heritage in a changing climate

in conversation with six experts about the consequences of climate change for heritage

01. Cover: Daelenbroeck Castle in Herkenbosch during the flooding of the river Roer, July 2021 (Photo: Ermindo Armino)

Foreword

Climate Heritage Network

In the face of an escalating climate crisis, the intersection of culture and climate has emerged as a crucial frontier. The Climate Heritage Network has committed to strengthening efforts to address climate change and support communities in achieving the decarbonization goals and other ambitions of the Paris Agreement. This commitment underscores the invaluable role of arts, culture, and heritage—including sites and landscapes, institutions and collections, as well as creativity, intangible heritage, traditional knowledge, and practices—in reducing greenhouse gas emissions, supporting local communities, and enhancing adaptive capacity.

The heritage of the Anthropocene, shaped by historical and socio-economic forces like colonialism and globalism, has spread 'petrocultures' and 'carbonscapes' across the globe. This has led to the extraction and exploitation of both people and nature, resulting in enduring inequities and injustices. Addressing these critical questions is essential to avoid further conflict and damage. Conversely, traditional knowledge, buildings, and landscapes that pre-date the fossil

fuel era offer insights into post-carbon living. Indigenous Peoples and local communities provide counterpoints to unsustainable notions of progress. Artistic, creative, and imaginative tools can bolster climate action and climate resilient sustainable development.

Interviews with heritage conservation practitioners about climate action are pivotal in advancing this collective work worldwide. The practitioners highlighted in this publication, encompassing a diverse array of professions — archaeologists, landscape architects, anthropologists, curators, and more— bring unique perspectives and expertise. By sharing their experiences and strategies, they highlight the practical applications of culture-based climate response and the potential for arts and heritage to drive climate action.

The Dutch Platform Klimaat en Erfgoed is a valued member of our expanding international network. Our aim is to share the diverse perspectives and insights from the interviews presented here with our global members, and we hope this initiative serves as an inspiring example for other countries. Our cultural heritage is crucial in addressing the climate crisis, and we believe this publication, and those that follow, will help persuade more people of its importance.

On behalf of the Steering Committee of the Climate Heritage Network,

Shanon Shea Miller

Climate Heritage NETWORK

www.climateheritage.org

Introduction

Platform Klimaat en Erfgoed

Your home village church. The ancient burial mound in the woods. The annual summer fun fair, and the museum in the city. These are all examples of heritage. These are all examples of heritage we wish to preserve for the future. For ourselves. They represent where we come from. They stand for stability, in a time of so much change. But we also keep them for the generations after us. Together they form the story of the Kingdom of the Netherlands, of Europe, of our world.

But will we manage to keep them? Climate change is transforming the world. In the long term, we're looking at a sea level rise measured in metres. It is not a question of whether, but of when we must surrender parts of the Netherlands back to the sea. Whether we call it 'surrender', or 'withdrawal', or 'adaptation': it will have a huge impact on the shape of our country and hence on our heritage.

"Oh, but that's so far away!", people sometimes say. Indeed, the sea level rises relatively slowly. Although the Dutch North Sea has already risen by 25 centimetres since 1900, and will reach approximately 80 centimetres in the next 75 years' time. And if the Antarctic

ice-shelf continues to melt, it might reach more than two metres by 2100.

Besides, climate change is already having a tangible impact. Much more rain in short periods, flooding churches and museums. Thunderstorms are increasing in strength and frequency, while droughts and heatwaves are causing more wildfires and very low groundwater levels.

Climate change is affecting our heritage. We are seeing water mills immobilised due to a lack of water, historical gardens dying out, monumental buildings subsiding, art works damaged by floods, and exposed shipwrecks by extremely low water levels. These are events that demonstrate the new reality: climate change is also endangering our heritage. And things will only get worse in the years to come.

But where's the debate? Where can people turn to with their concerns? How do we prepare our heritage for this changing world? No one seemed to be asking just a few years ago. Or there wasn't any place to raise these questions. The heritage sector seemed to lack a sense of urgency. That's why we founded the Platform Klimaat en Erfgoed, or Platform Climate and Heritage.

This collection of interviews shows how experts from across the Dutch heritage field are dealing with climate change. They are worried, but sometimes optimistic as well, and keen to find solutions. After all, techniques from the past and Traditional Ecological Knowledge often offer a solution for the future as well: ranging from a better use of rainwater to creating buffer zones inside homes. The experts describe their personal drives, their uncertainties, and their quest for a new approach to heritage as they face the reality of climate change in the Netherlands, in the Caribbean part of the Kingdom, and in Europe.

As the Board of the Platform, we hope that this publication will stimulate the debate domestically and internationally. We shall continue to share publications, carry out interviews, and of course to organise events. We look forward to meeting you at some point as well!

Board of the Platform Klimaat en Erfgoed,

Annabel Dijkema, Gertjan de Boer, Jacomine Hendrikse, Jelle Hettema, Olaf Satijn, Sander van Alphen, Susanne Bergwerff-Verburg and Vera Kuijpers

02. Diver conducts archaeological research at Wreck Burgzand Noord 9

Climate change also threatens underwater heritage

Martijn Manders

As a maritime archaeologist at the Cultural Heritage Agency of the Netherlands, Martijn Manders can see the underwater world changing. Climate change can be highly destructive for archaeology on the seabed.

In what ways are you involved with climate and archaeology?

I have been working as a maritime and underwater archaeologist with the Cultural Heritage Agency for 33 years now. I mainly research shipwrecks and supervise diving expeditions. I am also a professor at Leiden University, where I study underwater archaeology and work with students to research the maritime landscape and the bonds that people feel with a particular area.

Climate change is becoming increasingly important in my work. I used to see the deteriorating conditions in the underwater world that I observed over the course of years as a result of pollution and phosphates. But around eight years ago I began to realise that we need to focus on climate change

as the biggest threat to heritage. Even though I study climatological phenomena that occurred in the past, this remained a blind spot for a long time. It just wasn't a mainstream idea that climate change could threaten heritage, and not much research was performed in this respect. The opinions of climate thinkers were dismissed as extreme. Now their ideas are generally accepted, which is a good thing, because time is running out. Every time I go on a dive I'm shocked to see the effects of a warming ocean.

Every time I go on a dive I'm shocked to see the effects of a warming ocean

03. Martijn Manders

How are you seeing climate change affect underwater heritage?

Climate change has various effects which I am trying to map out. I research changes in water currents that could be due to climate change. These changes pose a direct threat to shipwrecks, as archaeological remains can be swept away from their original location. There are lots of archaeological sites in the Wadden Sea, including hundreds of shipwrecks. The remains are preserved because of the steady state that grew over the course of many years between the wreck and the seabed. Shipwrecks that lay directly exposed to the sea have long since disappeared, while those that lie beneath the sand are naturally protected. Any change in water currents upsets this steady state, which is actually very vulnerable.

Another consequence of climate change is that the sea is attracting invasive animal species, which can subsequently affect the heritage. For example, the naval shipworm (*Teredo navalis*) is steadily expanding its habitat, and this small mollusc bores tunnels into shipwrecks that until recently were in excellent condition. This

poses a direct risk to the – until now – extremely well preserved shipwrecks in the Baltic Sea.

