Batuhan Akkaya

CRITICAL HERITAGE URBANISM:

EXPLORING CLIMATE CHANGE AND HERITAGE NEXUS

IN IZMIR'S WATERBODIES

MA Thesis in Cultural Heritage Studies: Academic Research, Policy, Management.

Central European University

Vienna

May 2024

CRITICAL HERITAGE URBANISM:
EXPLORING CLIMATE CHANGE AND HERITAGE NEXUS
IN IZMIR'S WATERBODIES

by

Batuhan Akkaya

(Turkey)

Thesis submitted to the Department of Medieval Studies,

Central European University, Vienna, in partial fulfillment of the requirements

of the Master of Arts degree in Cultural Heritage Studies: Academic Research, Policy, Management.

Accepted in conformance with the standards of the CEU.

_____

Chair, Examination Committee

_____

Thesis Supervisor

_____

Examiner

_____

Examiner

CRITICAL HERITAGE URBANISM:

EXPLORING CLIMATE CHANGE AND HERITAGE NEXUS

IN IZMIR'S WATERBODIES

by

Batuhan Akkaya

Turkey

Thesis submitted to the Department of Medieval Studies,

Central European University, Vienna, in partial fulfillment of the requirements

of the Master of Arts degree in Cultural Heritage Studies: Academic Research, Policy, Management.

Accepted in conformance with the standards of the CEU.

_____

External Reader

Vienna

May 2024

CRITICAL HERITAGE URBANISM:

EXPLORING CLIMATE CHANGE AND HERITAGE NEXUS

IN IZMIR'S WATERBODIES

by

Batuhan Akkaya

Turkey

Thesis submitted to the Department of Medieval Studies,

Central European University, Vienna, in partial fulfillment of the requirements

of the Master of Arts degree in Cultural Heritage Studies: Academic Research, Policy, Management.

Accepted in conformance with the standards of the CEU.

_____

External Supervisor

I, the undersigned, **Batuhan Akkaya** candidate for the MA degree in Cultural Heritage Studies: Academic Research, Policy, Management declare herewith that the present thesis is exclusively my own work, based on my research and only such external information as properly credited in notes and bibliography. I declare that no unidentified and illegitimate use was made of the work of others, and no part of the thesis infringes on any person's or institution's copyright. I also declare that no part of the thesis has been submitted in this form to any other institution of higher education for an academic degree.

Vienna, 24 May 2024

_____

Signature

Abstract

This thesis contribution is ‘critical heritage urbanism’ that connects urban and heritage phenomena in addressing emerging urban issues of the Anthropocene. In this thesis, I reframed climate change as a cultural phenomenon and delved into the dynamics of water streams, wastewater flows, and treated water flows within the municipal climate heritage context, while also exploring the path to establishing a climate heritage nexus on an international scale. By investigating these interactions at both local and global levels, the research had knowledge contribution to intricate complexities inherent climate change and urban cultural heritage nexus in Mediterranean context. With these finding (mis)uses of heritage for climate action re-categorized by five: Impact of climate change on cultural heritage; solutions in heritage for climate action; cultural heritage as a resource for climate action; cultural heritage as an instrument for climate action; heritage is a process in climate action.

Acknowledgments

I would like to express my deepest gratitude to all those who have supported and guided me throughout this master's thesis. I would like to thank my advisors, Günhan Börekçi and József Laszlovszky, for their invaluable guidance. I am grateful to, Alice Mathea Choyke, Dóra Mérai, Ágnes Drosztmér, Vijay Ramchandani, and Anastasia Felcher, who have greatly enhanced the quality of this thesis. A special thanks to Aysel Aycan Aktaş, Bish Sanyal, Yonca Kösebay Erkan, and Bahanur Nasya for their support to this journey. Lastly, I am grateful to all the colleagues who contributed to this research, either directly or indirectly.

Table of Contents

List of Figures, Tables or Illustrations

List of Abbreviations

AIPH International Association of Horticultural Producers

CHN Climate Heritage Network

ESHOT Electricity, Water, Coal, Gas, Bus and Trolley Bus Company, Public Transport Institution

EU European Union

GHG Greenhouse gas

GIS Geographical Information Systems

HiCLIP Heritage in Climate Planning

ICOMOS International Council on Monuments and Sites

ICOM International Council of Museums

ICH Intangible Cultural Heritage

IMM Izmir Metropolitan Municipality

IPCC Intergovernmental Panel on Climate Change

IZBAN Local railway company of IMM

IZBETON IMM Concrete, Asphalt, Energy Generation, Distribution Facilities, Water and Sewage Company

IZBETON Construction Company of IMM

IZDENIZ A.S. Izmir Maritime Enterprises, Transportation and Tourism Company

IZDOGA Environmental Protection, Rehabilitation, Consultancy and Project Services Company

IZELMAN General Service Car Parks, Special Education, Fire Brigade and Health Services Company

IZENERJI Local energy production company of Izmir Metropolitan Municipality

IZFAS Izmir Fair Organizations, Art and Culture Services Company

IZKA Izmir Development Agency

IZMIR METRO A.S. IMM Subway Administration, Transportation and Construction Company

IZSU Izmir Water and Sewerage Administration

IZSU Izmir Water and Sewage Administration

IZULAS IMM Izmir Transport Services and Machinery Company

JDP Justice and Development Party

METRO AS IMM Subway Administration, Transportation and Construction Company

MoEUCC Ministry of Environment, Urbanization and Climate Change

NBS Nature-Based Solutions

RPP Republican People's Party

TURKSTAT Turkish Statistical Institute

UNESCO The United Nations Educational, Scientific and Cultural Organization

WHS World Heritage Site

WMO World Meteorological Organization

WWTP Wastewater Treatment Plant

Introduction: Critical Heritage Urbanism in Changing Climate

In thesis I delved into the intricate relationship between and climate change and urban cultural heritage. I explored how these entities intersect and influence each other in theory, policy and practice within an urban context. The terminology "climate change and heritage nexus" was used to refer these entities complex relation.

Three important developments have theoretically reevaluated my understanding of heritage, urbanism, climate change: critical heritage studies, critical urban theory, and historical climatology, each of which rethinks and retheorizes these three concepts separately. This research represents my experiment in integrating these three fields within the Mediterranean Region, specifically Turkey's Aegean region, and focuses on down to the urban context of Izmir's central districts watersheds amidst the challenges presented by climate change.

My thesis critically focuses on the (mis)uses of incorporating heritage into climate action in Izmir’s heritage urbanism. Heritage urbanism issued and considered as a tool for integrating the heritage actions to climate actions. Through systematic scientific examination of (mis)uses heritage for climate action, including instances of idealization and instrumentalization, I aim to deepen our understanding of the multifaceted relationship between climate change and heritage nexus in Izmir. More precisely, I explored the nexus between urban cultural heritage and anthropogenic climate change in Izmir's central districts' waterbodies by examining the (mis)uses of heritage urbanism for infrastructural projects.

Though out this thesis chapters I aim to target to answer these research questions below.

- How can the theoretical framework of the climate heritage nexus, which focuses on the intersection of anthropogenic climate change and cultural heritage, be enhanced to better understand and address their complex relationship?
- How can the climate change and heritage nexus be comprehended in practice within an urban context, and what methodologies can be employed to address this nexus in densely urbanized areas?
- What initiatives have heritage authorities implemented thus far in response to climate change, and what is the current position of the Izmir Metropolitan Municipality?
- What are the various applications and potential (mis)uses of heritage in Izmir's waterbodies to achieve a climate-neutral future?
- How can the findings from Izmir case be contextualized within broader environmental and cultural contexts?

Connecting existing heritage theories to practical climate-heritage actions can help us to answer these questions. I analyzed the institution to theorize the climate heritage nexus by looking the heritage urbanism projects in relation to climate heritage action strategies. I explored the (mis)uses of heritage in metropolitan municipal projects that aims to adapt urban watershed landscapes and their communities to mitigate the risks of climate change such as water scarcity, water pollution, food insecurity, sea level rise, heat waves and energy poverty. That made water a unifying theme for my thesis, encompassing not only natural water but also treated water and wastewater. Water is heritage that makes it the major themes in urban planning, heritage management and climate action. This is especially the case in densely populated coastal Mediterranean cities, where water brings life, but also problems in the form of floods and water shortages.

I connect the concepts from recent academic research on climate-heritage nexus with current municipal climate actions. This supported me not only to criticize the current heritage-oriented climate responses but more importantly it also made me highlight some of the complex realities

and ground truths, and to raise heritage concerns for future practice. Critically exploring the potential of heritage to activate climate action in specific metropolitan context, a Mediterranean metropolitan area facing with climate risks and severe water pollution, I showed wide range of Izmir Metropolitan Municipality's responses. Izmir is a metropolitan city located in the Mediterranean Basin, a multi-country region subject to climate risks and vulnerabilities.

The responses are presented, categorized and visualized in maps. By analyzing these maps, I focused on the discussions revolving around the three watersheds in Izmir's central districts that flows to the Bay of Izmir that municipality deliberately choose heritage discourses to reconstruct them.

To explore the climate change heritage nexus in a case metropolitan municipal urban area and to narrate this interdisciplinary conversation in between heritage, climate change and urbanism, I undertook an exploratory case study by examining the projects of Izmir Metropolitan Municipality (IMM) targeting Çiğli Wetland, Meles (Yesildere) Stream, Bornova Stream, Peynircioglu Streambed.

Çiğli Wetland is situated on the north side of Izmir, where one of the most important natural sites in Izmir, Çilazmak Lagoon, is located. However, in the area where the streams encompass the lagoon, Izmir's largest wastewater treatment center is also situated. Çilazmak Lagoon's streams used to be part of Izmir's one of the biggest rivers, Gediz. However, in 1886, the threats of the alluvions that closed the passage to Izmir Bay triggered one of the Ottoman Empire's most significant river projects. The watercourse of the river was redirected to Ağriya Bay. Currently, IMM is attempting to construct a canal to revive the old watercourse with an artificial river corridor. This region is designated to be a part of the Izmir Heritage Routes (Izmiras). However, the challenge lies in the fact that the projects in Çiğli aimed at reviving the lagoons is very expensive.

The second watershed in focus Meles (Yeşildere) originates about fifteen kilometers behind Kadifekale, passes through the foothills of Kadifekale which is the old town of Izmir and reaches the sea with a high and turbulent flow during the rainy months. Its bed is dry in the summer months. Kadifekale is one of the districts of The Historical Port City of Izmir Which is in the Tentative list of UNESCO World Heritage Site. On 2026, IMM is planning to hold an expo in this river corridor. The risky slums in this corridor were evacuated and declared the horticultural expo area by IMM. The expo's theme is living with harmony.

Bornova Stream originates from Mount Yamanlar. The Izmir Metropolitan Municipality (IMM) has constructed a park within the stream corridor as part of an effort to rejuvenate the watershed area. This initiative aims to establish a green corridor and a recreational space known as "Homer Valley." A part of the Bornova Stream is believed to house a cave and a rock mass, where the renowned poet Homer, associated with Izmir, is thought to have resided. To capitalize on this historical connection, the implemented project aspires to transform this valley into a focal point of attraction, aptly named "Homer Valley." The Bornova Stream continues to flow through the Historical Levantine Neighborhood of Bornova, where the historical mansions of Levantine families still stand. Finally, the river culminates in Izmir Bay, converging with the earliest settlements in the Izmir region, including Tepebaşı Mound.

The Peynicioğlu streambed located in the Karşıyaka district, which has recently been heavily affected by coastal flooding. This area is taken lands from wetlands and extended areas to sea. It serves as the demonstration site for the IMM's nature-based solutions (NBS) project. NBS efforts encompassing both river restoration and the establishment of a flamingo park referring the natural heritage of Izmir behind sea walls.

Theoretical Background

I have identified three disciplines concerning the complex relation between climate, epistemology of urban and the notion of cultural heritage. I introduce an interdisciplinary approach to examining the climate change and heritage nexus. I have integrated subfields from environmental history, heritage studies and urban studies. All these subfields are important to understand what is climate change, what is urban, what is heritage in this thesis context.

Historical Climatology: Climate as a Cultural Process

The first subfield is climate history or historical climatology, which studies and defines climate change beyond mere weather. Environmental history, especially within the domain of climate history, holds significant importance in tackling the difficulties presented by today's climate change. The body of scholarship on climate history have been contributing substantively to current debates about climate change.[1] The other way around as Bristow and Ford defined climate change necessitates a reevaluation of conventional methods of comprehending history and demands new ways of relating human knowledge, action and representations to the dimensions of geological and evolutionary time.[2] These responses employ interdisciplinary methods, where climate change research utilize history, archaeology, and earth sciences to better comprehend climate events.

What influences me in this thesis is the advancement within climate history regarding climate change as a social and cultural construct. I've been introduced this critical perspective from Mark Carey's article *Climate and history: a critical review of historical climatology and*

[1] White et al., "New Perspectives on Historical Climatology."

[2] Bristow and Ford.

climate change historiography.[3] This critical approach to climate history encompasses the study of climate that extends beyond mere weather, exploring its cultural construction rather than solely concentrating on its physical and measurable elements, such as temperature or precipitation.[4] Carey underscores how uncovering climate history extends beyond mere quantitative investigation, as it delves into an array of sources and archives.[5] Carey identifies four existing primary subfields within climate historiography. These are climate reconstructions, societal impacts and responses, the uses and abuses of climate knowledge, and cultural constructions and perceptions of climate.[6] These subfields provided me with pathways to explore the multifaceted dimension of the climate heritage nexus, avoiding a narrow view of climate change.

I've utilized the concept of 'climate reconstructions' by Carey.[7] Climate reconstructions can help us to understand the treats, apocalyptic and risk perspectives of climate change and it can reveal the regenerative solutions. The climate reconstruction is not retrospective exercise. It is a critical instrument for informing present and future responses, ensuring a more comprehensive and inclusive approach to address the challenges posed by climate change in our cities. It is a call to question the entrenched narratives and power structures that have influenced historical responses and to construct a more equitable and informed and grounded climate imaginaries.

In my research, the concept of 'cultural constructions and perceptions of climate' played an important role. It guided me to comprehend the evolving interplay between heritage and climate change, aiding my understanding of historical responses to climate change by international

[3] Mark Carey, "Climate and History."
[4] Carey, "Beyond Weather: The Culture and Politics of Climate History."
[5] Mark Carey, "Climate and History."
[6] Mark Carey.
[7] Mark Carey.

heritage authorities. Cultural constructions and perceptions of climate shows how predominant climate ideas and narratives can influence policy discussions, economic plans, power dynamics, and social relations across diverse societies and periods.[8] It helped me frame my findings in the first chapter The Path to Climate Change and Heritage Nexus. I investigated the actions taken by international heritage authorities regarding climate change and assessed the current position of the Izmir Metropolitan Municipality (IMM). The dominant narratives across different time frames within international institutions, later echoed by city management, converge and align in Izmir.

The second subfield, 'the uses and abuses of climate knowledge'[9]serves as a lens through which I contextualize the (mis)uses of cultural heritage. Carey's critical review provides examples of how climate knowledge has been used to justify historical inequalities such as colonialism, economic expansion, racism, slavery, and social divisions.[10] Carey highlights how climate knowledge has been used and abused by different social groups throughout history. Within my research (mis)uses of cultural heritage involve how certain social groups (in my case IMM) have utilized climate knowledge and heritage narratives to advance their own agendas as Carey detected directly and indirectly, intentionally and unintentionally.[11] Throughout this text, I draw specific attention to climate heritage actions as a tool to improve urban quality of life of Izmir but at the same time as an instrument to legitimize historical, social, and environmental injustices.

[8] Mark Carey.
[9] Mark Carey.
[10] Mark Carey.
[11] Mark Carey.

In summary, I utilized the subfields of climate history not merely as a retrospective exercise, but as critical instrument for approaching the climate and the challenges posed by climate change.

Critical Heritage Studies: Heritage as a Process

Two significant subfields of critical heritage studies directly inform the theoretical framework of this thesis. These encompass critical examinations of 'heritage futures and uncertainty'[12] and 'authorized heritage discourse'[13] (AHD). Heritage futures is particularly pertinent because current heritage practices often perceive cultural heritage solely as vulnerable to climate change, overlooking its broader roles. Moreover, I argue that municipalities, acting as local authorized heritage institutions, exert significant influence in shaping heritage narratives and practices within their respective jurisdictions.

The discourse on heritage as a vulnerable asset has been embedded in climate change thinking for a long time. In my thesis, I challenge the conventional vulnerable perspective on heritage, as articulated by Harvey and Perry "the traditional view that heritage conservation carries a treasured past into a well-understood future must be rejected" Climate change is a critical issue for heritage studies and there is a limited number of studies approaching on climate heritage nexus. David Harvey and Jim Perry's book, The Future of Heritage as Climates Change: Loss, Adaptation and Creativity, [14] filling this knowledge gap to understand the climate change and heritage nexus.

[12] *Heritage Futures*.
[13] Smith, *Uses of Heritage*.
[14] Harvey and Perry, *The Future of Heritage as Climates Change*.

