subsequent possible harm) of the interests of the community of practitioners within the Consortium.

<sup>3</sup> It is unfortunately common for larger wine-producing companies operating in Pantelleria to use only a minimal amount of traditional grapes ( $\leq 10\%$ ), purchased at low prices from local farmers, while fraudulently marketing their products as "wine from UNESCO heritage head-trained bush vines of Pantelleria".

## How can traditional knowledge be integrated into regulatory frameworks and global sustainability policies?

In this regard, the Pantelleria case suggests three key pathways:

1. **Legal and fiscal recognition of traditional practices:** incorporating traditional knowledge into national legislation is essential to ensure long-term viability. In amendment by Law 44/2017 extended eligibility to UNESCO Intangible Cultural Heritage elements. This evolution illustrates how legal frameworks can evolve to include living heritage. Moreover, tools like tax exemptions and guaranteed income schemes for traditional practitioners should be implemented as they can serve as a mechanism to sustain traditional practices and incentivize their transmission.
2. **Multi-level and cross-sectoral policy integration:** effective integration requires coordinated action across governance levels (i.e. municipal, regional, national) and across sectors such as agriculture, tourism, culture, and environmental protection. The Pantelleria model shows how participatory policy-making can embed community-driven practices into broader development strategies, ensuring that traditional knowledge informs decision-making processes and is not treated as residual or symbolic.
3. **Embedding traditional knowledge in international and sustainability agendas:** traditional knowledge can contribute meaningfully to global sustainability frameworks when adequately recognized and institutionalized. Instruments such as the UNESCO 2003 Convention, EU Rural Development Programs (e.g. EAFRD), and the UN Sustainable Development Goals (SDGs) provide opportunities for alignment. Innovative mechanisms like Living Labs and permanent forums further enable the co-design of policies that integrate traditional practices as dynamic, evolving responses to contemporary challenges.

## Conclusion

The Pantelleria case study offers valuable insights for broader sustainability discourse:

- **Integration of Traditional Knowledge:** the experience demonstrates how indigenous and local knowledge systems can complement scientific approaches to climate adaptation.
- **Participatory Safeguarding:** community-led approaches are essential to ensure that preservation efforts address actual practitioner needs rather than external assumptions.
- **Cross-sectoral Collaboration:** the initiative bridges agricultural practice, cultural heritage preservation, and climate resilience planning.
- **Scalable Innovation:** while respecting the specificity of the Pantelleria context, certain principles, such as microclimate management and water conservation techniques, offer potential applications for other vulnerable regions.
- **Economic Sustainability:** the 2025-2035 Safeguarding program reveals how cultural heritage preservation must be tied to economic viability to ensure long-term success.

In conclusion, the head-trained bush vine of Pantelleria represents more than a cultural curiosity: it offers practical solutions to contemporary challenges. By maintaining these practices through the **comprehensive and community-driven safeguarding program**, the community preserves

not only their cultural identity but also ecological knowledge that provides concrete climate resilience benefits. This case demonstrates how **intangible cultural heritage, when actively maintained and adaptively managed through participatory processes, can serve as a repository of sustainable solutions for present and future generations.**

## 14 The limits of terroir-as-heritage in European viticulture

**By Jenny Herman**

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Across Europe, entire cities, economies, and socio-environmental ecosystems are built around the namesake wines they produce such as Champagne, Tokaj, and Bordeaux to name a few. The idea that the wines are representational of a region, links as much to geological and climatic specificities, as to human traditions and practices. Many wines originating from regions with strong territorial reputations are bequeathed with various titles and categorizations which further anchor the link between taste and place. Whether designated with a geographical indication (GI) label such as an AOC,<sup>4</sup> or classified as a ‘cultural landscape’, the blending of nature and agriculture into economic and cultural policy has given rise to a flurry of regulations seeking to valorize, demarcate, typify, and safeguard these supposed place-based connections, which are deemed at risk in an epoch of globalization.