Climate change is furthermore causing the pH values to change at many locations on the seabed. A more acidic sea has a negative impact on the preservation of heritage, which until now remained in good condition in more calcareous areas.

In the long run, climate change is one of the biggest threats to archaeological remains, particularly because it's happening on such a vast scale. At the same time, measures taken to counter climate change also pose a big risk. A good example is the construction of wind farms: the turbines' supporting pillars disturb the seabed and the currents, causing erosion across a huge area.

What worries me is that we often don't even know which sites have disappeared or which are under threat

What worries me is that we often don't even know which sites have disappeared or which are under threat. We are insufficiently able to peer into the seabed and to monitor known sites adequately and systematically, both under and above water. Fortunately, the Cultural Heritage Agency is increasingly doing so, but they cannot do it on their own. The management of archaeological heritage has been decentralised, giving lower level governments as well as private parties an important role to play. Ideally we would collaborate much more. Simply focussing on archaeological state monuments won't be enough, since the list of monuments is far from complete and representative.

How do you see the future with regard to the impact of climate change on archaeology?

It is difficult to take a positive view of the future of maritime archaeology, I'm afraid; there just isn't a solution in sight. Climate change is accelerating and this will require some rigorous choices. It is impossible to preserve everything.

As an archaeologist, I wish that all valuable sites that are now seriously threatened could be excavated. But that's simply impossible. Then the million-dollar-question is: who

determines which heritage gets what level of attention? There is no clear answer to that, unfortunately.

As an archaeologist, I wish that all valuable sites that are now seriously threatened could be excavated

It is in any case essential to collaborate with stakeholders from a range of disciplines. Some of the shipwrecks could be opened up for the general public, so that diving enthusiasts and volunteers can research them. This fits well with the philosophy of the Faro Convention, which focuses on the relationship between people and society with heritage. This will obviously require guidelines and supervision on the part of professional archaeologists. And above all it requires having a party that is mandated to make choices.

The Cultural Heritage Agency could define the guidelines for volunteers and decide which sites to open

04. *Wooden shipwrecks that are exposed at the bottom surface are eaten by naval shipworms (Photo: Martijn Manders)*

05. *Offshore wind farm (Photo: Martijn Manders)*

up. This might seem like quite a change, but we are already moving in that direction. See for instance the changes to the rules as a result of the *Besluit Erfgoedwet Archeologie* (Decree on Archaeological Heritage Act), giving volunteers in underwater archaeology more opportunities to perform research. This demands great care from the archaeologists and volunteers involved, as well as clear arrangements on the collaboration and mutual trust. If we cannot come to these sorts of solutions together, then the alternative is that we lose lots of heritage without even having examined it. Nevertheless, preserving heritage in the seabed (in situ) and not intervening remains an important strategy in the archaeological care for monuments.

What measures do we need to take to limit the damage?

I would like us to overcome the dogmas that exist. Let's concentrate on the core of the matter. I feel that we're too rigid in the idea of preserving everything in situ. We only perform archaeological research and consider carrying out an excavation when a site has been disturbed (and there is someone to pay the bill).

Ultimately, archaeology is all about an inquisitiveness about the past. That's why I chose to become an archaeologist. The stimulus should be to satisfy that inquisitiveness, but then with all due care as described in the *Wet op de archeologische monumentenzorg* (Archaeological Monument Care Act), of which preservation in situ is a part, but not an end in itself. In this way we could prevent the loss of valuable sites.

The focus on preservation in situ has also fostered a passive attitude. The idea has taken hold that excavations should be left to successive generations. But the unintended consequence is that heritage disappears, unseen. What else can we do? We can invest in research agendas, formulate more research questions, and perform excavations in sites where questions can be answered. We must weigh the importance of the knowledge obtained through excavation against the possibility of preserving the site. If a site delivers lots of knowledge but is also deteriorating, and there's not much we can do to prevent the deterioration, then we need to decide on (partial) excavation. That seems like a no-brainer to me. But again, such considerations would ideally be make in consultation with all stakeholders.

How do you see maritime and underwater archaeology contributing to climate adaptation or mitigation?

I can offer a great example from Suriname. There, Sieuw Naipal, a hydrology professor working at the Anton de Kom University, is studying mangrove forests as a potential alternative to solid sea dikes. He has observed that, in the past, mangrove forests used to grow all along the coast. The mangroves break the waves and retain the sediment. This way they form a natural dike that can withstand the biggest of waves. It has been proven

06. Planting mangrove forests at the mouth of the Aceh, Indonesia

(Photo: Irwandi Wancaleu)

to work in practice, time and again. So it makes sense to study how people used to deal with the water and the sea. Our ancestors had very good ideas on how to protect against water, as well as how to utilise water. The relationship between man and water stretches back for many millennia, and this relationship is what we study in maritime archaeology.

Knowledge about the solutions of the past and an appreciation for historical landscapes can contribute to creating a habitat that is safer for people and more favourable for biodiversity.

Our ancestors had very good ideas on how to protect against water, as well as how to utilise water

Finally: is there anything else you would like to share with the readers?

I encourage people to see the film *Silence of the Tides* (Pieter-Rim de Kroon, 2020). This film shows the influence that people have on the Wadden Sea. You see the interaction between culture and nature and start to understand the character of the area. We need to start living in harmony with the character of the landscape, like our ancestors did. Their good solutions worked for hundreds of years, and that's no accident. We need to learn from that.

07. Excavation of the Roman 'Zwammerdam ships' in the wet soil near Alphen aan den Rijn, 1972 (Foto: W. Punt)

08. Former slave homes are threatened by rising sea levels. (Photo: Boy Lawson)

The Caribbean islands as harbinger for the Netherlands

Suzanne Loen

As a landscape designer and researcher, Suzanne Loen works with projects in the Caribbean area where the impact of climate change is felt more acutely than in the Netherlands.

In what ways are you involved with climate change and the landscape?

I advise several Dutch communities on the subject of landscape heritage, for instance with regard to strengthening the IJssel dikes in the Krimpenerwaard area. I also work on landscape projects in the Caribbean and am a lecturer in the 'Heritage and Design' minor of the 'Landscape Architecture' at Delft University of Technology. My students research and design historical green and water structures: these are landscape elements created by humans in the past and now shaped by nature, such as country estates, gardens, parks and city canals. One of the things I teach my students is that, for a long time, water management prevailed in how the landscape was designed. The Dutch landscape is largely shaped by human hands and technological developments. Knowledge of the history of our landscape is essential to understanding

our historical water and green structures and the underlying natural system.

Neither at the university nor in my discipline did people take much interest in the potential of historical freshwater systems to create a resilient water management system and to restore a healthy ecological equilibrium. Most of the attention went to water security. That's why I started the research project *Thirsty Islands* on Curaçao in 2020, in collaboration with the National Archaeological Anthropological Memory Management (NAAM). A follow-up to the project was launched in 2023 in the Erfgoed Deal-project *Awa pa Kòrsou* (Water for Curaçao) with a consortium of local nature and heritage organisations.

In the same year I started researching the potential of water heritage to build a resilient freshwater supply on Bonaire. Together with Jet Bakels of the Dutch Centre for Intangible Cultural Heritage we spoke with Bonaire-based heritage experts and residents about water heritage.