Harvey and Perry argue that heritage involves a present-centered and future-orientated processing of a tangible and intangible sense of the past. Climate change is a dynamic physical force that requires attention from all of society. The nexus between the two should be apparent: future climates threaten the heritage we wish to bring into the future. In fact, that is an inappropriately narrow and in operational view of the nexus. The heritage we carry forward is not simply the best of the past; in fact, it must be viewed as a dynamic expression of societal values".[15] Essentially, this interpretation of heritage also illuminates Rodney Harrison's dialogical model of heritage, which suggests that heritage is a dynamic process.[16] According to this model, uncertainty like climate change should not necessarily be perceived negatively. Instead, it offers an opportunity to reconsider the utilization of heritage in response to evolving environmental conditions.[17]

By focusing on Izmir Metropolitan Municipality, I highlight that municipal entities, as localized agents, embody a form of Authorized Heritage Discourse (AHD). The argument derived from Smith that there is a hegemonic 'authorized heritage discourse.'[18] The Authorized Heritage Discourse (AHD) criticizes the hegemony in heritage practices, powerful agencies on unpowerful, tangible aspects over intangible ones. This perspective gains significance within the context of my thesis focusing on Turkey, where heritage planning predominantly revolves around the preservation and restoration of tangible assets like buildings and monuments, sidelining intangible aspects. For instance, while it is acknowledged that climate change impacts heritage, such as historical sites, the surrounding areas are often overlooked in heritage conservation efforts.

[15] Harvey and Perry.
[16] Rodney Harrison, *Heritage: Critical Approaches*.
[17] Haboucha, "The Future of Heritage as Climates Change."
[18] Smith, *Uses of Heritage*.

"Heritage Urbanism considers the revitalization and enhancement of heritage through the context of spatial and urban planning and landscape and finds models for its integration into modern living."[19] Furthermore, heritage urbanism in Turkey tends to reinforce existing power structures. It remains unclear how just and fair these current heritage practices are. This oversight disregards the realities of local communities, leading to potential risks such as gentrification in urban areas. For example, instead of focusing on the vulnerability of historical sites to rising sea levels or extreme weather events, this AHD encourages my research to consider how the cultural significance of these areas extends beyond their physical structures.

Critical Urban Theory: Urban Metabolism

In my case studies, I critically focus on heritage urbanism projects within the densely urban environment of Izmir. These selected projects physically located in water bodies and thematically related to water and wastewater. These projects mainly target climate mitigation and adaptation, decreasing pollution and quality of life. I approach these projects in water bodies of Izmir through the lens of critical urban theory, particularly considering perspectives planetary urbanism, urban water metabolism and infrastructural ecology

Brenner and Schmid's Planetary Urbanism,[20] constitutes a conceptual framework within critical urban theory and practice today. It departs from traditional approaches, conceiving cities not in isolation but as interconnected components within a broader global network.[21] This perspective is crucial because climate change is a global phenomenon, and cities are closely linked to various regions, experiencing regional challenges and influencing neighboring urban centers and their surroundings. For instance, the structures of current approaches to addressing climate

[19] Obad Šćitaroci, Bojanić Obad Šćitaroci, and Mrđa, *Cultural Urban Heritage*.
[20] Brenner and Schmid, "Towards a New Epistemology of the Urban?"
[21] *Neil Brenner's Harvard GSD Open House Lecture*.

change and heritage conservation involve not only municipalities and national institutions but also global financial institutions and stakeholders. This structures not only affects the immediate urban environment but also influences municipalities through shared networks, economic interdependencies, and heritage conservation strategies.

Dialogical models of heritage prompt me to consider water bodies as heritage nature-cultures with interconnected relationships among urban, natural, infrastructural, political, and environmental issues. [22] These relations were complex. The urban water metabolism approach assists me in analyzing this interconnected relationship. Urban metabolism refers to the flow of energy, materials, and resources within urban areas, encompassing the processes of consumption, production, and waste generation.[23] By analyzing the streams and wastewater channels within and around water bodies, urban water metabolism helped me to identify areas of concerns, such as pollution, toxicity or habitat degradation. Furthermore, urban metabolism approaches facilitated me to understand different solutions for addressing the complex issues in Izmir's urban waterbodies, such as re-use of water, implementing green infrastructure, or optimizing wastewater management systems.

Critical heritage studies, the intersects with planetary urbanism focusing on "larger issues"[24] or other issues surrounding heritage. These studies tend to focus on existing socio-spatial and socio-political inequalities inherent in planetary urbanization. However, a highlight or at least equal voice needed related to human-dominated perspectives on the environment for interconnected global warming problem. This response emerged during my thesis research on urban metabolism and the concept of 'toxic heritage'[25] particularly concerning the

[22] Harrison, "Beyond 'Natural' and 'Cultural' Heritage."
[23] Currie and Musango, "African Urbanization," 4.
[24] Winter, "Clarifying the Critical in Critical Heritage Studies."
[25] Kryder-Reid and May, *Toxic Heritage*.

interconnection between toxic residues in wetlands and their use of polluted water for heritage regeneration.

Methodology and Methods:

By creating interdisciplinary conversation from these fields above environmental history, urban theory and critical heritage studies, I had a better understanding the multifaceted dynamics of urban heritage in the context of global warming. These approaches are crucial for me from the socioeconomic justice framework due to the uneven distribution of climate risks within urban areas. Additionally, they are significant from an environmental humanities perspective because of the interconnectedness of human and non-human worlds.

Thus, the methodology employed in this research is designed to provide a comprehensive understanding of climate change and heritage nexus in different scales. Theses consists of three methods: literature review, policy review, fieldwork which includes expert interviews, field observations and use of GIS. I adopted an approach that extends beyond methodological nationalism, incorporating a 'multiscalar'[26] and transnational perspective which includes international, national, reginal, metropolitan and local scale academic knowledge and practical experiences. I explored the nexus between heritage and climate change by concentrating on global academic knowledge, examining international heritage and climate authorities' policies and recommendations, and assessing national, sub-regional, and local policies and interventions.

[26] Simsek-Caglar and Schiller, *Migrants and City-Making*.

Literature Review

I reviewed relevant academic literature in the fields of heritage studies, urban studies, climate science and environmental history to gain a comprehensive understanding of the key concepts and theories related to climate change and heritage nexus. The research tools and resources used are library catalogs and internet search engines, which provide access to a wide range of scholarly articles and books.

Policy Reviews

I analyzed the latest climate heritage interventions in the Mediterranean context, focusing on the documents of international heritage organizations. The research resources for this phase include knowledge management platforms (e.g., EU, Climate Change and Heritage Working Group of ICOMOS, UNESCO) and networks (e.g., Climate Heritage Network, European Heritage Hub), which collects up-to-date information on climate heritage interventions.

I explored the potential of climate heritage at the national scale in Turkey. I examined existing heritage and climate action plans, as well as relevant policy documents from institutions such as the Ministry of Culture and Tourism, the Ministry of Urbanization, the Union of Municipalities of Turkey, the Union of Historical Towns of Turkey, Izmir Development Agency, Izmir Metropolitan Municipality. These resources provided insights into the national policy framework, regional and metropolitan development patterns.

Izmir Field research

A key step of this research was the field study. In this study, prior to selecting the case study area, I established a set of criterions for case study area and institution selection. Using the criteria outlined below, I selected the Izmir Metropolitan Municipality (IMM) in the Mediterranean Basin as the case study.

- Criterion 1: To be part of a multi country regional context that have climate vulnerabilities (see page. 42)
- Criterion 2: To have significant climate vulnerabilities among the different areas in its urban context (see page. 42)
- Criterion 3: To have diverse heritage (tangible and intangible, natural and cultural) context (see page. 41)
- Criterion 4: To be a local government that have climate change awareness and change policies (see pages 36 and 45)

Izmir has the status of a metropolitan municipality as it manages different, densely populated settlements.[27] Turkish municipalities can be divided into different categories: metropolitan, district and town. Izmir comprises one metropolitan municipality and 30 district municipalities. In 1984, Izmir was designated as a metropolitan municipality, bringing together the central districts and those in the surrounding area. Initially, the jurisdiction of the IMM was limited to the central districts. However, through the enactment of laws in 2004 and 2012, the geographic boundary of the IMM expanded significantly. [28] The scope of my case studies is the very densely populated and built up environments of the 11 central districts of Izmir (see Figure 1: Güzelbahçe, Narlıdere, Balçova, Karabağlar, Gaziemir, Buca, Konak, Bornova, Bayraklı, Karşıyaka and Çiğli).

[27] In 2022, the assessment was that 78.6% of the residents of Izmir resided in these densely populated districts, 12.2% of the population resided in intermediate-density districts while 9.1% of the people who resided in less densely populated areas. TURKSTAT, "Urban-Rural Population Statistics, 2022."

[28] According to the Law No. 6360 that established the metropolitan borders in 2012, all the villages in the provincial borders were defined as neighborhoods. This expansion of the metropolitan municipality's jurisdiction has resulted in increased resource requirements. The IMM governs a vast area of around 12,000 km2

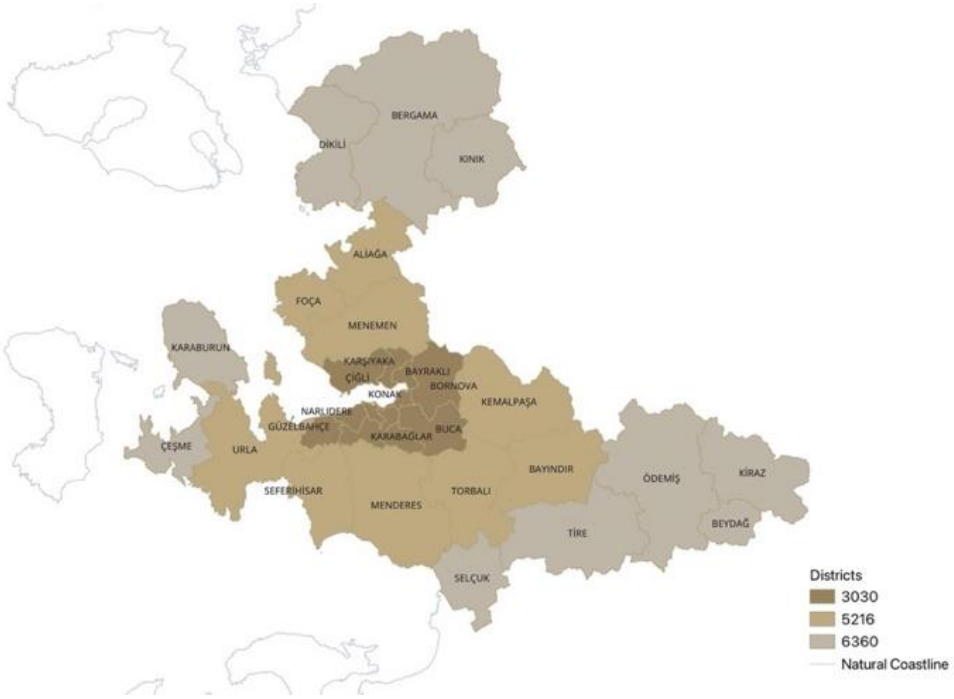

Figure 1. The expansion of the jurisdiction area of the Izmir Metropolitan Municipality. The districts of Izmir were designated through various laws, specifically law no. 3030 in 1984, law no. 5216 in 2004, and law no. 6360 in 2012.

Interviews

My first filed study was held from the 17th till the 20th of July 2023 and the second field study was held 3th December to 10 December 2023. The objective of the field studies was to meet relevant key stakeholders in order to better understand Izmir Metropolitan Municipality's development strategy, priorities and make observations on the field to collect data regarding current climate change and heritage-oriented initiatives. I conducted eighteen unstructured interviews and twelve field observations. I have obtained relevant spatial data from Izmir Metropolitan Municipality (IMM). I analyzed and visualized it using GIS.

The Izmir Metropolitan Municipality (IMM) is characterized by a high degree of organizational complexity. To inform the selection of interview subjects, I conducted a thorough analysis of IMM's organizational structure and created a visual representation of it (see Figure 2). I conducted unstructured interviews with officials from nine different departments of the Izmir Metropolitan Municipality (IMM), five different municipal corporations, and two general

directorates. My aim was to interview representatives from at least one department managed by each of the five general secretaries. Additionally, I sought to ensure diversity among the interviewees expertise by targeting individuals with different backgrounds architecture, urban planning, civil engineering, landscape architecture, directorship, cultural work, sociology, political science, and municipal finance.

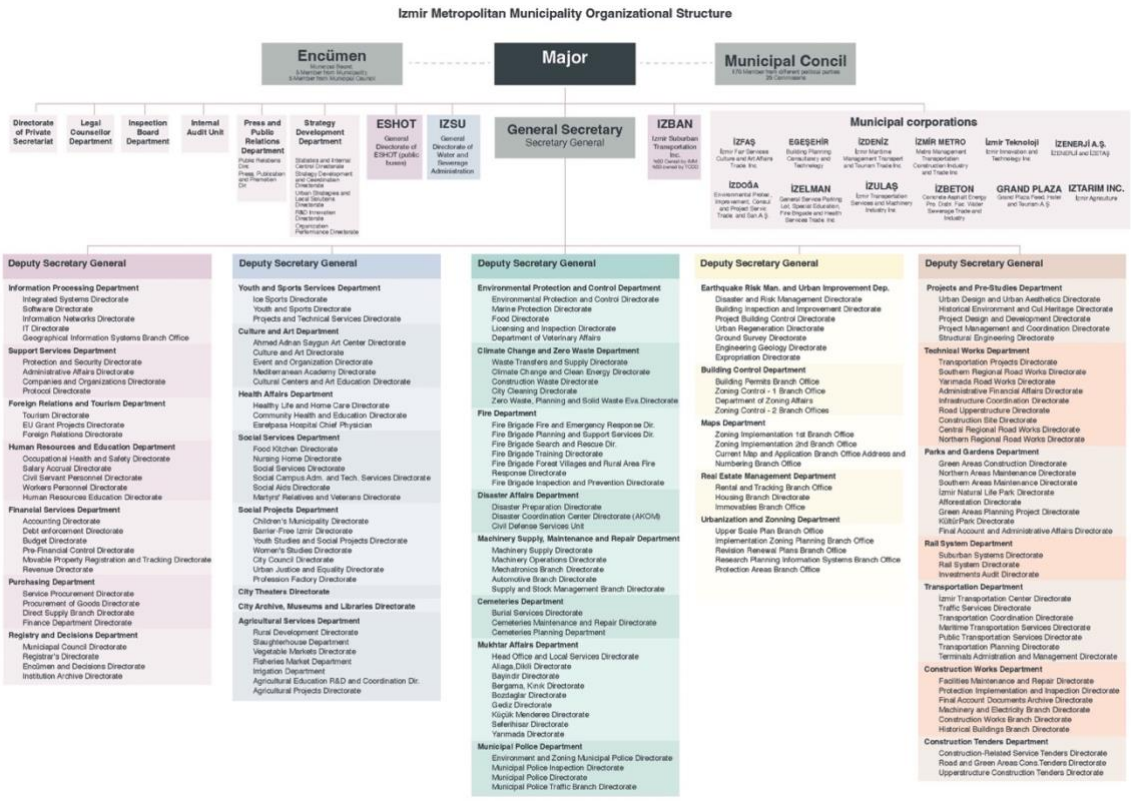

Figure 2. Illustration of the organizational structure of Izmir Metropolitan Municipality.

The Izmir Metropolitan Municipality (IMM) serves as a political institution. Throughout my interviews, many municipal workers expressed a preference for anonymity. Honoring their requests facilitated more in-depth discussions on sensitive topics. Frequently, interviewees invited their colleagues to contribute, enriching the dialogue with comprehensive insights. To respect confidentiality, I anonymized interviewers by identifying them solely by their departmental affiliations, such as Climate Change and Zero Waste Department expert. These interviews included eighteen different experts (IZDOGA Expert, IZSU Wastewater Treatment Unit Expert, IZENERJI Expert, ESHOT Expert, IZFAS Expert, IZDENIZ Expert, Strategy

Development Department Expert, Citta Slow Project Expert, Social Projects Department (Urban Agriculture Project) Expert, Earthquake Risk Management and Urban Improvement Department Expert, Climate Change and Zero Waste Department Expert, Citta Slow project Expert 2, IZSU Expert 2, Financial Services Department Expert, Earthquake Risk Management and Urban Improvement Department Expert 2, EgeŞehir Municipal Corporation Expert, Parks and Gardens Department Expert, Project and Studies Department Expert). The provided text from these interviews represents the results of Turkish to English translations.

Field Observations

As part of my field research, I conducted 15 site visits to gain firsthand insight and observe concrete examples of the ongoing initiatives and projects implemented by the Izmir Metropolitan Municipality (IMM). These site visits included Çiğli Wastewater Treatment Plant (WWTP), Gediz Delta Wetland, Gediz Delta Çamaltı Saltworks, Karabağlar WWTP Project Area, Meles Stream Karabağlar Section, Peynircioğlu river renaturation pilot project area, Kadifekale Neighbourhood, Pazaryeri CittaSlow pilot neighbourhood area, Pazaryeri Sakin Mekan Agora (Community House) and Kadifekale urban agriculture area, Urban regeneration projects (Ege, Uzundere, Örnekköy neighbourhoods), Yesildere horticultural expo area, Historical Kemeraltı District.