Much like a terroir, a cultural landscape is defined as resulting from the combined interactions between humans and their natural environments, arising from traditions and culturally-specific practices.<sup>5</sup> Holding important economic and social implications, cultural landscapes can stimulate tourism, boost regional pride, and help preserve unique cultural elements for future generations. Several European wine regions benefit from UNESCO recognition as cultural landscapes, seeking to protect specific parcels of land, processing structures, cultivation and production methods from global pressures and the eroding effects of time. For example, Champagne’s hillsides, Burgundy’s ‘climats’, Tokaj’s tunnel-like cellars, and the Douro’s terraced valley, all present iconic aesthetics treasured by wine enthusiasts, passing travelers, and locals alike. Wines from such regions, in both taste and appearance, are likewise associated with an idea of timelessness. Romanticized notions of terroir and authenticity play into marketing strategies for protected regions, just as the EU-wide geographical indication system reinforces the supposed relationship between tradition, place, and quality. However, despite the visual allure of rolling stretches of cultivated grapevines in a celebrated region, global realities of climate change and biodiversity loss, among others, call this ‘terroir logic’ into question.

While protected heritage status may be helpful for market competition and attracting tourism, the dependence on notions of timelessness and specificity also restricts winemakers from adapting to contemporary realities. Today, many European vineyards with geographical indications are highly regulated in terms of irrigation, harvest dates, and permitted grape varieties, some of which are increasingly unsuitable for cultivation in their celebrated regions. Areas closely associated with a grape variety (and style) face even greater pressure to remain unchanged, such as pinot noir in Burgundy, or furmint in Tokaj. Consequently, in a time of rapid climate change and globalization, this system, which blends economic protectionism and social conservatism, places pressure on Europe’s wine industries.

Growing season temperatures are projected to rise as much as +3.7 °C in regions around the Mediterranean by 2070, foretelling devastating losses for communities and economies linked to

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<sup>4</sup> AOC: Appellation d’origine contrôlée (France), PDO: Protected Designation of Origin (EU-level-equivalent)

<sup>5</sup> <https://whc.unesco.org/en/culturallandscape/>

wine production (Zito et al. 2023). Monocropping, water-table depletion, soil impoverishment, widespread pesticide usage, excessive emissions and energy consumption, make modern viticulture an environmental burden. Beyond policy-hindered adaptability for winemakers, a more glaring relic of agricultural reforms spurred productivity, poses a greater threat than difficulties with GI compliance. Monoculture farming, continuously growing a single crop in the same location, “reduces the availability of certain nutrients and degrades the soil.” (Balogh 2021) Given that today, agriculture is bound in a global capital system, so too are GI products, whose value is based upon anchoring delimited places to specific products. When a cultural landscape which is defined by one type of cultivation it begins to lose its charm.



Figure 1 Langa of Barolo, screengrab from: UNESCO  
<https://whc.unesco.org/en/list/1390/maps/#map>

I recall a trip to Italy’s Piedmont region in September of 2022. Passing through the ‘Vineyard Landscape of Piedmont’, inscribed as a UNESCO cultural landscape in 2014, rather than being swept away by the beauty of bucolic slopes, I was alarmed by the lack of biodiversity stretching away from each new vista. This profitable and protected agricultural zone was capitalized upon until a mere skeleton of the landscape remained. With countless

kilometers of vineyards, abbreviated occasionally with hazelnut trees (Piedmont’s other prominent culinary crop thanks in part to the fame of Ferrero Rocher and Nutella) or a patch of trees in which the white truffles still grow.



Figure 2 Screen Grab cote d'Or south of Beaune,  
<https://whc.unesco.org/fr/list/1425/cartes/>

I experienced a similar sensation when travelling in France through Burgundy’s famed Côte d’Or. Where instead of the imagined lush, green hills with vineyards among other crops, a bald south-facing hillside stretched the length from Dijon to Beaune. The same mapping can be repeated with nearly any viticultural area designated as cultural landscape.