My decision to research the islands was motivated in part by the fact that islands and island communities have always had to be self-reliant. Islands are surrounded by salt water, have relatively few natural freshwater sources, and have limited room to store water. This forced island populations to come up with inventive solutions, from which we now stand to learn. Just like islands, delta areas are particularly vulnerable to the rising sea water

09. *Suzanne Loen*

level. That's why these are instructive examples for the Netherlands as well.

The impact of climate change on the Caribbean islands is also a harbinger of the future for the Netherlands. Based on my experience with this project, I now see the Netherlands as through a different prism. Here, the availability of freshwater has long been taken for granted, yet that belief turns out to be unfounded.

How are you seeing climate change affect the landscape?

We've been hearing and reading a lot about the extreme heat and wildfires in southern Europe in recent years. In the Netherlands, too, extreme rainfall, flooding and droughts have caught us by surprise. My feeling is that the prognoses are being overtaken by reality.

10. *The principle of rainwater collection and distribution system of the Bonairean Landhuis Rooi (Photo: Jet Bakels. Edited by LILA Living Landscapes)*

Everywhere we're seeing the number of heavy downpours and extended periods of drought and heat increase. On the Caribbean islands we are seeing how the impact of climate change is exacerbated by the deterioration of the natural resilience of ecosystems. For example, the colonial regimes of the past were responsible for an excessive exploitation of water systems and for large-scale deforestation. Still today we are seeing the effects of this in the form of erosion and the reduced capacity of the soil to store rainwater. So the colonial past continues to affect the present.

"On the Caribbean islands we are seeing how the impact of climate change is exacerbated by the deterioration of the natural resilience of ecosystems"

Nowadays, the tourism industry is placing a major strain on the freshwater supply. Relevant policies and the design of the living environment are not yet adjusted to the new reality of freshwater scarcity.

A further problem concerns the salinisation of freshwater sources and of nature along the coast, as a result of the rising seawater level. The demand for freshwater has been outstripping the supply for a long time now. Not surprisingly, the world's oldest desalination installation is on Curaçao.

Due to the limited availability of freshwater, the Caribbean islands have a long history of catching rainwater in cisterns and water tanks. Fearing the diseases transmitted by mosquitos, the government discouraged this tradition and instead invested in piped water. I think we need to return to a combination of central urban systems and decentral house-bound systems. We could catch and store much more rainwater, obviously taking account of the ground water level, and we need to kick our addiction to the permanent availability of fully filtered drinking water. Our research on Bonaire shows that the population is eager to revive the custom of using rain tanks again.

In the Netherlands we used to rely on three forms of water supply: well water (groundwater), surface water, and rainwater. Where possible, people used to catch and store rainwater at home. The quality and availability of the water determined whether it was used for drinking, for doing the laundry, or for watering crops. For the Netherlands, too, it's worthwhile reconsidering these customs.

How do you see the future with regard to the impact of climate change on the landscape?

The industrial sector has traditionally had a major influence on the freshwater supplies on the Caribbean islands. On Curaçao, important freshwater sources and retention areas were confiscated by Shell, with the support of the Dutch state. The historical water system consisting of so-called 'rooien' (natural or artificial watercourses and streams) and dams were increasingly modified to serve the operation of so-called water plantations, while the local agriculture and nature relied on this system of gulleys. Water plantations supplied water to urban residents, businesses, public authorities and the army, until the first desalination installations were introduced. This way, in times of need Shell could sell drinking water to the island inhabitants. In the Netherlands, the beer producers had a similar monopoly on drinking water in the sixteenth and seventeenth centuries. I believe that drinking water is a common good and should be treated as a public utility. It should be shared fairly, without favouring commercial enterprises, farmers or the industry. People, nature, plants and animals all have a right to water. It's actually a political matter. Powerful commercial companies are twisting the government's arm and are extracting water from the public drinking water supply. This I find a terrifying scenario. We need to watch out that we don't return to a neo-colonial system.

I think everyone understands that something drastic has to happen, but people differ in how fast they want to see the change. People sometimes

11. *Rooi Magdalena is one of the most famous rooien of Curaçao. A rooi is a natural or artificial watercourse that drains rainwater to lower areas and the sea. This historical system of channels can limit the effects of extreme weather conditions. (Photo: John Dohmen)*

deny the reality of climate change because they already feel threatened in their existence. Not everyone can stop using gas and move to a house that's safely above seawater level. So we need to keep looking out for the weakest groups in society and be sensitive in our approach, as the inequality among people will only increase as a result of climate change.

"I think everyone understands that something drastic has to happen, but people differ in how fast they want to see the change. (...) So we need to keep looking out for the weakest groups in society and be sensitive in our approach, as the inequality among people will only increase as a result of climate change"

What measures should we take to limit the damage?

We increasingly need the historical green and water structures, while they are weakening due to exotic plagues and extreme weather types. Water levels are fluctuating, river banks are collapsing and native flora cannot cope with the heat and drought. In order to preserve these structures, I think we need to be a lot more mindful of climate change and to accept that certain historical, native types of plants cannot survive in a changing climate.

Besides that, we should learn to adopt a much more modest and supporting attitude to nature in our spatial management. We need to examine more closely how we can modify our life environment to create room for biodiversity. I often see renderings of nature-inclusive plans with generic solutions that don't necessarily suit the local situation. We need to be careful about the 'greenwashing' of spatial developments.

What possibilities do you see in the landscape to contribute to climate adaptation or mitigation?

I see lots of possibilities for climate adaptation and the restoration of biodiversity in the downscaling of the landscape and a fairer distribution of power. The parcelling of land carried out in the twentieth century shaped today's landscape. The larger the plots of land were, the fewer owners were required. Historically there were many more water boards, for example.

Today, water management has been centralised and the responsibility is entirely in the hands of government bodies. Water boards are saying: "We can't do this by ourselves anymore." The structuring and management of the landscape could become more of a shared and communal task.

Finally: is there anything else you would like to share with the readers?

Landscapes are dynamic. The Netherlands has a tradition of formulating rules for everything and assigning a purpose to every piece of land. We are now entering a different phase. I would like to call on everyone to start seeing heritage differently and to recognise the opportunities.

We need to start seeing the value of heritage differently, and need to dare to let go of things, as long as we make the knowledge about our heritage accessible to future generations. But the question is whether the heritage sector is ready for that

A colleague from abroad once said: "There are barely any ruins in the Netherlands!" Decay is still not fully embraced, while ruins, shipwrecks and fallen trees are ideal hotspots for flora and fauna. We need to start seeing the value of heritage differently, and need to dare to let go of things, as long as we make the knowledge about our heritage accessible to future generations. But the question is whether the heritage sector is ready for that. «

12. The Terp fan de Takomst is a land art intended to restore the historical connection with the Wadden Sea. The Wadden Sea is a UNESCO world heritage site, but nature is threatened by rising sea temperatures and rising sea levels. Just like the Wadden Sea, the terp outside the dike is transient in nature and subject to the elements. (Photo: Robin Ammerlaan)

13. *The gardens of Muiderslot castle (Photo: Marion Golsteijn)*

Climate change and museums

Annemarie den Dekker

Annemarie den Dekker has served as the director of Muiderslot castle (Rijksmuseum Muiderslot) since 2018. She is also the chair of the Supervisory Board of the Climate Museum (Klimaatmuseum). Climate change plays a prominent role at Muiderslot castle.