Spatial Analysis

I collected a dataset comprising 212 distinct sets of spatial information sourced from various departments within the Izmir Metropolitan Municipality (IMM). Subsequently, I organized and processed this data to facilitate my analysis within the context of Izmir's central districts.

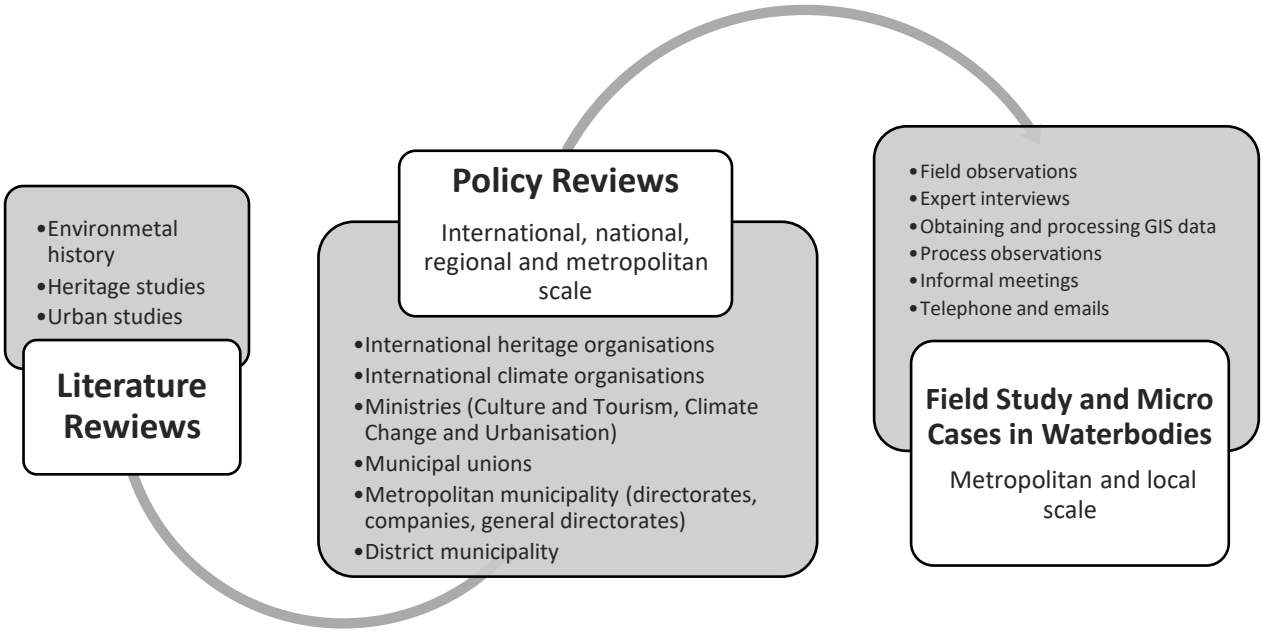

Figure 3. Scenario of the research methodology.

The Path to Climate Change and Heritage Nexus in Izmir

Climate change could be interpreted as either not being a focus for authorities in cultural heritage studies or, conversely, as climate authorities demonstrating little interest in cultural heritage. One of the objectives of this research to create an academic dialog between cultural heritage and climate change with a short overview of how climate change, recognized in heritage practices. This is also to understand what actions have heritage authorities taken regarding climate change so far, and what is the current stance of Izmir Metropolitan Municipality?

It was not only the heritage discussions but also the incorporation of climate change science into other areas posed communicative and scientific challenges. Several factors contributed to communicative difficulties, including the invisibility of causes,[29] skepticism about human global influence, the inherent complexity and unpredictability of climate issues, and a lack of unambiguous signals suggesting the need for change. Unfortunately, acknowledgement of climate science's warnings itself has been delayed inside cultural arenas. Until the last decade the heritage studies community was not the part of the communities that involved, while "philosophers, naturalists, agriculturalists, meteorologists, climatologists, geologists, climate modelers, and others developed own specific understandings of and interests in climate."[30]

[29] Moser, "Communicating Climate Change."

[30] Heymann, "The Evolution of Climate Ideas and Knowledge," 593.

After the increasing global conversation about climate change and tangible effects of 'global weirding'[31] there has been an increasing awareness that cultural heritage is not exempt from the impacts of climate-related issues.

Climate, a complex term, underwent varied interpretations and conceptual shifts throughout history where different actors and communities developed diverse concepts, influenced by technological, political, and cultural contexts.[32] It was only in the nineteenth and twentieth centuries that specific scientific concepts of climate, such as a geographical understanding in climatology until the mid-twentieth century and a physical understanding in climate science in the latter half of the twentieth century, attained superior social credibility and cultural dominance.[33] The comprehension of heritage, characterized by its complexity, also has undergone conceptual shifts over time. In the scholarly work entitled "Definition of Cultural Heritage References to Documents in History," authored by Jokilehto, an insightful examination is undertaken with a focus on organizing the conceptualization of cultural heritage with a chronological approach.[34] By looking at this organized approach that helps us explore the changing ideas about cultural heritage, it's clear that our understanding of heritage is still in flux—constantly negotiated, changing, and evolving. The definition of heritage itself, the institutions it has shaped, and the people who interact with it are all adjusting to a world that is changing and going through turbulent times. As a result, the lag in establishing the two scientific fields both heritage studies and climate chance science may explain the delay in crossing their paths.

[31]Global weirding is the idea that global warming is not simply about rising global temperatures, but about the concomitant emergence of variable and freakish weather, including extreme weather events, drought, dust storms, ice storms, hurricanes, and other atypical weather and geophysical events. Wilson and Stevenson, Building Sustainability Through Environmental Education.

[32] Heymann, "The Evolution of Climate Ideas and Knowledge," 592.

[33] Heymann, "The Evolution of Climate Ideas and Knowledge."

[34] Jokilehto, "Definition of Cultural Heritage References to Documents in History."

There is another reason might be explained by the term 'authority'[35] in which the way Heymann describes holds key insights into why heritage studies may face challenges in establishing connections with climate science. It is known through history that "major shifts of the climate understanding did not evolve within one scientific community, but were brought up and developed within separate communities, which gained authority and predominance."[36] The authority ascribed to climate understandings depended on various factors. Authority was mediated by particularly influential personalities by enabling technologies. Authority was also produced by institutions and successful institutionalization, which built on or purported specific framings of climate. While climate authorities neglected the cultural domain regarding climate change, the 'traditional heritage canon'[37] also ignored any potential significance of climate change until it began impacting an increasing number of heritage sites and properties.

Consequently, the following section outlines the evolution of the climate change and heritage nexus, segmented into ten-year periods. Currently, the focus of this progression has centered on international heritage authorities' policies that has a wider impact to global heritage policies. Acknowledging, solely examining international heritage institutions and developed countries heritage policies will offer a western oriented constrained framework for the development of the climate change heritage nexus. Further in this section it is aimed to narrowed this scope in Turkey, Izmir context. Nevertheless, this section continues by providing chronological information on the somewhat limited but emerging link between climate change and heritage within the previous outlined constraints.

[35] Heymann, "The Evolution of Climate Ideas and Knowledge," 593.

[36] Heymann, 593.

[37] Gentry and Smith, "Critical Heritage Studies and the Legacies of the Late-Twentieth Century Heritage Canon."

The Path of International Heritage Organizations

Understanding the urgency of addressing climate change in heritage context is crucial, especially given the current trajectory of warming trends. With existing policies indicating a high probability of exceeding the 1.5°C threshold and posing challenges to keeping warming below 2°C, [38] the need for decisive action has never been more pressing. Despite the discussions and agreements reached at events like the 27th and 28th Conference of the Parties (COP), there remains a notable gap between commitments and tangible actions for climate neutrality.

60s and 70s: Environmentalism and Universality

The scientific recognition of climate change has evolved over time without a definitive, universally acknowledged year. The chronological inception back to the 1960s due to the heightened awareness of climate change during the 1960s and 1970s, marked by deliberations on the potential impacts of increasing greenhouse gas emissions.

In the 1960s and 70s, the acknowledged threat by the authorities was not climate change but rather pollution, technological developments, and other human interventions identified as environmental and heritage concerns. Despite earlier insights, such as those presented by Gilbert Plass who proposed 'The Carbon Dioxide Theory of Climatic Change'[39] in 1955, climate change did not play a prominent role in these decades. In 1962, the UNESCO Recommendation concerning the Safeguarding of Beauty and Character of Landscapes and Sites highlighted construction, pollution, and deforestation as threats.[40] It underscored the importance of safeguarding the beauty and character of both natural and man-made landscapes.

[38] Calvin et al., "IPCC, 2023."

[39] An increase in CO2 concentrations lead to a rise in temperature. Plass, "The Carbon Dioxide Theory of Climatic Change."

[40] UNESCO, *Records of the General Conference, Twelfth Session, Paris, 1962*.

1971 UNESCO Convention in Ramsar and then 1972 United Nations Conference on the Human Environment in Stockholm made the environment a major issue. [41] The debates in Stockholm covered a wide range of pressing environmental issues at the time, such as chemical pollution, nuclear weapon testing, and whaling. Stockholm Conference brought environmental problems to the world's agenda, which also had an impact on Turkey, and the Environmental Research Unit was established within the Prime Ministry in 1972.[42] The only evidence of climate change concerns from Stockholm report is the Recommendation 70 from the section on "Identification and Control of Pollutants of Broad International Significance" regarding pollution in general: Governments were recommended to be mindful of activities that pose a significant risk of impacting the climate. To achieve this, they should carefully assess the probability and scale of climatic effects and disseminate their findings as widely as possible before undertaking such activities.[43]

Concurrently, the World Heritage Convention was held in Paris that same year which defined the natural and cultural heritage of outstanding value that ought to be transmitted to future generations.[44] Turkey accepted the convention on 16 March 1983. It seemed unthinkable then the reality that has emerged since, that climate change would become a ubiquitous threat to World Heritage sites.

These decades also have a tangible understanding to heritage. The Athens Charter for the Restoration of Historic Monuments released in 1931 as a pioneering document, outlined the key principles to govern conservation efforts. This charter was crucial in developing a global movement devoted to cultural preservation. An important shift happened, however, in 1964,

[41] UNESCO, *Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar 1971*.
[42] Öztürk, "Environmental Discourses and the Course of Environmental Movements in Turkey."
[43] United Nations, "Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972."
[44] UNESCO, "Convention Concerning the Protection of the World Cultural and Natural Heritage."

with the establishment of The International Charter for the Conservation and Restoration of Monuments and Sites', adopted by the 2nd International Congress of Architects and Technicians of Historic Monuments in Venice, commonly known as the 'Venice Charter'.[45] While primarily focusing on the physical features of constructed heritage, this charter signified an enhanced international commitment to preserving the monuments for future generations and is regarded as the prelude to the formation of ICOMOS in 1964.[46] Ten years later ICOMOS Turkey National Committee was established in 1974 within the framework of international practices and ICOMOS Turkey National Committee Regulation.

The Amsterdam Declaration in 1975 demonstrated a tendency to eliminate the hierarchical distinction between groups of buildings of outstanding artistic interest and those of lesser importance. It was emphasized that the elimination of the threat to architectural heritage for the sake of profit would generate a social shock.[47] While the Amsterdam Declaration does not explicitly address climate change, it places emphasis on the economic value of reusing and adapting the existing historical building stock, combating waste, reduce encroachments on agricultural land which are considered a circular practice supporting climate action. Briefly, the Amsterdam Declaration supported todays notion that building re-use is a form of climate action.

In 1976 ICOMOS Cultural Tourism Charter, one of the signatories of the document Europa Nostra realizes negative effects of tourism as the elimination of any form of pollution which affects the human environment and which threatens the natural and architectural heritage of

[45] Jukka Jokilehto, "The Context of the Venice Charter (1964)."

[46] ICOMOS, "Questions and Answers."

[47] The Council of Europe, "European Charter of the Architectural Heritage, Adopted by the Council of Europe in Amsterdam, 21-25 October 1975."

Europe. [48] Evidently, tourism was not anticipated as one of the major contributors to greenhouse gas emissions at the time this charter was drafted.

In 1976 same year, UNESCO issued the 'Recommendation Concerning the Safeguarding and Contemporary Role of Historic Areas,' emphasizing the importance of preserving the authenticity of historical areas and listing pollution as a potential threat.[49] The 1978 Recommendation for the Protection of Movable Cultural Property is among the earliest identified texts in this research's context that acknowledges the concept of climatic change. However, it's important to note that in this context, 'climatic change' doesn't refer to the contemporary understanding of climate change as we know it today. In the given context of 1978 Recommendation, 'climatic changes' refer to variations or fluctuations in the climate conditions, including temperature, humidity, and other environmental factors. [50]

The Ministry was established as the Ministry of Press, Broadcasting, and Tourism on November 25, 1957. It was renamed the Ministry of Tourism and Promotion on July 19, 1963. On July 13, 1971, the Ministry of Culture was established. On December 10, 1981, the two ministries were merged to form the Ministry of Culture and Tourism. The Ministry was divided again into the Ministry of Culture and the Ministry of Tourism on March 17, 1989. On April 29, 2003, the two ministries were merged once again.

The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance, known as the Burra Charter, was first adopted at Burra Australia in 1979. [51] The Charter promising to set a standard of practice for those who provide advice, make decisions about, or undertake

[48] ICOMOS, "Charter of Cultural Tourism," 13.
[49] UNESCO, *Records of the General Conference, 19th Session, Nairobi, 1976*, 136.
[50] UNESCO, *Records of the General Conference Twentieth Session, Paris, 24 October to 28 November 1978*.
[51] ICOMOS, *The Burra Charter*.

works to places of cultural significance. [52] Burra Charter revised several times in 1981, 1988, 1999 and 2013. Furthermore, Australia ICOMOS have been developing a series of Practice Notes to supplement and provide practical advice on aspects of the Burra Charter and its application. The aim of Practice Notes is to cover a wide variety of topics, including emerging subjects such as indigenous heritage, cultural routes, intangible heritage, sustainability, and cultural landscape.[53] Among eleven of Practices Notes developed in 2013, 2017 and 2019. Heritage and Sustainability Practice Note 1: Built Heritage adopted in 2019 first used the term carbon reduction and climate change.[54] The "Heritage and Sustainability Practice Note 1: Built Heritage" is the first in a series of practice notes and it relates to the conservation of existing buildings and improvements to their environmental performance.[55] Australia ICOMOS with other practice notes planned to consider other aspects of sustainability and cultural heritage. The Heritage and Sustainability Practice Note series later included: Heritage and Sustainability Practice Note 2: Cultural Landscape. Australia ICOMOS expect to include Heritage and Sustainability Practice Note 3: Intangible Heritage; Heritage and Sustainability Practice Note 4: Climate Change.[56] Shortly, it took nearly forty years for the Burra Charter Review Process to address climate change issues.

80s and 90s: Diversity and Sustainability

In 1982 the Deschambault Declaration adopted by the Council of Monuments and Sites of Quebec, French-speaking committee of ICOMOS Canada**.** Deschambault Declaration defined heritage as the collective legacy of nature and humanity, transcending historical buildings and

[52] *ICOMOS.*
[53] ICOMOS Australia, "Burra Charter & Practice Notes | Australia ICOMOS."
[54] ICOMOS Australia, *Heritage and Sustainability 1: Built Heritage Practice Note*.
[55] *ICOMOS Australia.*
[56] *ICOMOS Australia, 1.*

encompassing material culture, the geographic environment of Quebec, and the human environment with its customs and traditions. The significance lies in acknowledging the complex structure of heritage with the material environments (tangible), the people in their environment (intangible aspects) and that preservation efforts should align with the recognition of citizens and individuals.[57] However, an obvious bias toward material aspects becomes apparent upon deeper inspection of the declaration. The national heritage, which was based on lands taken from indigenous populations, is dealing with the problems brought by a hard environment. The architectural landscape of Quebec, in particular, bears the burden of this harsh climate, highlighting the fragile situation of the heritage in question. Naturally similar to other developments in heritage, the declaration lacked the greater issue of global climate change, instead focusing on the limited effects of periodic icing and thawing.