The ‘safeguarding’ of product and practice which occurs in these demarcated areas especially safeguards the irreproducibility of wines imbued not only with a historical narrative, but also with

a built-in market niche. GI and cultural policies emphasize upholding generations of tradition, thus codifying products into certain parameters. For instance, an AOC regulation for Burgundy, as pictured above, limits which grape cultivar may be grown on a particular plot of land, marrying a notion of continuity with established market recognition. As a result, grape cultivation in the Côte d'Or presents not only viniculture-as-monoculture, but further requires varietal monoculture. Products driven by terroir-logic, in this light, are not only ill-equipped to adapt to changing environmental realities, but their relentless, intensive monoculture also directly contributes to biodiversity loss. This is an interesting inversion of perception, considering the image of traditional products suggests a sort of stewardship for the environment. While a terroir product linked with a region may seem to uphold more sustainable principles, only a strong cultural narrative differentiates endless kilometers of vineyard plantations, and monoculture plantations of avocados, bananas, or cacao trees with provenance from the Global South. Such crops are constantly referenced as harmful consumer choices in the Western ethical consumer's gaze, while wine, as a globalized culture-aligned commodity contributes to similar resource-extraction and biodiversity loss. Nestled within this shroud of civilization, a single producer of Bordeaux wine may give the individual appearance of small-scale production. The earth, however, does not make such superficial distinctions as property lines and plots of terroir. A viticultural landscape must be taken as a sum of its parts, and the Bordeaux region alone amasses nearly 14000 producers.<sup>6</sup> In terms of biodiversity and monoculture farming, this bears a startling resemblance to fields of sugarcane in Brazil or avocado plantations in Mexico, products demonized with narratives of deforestation and exploitative labor. This unpalatable reality conjures a rather different vision of our celebrated viticultural landscapes, one which reflects the onset of globalization, agricultural industrialization, and illustrates, rather than a symbiosis between humans and nature, an unbridgeable distance between people and their environments.

Given its wide-spanning influence on wine industry practices, this paper will analyze the current French AOC system and problematize its viability in an epoch defined by global upheaval and climatic crises. From this problematic, I will identify concrete risks facing winemakers, landscapes, and their more-than-human components today, while questioning the status of viticultural landscapes. To contextualize the link between geographical indications, agricultural policy, and cultural landscapes, I will first touch upon the emergence of this form of heritage recognition and trace both institutional and theoretical perspectives on landscapes, linking the former with GI policies and the commodification of the local. Taking France as an example, I will unpack current challenges posed by AOC regulations which limit the adaptability of winegrowers and makers in the face of climate change and biodiversity loss in viticultural landscapes. Highlighting the economic importance of European viticulture and considering the rise of natural and biodynamic wine movements, this paper will finally explore potential solutions to foster biodiversity which is threatened by conventional (industrialized) production methods and link this with theory focused on care and multispecies entanglements.

This research centers around textual analysis of both heritage and agricultural policy reports and regulations related to the AOC, which I began studying in relation to climate change in 2016, UNESCO's heritage framework, and wine industry data for the European Union, and is informed

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<sup>6</sup> <https://www.lagrandecave.fr/page/apprendre/place-bordeaux>

by participant observation fieldwork from my visits to various wine-specific ‘cultural landscapes’ and other vineyards across Europe, including Burgundy in France (July 2021), Piedmont in Italy (September 2022), Tokaj in Hungary (May 2024), Douro Valley and Bairrada in Portugal (November 2024, January and May 2025), Flanders in Belgium (February 2025) and Irouléguy in the French Basque (March 2025). The visits from 2024 and 2025 were primarily with winemakers already employing some level of integrated viticulture. I draw from semi-structured interviews with winemakers and from observations in vineyard and winery visits, making connections between their lived experience, agricultural policy, and climate change data. I also employ the embodied practice of having participated in and passed a WSET exam in world wines (September 2024) and explore the implications of an institutionalized approach to categorizing, identifying, and attributing value to wines in a changing climate.<sup>7</sup> These interdisciplinary methods (centered in cultural studies and socio-cultural anthropology) are reinforced by engaging with literature in the domains of rural studies, treating questions of viticultural challenges, innovations and the concept of landscape (WJT Mitchell, Kallio and Will LaFleur), of political ecology and eco-criticism, expounding on more-than-human relations, the Anthropocene, and climate change (Miller and Gibson-Graham, Baptista), and texts from contemporary philosophy, problematizing power structures and embodied knowledge (Illich, Puig de la Bellacasa). Finally, I integrate the works of authors writing specifically on wine as a cultural object (Boulanger, Demossier, Viecegli) and the roles of natural and biodynamic winemaking (Foyer, Krzywoszynska). This work traces issues arising from the institutionalized ‘terroir logic’ which is deeply embedded in policies steering winemaking today, with impacts stretching beyond the European cases treated here.