In what ways are you involved with climate change and museums?

Today, much more than in the past, Muiderslot castle links together art and nature. This is strongly motivated by the actual environment of Muiderslot, but also by climate change. Connecting art with nature is very appropriate to the history of the castle, which forms part of the Dutch Water Defence Line (Hollandse Waterlinie) and is surrounded by water and greenery. In the seventeenth century, the writer and poet P.C. Hooft would invite his creative, open-minded friends to the castle to enjoy the recently created gardens that served both decorative and useful purposes, with medical herbs and plants and a vegetable garden. Hooft also served as chair of a water board.

Under the former museum policy, the focus was fully on the castle and

the Middle Ages. Now we strive to highlight the value of the ensemble formed by the castle and natural environment, together. The four pillars of our programme are: castle, greenery, water and performance stage. One specific consequence is that we have appointed a *hortulanus*, or garden curator. We also have a curator for greenery & sustainability.

The historic gardens, the vegetables, flowers and herbs have been part of the collection since a number of years, with certain challenges as a result. How do you adhere to standards for the registration and treatment of this green collection? We had some good discussions about this with experts and with the Information and Heritage Inspectorate (Inspectie Overheidsinformatie en Erfgoed).

Our garden curator treats the greenery just like a collection of paintings. This way, we can connect the castle and the art with the surrounding nature, for instance by explaining how the vegetal pigments that form the basis for the paint on paintings can be sourced from the garden. Or we organise historical tastings to bring together the castle's culinary history, the still-lifes depicting food, and the garden's plants and herbs.

''Our garden curator treats the greenery just like a collection of paintings. This way, we can connect the castle and the art with the surrounding nature''

14. *Annemarie den Dekker*

For us it's only natural to include the subject of climate change in our programming. For instance, in the spring of 2023, during the water board elections, we presented the exhibition 'Here comes the flood' with work by photographer Rem van den Bosch that shows how far the water will reach if the Dutch dikes were to collapse. In 2024 we organised a major 'Climate Expo' in the castle and gardens, with work by contemporary artists who reflect on the climate crisis.

How are you seeing climate change affect museums?

Many museums are housed in historic buildings that were not built to cope with extreme weather. For instance, the Louvre relocated its depots to higher grounds due to the increased risk of flooding by the Seine. Muiderslot is also surrounded by water, which is controlled by a historical stone 'batardeau' or turning wall – a kind of hollow sluice – that provided the surroundings with water. An emergency pump had to be installed following the major drought of 2022. Such droughts, but also extreme water nuisance, poses a danger to the surroundings and to a great extent also to the castle, which is our top piece. The emergency pump is not a structural solution. We are now looking into the possibility of placing a permanent pump. But a major disadvantage of a permanent pump is that it will damage the monument. Conversely, a heavy downpour leads to water running down a number of stairs. We have adjusted our emergency plan, in which we accept a certain level of risk. We've factored in two extreme weather events per year and accept that in certain cases we may need to remain closed to the public for a day. We are also considering introducing different summer and winter opening hours.

In most museums, art works are stored under highly controlled conditions: the temperature and humidity must always remain stable in order to conserve the works as well as possible. This costs a lot of energy, of course. My feeling is that the museum world has taken things a bit too far and should reconsider the possibilities. I'm happy to see cultural institutions having this discussion nowadays.

Research has demonstrated over many years that storage conditions needn't be so strict. The Climate Declaration for Heritage Institutions (*Klimaatverklaring voor erfgoedorganisaties*) drawn up by the Cultural Heritage Agency is a step in the right direction, but it remains strict and, in my view, a compromise. Museums are afraid that sister institutions may refuse to loan pieces to them if the exhibition galleries no longer apply the original rules. In this way museums are holding each other captive. I hope that a number of museums will dare to break ranks and go one step further. We intend to engage our loan givers in this discussion.

We also wish to stimulate discussion of the phenomenon of a usage collection. This is part of the collection for which the rules are less strict than for the core collection. Not all museum pieces can and need to be stored under the best possible conditions for all time. The current museum standard of preserving for eternity is untenable, given the reality of climate change. I believe – in any case for a site like Muiderslot – that it's important to be responsive to the seasons, to carefully choose in which rooms you do or do not install climate control, to be willing to take more risks and to bid farewell to certain matters.

''The current museum standard of preserving for eternity is untenable, given the reality of climate change''

15. *Muiderslot castle with stone 'batardeau' on the left (Foto: Nanda de Jong)*

How do you see the future with regard to the impact of climate change on museums?

In the short term I expect to see a shift in the programming and operational management. Increasingly, museums are incorporating the climate crisis in their exhibitions, educational processes or operational management. The mandatory sustainability effort will lead to changes in building management. I hope that this will also lead to a change in mentality and behaviour. The point is not to think about whether or not to improve sustainability, but how to improve sustainability across the board in museums.

Museums are increasingly devoting attention to climate change in their fringe programmes and exhibitions. We must certainly address the emergency situation, but without losing hope. Museums are a perfect place to do so in an effective and accessible manner.

''We must certainly address the emergency situation, but without losing hope. Museums are a perfect place to do so in an effective and accessible manner''

I don't think that it's a museum's role to address the public in a patronising manner: it simply won't work. What we can do is to stimulate the public's awareness and to offer a platform to artists who can get people thinking, can facilitate a dialogue, and can encourage personal action. It's very important for museums to offer their visitors a hopeful perspective. I believe that this can prove infectious.

In the longer term I expect to see a more flexible approach to collection management, more tailor-made

16. *Musée du Louvre moved depots to higher ground due to flood risk (Photo: Wolfgang Moroder)*

approaches, and the acceptance of certain risks. Sustainability is not just about saving energy and reducing greenhouse gases. It's about sustainable processes, logistics, procurement, suppliers and materials.

I believe in sharing knowledge. Recently, the Netherlands Museum Association (Museumvereniging) teamed up with Federatie Cultuur, Kunsten '92 and the Cultural and Creative Sector Taskforce to draw up an ACTION plan for the greening of the cultural sector. Museums can exchange experiences about the greening effort on the website 'Actie als cultuur' ('Action as culture'). This is a good initiative.

We will also need to start looking differently at art and exhibitions. For instance, we can start making better use of existing display cases and materials, or of art works that have no place in permanent exhibitions. I am already seeing examples of this in practice.

At the same time, I often still see a discrepancy between policy makers and the implementation. The will to pursue greening is there, but it often isn't easy in practice. Still, you can't get around it: we are trying to incorporate the greening goal in all the decisions we make and to communicate to both the public and the organisation that we find this important. Sustainability is a prominent part of our organisation. Our head of operational management is an ecologist, for example. We also have an active 'green team' that introduces sustainable changes at the micro and macro levels. Personal sustainability is also important in our organisation: this concerns care for each other, remaining balanced and not exhausting people, but empowering them.

Finally: is there anything else you would like to share with the reader?