The same year "The Florence Charter," adopted by ICOMOS in December 1982, focused on the preservation of historic gardens.[58] It defined historic gardens as architectural and horticultural compositions, considering them as monuments. The charter underscored the significance of conserving historic gardens and their harmonious integration with the surrounding environment, specifically in addressing recreational pressures. However, it does not provide guidance on how a historic garden can adapt to climate change, encompassing its historical, mitigative, and narrative roles in contributing to discussions on climate-related issues. Because today it is known that Historic gardens are proposed as ideal settings for narratives that integrate climate change as both historical and present experiences. Educational initiatives in these gardens can contribute to a transformative understanding of nature, foster appreciation for their historical value, and communicate the challenges involved in their

[57] ICOMOS, “Charter for the Preservation of Quebec’s Heritage (Deschambault Declaration) - 1982.”
[58] ICOMOS, “The Florence Charter 1982.”

maintenance, while simultaneously raising public awareness of the positive impacts and creating recreational spaces in line with climate change adaptation.[59]

After the 1982 definition by the Quebec Association for the Interpretation of the National Heritage broadened the concept to include nature, humanity, material culture, and customs. 1983 ICOMOS Canada, Appleton Charter introduced a framework advocating for careful assessment and environmental control system upgrades, highlighting the ongoing challenge of developing a comprehensive approach to safeguard heritage amidst the intricate interplay of cultural and environmental factors. However, even with an emphasis on a comprehensive approach, the ICOMOS approach in the 1980s fell short of adequately addressing the pressing need to integrate environmental concerns, especially concerning the intersection of climate change and heritage. In 1982 and 1987 UNESCO made two amendments of the RAMSAR Conventions about the wetlands but these amendments were about increasing the bureaucratic effectiveness of the convention. [60]

The Intergovernmental Panel on Climate Change (IPCC) was set up in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

Anthropogenic climate change first emerged on the public agenda in the mid-to-late 1980s. It wasn't until 1992 that the world recognized climate change as a major concern.[61] The link

[59] Hüttl, David, and Schneider, "Historic Gardens and Climate Change."

[60] UNESCO, "Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat Known as the Paris Protocol Adopted at the Extraordinary Conference of the Contracting Parties, Paris, France, 2-3 December 1982."

[61] The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty established to address "dangerous human interference with the climate system" by stabilizing greenhouse gas concentrations. Adopted at the Earth Summit in Rio de Janeiro in June 1992, it entered into force on 21 March 1994. This treaty, ratified by 197 countries, represents the first global effort to limit greenhouse gas emissions and combat climate change.

between the environment and human rights was first recognized internationally in the Stockholm Declaration of 1972 and was given a far higher profile at the Rio de Janeiro 'Earth Summit' (1992).[62] The 'Earth Summit' established that making sustainable development a mandatory objective was crucial for the global population.[63] As a result At the Earth Summit, the concept of sustainable development was deemed an attainable goal for all the people of the world, and the United Nations Framework Convention on Climate Change was signed. 1994, the Global Conference on the Sustainable Development of Small Island Developing States (SIDS) in Barbados recognized the vulnerability of island nations' cultural heritage to climate change and sea level rise.

2000s and 2010s: Sustainability to Resilience

After 2000s, the International cultural heritage communities started to recognize that climate change is currently one of the most important and fastest growing threats to humans and their heritage worldwide. What is strikingly revealed is that all categories of heritage from examples of civil architecture to living communities were under the threat and impact of climate change. Temples and other historical structures along the river were severely damaged by flash floods in Uttarakhand, India in June 2013; In 2007, many historical city centers such as Rome (Italy) and Beverley (England) were flooded by the storms in Western Europe. The flood disaster, which affected millions of people in Pakistan, affected cultural heritage sites. It should be known that Turkey is among the countries at high risk for the potential effects of climate change. The irreversible effects of the climate crisis in Turkey are observed with the

[62] United Nations, "United Nations, Conferences, Environment and Sustainable Development."

[63] United Nations, "United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992."

Mediterranean and Aegean Region affected by the forest fires; the Black Sea Region affected by the floods; and Central Anatolia affected by the drought.

In 2003, UNESCO's initial budget proposal for 2004 incorporated climate change within Main Line of Action 1.4; however, the primary emphasis remained on the natural environment, specifically centered around marine ecosystems.[64] The same year UNESCO adopted 'the Convention for the Safeguarding of Intangible Cultural Heritage' in 2003. However, it is noteworthy that this significant text initially did not recognized and mentioned climate change as a treat.

Recommendation on the Historic Urban Landscape (HUL) published by the UNESCO in 2011. The historical urban landscape emerged as an extended vision to understand the historical urban spaces to tackle the complexity of urban issues and new emerging problems such as climate change, rapid urbanization, over tourism. HUL is recognized for reflecting a century of evolution on theories related to urban heritage management.[65] Historical urban landscapes are commonly recognized as material places and objects of the past which still tend to be illustrated through tangible aspects by its audiences. While considering these emerging problems and sustainability, HUL approach is re-emphasizing the excluded dimensions from the practical processes. For instance, "the site's topography, geomorphology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions and visual relationships, as well as all other elements of the urban structure. It also

[64] UNESCO, "Draft Programme and Budget, 2004-2005: Fascicules 1-17."
[65] Veldpaus and Pereira Roders, "Urban Heritage."

included social and cultural practices and values, economic processes and the intangible dimensions of heritage".[66] [67] HUL provided a landscape approach beyond the boundaries.

The Hangzhou Declaration, which placed culture at the heart of sustainable development policies in 2013, examined the role of culture within the global sustainable development agenda.[68] It positioned heritage as an integral component of the United Nations' 2030 Agenda and its millennium goals.

Starting in 2011, UNESCO has provided 'The Basic Texts,' serving as a practical guide for the 2003 Convention and its optimal implementation, with periodic revisions to align with resolutions from the General Assembly of the States Parties.[69] There are seven editions of the basic texts in the years 2011, 2012, 2014, 2016, 2018, 2020, 2022. Thirteen years after the 2003 convention, among the seven published texts the fourth edition in 2016 is this is the first one in which climate change is mentioned.[70] The 2016 Basic Text's 'Chapter VI Safeguarding intangible cultural heritage and sustainable development at the national level', States Parties are mandated to safeguard the intangible heritage and acknowledged community-based resilience for the sustainability of food, water, natural resources and geoscientific knowledge.[71] In 2022 edition's foreword intangible heritage remained highly relevant to address challenges of climate disruption.[72] The statement in the foreword, "Every day, this heritage proves that it is not fragile but truly alive," emphasizes heritage not only as a fragile element but as a living one.

[66] UNESCO, "Recommendation on the Historic Urban Landscape."
[67] Rogers, "Historic Urban Landscape Approach and Living Heritage."
[68] UNESCO, "The Hangzhou Declaration: Placing Culture at the Heart of Sustainable Development Policies."
[69] UNESCO, "Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage."
[70] UNESCO, "Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2016 Edition."
[71] UNESCO, 66–74.
[72] UNESCO, "Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2022 Edition."

The ICOMOS Climate Change and Heritage Working Group (CCHWG) was established in 2016 and since then, it has taken an active role in advocating a resolution aimed at encouraging the cultural heritage community to take up action against climate change.[73] The 2017 ICOMOS Triennial General Assembly was one of the significant events that highlighted the significance of climate change in terms of cultural heritage. According to an assessment by the General Assembly, efforts to adapt to and mitigate the ramifications of climate change are crucial as cultural heritage is at risk. In 2019, the working group published The Future of our Pasts: Engaging Cultural Heritage in Climate Action report, which put forward a multi-disciplinary approach to cultural heritage.[74] The key messages from the report. "Climate change is already impacting communities and heritage globally, and these trends are rapidly worsening. Due to the nature and scale of climate impacts, how we conceive of heritage and how we manage will require update."[75]

2020s: Global and Local Resilience

In 2020, the ICOMOS General Assembly declared a Climate and Ecological Emergency. In 2021, the Assembly endorsed an ambitions Triennial Scientific Plan which, for the first time, established the organization's research agenda around a single issue: Climate Change. In 2021, the International Co-Sponsored Meeting on Cultural Heritage and Climate Change, organized by ICOMOS, IPCC, and UNESCO, took place. The meeting aimed to assess the current state of knowledge concerning the links between culture, heritage, and anthropogenic climate change. Outcome of this significant meeting was a scientific report and three white papers. It should be noted that the meeting addressed culture as well as heritage.

[73] ICOMOS, "ICOMOS Climate Action Working Group."
[74] ICOMOS Climate Change and Cultural Heritage Working Group, *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*.
[75] ICOMOS, "ICOMOS Releases 'Future of Our Pasts' Report."

In 2018, The Global Climate Action Summit, mobilized the Climate Heritage Network (CHN) the network officially lunched in 2019.[76] In 2021 The Role of Culture in Climate Resilient Development discussed in local governments scale, a draft report has been presented at the 4th UCLG Culture Summit organized in Izmir (Turkey) on 9-11 September 2021, and the final version of the report prepared for the 2021 United Nations Climate Conference (COP26) in Glasgow.[77] In 2020, ICOMOS WG4 initiated its main project, Cultural Heritage in Climate Planning (HiCLIP). This project aimed to develop a methodological tool for analyzing the inclusion of heritage and cultural resources in climate plans (both adaptation and mitigation). The goal was to identify the current status of policy gaps and best practices for addressing the cultural dimensions of climate change.[78] HiClip focused on examining climate action plans at the national, regional, and municipal levels. It's important to note that the project did not investigate plans developed by the cultural sector specifically addressing climate concerns but rather the treatment of cultural resources within broader climate plans.[79] In 2021, CHN's activities were focused on addressing the topic of climate heritage within the municipal context. This is the year to spotlight Izmir, which serves as the focal point for the subsequent chapters of this thesis.

In 2023, a Global Call to put Culture at the Heart of Climate Action was lunched with the aim to include culture domain in the COP28. The campaign was a civil society contribution.[80]

[76] International Society of City and Regional Planners (ISOCARP), "Climate Heritage Mobilization at Global Climate Action Summit 2018 Heritage."

[77] Potts, "The Role of Culture in Climate Resilient Development."

[78] Guzman and Cathy, "Cultural Heritage in Climate Planning; The HiCLIP Pilot Project for Understanding the Integration of Culture into Climate Action."

[79] Guzman and Cathy.

[80] The Global Call to Action does not belong to a single organization, but rather is a coalition of cultural heritage, the arts and creative sectors and has been initiated with the backing of founding signatories. The Global Campaign is for people and institutions who cares about empowering cultural voices, actors and sectors in the fight against climate change. People and institutions are invited to add their voice and share the campaign with their communities and networks. The Global Call already has 1500 signatories and counting, including organizations with large membership or networks representing many thousands of other organizations and their communities. The management of the Global Call campaign is being undertaken in the framework of the Climate Heritage Network Culture at COP28 Working Group, under the leadership of Julie's Bicycle. Europa Nostra/European Heritage Hub provides the secretariat for this CHN Working Group.

According to the members of the Climate Heritage Network (CHN)[81] who played a key role in this campaign, current mitigation and adaptation planning often overlook the power of culture- of the Paris Agreement. [82] This campaign prompted a ministerial meeting at the COP28.[83] The meeting was attended by over 30 Ministers, including government representatives and a large delegation of committed cultural advocates, including organizations such as UNESCO, EU Commission, Europa Nostra, Southeast Asian Cultural Heritage Alliance (SEACHA), International Council of Museums (ICOM) International Council on Monuments and Sites (ICOMOS). As a result, more than 25 nations joined the new Group of Friends of Culture-Based Climate Action (GFCBCA) on the first ever multilateral High-Level Ministerial Dialogue on Culture-based Climate Action. The meetings one of the tangible outcomes was the 'Emirates Declaration on Cultural-based Climate Action'. The participants unanimously adopted the declaration. This declaration aimed to pave the way for the adoption of a Joint Work Decision on Culture-Based Climate Action at COP 29, which will take place in Azerbaïjan in 2024, and subsequently to a related action plan ahead of COP 30 in Brazil.[84] It took a decade of campaigning for the arts, heritage and creative industries to be at the agenda of global climate action discussions.[85]

The scientific outcome of Global Research and Action Agenda on Culture, Heritage and Climate Change was consolidated in a report.[86] The report provides information about three themes of the meeting. The first theme is the 'knowledge systems'; second the 'impacts' of

[81] The Climate Heritage Network (CHN) is a voluntary, mutual support network of government agencies, NGOs, universities, businesses, and other organizations committed to tackling climate change and achieving the ambitions of the Paris Agreement. Mobilized in 2018 during the Global Climate Action Summit and launched in 2019, the Climate Heritage Network works to re-orient climate policy, planning, and action at all levels to account for dimensions of culture - from arts to heritage.

[82] Climate Heritage Network, "Press Release 'Group of Friends of Culture-Based Climate Action' Launched at COP 28 in Response to Global Campaign by Cultural Voices."

[83] United Nations Climate Change, "High Level Ministerial Dialogue for Culture-Based Climate Action."

[84] European Investment Bank Institute, "When Culture Meets Climate."

[85] Europa Nostra, "'Group of Friends of Culture-Based Climate Action' Launched at COP 28 in Response to Global Campaign by Cultural Voices."

[86] Morel et al., *Global Research and Action Agenda on Culture, Heritage and Climate Change*.

climate change on culture and heritage, the third theme is the 'solution' and the roles of culture and heritage in steering transformative change and fostering alternative sustainable futures. The report identifies and categorizes knowledge gaps and potential actions such as cross-cutting concerns, governance and institutional frameworks, integration of natural and cultural heritage, inequalities, climate justice. Aligning with the themes of the meetings theme there were three white papers has published. One white paper that underscores the significance of collaborating with Indigenous, local, and scientific knowledge systems for enhancing the effectiveness of climate action.[87] Suggesting that such collaboration is compatible with preserving the autonomy and distinctness of each knowledge system, and the careful design of governance procedures can ensure each system's autonomy while boosting their joint efficacy. Other white paper that identifies the very high probability of severe impacts and risks of climate change to culture and heritage.[88] Last white is paper about the Role of Cultural and Natural Heritage for Climate Action.[89]

In March 2023 ICOMOS announced global initiative 'Preserving Legacies: A Future for Our Past' to safeguard sites of cultural significance from the impacts of climate change. The initiative addresses the pressing demand to protect cultural heritage by emphasizing the critical necessity of providing communities across the globe with tools for precise anticipation of current and future climate impacts.[90] The initiative is currently undertaking a project encompassing 10 heritage sites, with a focus on two primary locations: The Rice Terraces of the Philippine Cordilleras in the Philippines and Petra in Jordan. Additionally, there are eight

[87] Orlove et al., *ICSM CHC White Paper I: Intangible Cultural Heritage, Diverse Knowledge Systems and Climate Change. Contribution of Knowledge Systems Group I to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change.*

[88] Nicholas P. et al., *ICSM CHC White Paper II: Impacts, Vulnerability, and Understanding Risks of Climate Change for Culture and Heritage: Contribution of Impacts Group II to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change*.

[89] Shepherd et al., *ICSM CHC White Paper III: The Role of Cultural and Natural Heritage for Climate Action: Contribution of Impacts Group III to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change*.

[90] Preserving Legacies, "About Preserving Legacies."

observer sites integral to the initiative's comprehensive efforts.[91] With support from the sponsors such as The National Geographic Society, a global nonprofit organization and Manulife, a Financial Corporation these mainly technical assistance type of support encompasses different heritage typologies, like archeological sites and agricultural landscapes, and different climate threats, like sea level rise and extreme heat. However, due to the limited resources of the ICOMOS there is a very limited heritage site on focus. In urban context there are two learning heritage sites.[92]

The Path of Izmir Metropolitan Municipality

Izmir Metropolitan Municipality is a local government that have climate change awareness and change policies. It is essential to revisit the topic introduced in the previous section concerning the Climate Heritage Network (CHN), while in 2021, the draft report on "The Role of Culture in Climate Resilient Development" was deliberated at the local government level during the 4th UCLG Culture Summit held in Izmir and hosted by IMM. [93] [94] The joint discussion of climate change and cultural heritage at the municipal level was a rare and a significant development in the Turkish context. The organizational structure of Izmir Metropolitan Municipality is overcomplex (see Appendix 4).[95] Therefore, I attempted to analyze the Izmir's context that brought cultural heritage and climate change discussion together to the municipal level.

[91] ICOMOS, "ICOMOS Coordinates New Global Initiative to Safeguard Heritage from Climate Change."

[92] "Places, Explore Our Cultural and Natural Heritage Sites across the Globe."

[93] Potts, "The Role of Culture in Climate Resilient Development."

[94] International Society of City and Regional Planners (ISOCARP), "Climate Heritage Mobilization at Global Climate Action Summit 2018 Heritage."

[95] The IMM's organizational structure comprises the Metropolitan Council, Metropolitan Executive Committee, Mayor, and General Secretaries overseeing various departments.

The Secretary General main focus is the Finance Department, IT, Foreign Relations and Tourism, Human Resources and Education, Financial Services, Purchasing, and Official Registry. The second Deputy Secretary General oversees cultural, social, and agricultural services, while

The first aspect concerns Izmir Metropolitan Municipality (IMM) is politics, particularly the influence of political parties, especially the ruling party and the main opposition party in Izmir. The second aspect is legal and spatial; IMM operates within the legal framework established by Turkish laws, which outline the specific powers granted to metropolitan municipalities. These laws also define the geographical areas where the IMM provides public services, particularly in cultural and environmental contexts. The third element encompasses both bureaucratic and political dimensions, focusing on how the IMM has established an institutional organizational structure within the legal framework to advance policies promoting culture and nature-oriented development.