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<sup>7</sup> The Wine & Spirit Education Trust (WSET) is a training international program recognized in wine professions

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## 15 The LIVIND project – Living Heritage as a Catalyst for Sustainable Solutions

**By Leena Marsio**

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The LIVIND -project (Creative and Living Cultural Heritage as a Resource for the Northern Dimension) explored the critical intersection of living cultural heritage and sustainable development in Northern Europe 2021-2024. It involved collaboration among partners from nine countries: Finland, Sweden, Norway, Denmark, Iceland, Estonia, Latvia, Lithuania, and Poland. The Nordic autonomous regions (Faroe Islands, Greenland, and the Åland Islands) and the Saami area were also part of the project. All in all, LIVIND engaged hundreds of actors from 36 countries in online events and initiatives to emphasize the role of intangible cultural heritage in addressing sustainability challenges. The project was led by the Finnish Heritage Agency and funded by the Finnish Ministry of Foreign Affairs and Northern Dimension Partnership on Culture (NDPC) with a total budget of 463 000 euros.

### **Why LIVIND?**

LIVIND was based on the standpoint that living cultural heritage has yet to be fully acknowledged as a resource for sustainable development in the Northern Dimension Cultural Partnership countries. Indicating that the proposed cooperation network for the project already existed and the UNESCO intangible cultural heritage framework was familiar to everyone, it was suggested that there was a development need for capacity building and awareness raising at the intersection of living cultural heritage and sustainable development among the stakeholders already active in the cultural heritage field.

The project was based on UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage, the Council of Europe's Faro Convention, and the UN's Agenda 2030 Goals for Sustainable Development. Regionally, the project addressed the goals of the Northern Dimension Cultural Partnership Strategy 2021–2024 by strengthening networks and cross-border cooperation in the area.

### **Concrete Results**

The project's multinational cooperation network mapped and shared good practices and operational models in creative and living cultural heritage work through webinars, workshops, and events at international, national, and local levels. In total, over a hundred entities from the fields of living heritage in the Nordic countries, the Baltics, and Poland participated: experts, NGO members, activists, and entrepreneurs.

The project's 16 online events attracted approximately 1,600 participants and organizations from 36 different countries. The recorded events have been viewed 2,600 times on YouTube as of March 2025.

Under LIVIND, 20 pilot projects were carried out in the Nordic and Baltic regions and in Poland. Through these courses, events, demonstrations and activities, practical pilots were conducted

to see how intangible, living heritage can support sustainability efforts while strengthening the role of local communities as supporters of well-being and vitality in the face of climate change.

The results of LIVIND have been compiled onto an English-language online platform, *Livind.fi*, which offers resources, tools, and ideas for use and application. The LIVIND site includes tools created during the project, recorded webinars, materials, and a link library to resources from other international actors that support work in living heritage and, more broadly, in culture and cultural heritage. There are also extensive reports on all of the 20 pilot projects from all areas of living heritage. Recorded subtitles for English-language webinars and research results also available on the website.

### **Research component**

The project included a research component, the results of which deepen the understanding of sustainability work in living heritage. There is currently little research connecting these fields, thus a comprehensive research paper titled “Living Cultural Heritage and Sustainable Development: Research Papers and The Policy Recommendations of The LIVIND Project” was produced along with policy recommendations that outline the conditions for realizing intangible cultural heritage and sustainable development work.