There are passionate people in every organisation. Find the people inside and outside your organisation with whom you feel a click – this is motivational. Get together, join forces, and don't be afraid. What's important is to formulate a clear definition of 'sustainability' as an organisation, and to allocate budget to this. Then you can make agreements and adhere to these in practice. Good initiatives need to be implemented at all levels.

17. Levee in the Dommel at the Van Abbemuseum in Eindhoven (Photo: Aggeres)


Waterschap
De Dommel
Gemeente
Eindhoven

18. The Acropolis during a snowstorm on February 17, 2021 (Photo: Stavros Petropoulos)

Protecting Europe's heritage: a monumental challenge

Anne Grady

Anne Grady works at the European Parliament's Committee on Culture and Education (CULT) in Brussels. She is very involved in strengthening cultural heritage resilience for climate change in Europe. Anne Grady is partaking in this interview in a personal capacity.

In what ways are you involved with climate change and heritage?

The Committee on Culture and Education (CULT) of the European Parliament is one of the 20 parliamentary committees that undertake the preparatory work for the Parliament's plenary sittings. Amongst other duties, I co-ordinate and assist Members in drafting legislative and non-legislative reports and opinions, and define policy lines and advise on the European Commission's proposals relating to cultural heritage.

I have a long and rewarding career of working in the cultural heritage field. In 2016, I joined the EU Institutions in Brussels. I worked with the Cultural Policy Unit of the Directorate General Education, Youth, Sport and Culture (DG EAC), emphasising the safeguarding

of both the tangible and intangible cultural heritage of Europe.

Such is my interest in heritage and climate change, I volunteered for the role of leading the high profile Member States' expert group (Open Method of Coordination - OMC) on the subject of cultural heritage and climate change. The Open Method of Coordination is an EU policy-making process that does not result in EU legislation, but is a method of soft governance, which aims to spread best practice and achieve convergence towards EU goals in those policy areas, which fall under the competence of Member States. The OMC does so by establishing guidelines, quantitative and qualitative indicators and benchmarks, and national and regional targets, backed by periodic evaluations and peer reviews. In its mandate, this OMC group was asked to explore the contribution of cultural heritage to the European Green Deal and identify threats and gaps relating to cultural heritage in the context of climate change. The group comprised 55 enthusiastic and motivated experts from 28 countries (25 Member States plus three associated countries). Chair of the group was Dr Johanna Leissner.

19. *Anne Grady.*

The final report, 'Strengthening Cultural Heritage Resilience for Climate Change', was published in September 2022. It includes ten recommendations as well as 83 examples of best practice outlining research, techniques and work programmes relating to the fight against climate change.

Interestingly, a year after the OMC report was published, 2023 was confirmed as the warmest calendar year on record. This data reinforces the need to manage climate risks to protect our planet as we face one of biggest challenges of the century. I am on a mission to promote the OMC report and raise awareness of just how

vulnerable our cultural heritage is to the effects of climate change.

How are you seeing climate change affect Europe's heritage?

The OMC group members were unanimous in their viewpoint that the extraordinary speed and scale of climate change is threatening all forms of cultural heritage, both tangible and intangible. To quote from the report:

The most evident threats stem from extreme climatic events – severe precipitation, long heatwaves, droughts, strong winds and sea-level rise – all of which will increase dramatically in the future, as predicted by the Intergovernmental Panel on Climate Change. These events have immediate consequences, such as floods, forest fires and erosion, for Europe's tangible and intangible cultural heritage. The impacts of catastrophic events are coupled with the slow onset of changes arising from deterioration processes.

Additionally, it became apparent that in most of the participating countries, the information available relates to the impact of climate change on tangible heritage; very little information exists for intangible heritage. Even so, what information that does exist on tangible heritage is limited.

The 83 best practices in the report clearly show how heritage is under siege from the effects of climate change. Having said that, each best practice provides information on varying approaches being undertaken to protect Europe's heritage. Each best practice provides clear information for climate change decision-makers and offers practical examples of the role that cultural heritage can play in tackling climate change.

"The OMC group members were unanimous in their viewpoint that the extraordinary speed and scale of climate change is threatening all forms of cultural heritage, both tangible and intangible"

What should be done to limit the possible damage of climate change on heritage, in particular on the European level?

The EU has limited competence in relation to cultural policy; it falls

primarily as a national responsibility. Its role is therefore limited to providing funds, which it does in areas such as cooperation, networking, exchange of best practices, research and education. Nevertheless, cultural heritage has always been recognised as one of the pillars of European society and identity.

Research on climate change and heritage has been supported by the EU for some time now. For example, over twenty years ago, the Noah's Ark Project was funded by the EU. This project was ahead of its time; it recognised the impact of climate change on Europe's built heritage and cultural landscapes. It was the very first call in the world for a research project on this subject.

Since then there have been many EU funded projects relating to climate change and cultural heritage under programmes such as *Horizon 2020 and Horizon Europe*. It is critical that these types of research projects continue to receive funding, not only to facilitate cutting-edge research but also to allow for the exchange of valuable information between partners and build long lasting networks. This is one of the recommendations from the OMC report.

20. *Cemetery and Grand Oratory of Sceilg Mhichíl in Ireland (Photo: jibi44)*

21. As part of the Climate-Resilient Castles and Country Estates project, the monumental meandering pond at the Hoog Beek en Royen country estate in Zeist has been restored. (Photo: Ivor de Baat)

In this discussion, we should not overlook the roles of national and regional authorities. The OMC group recommended that in addition to EU-funded programmes, governments must initiate research programmes at national level to enhance knowledge sharing and cooperation between cultural heritage and climate science experts.

At both national and regional level, there is also a need to encourage investment and the development of incentives for the safeguarding of heritage against climate change through monetary and fiscal policies. In essence, the responsibility of safeguarding Europe's heritage rests with not only the EU but filters right down to local administrations.

What possibilities do you see for heritage to contribute to climate adaptation or mitigation?

We can learn so much from cultural heritage relating to the fight against climate change. The OMC group emphasised any adaptation and mitigation measures undertaken must be in line with quality principles to ensure the protection of cultural heritage - as well as avoiding maladaptation. It requires a holistic approach, continuous maintenance and monitoring, and adaptation work, such as installing alternative energy sources and/or smart retrofitting to avoid waste.

One best practice of mitigation given in the OMC report is the research project ProteCHt2save, funded under Interreg (an interregional cooperation programme, co-funded by the European Union). The research contributed to an improvement of capacities of the public and private sectors to mitigate the impacts of climate change and natural hazards on heritage sites, structures and artefacts. Amongst other things, it produced a Web GIS tool for risk mapping to support policy and decision makers for the development of measures and strategies of preparedness with a short and long-term perspective. It aimed at the protection of cultural heritage in Central Europe where sites are often exposed to extreme events linked to climate change (particularly heavy rains, flood and fire due to drought periods).

The Netherlands' best practice of *Towards climate-resilient castles and country estates* (Klimaatrobuuste Kastelen, buitenplaatsen en landgoederen) is another pertinent example from the OMC report. It recognises the fact that the problems affecting castles and country estates do not exist in isolation.