In Turkey's urban management system, the influence of political parties has an important place both in local governments affiliated to the central administration and in elected local government institutions.[96] For the last two-decade, Turkey's laws and political system affecting the management of cities had changed. Since 2016, there has been a transition in Turkish politics from a state characterized by a dominant-party regime to one marked by a centralized personalist regime.[97] According to constitutional amendments to the Turkish Constitution system, the president of Turkey is elected, by direct popular vote. Currently Turkey's President is the head of state. Appointments to be made to high-level authorities such as city governor,

the third focuses on environmental and climate services. The fourth Deputy Secretary General handles urban planning, and the last oversees transportation, urban design, green areas, and urban projects.

Municipal companies under IMM support diverse sectors including transportation, environment, and urban development. Among the two General Directorates IZSU (Izmir Water and Sewerage Administration) manages water and sewerage services, ensuring comprehensive control for efficient delivery. ESHOT (the General Directorate of Electricity, Water, Gas, Bus, and Trolleybus) provides public transportation services, consolidating bus management for efficiency.

[96] Turkey is divided into 81 geographic provinces, which are further sub-divided into districts. It is possible to divide the institutions involved in the city administration of Turkey into two, as local governments are appointed from the central government and elected local governments.

The local central administrations are the city governorship and district governorship. There is one Governor of Izmir also known as Vali and there are 30 district governors known as Kaymakam. On the other hand, the local governments elected by the votes of the people are municipality majors and the neighborhood level local authorities called as mukhtars.

[97] Öztürk and Reilly, "Assessing Centralization."

are made by the president. These appointments were previously made by the Council of Ministers.

Turkey's President Recep Tayyip Erdoğan made a speech at the World Climate Action Summit held as part of the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28) in Dubai. Addressing the World Climate Action Summit, President Erdoğan said: "Although our historical responsibility for the greenhouse gas emission is below 1 per cent, we take very significant steps by using our own means. We plan to achieve the net zero emission target by 2053."[98] Although many other countries are targeting 2050, Turkey seems to have set its sights on 2053, which might be seen as an odd date, three years later than the global trend. The year 2053 holds significance in the president's vision and propaganda. Erdogan also occasionally mentions 2053, commemorating the 600th anniversary of the fall of Constantinople, as well as 2071, which will mark the millennium of the arrival of the Seljuks in Anatolia.

In Turkey's increasing centralized regime, the form of strong mayor-weak council has been in effect for decades.[99] The latest Turkish local elections were held on March 2019. A total of 30 metropolitan and 1,351 district municipal mayors were elected. The ruling party in the current session of the Turkish Parliament is Justice and Development Party (JDP), which is a conservative party lead by President Recep Tayyip Erdoğan. The mayor of Izmir Metropolitan Municipality and majority of the Municipal Council was elected from the Republican People's Party (RPP), which is the main opposition. Likewise, most Izmir district municipalities mayors are elected from the Republican People's Party. Izmir continued to be ruled by the opposition party. There are 24 RPP, 4 JDP, 2 other party elected mayors in 30 districts of Izmir. In addition,

[98] Presidency of The Republic of Turkey, "'We plan to achieve the net zero emission target by 2053.'"
[99] İkizer, "Weakening the Strong Mayor."

there is a centrally appointed Governor and there are 30 centrally appointed district governors in Izmir.

Tunç Soyer from RPP, was elected as the Mayor of Izmir Metropolitan Municipality in the local elections of March 2019. Before the IMM elections Soyer had played a significant role in establishing an active holiday village in Seferihisar in 1991, contributing to the tourism development of Izmir. In 2009, Soyer was elected as the Mayor of Seferihisar and served two terms. He introduced the "Citta Slow" (Slow City)[100] movement, aiming to promote small towns and boost their economies internationally. He expanded the movement to seven different regions of Turkey. Soyer held various positions, including Deputy President of the World Cittaslow Association in 2013, member of the Executive Bureau of United Cities and Local Governments (UCLG) in July 2019, and Vice President of the Congress of Local and Regional Authorities of the Council of Europe in October 2019.[101] In this moment It is essential to revisit the topic introduced in the first chapter concerning the Climate Heritage Network (CHN), while in 2021, the draft report on "The Role of Culture in Climate Resilient Development" was deliberated at the local government level during the 4th UCLG Culture Summit held in Izmir and hosted by IMM. [102] [103] The discourse on the climate change heritage nexus at the municipal level marked an uncommon advancement within the Turkish context, an achievement largely facilitated by Soyer's international engagements.

[100] Cittaslow International is a worldwide network of towns (see www.cittaslow.org). Founded October 15, 1999 in Orvieto (Italy), Cittaslow (or Slow Towns) is a non-profit Association that brings together Mayors of small and medium-sized towns. Metropolises, regions, parks, associations of municipalities, etc. can also join as Supporters. Cittaslow cannot exist without the active contribution of local entities, traders, craftsmen, farmers, schools, volun-tary associations, etc. The primary objective is to preserve the spirit of community and at the same time transmit knowledge to the new generations to make them aware of their cultural heritage. Cittaslow International, "Cittaslow: International Network of Cities Where Living Is Easy."

[101] Tunç Soyer, "About Me: Tunç Soyer."

[102] Potts, "The Role of Culture in Climate Resilient Development."

[103] International Society of City and Regional Planners (ISOCARP), "Climate Heritage Mobilization at Global Climate Action Summit 2018 Heritage."

Contrary to Erdoğan's vision targeting 2053 Izmir targeted 2050 to be carbon neutral. IMM prepared plans, strategies, projects and new regulations for climate adaptation and mitigation such as Izmir Sustainable Energy and Climate Action Plan, 2020 (Izmir SECAP), Izmir Green City Action Plan, 2020 (Izmir GCAP). Soyer nominated the Izmir as a Citta Slow Metropol.[104] Due to these efforts, Izmir has been selected for the Climate Neutral and Smart Cities Mission of the European Union for 2050.

[104] Cittaslow Turkey, "Cittaslow Metropolis."

Waterbodies of Izmir for Climate Heritage Action

The interconnectedness of natural landforms, climate change, cultural heritage, urban management, and communities in Izmir is evident in the city's waterbodies particularly in streambeds and the bay. These waterbodies represent tangible and intangible 'heritage nature-culture' corridors, forming interconnected networks that extend across urban and rural areas. The context of the case studies in this thesis are climate-heritage actions shaped around waterbodies of Izmir's central districts.

Heritage

Izmir has a diverse heritage context. Undertaking a comprehensive analysis of all aspects of Izmir's heritage presents a formidable challenge, considering the city's intricate and multifaceted cultural landscape. Through my analysis in Izmir's central districts within a climate-heritage context, I have been able to distinguish the diverse 'layers'[105] that form the framework of urban heritage including landforms, biodiversity, communities including social minorities and majorities, historic neighborhoods, culinary traditions, the traces of the Turkish nation building process, maritime infrastructures and buildings from the industrial past as well as, trade and cultural routes and international social networks and the living customs of the people.

'Dialogical model of heritage'[106] prompt me to inform that the compilation of heritage layers above is not exhaustive, as urban heritage encompasses a multitude of facets beyond those

[105]The HUL approach is a way of understanding urban heritage as part of a landscape or system composed of different elements and layers. UNESCO, "Recommendation on the Historic Urban Landscape."

[106] Rodney Harrison, *Heritage: Critical Approaches*.

identified here. The listing of these layers was not intended to establish a hierarchy among not listed here. However, through my fieldwork and interviews, it became evident that discussions regarding Izmir's urban heritage predominantly focus on these layers.

I've analyzed these layers of heritage of Izmir because they are all connected to the city's water bodies. Water bodies have been integral to Izmir's cultural heritage and cultural memory, serving as gathering places and vital water sources for daily activities, agriculture, and industry. They played a significant role in the city's history, with early settlements often situated near them. Moreover, beyond their cultural and historical significance, water bodies in Izmir are crucial components of the city's natural environment, supporting diverse ecosystems.

Climate

Through a review of relevant scientific papers, project reports, and my interviews with municipal experts, the following climate challenges affecting water bodies in Izmir's central districts have been revealed. These challenges could be addressed at multicounty regional, national, and metropolitan level.

Firstly, there are regional issues. Izmir is a growing city and a vital economic hub in Mediterranean. [107] The Mediterranean Basin is one of the most sensitive regions on the planet due to adverse effects connected to global climate change.[108] [109] Climate change strongly affects other environmental problems in the Mediterranean Basin, resulting from urbanization, land use change, overfishing, pollution, biodiversity loss and degradation of land and marine

[107] With a GDP per capita exceeding the national average, reaching 462 billion TL in 2021, Izmir contributes significantly to Turkey's economic output, accounting for an average of 6.12% of the total GDP. Additionally, by generating 9.3% of the country's industrial production. Izmir Development Agency (IZKA), "Strong Economy."

[108] Ministry of Environment and Urbanisation, "Turkey's National Climate Change Adaptation Strategy and Action Plan 2011–2023."

[109] Giorgi and Lionello, "Climate Change Projections for the Mediterranean Region."

ecosystems.[110] Heritage practices in Mediterranean Region needs to assert their relevance in climate change debates.

Surrounded by three continents and bordered by more than twenty countries, the Mediterranean represents a wide cultural basin that shares the same sea, fostering intense interaction among different countries. The region has seen continuous change in human activities and now hosts more than 500 million people with a high concentration of urban settlements and industrial infrastructure located close to sea level.[111] The region is the world's leading tourist destination and one of its busiest shipping routes.[112] Mediterranean countries are overexploiting water resources, and water scarcity is a crucial problem that is expected, in many cases, to worsen in the future.[113] The rising level, temperature, and salinity of the Mediterranean Sea could alter its circulation patterns, making it challenging to forecast future impacts, with potential repercussions extending to the global scale through its connection with the Atlantic Ocean.[114]

Figure 4. Izmir's location among Mediterranean countries.[115]

[110] Calvin et al., "IPCC, 2023," CCP4.1.1.

[111] Calvin et al., "IPCC, 2023."

[112] Calvin et al.

[113] Lionello, *The Climate of the Mediterranean Region*.

[114] Lionello.

[115] Akkaya, "Izmir's Location among Mediterranean Countries. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality GIS Directorate and OpenStreetMap Contributors."

Secondly there are national issues. In last five year the irreversible effects of the climate crisis in Turkey are experienced with the Mediterranean and Aegean Region affected by forest fires, floods and drought.[116] The IPCC's Fourth Assessment Report forecasts a 1˚C - 2˚C temperature rise in the Mediterranean Basin, leading to increased aridity and more frequent heat waves, particularly in inland regions. Turkey's temperatures are expected to increase by an average of 2.5°C - 4°C, up to 5°C in inner regions and by 4°C in the Aegean Region and Eastern Anatolia.[117] This suggests Turkey will experience hotter, drier conditions and more unstable precipitation patterns in the near future, according to various scientific modeling studies.

Lastly there are metropolitan level issues. Izmir, with its diverse landscapes ranging from urban areas to rural countryside, hosts a network sub-centers with complementary functions including agriculture, tourism, industry, port operations, and commerce. Izmir has expanded and there were significant changes in land cover and the urban fabric during the period from 1963 to 2009. The built-up area increased from 8.2 % to 28.9 %, primarily at the expense of agricultural land.[118] I have observed and analyzed that this urban sprawl, driven by rapid development, exerts considerable pressure on its sensitive coastal wetland ecosystems leading to their degradation and loss.[119]

As regards issues on metropolitan lands, urban sprawl, poorly planned urbanization, and high population and built density contribute to the heat island effect. Urban growth is amplifying challenges in water bodies and their water management. As regards metropolitan level issues related to water, droughts, flooding, and sea level rises are prominent concerns. As regards

[116] Akkaya et al., "Cultural Heritage as a Resource for Resilience in the Climate Crisis (İklim Krizinde Dayanıklılık için Kaynak Olarak 'Miras')."

[117] Nuran Talu et al., "Enhancing the Capacity of Turkey to Adapt to Climate Change: Participatory Vulnerability Analysis."

[118] Hepcan et al., "Analyzing Landscape Change and Urban Sprawl in a Mediterranean Coastal Landscape."

[119] Izmir Development Agency (IZKA), "Izmir Regional Plan 2014 - 2023."

issues with air quality, extreme weather events, temperature rises and air pollution represent significant challenges. Climate vulnerabilities of Izmir include climate risk exposures such as heatwaves, prolonged periods of warmth, drought, and extreme winds. Izmir's geographical sensitivity exacerbates water stress, drought risk, soil degradation, water and soil pollution. These vulnerabilities are further heightened by the risk of earthquakes. Particularly, coastal communities and low-income areas in precautionary neighborhoods, as well as livelihoods in wetlands, are significantly affected by these vulnerabilities.

Actions

IMM acknowledges water bodies as crucial components in climate action. Water bodies are integral to at least seven climate actions outlined in the Izmir Sustainable Energy and Climate Action Plan (SECAP).[120] These actions include facilitating more sustainable waste management, water cycle management, addressing the urban heat island effect, implementing strategies for urban greening, protecting, restoring, and regulating the natural environment and ecosystems, reducing pollution, and fostering cross-sector collaboration.

There is a growing recognition to conserve and restore these waterbodies. IMM aims to protect waterbodies through water treatment, water re-use, water quality monitoring, sewage and rain water separation and habitat restoration projects.[121] Additionally, efforts are underway to integrate streams into urban planning and design, fostering green spaces, recreational amenities, urban gardens and cultural routes along stream corridors (see Figure 5).[122] [123]

[120] Izmir Metropolitan Municipality, "Izmir Green City Action Plan 2021-2030."

[121] IZDOGA Expert, Personal Interview 1 with IZDOGA (Izmir Metropolitan Municipality Environmental Protection, Improvement, Consultancy, and Project Services Trading and Industry Inc.).

[122] IZDOGA Expert.

[123] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

Swimming in the bay holds significant importance in the memories of Izmir citizens. However, due to water pollution, swimming is currently not feasible. Water infrastructure projects are part of IMM initiated Izmir Living Bay Program to tackle with the pollution of the Izmir Bay and reduce carbon emissions while integrating the water bodies into Izmir's cultural and recreational routes, known as Izmir's IzHeritage Routes and Izmir Living Parks (see Figure 6).[124] [125] Water projects also support Cittaslow neighborhood programs, which aim to promote community and heritage-oriented neighborhood regeneration.[126] Lastly, water projects also support slum area regeneration with the aim of earthquake risk reduction.

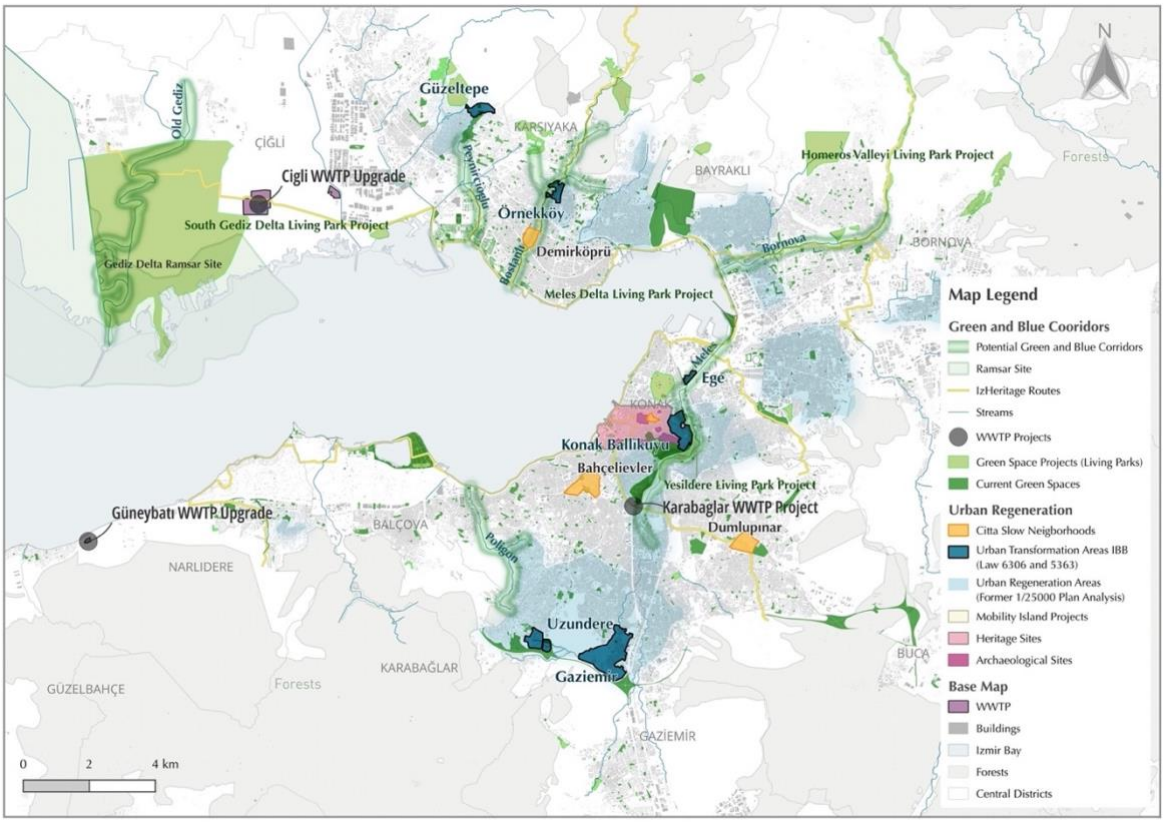

Figure 5. The different layers of IMM's strategies for climate heritage action.[127]

[124] These routes encompass biking paths and recreational areas, including wildlife parks, birdwatching spots, the zoo, and boat tours.