The research component was carried out by the UNESCO Chair on Applied Studies of ICH, University of Tartu in Estonia (led by Kristin Kuutma) and UNESCO Chair on Intangible Cultural Heritage Policy and Law in Institute of Arts and Cultural Studies at Latvian Academy of Culture (led by Anita Vaivade).

Research activities were conducted using various methods, such as desk research (including the analysis of project documentation, legal frameworks, national contexts, periodic reports submitted to the UNESCO by the States Parties), semi-structured interviews with project participants, participant observation during online and on-site events, and autoethnography. As a result, the report addresses the prevailing connection between living cultural heritage and sustainable development in the Northern Dimension Region on the policy level, in research, and through concrete actions on the ground.

The report addresses the conceptual, analytical, and policy frameworks that direct and reflect the work on sustainable development and living heritage in the project area. Following the analysis of the periodic reports on implementing the UNESCO 2003 Convention, the attention is directed towards the strategies of putting the aforementioned frameworks into practice. After setting the scene for intangible heritage and sustainable development, the focus is set on the LIVIND project’s role, aspirations, implementation strategies, and outcomes.

### **ICH and climate change**

Part of the LIVIND project research tasks was to take a closer look at those connections between ICH safeguarding and sustainable development dimensions in the periodic reports of LIVIND partner countries on of the four aspects of sustainability (cultural, social, ecological and economical). The purpose of the analysis was to provide an overview of a diversity of practices in the project member countries on how sustainable development is enhanced in relation to ICH and how ICH supports sustainable development.

The analysis of the ecological dimension of sustainable development highlighted such aspects as raising ecological awareness and responsible behavior through ICH-related education, promoting sustainable use of natural resources, and addressing climate change. Its sub-themes included the development of ecological literacy through educational activities and public engagement, ensuring sustainable use of resources in various domains of ICH, as well as informing about climate change and reconnecting people to their landscape.

Non-governmental organisations also actively focus on informing the public about ICH and ecological issues. They play an important role in strengthening public participation and transmitting ICH practices to younger generations. Furthermore, some organisations combine ICH practices with activities aimed at social welfare, health, as well as nature protection, and various organisations that safeguard ICH also implement appropriate environmental sustainability measures in their own work. Bottom-up initiatives contribute to reconnecting people with their localities and consequently ICH.

Furthermore, some of the pilot projects had a focus on climate change. The "Birdhouses to the Archipelago" project aimed to support the common goldeneyes bird population in the Åland Islands by reviving traditional birdhouse-making practices. This initiative addressed biodiversity loss and promoted sustainable interactions between humans and wildlife, contributing to ecological balance. By fostering community engagement and sharing knowledge about local heritage, the project enhanced resilience against climate change impacts on fragile ecosystems. Ultimately, it emphasized the importance of preserving living heritage while supporting conservation efforts in the face of environmental challenges.

The "Land Pilot Project" aimed to develop an educational program at the LungA School in Seyðisfjörður, Iceland, focusing on local environmental issues and living heritage. In response to the climate crisis impacting the fishing industry, the project engaged local children and young adults in workshops that connected them to nature through food production practices. Participants learned about fishing heritage and fermentation, fostering a greater appreciation for local resources and sustainable consumption. The project successfully bridged the gap between production and consumption, enhancing community involvement and leading to the establishment of a more comprehensive Land Program for future learning.

## **Conclusions**

Acting for a sustainable future is crucial – we all need to ensure the well-being of our planet and future generations. This imperative guided us as we began planning the LIVIND project. Agenda 2030, the UNESCO 2003 Convention, and other conventions showed us the path we need to follow. However, the language is often complex, and the task can seem almost insurmountable. In the LIVIND project we worked hard for over three years to make a change and take the first steps in understanding, on a very concrete level, what the contribution of living heritage can be in this work. Covering nine countries in Northern Europe, the project was the first of its kind and scale, strengthening cooperation between these countries and regions, especially in the field of intangible cultural heritage across sectors. We hope the LIVIND project, with its methods and findings, will inspire many other countries to use the tools of living heritage to overcome the biggest challenges of our time and to find solutions to climate change mitigation.

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