The Sceilg Mhichíl case is one of Ireland's best practice examples. It is a UNESCO world heritage site offering information on how this site, dating from the sixth century, battles the wild Atlantic Ocean. It outlines the measures being undertaken to

adapt to weather conditions and how to mitigate the effects of inclement weather. Interestingly, Sceilg Mhichíl is the only site in Europe that has been selected to take part in a global initiative to safeguard sites of cultural significance from the impacts of climate change. The project, *Preserving Legacies: A Future for our Past* will equip communities worldwide with the tools to assess worsening and future climate impacts on heritage sites in order to save them before it is too late. The project is being managed by ICOMOS in partnership with the National Geographic Society and the Climate Heritage Network.

How do you see the future with regard to the impact of climate change on Europe's heritage?

There is a growing awareness of how susceptible Europe's heritage is to the impact of climate change. While the OMC report does not have all the answers, it does have a wealth of information and knowledge particularly in the best practices allowing for the future proofing of our valuable heritage. As part of this future proofing, knowledge and its transmission is essential. I hope we will build capacity through training, upskilling and imparting expertise in new knowledge and technologies while retaining and revitalising traditional skills. Both are vital.

"For the future proofing of our valuable heritage (...) knowledge and its transmission is essential"

The Croatian example of preserving the dry-stone masonry techniques of eastern Adriatic in the OMC report illustrates how drystone walls play a vital role in preventing floods and avalanches, combating erosion and at the same time enhancing biodiversity. These skills are part of intangible heritage and inscribed on the UNESCO representative List of the Intangible Cultural Heritage of Humanity in 2018. The training programmes of the dry-stone techniques are specifically aimed at young people, ensuring that this knowledge is passed onto the next generation.

Finally: is there anything else you would like to share with the reader?

The OMC report highlights cultural heritage is both a victim of climate change and an integral part of the solution. It highlights the need to strengthen cultural heritage resilience to climate change and to commit to fight climate change. We hope it is a source of inspiration throughout Europe and other regions of the world. I would encourage everyone to study the report and to draw inspiration from its contents. If you do not have the time to go through the full report, there is also an excellent Executive Summary on the Publications Office of the European Union website. Together with determination and resources, I hope we can collectively make a difference as we face the monumental challenge of safeguarding Europe's heritage.

To conclude, I would like to finish with an Irish 'seanfhocail' or proverb: Ní neart go cur le chéile; There is no strength without unity.


staatsbosbeheer
Welkom op
Broekhuizen

22. Hundreds of trees were destroyed by the downdraft in June 2021, such as at the Broekhuizen estate (Photo: Marco van Burgwal)

23. Water-meadow on the Lankheet estate (Photo: Eric Brinkmann)

New roles for intangible heritage

Jet Bakels

As a scientific staff member and anthropologist at the Dutch Centre for Intangible Cultural Heritage (Kenniscentrum Immaterieel Erfgoed Nederland), Jet Bakels examines how intangible heritage can contribute to an ecologically more sustainable future.

In what ways are you involved with climate change and heritage?

As an anthropologist, I am fascinated by rural communities and their local knowledge, skills and beliefs with respect to nature. We now refer to this as Traditional Ecological Knowledge, or TEK. In my view, this knowledge has both an ideological and a poetically inspiring component. There is a huge amount of respect for forests, trees and certain animals. At the same time, it includes very practical knowledge about for instance animal behaviour, hunting and fishing, and about the effects of the seasons on water systems and soil fertility.

This kind of knowledge and these skills are what we refer to as intangible heritage. After all, the practitioners of this (traditional) knowledge pass this knowledge on to successive

generations. TEK is something you can research all across the globe, and given the current climate change and biodiversity crisis, I think it is a matter of great urgency.

I know that heritage will be lost due to climate change. But I find it more important to raise awareness of how intangible heritage can contribute to creating or preserving a more climate resilient and biodiverse landscape. This positive, instrumental side to intangible heritage inspires people and can make a difference.

How are you seeing climate change affect intangible heritage?

I find it hard to only talk about the impact of climate change with respect to intangible heritage, because climate change often goes hand in hand with the biodiversity crisis. For example, when I look at the forms of intangible heritage that I investigate, then I can see how the two reinforce each other. Nature has become imbalanced due to human action. Entire ecosystems are changing. But remarkably, various forms of intangible heritage are energised because of these problems.

Of course there are specific forms of intangible heritage that can no longer be exercised. Consider for instance ice skating on natural ice. This is a great pity, certainly. Yet it is also a feature of intangible heritage that it is dynamic and changeable. We also need to ask how relevant ice skating is for skaters, as the huge effects of climate change

24. Jet Bakel

come bearing down on us. When that happens, I think that the possibility of going skating will rank among our minor concerns. In my view, it is much more inspiring to do something which you believe the future needs than to focus on the inevitable fact that some forms of intangible heritage will perish.

What measures should we take to limit the damage?

Practitioners of intangible heritage can be important messengers to stimulate public authorities to take action. It is important that their voices and warnings are heard. This happens far too little, all across the world. That is why we established the international working group 'Living Heritage, Climate Change and the Environment' within the ICH NGO Forum (consisting of NGOs accredited by UNESCO). I think that scientists can fulfil an important role here, as they are sometimes more alert and faster to respond to signals based on local knowledge than public authorities. There are inspiring examples of local experience experts and academic researchers forming a bond. It has become a cliché, but it is of course true in the end that we need to change our lifestyle to counter climate change. For your well-being it is better to do something, such as practicing 'green' intangible heritage, than only giving up something.

For your well-being it is better to do something, such as practicing 'green' intangible heritage, than only giving up something.

What possibilities do you see for intangible heritage to contribute to climate adaptation or mitigation?

I see lots of possibilities for local knowledge and skills. One example is traditional grassland irrigation. Here, grasslands are supplied with water and minerals through a system that relies on slope gradients, ditches, channels and weirs. Artificial fertiliser rendered this know-how obsolete. Practitioners are now reapplying this know-how as a sustainable solution for healthy grasslands.

Another good example is that a (usually) new group of beekeepers chooses to keep bees, in order to reconnect with nature through the bees. Because of that bond, they realise

25. *Lacy Gijsberta working on a cactus hedge on Bonaire 2023 (Photo: Jet Bakels)*

that they have a responsibility for the bees' life environment. You can't put a beehive just anywhere, because our landscape is so polluted, impoverished and withered that it can be very hard for bees and other insects to find food. These beekeepers therefore feel a much greater responsibility to adopt the role of landscape architects and biodiversity thinkers to work towards a green and healthy environment.

Beekeepers also seek out new forms of collaboration. For instance with local authorities, to encourage them to pursue a better, more insect-friendly road verge policy. These collaborations are very important to the future of intangible heritage, as it retains its relevance in this way, but also for climate adaptation and for biodiversity.

26. Wilsterflapper. Jaap Strikwerda measures a bar-tailed godwit for scientific research 2022 (Photo: Jet Bakels)

People are furthermore developing new practices such as the planting of food forests, guerrilla gardening, and replacing pavement tiles with mini gardens. It gives people the feeling that there are things they can do – which indeed they can – in the face of something so huge and ungraspable as climate change.

And I would also like to touch briefly on the Caribbean area, since climate change is much more of a pressing issue on for instance Bonaire than in the Netherlands. That's why we are also doing research with our partners on Bonaire, including Liliane de Geus. We have examined the role of cactus hedgerows on the island, and with Suzanne Loen and Rosann Jansen I

mapped out the use of springs, wells and rain tanks.