[125] Parks and Gardens Department Expert, Personal Interview 17 Izmir Metropolitan Municipality Parks and Gardens Department.

[126] Cittaslow Project Expert, Personal Interview 8 with Cittaslow Izmir Unit of Izmir Metropolitan Municipality.

[127] Akkaya, "The Different Layers of IMM's Strategies in the Context of Heritage and Climate Action. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality; Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks; and OpenStreetMap Contributors."

IMM frequently incorporates heritage narratives into its projects concerning water bodies. These narratives often revolve around collective memories such as stories about ancient river beds, historical figures, local horticultural heritage, swimming and fishing. The subsequent section, which features three case studies, will further explore these issues by addressing questions such as: What climate heritage aspects are included? Why is heritage being managed or utilized? Who are the stakeholders involved? What climate heritage aspects are excluded, and who are the ones left out?

Çiğli Wetland

In Izmir's central districts, the landscape encompasses various geomorphologies, including bays, mountains, wetlands, streams, valleys, coastlines and islands all of which constitute fundamental elements of the city's cultural landscape.[128] [129] One of this landforms, Gediz Delta including Çiğli Wetland is a protected nature site in the midst of climate and heritage actions.

In the following parts I examined the IMM's projects in Çiğli wetland targeting water management, with an urban water metabolism framework. Çiğli is a district on the northwest side of Izmir Bay, home to one of Izmir's most important natural sites. The Çiğli wetland is situated within the expansive Gediz Delta. The delta consists of shallow waters and fisheries abundant in fish and birdlife, as well as salt marshes, coastal lagoons, and streams.[130] The biodiversity of Çiğli encompasses a diverse range of vegetation and animal species. Pollution[131] and expansion from urbanization poses threats to the integrity of these landscapes and species.

[128] IZDOGA Expert, Personal Interview 1 with IZDOGA (Izmir Metropolitan Municipality Environmental Protection, Improvement, Consultancy, and Project Services Trading and Industry Inc.).

[129] Izmir Metropolitan Municipality, "Izmir's Strategy for Living in Harmony with Nature 2021-2030."

[130] Ahmet Karataş, Erol Kesici, and Levent Erkol, "Assessment of Izmir Gediz Delta According to UNESCO World Heritage Criteria."

[131] Uluturhan Suzer, Kontaş, and Yılmaz, "Assessment of Heavy Metal Pollution of Surface Sediments from Lagoon Areas of Gediz Delta (Izmir Bay)."

At least 211 bird species including flamingos inhabiting the Gediz Delta wetlands.[132] 5% of the world's flamingo population lives in Izmir's largest wetland, the Gediz Delta.[133] The delta was designated as a Ramsar site in 1998. In November 2019 an official application was submitted by IMM to the MoEUCC (Ministry of Environment, Urbanization and Climate Change) to be inscribed to UNESCO World Nature Heritage Site.

Flamingos, Sewage Sludge and WWTP

Çiğli is an area is 'operationalized'[134] to function the city of Izmir. The largest wastewater treatment plant (WWTP) in Izmir is situated at the center of the Çiğli Wetland. Known as the Çiğli WWTP, it treats 90% of Izmir's wastewater.[135] IMM is aware that such a centralized water treatment plant situated in a naturally sensitive place has its disadvantages.[136] IMM has an investment program for Çiğli WWTP to increase the plant's capacity and condition, to redirect the discharge channel to restore the old watercourse, introduce a new discharge sludge drying unit, and to ecologically restore the sludge stockpiles.[137] These projects aim to enhance the plant's functionality while integrating the area into Izmir's cultural and recreational route, known as Izmir's IzHeritage routes[138] and Izmir living parks with the potential for the delta to be listed as a World Heritage Site (see Figure 6).

[132] Mehmet Sıkı, "The birds of Gediz Delta (Izmir Bird Paradise)."

[133] Izmir Metropolitan Municipality, "Izmir's Strategy for Living in Harmony with Nature 2021-2030," 8.

[134] "The spaces of the non-city have been continuously operationalized in support of city-building processes throughout the global history of capitalist uneven development." Brenner, "The Hinterland Urbanised?," 123.

[135] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[136] IZSU Wastewater Treatment Unit Expert.

[137] Expected cost of Çiğli projects is approximately 250 million euros. IMM seeking foreign credits to implement the Çiğli projects. IMM inscribed Çiğli projects in the Turkey presidential investment program, which seeks national and international financial resources for large-scale projects. Since 1963, Turkey has had an Investment Program, but with Turkey's transition to the presidential system in 2018, municipal projects seeking international funding, such as the Çiğli projects, require presidential approval.

[138] These routes encompass biking paths and recreational areas, including wildlife parks, birdwatching spots, the zoo, and boat tours.

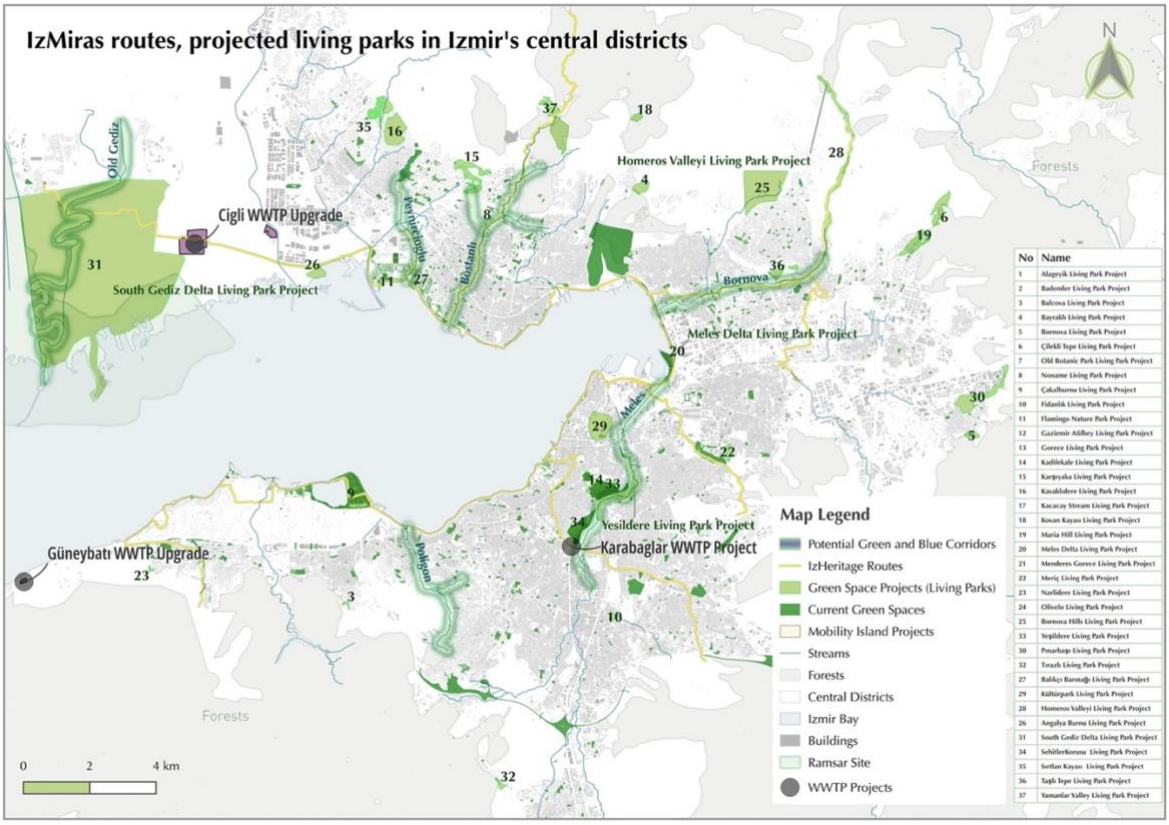

Figure 6. IzHeritage routes, projected living parks in Izmir's central districts.

The initial project of IMM is to complete the Çiğli WWTP 4th Phase to restore the quality of treated water. Çiğli WWTP is operating at its maximum capacity with frequent pollution discharges in the environment due to hydraulic overloads especially during rains, as the sewerage and storm water drainage networks are combined in most parts of Izmir.[139] Çiğli Wastewater Treatment Plant, was completed in 2000 (see Figure 7). It consists of 3 lines (phases) with a total treatment capacity of 604.800 m³/day.[140] An additional 4th phase was projected in the early 2010s in order to allow annually maintenance of the lines and to cope with the future wastewater loads from the increase of population. Works started in 2013 financed by an IFC (International Finance Corporation) loan. However, during the implementation of the project, the maximum available budget has been reached before the

[139] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[140] IZSU, "Çiğli Wastewater Treatment Plant."

completion of works which has been stopped at the structural works stage. In 2023, a new tender was launched for the completion of works of the 4th phase of Çiğli WWTP.

Figure 7: Çiğli Wastewater Treatment Plant, behind Çiğli Wetland. [141]

The sludge stockpiles in the WWTP plant are full and create other ecological problems. The year's wastewater sludge is stocked and creates a heavy smell and mosquito infestation. This is addressing approximately 2.5 million cubic meters of sludge spread across an expansive area of 1 million square meters.[142] The smell spreads tens of kilometers from the facility to the central areas of the cities. Academicians from the Izmir Institute of Technology have done technical suitability reports for the on-site rehabilitation of the sludge stock areas at the Çiğli Wastewater Treatment Plant.[143]

The other project of IMM is the rehabilitation and enhancement of Çiğli WWTP existing sludge digestion and drying units. The existing Çiğli Sludge Digestion and Drying Unit was

[141] Akkaya, *Çiğli Wastewater Treatment Plant*.

[142] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[143] IZSU Expert 2, Personal Interview 13 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

commissioned in 2013. The unit was operated for a long period of time, but then it was deactivated after a while due to breakdowns and maintenance difficulties, especially in the sludge drying unit. In order to meet the more stringent landfilling standard, the moisture content of the sludge needs to be further reduced.[144] At present, the sludge taken from the pre-sedimentation and final sedimentation tanks is dewatered by centrifugal decanters to 20-25% solids content and then removed from the plant with trucks.[145] The aim of this project is to rehabilitate and/or renew the sludge digestion and drying units and to ensure that the sludge produced in the plant is disposed of with at least 90% solids content. The reduction of energy consumption and greenhouse gas (GHG) emissions has become a significant global concern in cement production, which consumes a large amount of energy.[146] IMM aims to provide a better solid content to cement factories near Izmir.

Izmir faces the imminent threat of hydrological drought, which jeopardizes agricultural productivity, industrial operations, household's usage. This is accompanied by decreasing water tables and increasing salination, as well as an increased consumption of groundwater during long and dry summers.[147] [148] [149] Droughts also result in degradation of the wetland ecosystems, contributing to the extinction of species and accelerating biodiversity loss, particularly in response to rising seawater temperatures. The Gediz Basin, closely linked to the city of Izmir, is already experiencing water scarcity as a result of rising water needs. The effects of climate change are anticipated to aggravate this issue further.[150]

[144] Ping et al., "Feasibility and Carbon Footprint Analysis of Lime-Dried Sludge for Cement Production."
[145] IZSU Expert 2, Personal Interview 13 with IZSU (Izmir General Directorate of Water and Sewerage Administration).
[146] Ping et al., "Feasibility and Carbon Footprint Analysis of Lime-Dried Sludge for Cement Production."
[147] Şerif Hepcan et al., "URBAN GreenUP Report on the Diagnosis of Izmir."
[148] Dabanli, "Drought Risk Assessment by Using Drought Hazard andVulnerability Indexes."
[149] Mersin et al., "Drought Assessment in the Aegean Region of Turkey."
[150] Ozkul, "Assessment of Climate Change Effects in Aegean River Basins."

The Çiğli wastewater reuse project aims to address various environmental challenges and promote sustainable water management practices. This project seeks to create alternative water resources and reduce the depletion of existing groundwater and surface water sources. Additionally, the project aims to adapt local agriculture to the effects of climate change. The project involves the reuse of treated wastewater from the outlet of the Çiğli WWTP for multiple purposes, including irrigation of urban green areas, agricultural irrigation across six districts (Menemen, Çiğli, Karşıyaka, Bornova, Bayraklı, Konak), environmental uses within the Gediz Delta during non-irrigation periods, and meeting the internal water demand of the Çiğli WWTP.[151]

Old River Bed and Fisheries

Two connected projects involved in the Çiğli program are restoration of an old riverbed and a fishery. One is redirecting the discharge channel of the Çiğli WWTP to revive the Gediz's old river bed with the treated water from Çiğli. This project uses river's historical bed as a heritage narrative. The second project involves the restoration of the Çilazmak lagoon islands and fisheries at the mouth of the old Gediz riverbed. This project uses the fishing culture and protecting bio-diversity as heritage narrative.

Within the Çiğli wetland, from north to south, there are small island systems which are debated to be lagoons or fisheries, namely Kırdeniz, Homa, Çilazmak, and Ragıp Pasa.[152] The difference lies in lagoons being natural formations, whereas fisheries are human interventions for fishing. The Izmir Bay lagoons lost their natural characteristics over time.[153] There were human

[151] Climate Change and Zero Waste Department Expert, Personal Interview 11 Izmir Metropolitan Municipality Climate Change and Zero Waste Department.

[152] Tağil, Alevkayali, and Aytan, "Assessment of Shoreline Evolution and Erosion Sensitivity Along the Gediz Delta Wetland (Gediz Deltası Sulak Alanı Boyunca Kıyı Şeridi Evrimi ve Erozyon Hassasiyetinin Değerlendirilmesi)."

[153] Zafer Tosunoğlu, "The Coastal Fisheries of Izmir."

interventions to protect the lagoon island systems and fisheries due to rising water levels and salinization.[154] Using fill materials in the sea and conducting bottom surveys related to water depth are artificial interventions aimed at controlling the depth of the water. However, there were no effective human interventions and measures taken to protect Çilazmak Lagoon. There has been a significant loss of Çilazmak lagoon islands over the span of seven decades. The figure below depicts a geoprocessed map of the Çilazmak lagoon islands in 1953 (see Figure 8). The barely visible black areas illustrate the current state of the lagoon islands.

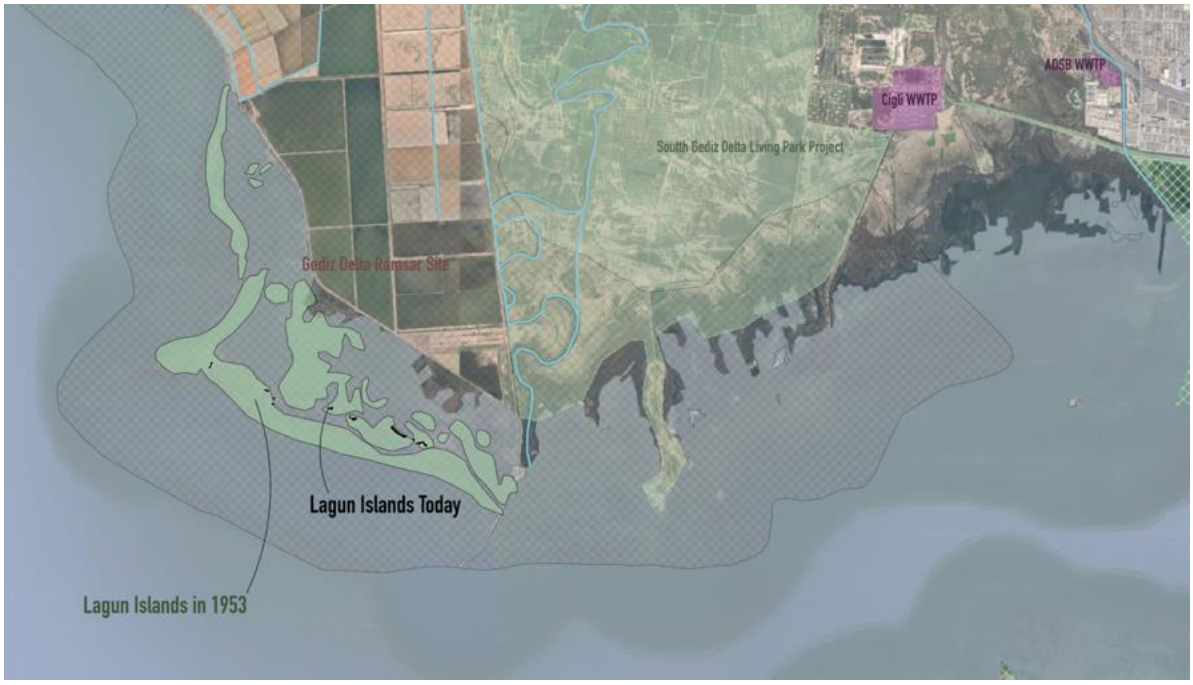

Figure 8. Çilazmak Lagoon islands in 1953 compare to 2023 and old Gediz river course.[155]

The Çiğli wetland previously served as the old river course of one of Izmir's largest river, Gediz. However, in 1886, due to the threats of flooding and the accumulation of alluvial deposits that obstructed passage to Izmir Bay, one of the Ottoman Empire's most significant river projects was initiated. The watercourse of the river was diverted to Aliağa Bay located 20 km north of

[154] Izmir Metropolitan Municipality, "The Izmir Bird Paradise."

[155] Akkaya, "Lagun Islands in 1953 Compare to 2023. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality and OpenStreetMap Contributors."

the original water course of the Gediz river. Currently, treated wastewater from the Çiğli Wastewater Treatment Plant is released into the Bay of Izmir via a 2.5 km long, 8 m wide, and 2 m deep reinforced concrete transmission line (see Figure 9).[156] To alleviate pressure on the existing discharge point, located in a shallow area of Izmir Bay, mitigate odor issues and pollution, and counteract ecological damage caused by salinity, the treated wastewater will be rerouted to the former Gediz riverbed.[157]

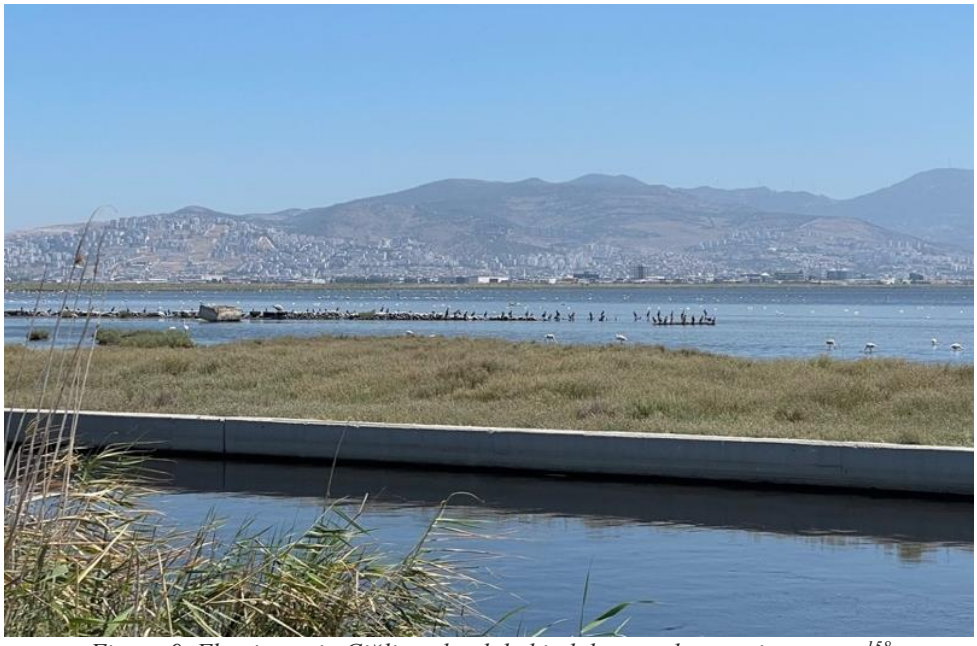

Figure 9. Flamingos in Çiğli wetland, behind dense urban environment. [158]

This intervention is associated with the restoration of the Çilazmak Lagoon, which aims to address degradation caused by issues such as shallowing and sediment accumulation in the lagoon. As part of the project, sediments accumulated in Izmir Bay due to the shallowing of the Gediz River will be collected through underwater sediment removal activities in the Circulation

[156] IZSU, "Ciğli Wastewater Treatment Plant."

[157] IZSU Expert 2, Personal Interview 13 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[158] The first layer in this photograph is a humanmade concreate canal where the wastewater treatment plants discharge the residual water. The next layer consists of various bird species, followed by Izmir Bay. Beyond Izmir Bay, you will observe the dense urban area of Izmir. Further off in the background are the mountains. Akkaya, *Pelicans and Other Bird Species in Çiğli, Gediz Delta*.

Canal.[159] [160] These sediments will then be pumped into the Çilazmak Lagoon for coastal reinforcement. These sediments together with the revised river bed will contribute to the rejuvenation of the lagoon. These two projects excepted to have a positive impact for fish stocks and nature tourism in the lagoon.[161] [162]

Forgotten Industrial Past: Çamaltı Saltworks

The Çamaltı Saltworks was located only 4km west of the Çiğli WWTP and parallel to Çilazmak Lagoon Islands. In all heritage narratives surrounding the Çiğli water management projects, I noted the absence of the Çamaltı Saltworks during my site observations. Çamaltı Saltworks is a place where salt is produced on an industrial scale using salt pools and industrial equipment, with the assistance of sun and wind.

Çamaltı Saltworks has 161 years of industrial past. It was opened for operation in 1863 during Ottoman period by Italians. During Turkish Republic Period the operation was transferred to *Tekel* (the state monopoly) in 1933.[163] Çamaltı Saltworks operation was privatized under the contract signed with the Privatization Administration Presidency of the Republic of Turkey in April 2010.[164] [165] The salt works increased its capacity since it started to operate. Today, Çamaltı Saltworks, situated on a 73 square kilometer area in the delta of the Gediz River, is the largest sea salt works in Turkey.

[159] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[160] IZSU Expert 2, Personal Interview 13 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[161] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[162] IZSU Wastewater Treatment Unit Expert.

[163] Edis Koru, "Artemia and It's Importance in Çamaltı Saltworks (Izmir, Turkey) Ecosystem."

[164] The privatization of the Çilazmak Saltworks created significant political criticism in Turkey.

[165] Binbir Gıda, "About."

Figure 10. Wooden structures in Çamaltı Saltworks. [166]

The produced salt was collected on salt mountains, with transportation facilitated by trucks organized by excavators. Within the saltworks, there were remnants of old wooden constructions. Salt production occurred utilizing salt lakes situated at varying elevations. The presence of numerous flamingos was observed in these lakes, and it was subsequently learned that the shallow salt lakes provided an ideal feeding habitat for them.[167] The landscape was characterized by a juxtaposition of birds, salt lakes, machinery, salt mountains, and the distinct smell emanating from the Çiğli Wastewater Treatment Plant's sludge, offering a panoramic view of the low-height vegetation in the area.

The structures, machinery, and industrial facilities observed during the survey possess notable historical significance and may qualify for designation as industrial heritage sites. Additionally, the Çamaltı Saltworks, characterized by its expansive landscape featuring salt lakes, mountains, and diverse wildlife such as flamingos, represents a unique intersection of industry and natural

[166] This picture is taken from my field observation to Çamaltı satworks. It was a rainy day. I have encountered many flamingos feeding in the salt lakes. Akkaya, *Wooden Structures in Çamaltı Saltworks*.

[167] Casler, Esté, and Este, "Caribbean Flamingos Feeding at a New Solar Saltworks in Western Venezuela."

environment (see Figure 10). This suggests that Çamaltı Saltworks could be considered for recognition as an industrial heritage site within a designated nature conservation area.

Meles Stream

The Meles Stream, also known as Yeşildere, holds a significant place in the historical narratives of Izmir. Meles Stream passes through the foothills historical and contemporary neighborhoods. Repeatedly mentioned in historical texts as 'The River Meles,' it has been revered as a watercourse of historical importance since ancient times, often associated with the Homer. From its prominence in the 19th century as a route for travelers and commercial activities to its current state affected by urbanization and pollution, the Meles Stream has undergone notable changes.[168]

Despite these challenges, there is an ongoing effort by IMM to restore the Meles Stream's ecological integrity and cultural significance. This effort includes spearheading the Yeşildere Living Park project and hosting the International Horticulture Expo 2026.[169] The Horticultural Expo 2026, an international event to be held in Izmir, has been approved by the International Association of Horticultural Producers (AIPH).[170] The expo aims to attract 4.7 million visitors and will include more than 200 events and more than 100 conferences and workshops.[171]

IMM strategically incorporates climate and cultural heritage narratives into the themes, strategies, and communication of the Horticultural Expo 2026. Centered around the tagline of "Living with Harmony," the first themes of the expo is origins of horticulture. This is highlighting the plant species indigenous to the region, the expo will introduce these floras to

[168] Çiğdem Kılıçarslan and Bülent Özkan, "From Past to Extant The River Meles."
[169] IZFAS Expert, Personal Interview 5 with IZFAS Izmir Fair Services Culture and Art Works Trade. Inc. of Izmir Metropolitan Municipality).
[170] AIPH was established in Switzerland in 1948. In 2013, AIPH was incorporated in Brussels as an international non-profit association.
[171] Rachel Wakefield, "Expo 2026 İzmir Promises to Connect Its Past with a 'Nature-Based' Future."

the global stage as new ornamental plants, showcasing the area's horticultural heritage. The second theme is seed resilience. This theme is dedicating a section to the philosopher Anaxagoras of Izmir, Urla, renowned for his early definition of seeds as fundamental substances on earth, innovative projects will be showcased to protect seeds within the evolving global economic system. A display area resembling Noah's Ark will exhibit seeds, symbolizing preservation and resilience. The third theme is climate resilience. With Mediterranean cities like Izmir facing escalating water stress, the expo addresses future landscape challenges by advocating for climate-friendly landscaping practices.

Initiating with the expo, IMM proposes to establish a green space system along the Meles Stream and other existing open areas. Additionally, it aims to integrate the city's cultural and natural elements, such as the Vezirsuyu Aqueducts, Kadifekale, Halkapınar Spring, and Wells.

Figure 11. Kızılçullu Aqueducts on the front and Kadifekale on the hill ahead.[172]

[172] Levantine Heritage Foundation, *Aqueduct from the Brian de Jongh Collection.*

Evacuation and Expropriation in the Valley of Slums

The expo 2026 will be held in a large area covering 100 hectares along the Meles Stream. It's essential to understand two key aspects of the Izmir landscape: traditional neighborhoods or *mahalles*, and informal settlements known as *gecekondu*. Because the expo site which will integrate the built area evacuated on the south of Kadifekale.

Kadifekale is in the Tentative list of UNESCO World Heritage Site as one of the neighbors of the Historical Port City of Izmir.[173] "In a single day and in Izmir, one can relive 8500 years of history".[174] From the Neolithic settlement at Yeşilova tell to Old Smyrna, and from Helleno-Roman Smyrna to the modern city, the four historical faces of Izmir will be chronologically and briefly described.[175]

Figure 12. Children play amidst the ruins of Helleno-Roman Smyrna in Kadifekale.[176]

[173] UNESCO, "The Historical Port City of Izmir."

[174] Izmir Foundation, "8500 Years in a Single Day."

[175] Derin, "Human Existence in Smyrna during the Pre-Historic Era."

The Meles Stream corridor is the place to follow all these layers. Neighborhoods in Meles, such as Kadifekale, encompass not only areas of archaeological significance, ancient cities, and historical centers but also vibrant living communities (see Figure 12). Known as *mahalle* in Turkish, these living spaces, whether translated as quarters or neighborhoods, are integral to Izmir's urban fabric.[177] Defined by shared amenities, and interpersonal connections, this heritage form reflects the living urban culture.

Neighborhoods in Izmir are segregated based on income and social status. They nevertheless function as conduits for interpersonal connections. Izmir experienced the intense wave of internal migration that has been faced by all large cities in Turkey since the 1950s.[178] Izmir's rapid population growth, the urgent need for housing combined with a lack of government control and poor urban planning has led the Meles Stream corridor being affected by illegal housing. It is revealed that the rate of informal construction in Izmir is approximately 65% (see Figure 13).[179] Due to these factors, *gecekondu*, which could be translated slums are formed. *Gecekondu* was the responses of the people who need housing due to lack of the state capability of responsible for the housing production.

The urban fabric where informal construction is observed has been legalized through various legal regulations or temporary usage permits. The dominance of irregularly developed areas or new, developed areas over the irregular parceled structures as well as inadequacies due to the

[176] The first layer of this photograph depicts the Helleno-Roman Smyrna ruins, a protected area. However, children somehow find their way inside and transform it into a playground. Beyond the ruins, you can see the Kadifekale neighborhood, followed by Konak, Izmir's most important center. Akkaya, *Children Play Amidst the Ruins of Helleno-Roman Smyrna in Kadifekale*.

[177] Ekşioğlu Çetintahra and Karataş Ünverdi, "Reflections of the Socio-Economic Structure of Izmir Neighborhoods on Space from the Ottoman Period to the Present (Osmanlı'dan Günümüze İzmir Mahallelerinin Sosyo-Ekonomik Yapısının Mekana Yansımaları)."

[178] Izmir Development Agency (IZKA), "Izmir Regional Plan 2014 - 2023," 129.

[179] Selahattin Varan, "Urban Transformation Practices of the Ministry of Environment and Urbanization."

physical and technical deficiencies of the existing building stock mark important problems within this built environment. Izmir became an uneven developed city (see Figure 17).

These urbanization dynamics has impacted the Meles Stream, leading to the development of slums and industrial infrastructure along its banks, while pollution has degraded its water quality. The Grand Canal Project, developed by IZSU in the early 2000s to prevent floods, involved the conversion of the Meles Stream into a concrete canal, resulting in a complete disruption of its natural relationship with the surrounding environment and soil (see Figure 15).[180] Consequently, the river has lost its natural characteristics and now resembles more of a valley of *gecekondu*.

One of the areas where the expo will be held is an evacuated gecekondu area. Due to the earthquake and landslide risks, some gecekondu areas at the foothills of Kadifekale were declared urban renewal zones, and their lands were evacuated. Izmir is located on seismically very active ground that makes the city susceptible to earthquake hazards. According to Turkey Earthquake Hazard Map published in published in 2018, Izmir is located within the 1st grade seismic zone.[181] Therefore, while structural safety is of vital importance, it appears that a significant amount of building stock is concentrated on unstable land with high earthquake and landslide risks. The recent earthquake on 30 October 2020 brought to light a long-standing problem of the building stock in the city and the need for regeneration as mentioned in the IMM strategic plan of 2020-2024.[182] Currently, due to poor living conditions and the risk of earthquakes, the primary challenge faced by various levels of governmental institutions, from

[180] IZDOGA Expert, Personal Interview 1 with IZDOGA (Izmir Metropolitan Municipality Environmental Protection, Improvement, Consultancy, and Project Services Trading and Industry Inc.).

[181] The Disaster and Emergency Management Authority (AFAD) of Turkey, "Türkiye Earthquake Hazard Map."

[182] Izmir Metropolitan Municipality, "Izmir Metropolitan Municipality Strategic Plan 2020-2024."

ministries to municipalities, is to transform these vulnerable areas (former and current *gecekondu* areas) into safe living environments (see Figure 13).

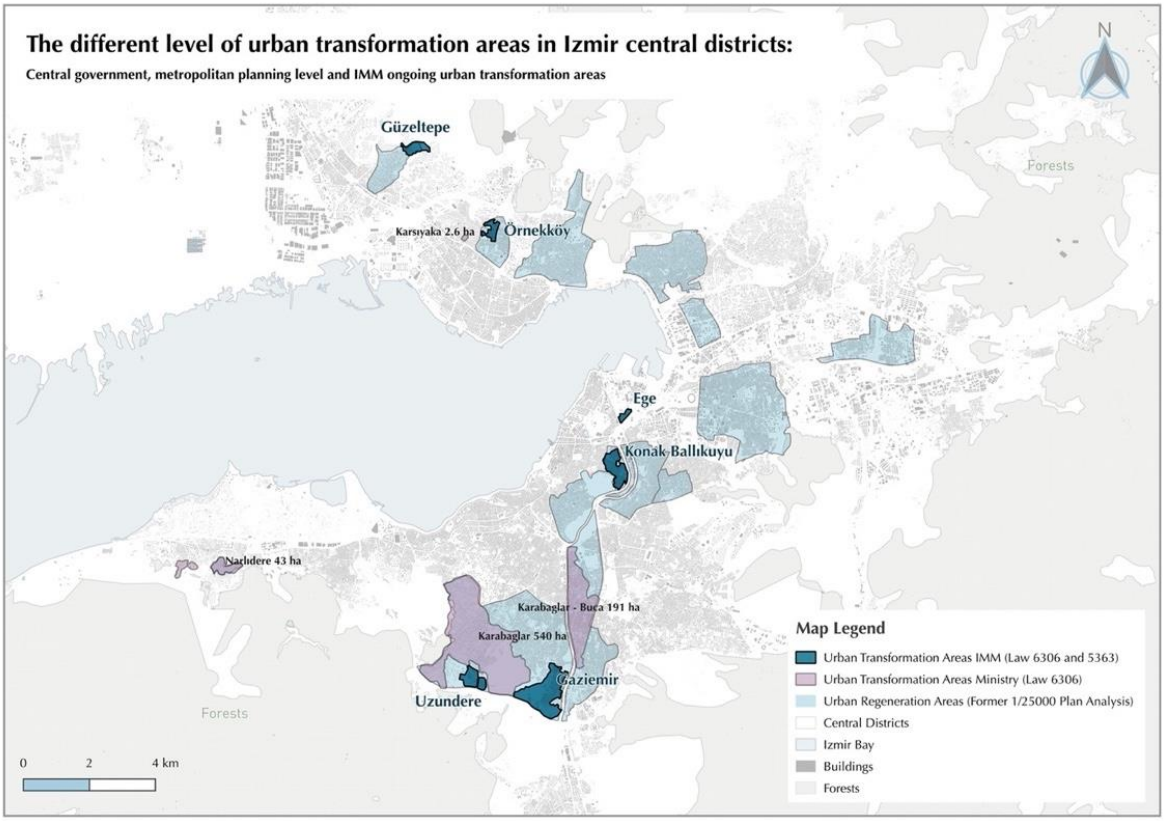

Figure 13. The different level of urban transformation areas in Izmir central districts.[183]

Additionally, gecekondu areas close to the Meles Stream are being expropriated to be included in the expo area (see Figure 14). It is not the first time Izmir has used the expo theme for expropriation. Following the 1922 fire, which inflicted significant damage on the city, modern Izmir shaped in accordance with the objectives of the Republic regime.[184] This development included hosting the 1st Economy Congress. Subsequently, The *Kültürpark* (Izmir International Fair area)" in 1937, established within the former non-Muslim neighbors devastated by the fire.