How do you see the future with regard to the impact of climate change on intangible heritage?

One interesting consequence of climate change for intangible heritage is that it is changing its significance and role. See for instance the collaboration between the University of Groningen and the so-called 'wilsterflappers', which are bird catchers. They use a particular netting method to catch golden plovers and bar-tailed godwits. In the past these birds were caught for consumption, but today they are caught for scientific examination and to ring them. The link with climate change and biodiversity is that the research into these migrating birds helps us to understand the food situation in the Wadden Sea area, which is a World Heritage Site. This is where the birds need to fatten up before flying on to the north to breed, or to the south to pass the winter. Was there enough food for them? What changes can we see over the course of years? It's like looking at the health of the Wadden Sea area through the birds' eyes.

In my view, the role of the Dutch Centre for Intangible Cultural Heritage is to support communities in transforming activities that previously had a negative impact on biodiversity into a positive form, which at the same time helps to preserve the heritage.

In addition, I see the collaboration between academic science and lay scientists (the heritage practitioners)

as an opportunity for the future that is made all the more important by climate change. If both parties wish to protect biodiversity and to cope with and better understand the effects of climate change, then science and intangible heritage can join forces in an unexpected and innovative way. It does require that the people possessing local knowledge are taken fully seriously, and not disparaged as being 'traditional'. These are people who often grew up in a certain area and who know very well what is happening and how the landscape is responding to climate change. They are a source of knowledge and skills which, as said, deserve to be acknowledged by policy makers.

(...) science and intangible heritage can join forces in an unexpected and innovative way. It does require that the people possessing local knowledge are taken fully seriously, and not disparaged as being 'traditional'

Finally: is there anything else you would like to share with the reader?

My feeling is that all these different examples of intangible heritage force us to think about progress and about the importance of local insights and knowledge systems. After barbed wire was invented, people destroyed hundreds of thousands of kilometres of hedgerows and replaced them by barbed wire as a means to separate pastures. Now we are trying to bring hedgerows back and to weave them together, because now we understand that they provide for cooling, biodiversity and better soil quality. We talk about 'old traditions', while in fact they are the answer to the problems caused by today's so-called progress. «

27. Braided hawthorn hedge in Laren (Achterhoek) (Photo: Lex Roeleveld)

28. Digging a ditch for water-meadow (photo: Eric Brinkmann)

29. Red solar panels in a protected townscape in Leiden. (Photo: Vera Kuijpers)

The past as a source of inspiration for built heritage

Gabri van Tussenbroek

Gabri van Tussenbroek is a senior specialist in building history at the Cultural Heritage Agency of the Netherlands and a professor of Urban Identity and Monuments, in particular of the Dutch building history at the University of Amsterdam. He sees the past as a source of inspiration for the built heritage of the future.

In what ways are you involved with climate change and built heritage?

I notice through my work how relevant climate change is to the monument sector. Insulation is of particular concern, given the energy crisis. This elicits further questions about the consequences of climate adaptation for monuments. We need to figure out how to deal with that, also with a view to the societal consequences.

I'm pleased that the heritage sector is responsive to today's developments. Years ago it was simply out of the question to replace drawn glass with double glazed windows. Today we weigh the options: is this piece of drawn glass essential to the story of this

monument? Or, if it is a special window, should we say: document it well and let's think about a good solution that preserves the visual aspect? If you don't, then you lose support. And whatever you choose to do, having that support is indispensable.

Years ago it was simply out of the question to replace drawn glass with regular glass. Today we weigh the options: is this piece of drawn glass essential to the story of this monument?

The past offers a parallel here. Amsterdam was ravaged by a huge fire in the fifteenth century. To avoid a repeat, the city government urged everyone to start using bricks for construction. But the bricks had to be imported, while wood was cheaper and did not require an expensive foundation. Year after year the city government called for brick construction, but was largely ignored. It was only in the sixteenth century, when space became scarce, the economy prospered and people wanted to add an extra floor to their dwelling, that people started building with bricks. You can see something similar happening now with solar panels and insulation. People need a reason to embrace new

30. *Gabri van Tussenbroek (Photo: Dirk Gillissen)*

measures, and there's always some kind of tipping point. For instance the price of gas, or water nuisance.

This sets us the task of inventorying which monumental values are at risk of being lost. Consider for instance the earliest examples of sash windows in the Netherlands. Original exemplars have become exceedingly rare. Does their value weigh up against the higher energy bills it causes for the buildings that have them? They are so special! But if it's the run-of-the-mill nineteenth-century type of window, we need to ask whether its value justifies its preservation for posterity, or that the value of the building resides elsewhere. To determine this requires research and a tailored approach.

This applies just as well for the bigger story of the Netherlands as a whole. What is typical for one region, and not for another? Consider for instance the wharf cellars, which are only found in the cities of Utrecht and Leeuwarden. Our job as heritage sector is to document, research and disseminate information about the things that really are special.

How are you seeing climate change affect monuments?

How can you not notice the effects of climate change? We can see the effects everywhere around us. We see it in the news from around the world and in our direct environment. See the rotting wood in the foundations of Amsterdam's canal houses due to fluctuating groundwater levels, subsidence or salinisation, or the cracks in the walls of monuments caused by subsiding soil due to drought, or the threat of wildfires and floodings like occurred in Limburg in July 2021.

The measures to improve the sustainability of historic buildings can also be seen everywhere. Greening a monument means modifying a monument, which inevitably means the loss of historic material. The appearance of historic buildings is changing.

Solar panels are being installed on monuments and in protected townscapes with increasing visibility. Airco-units and heat pumps are attached to facades, on dormers and in gutters. Historic windows are replaced by window frames that offer better insulation, and these windows are fitted with insulating glass.

How do you see the future with regard to the impact of climate change on monuments?

The amount of historic material never grows, it only diminishes. Of course it still happens that people find an old painting in the attic, but we can never add an authentic seventeenth-century period room. Complete fifteenth-century interiors no longer exist, we might have a few sixteenth-century interiors, and a few more seventeenth-century interiors. Historic material is lost due to ageing, or vandalism, or because it is replaced by something new. This process will only accelerate due to the effects of climate change. That's why we need to consider carefully what we wish to cherish, what we wish to document, and what we might perhaps find less important.

Drawing up a cultural-historical value chart prior to taking measures can help in our decision-making. In the heritage sector, we always need to ask what a building's story is. We shouldn't just preserve the historic material because it is old, but must try to understand its significance. At the same time, historic material can answer questions which we haven't yet thought to ask.

If we document a wood construction and then let it disappear, we also lose the option of performing a dendrological (tree ring) analysis at

31. Adjustment of wooden construction due to subsidence (Photo: Vera Kuijpers)

a later point. We also cannot apply techniques that might be developed in the future. If we choose to not protect but only document threatened heritage, then we will lose a huge treasure trove of potential knowledge. Despite the inevitable erosion, I refuse to just let this happen. The primary goal is preservation. The historic material is important as scientific 'evidence' regarding the past.

If we choose to not protect but only document threatened heritage, then we will lose a huge treasure trove of potential knowledge

Which measures should we take to limit the damage?

In my view, climate change will force us all to adopt a more sober lifestyle, at both the personal and societal level. Wait another ten years before getting a new kitchen, or don't get a new one at all. Stick it out with your car for another five years. Buy less stuff, focus on having a repair society rather than a disposable society. Ask yourself whether material consumption and new stuff really contribute to your quality of life.

One of the possible future scenarios is that we will need to give up parts of the Netherlands. Debating which parts to give up is not up to the heritage sector but society as a whole. The heritage professional will only get involved after those decisions have been taken. But heritage does need to be considered when making such decisions. Heritage professionals can contribute knowledge and considerations when asked. By that time, the heritage sector needs to have mapped out the country in detail. This opens up an opportunity: providing a better understanding and documentation of what we have. Technology has now advanced to the point where we can build an increasingly detailed picture in maps and databases.

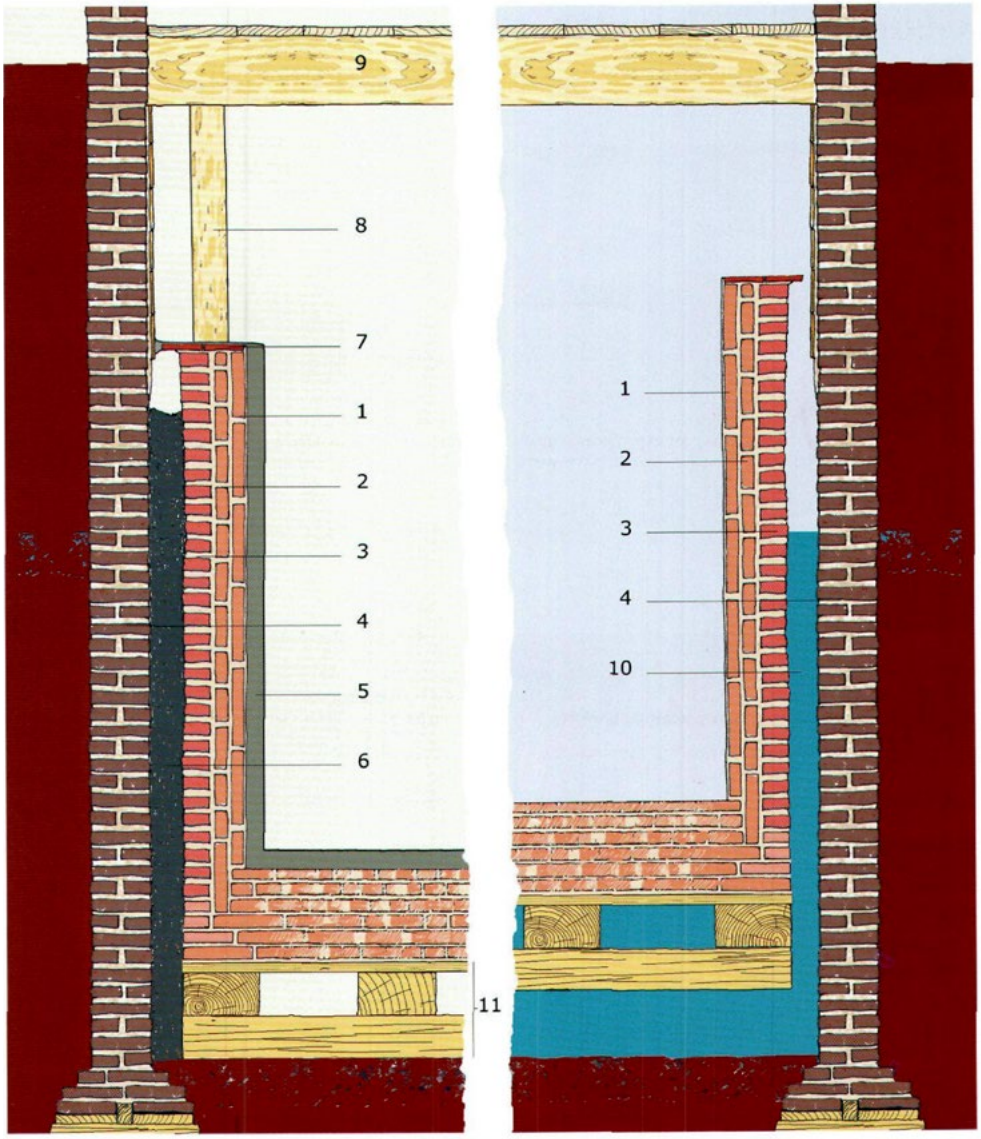
What possibilities do you see for built heritage to contribute to climate adaptation or mitigation?

The past is a source of inspiration, also for built heritage. Buildings used to be constructed in a more climate adaptive manner than nowadays. Parts of historical houses weren't used, for example the attic. Attics were freezing

32. *Frost damage to bricks due to rising damp (Photo: Vera Kuijpers)*

in winter and very hot in summer. This extra space served as a buffer. Nowadays we use all the spaces in a house. The past could inspire us to start incorporating buffers again.

The floating cellar is something typically found in the west of the Netherlands, for example in Leiden, Dordrecht, Maarssen, Amsterdam, Edam and Duivendrecht. These cities also had to cope with ground water problems, hundreds of years ago. Fixed cellars were rented out and used to store products. But if the cellar flooded, then was that the renter's liability or the landlord's? To avoid



Afb. 1. Schematische doorsnede van een vastgezette (l) en een nog drijvende kelder (r). 1 en 2 klamplagen binnenzijde kelderbak, 3 halfsteens buitenwand kelderbak, 4 bouwmuur van het huis, 5 later aangebrachte betonmantel, 6 puinvulling, 7 afdekplavuizen, 8 stijl waarmee de kelderbak is vastgezet, 9 kelderbalklaag, 10 grondwater, 11 basisrooster, 12 paalfundering.

33. *Schematic representation of a fixed cellar (left) and a floating cellar (right) (Image: Dik de Roon)*

endless litigation, the city of Amsterdam decided to ban the construction of cellars with a floor below the ground water level. But the ground water level would fluctuate. So then people came up with the idea of constructing floating cellars that could move up or down with the ground water level. This was back in the seventeenth century! Today's problems are not necessarily new, so we can learn a lot from such solutions.

One other example concerns all the twentieth-century interiors that have been wiped out in recent decades. The 1930s style houses are hugely popular nowadays, but only from the outside. On the inside, many people like to make it all white and spacious. The first to go are those classic en-suite sliding doors. The result is one big open space, while the advantage of having separate compartments is that you can heat them individually in winter. The house heats up much more quickly, making it more comfortable in winter and perhaps cooler in summer, and you end up paying less energy costs. We stand to gain so much by properly researching the past.

We stand to gain so much by properly researching the past

Finally: is there anything else you would like to share with the reader?

We tend to view the Netherlands as one big entity, but there were strong regional differences in the past, also in terms of construction. I think we should let those differences play a much bigger role when weighing how to deal with monuments. This could also inspire new developments, not just for buildings but also for water management and landscapes. Solutions often can be found in the past. «

34. Breklenkamp retaining wall (Photo: Rob Warmes)

Colophon

Platform Klimaat en Erfgoed

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35. *Flooding in Limburg, 2022 (Photo: Jos van Alphen)*

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