[183] Akkaya, "The Different Level of Urban Transformation Areas in Izmir's Central Districts. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Urbanization and Zoning Department and OpenStreetMap Contributors."

[184] Morack, "Expropriating the Dead in Turkey."

The expo is a means of constructing Izmir's second *Kültürpark*, drawing on the early republican heritage of Turkey.

Figure 14. Expropriated areas, gecekondus, and Meles Stream.[185]

Reviving the Ancient River with Treated Water

As human water demands increase and stream flows diminish in water-stressed regions like Mediterranean, urban stream base flows are becoming reliant on wastewater.[186] Climate change will exacerbate this by making regions both warmer and drier. The Meles Stream is typically dry during the summer months but experiences a turbulent flow reaching the sea during rainy periods. This low fluctuation in water flow contributes to issues such as foul odors. Moreover, these challenges intersect with the planning of the expo.

[185] The vacant plot is part of the land expropriated for the Expo, situated behind the gecekondu areas and between the Meles Stream.Akkaya, *Expropriated Areas, Gecekondus, and Meles Stream.*

[186] Luthy et al., "Wastewater-effluent-dominated Streams as Ecosystem-management Tools in a Drier Climate."

Preparations are underway at the IMM for the establishment of a wastewater treatment plant in the Karabağlar district. WWTP raising concerns about its proximity to residential areas. IMM IZSU Logistic Center, situated in a gecekondu neighborhood, is planned to be transformed into the Karabağlar WWTP. It was revealed that the plant will be Izmir's first underground treatment facility. One key aspect highlighted is the project's role in addressing wastewater treatment challenges not only in Karabağlar but also in neighboring districts such as Gaziemir and Buca.[187] The project aims to optimize wastewater treatment processes across these areas. It also aims to reduce the load on the main water treatment plant of Çiğli WWTP with the aim to treat 30% of the city's wastewater.[188]

This facility in Karabağlar will accelerate the slow water flow, which occasionally causes odors. By directing treated wastewater from this facility to the Meles Stream, a water source will be created for the Meles, forming a constant flow.[189] This will help the revitalization of the Meles Stream with a water source. This 850 million lira investment, to be completed in 2026, is its integration as a complementary part of the expo project.[190] This facility is located on a hill parallel to the south entrance of the expo area and the significant built heritage of Izmir Kızılçullu Aqueducts.[191] The water treated on the hill will be transferred to the Meles Stream through underground channels. This point will be positioned before both the expo area and the aqueducts. Therefore, artificial water flow will be established along the expo area and the water conduits.

[187] IZSU Wastewater Treatment Unit Expert, Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration).

[188] The Çiğli WWTP is currently treating 90% of the wastewater of Izmir's central districts. IZSU Wastewater Treatment Unit Expert.

[189] IZSU Wastewater Treatment Unit Expert.

[190] Municipal Finance Expert, Personal Interview 8 with Financial Services Department.

[191] Ministry of Culture and Tourism, "Historical and Cultural Places: Aqueducts and Bridges."

Figure 15. Proposed Karabağlar WWTP discharge point in Meles Stream. [192]

Overall, the Karabağlar wastewater treatment plant project, designated to be located in a gecekondu area, will address wastewater management challenges while aligning with the goals of expo targeting 2026.

Bornova Stream

The Bornova Stream originates from Mount Yamanlar. The Izmir Metropolitan Municipality (IMM) has constructed a park within the stream corridor as part of an effort to rejuvenate the watershed area. This initiative aims to establish a green corridor and a recreational space known as Homer Valley. The Bornova Stream continues to flow through the Historical Levantine Neighborhood of Bornova, where the historical mansions of Levantine families still stand. Finally, the river culminates in Izmir Bay, converging with the earliest settlements in the Izmir region, including Tepebaşı Mound. However, this corridor is fragmented by numerous

[192] Akkaya, *The Section of the Meles Stream Where the Proposed Karabağlar WWTP Will Release Treated Water*.

transportation infrastructures, including regional roads and boulevards, which physically sever the connections between these cultural nodes. By opening the cultural road along the Bornova Stream, IMM aims to reestablish these connections.

Homer

Located in Bornova and operated by the IMM, the Homer Valley serves as a recreational area. The area is rich in forests, streams, and biodiversity, hosting 182 plant species and 103 bird species. A part of the Bornova Stream is believed to house a cave and a rock mass, where the renowned poet Homer, associated with Izmir, is thought to have resided. To capitalize on this historical connection, the implemented project aspires to transform this valley into a focal point of attraction, aptly named "Homer Valley." The recreational area is created for Izmir residents to enjoy nature and breathe in the dense environment of Izmir.

Figure 16. 19th century engraving of the valley of Bornova stream where the Homer's cave was believed to be and on the right present-day view of this supposed caves.[193] [194]

Izmir has a Mediterranean climate. Summers are hot and dry and winters mild and rainy. Temperatures are above 30 degrees Celsius are experienced for approximately hundred days a year between June and September.[195] This negatively affects Izmir's central districts

[193] Levantine Heritage Foundation, *19th Century Engraving of the Valley of Bornova Stream*.

[194] Izmir Metropolitan Municipality, "Homer Valley Living Park."

[195] Şerif Hepcan et al., "URBAN GreenUP Report on the Diagnosis of Izmir."

neighborhoods since the city became a very dense urban environment with few common public spaces or green areas (see Figure 17).[196]

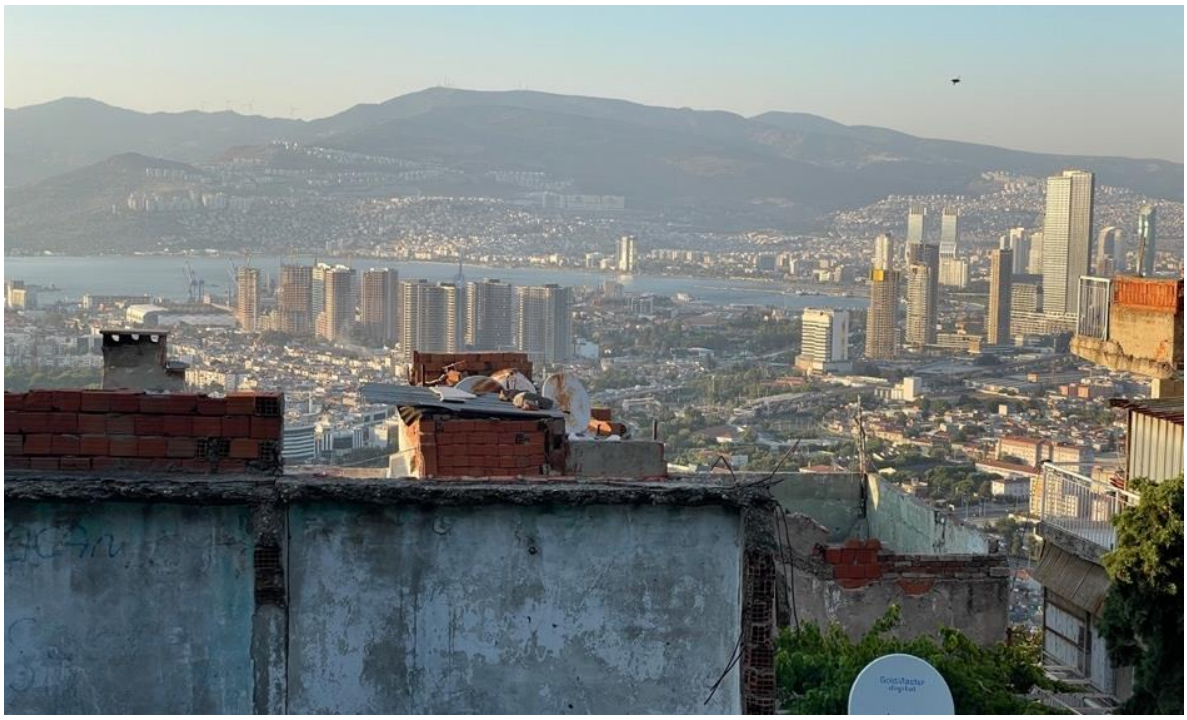

Figure 17. The dense urban environment of Izmir's central districts.[197]

Izmir is experiencing a widespread heat island effect, resulting in poor and uncomfortable bioclimatic conditions for residents. This problem is accompanied by relatively high levels of air pollution emissions, contributing to degraded air quality and public health concerns. Natural air ventilation is limited due to Izmir's geographic features and urbanization pattern, exacerbating air quality issues and heat-related discomfort. Additionally, the lack of sufficient green spaces (see Figure 18) and urban trees exacerbates the heat island effect.[198] [199]

[196] Healthy City Project Office, "Izmir City Health Profile." According to year 2007 data included under Izmir Urban Health Profile study, active green area size per capita was found to be 3.46 m2. This data is significantly below the 10 m2 standard stipulated by legislation.

[197] This photograph is taken from the historical Kadifekale District. In the foreground, the arrangement of neighboring buildings of slums can clearly be seen. Moving further into the image, the second layer reveals the high-rise developments of the central area. On the opposite side of the bay, nestled among the hills of Bornova, there is another perspective. Akkaya, *The Hyperdense Urban Environment of Izmir's Central Districts*.

[198] Corumluoglu and Asri, "The Effect of Urban Heat Island on Izmir's City Ecosystem and Climate."

[199] Şerif Hepcan et al., "URBAN GreenUP Report on the Diagnosis of Izmir."

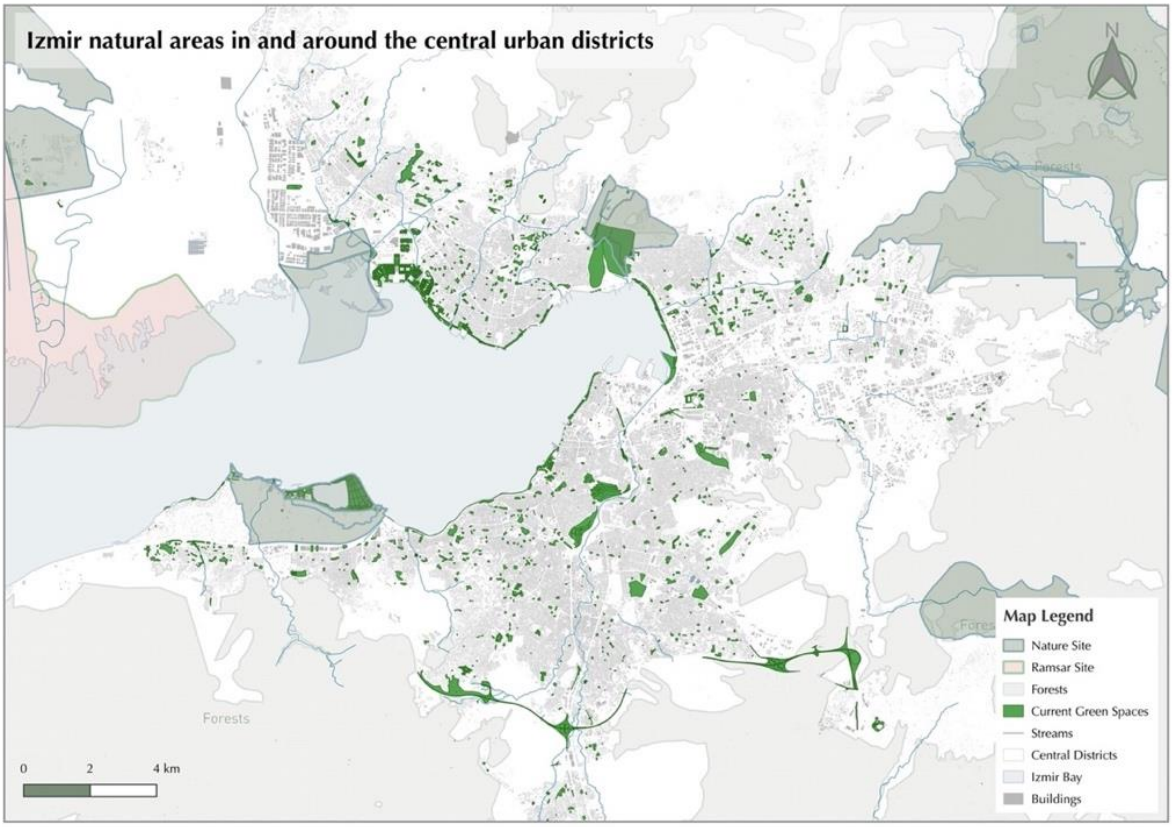

Figure 18. Izmir's natural areas and green spaces in and around the central urban areas.[200]

As part of green and resilient development IMM promised to increase the green areas. However, in the densely environment of the Izmir, it is rare to find parcels to develop green spaces. The first resource is the forests in the uphill areas of the Izmir. These hills are naturally hard to access.

Levantines

Izmir have been an attractive territory for migration, as a result of the economic opportunities offered there, the quality of life and landscape.[201] While the population of Izmir was around 530,000 in 1927, the metropolitan municipality is now home to a total population of 4,479,525

[200] Akkaya, "Izmir's Natural Areas and Green Spaces in and around the Central Urban Areas. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Parks and Gardens Department; Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks; and OpenStreetMap Contributors."

[201] Kaba, "Lifestyle migration from İstanbul to Izmir."

as of 2023.[202] Izmir is the third largest city in Turkey in terms of its population density which is above the country average. One of the most populous districts of Izmir is Bornova, with a population of 452.867 people.

Figure 19. Three layers within the Ege neighbourhood: modest house, church and a highrise construction.[203]

Bornova's diverse heritage is constructed through patterns of migration, as well as its contemporary ethnic and religious communities, which have significantly influenced the city's socio-spatial composition. Bornova is a district of different religions, peoples, and cultures.[204] From longstanding Ottoman-era religious communities to Izmir's forgotten non-Muslim

[202] Turkish Statistical Institute (TURKSTAT), "Address-Based Population Registration System Results, 2023."

[203] This picture was taken in the Ege neighbourhood where Roma predominantly reside. The first layer of this photo depicts a modest house. Beyond it, a church is clearly visible (Agios Ioannis Sten Alygaria Church). Upon closer inspection of the background, one can discern new urban transformation projects that have led to the construction of a high-rise building near the Ege neighborhood. Akkaya, *Three Layers within the Ege Neighborhood*.

[204] Mehmet Akif Erdoğdu, "Bornova as a Place of Different Religions, Peoples, and Cultures."

communities,[205] such as the Levantines,[206] [207] Jews,[208] Armenians.[209] formerly pastoralist Yörüks,[210] Roma people[211] and *muhacirs* (Balkan migrants) Izmir's had/has varied community identities. Moreover, the city reflects the ongoing impact of domestic internal migration, including the Kurds.[212] International refugee trends exemplified by arrivals from countries such as Syria mark another source of cultural diversity.[213]

There is a notable gap in awareness among the people of Izmir regarding the minority heritage of the Levantines. The last representatives of Levantines who came to Ottoman lands centuries ago are now trying to preserve the fading Levantine culture, architecture, theater, football, and culinary.[214] The implementation of the Homer Valley project in the north and the presence of the Yeşilova Tumulus in the south brought to attention the important gap in the urban heritage of Bornova. This gap was addressed with the Bornova Culture Island project, which aims to integrate the Levantine heritage of Bornova's urban areas with these two focal points.

The Bornova Culture Island project, initiated with the support of Izmir Metropolitan Municipality and Bornova Municipality, and led by the World City Izmir Association, Levantine Association Izmir, and Service Industry Employees Education and Solidarity Association, aims to promote and leverage the historical and cultural values of Bornova for tourism. The signing ceremony for the Bornova Culture Island took place on October 5, 2022.

[205] Gönlügür and Sezer, "Therapeutic Forgetting, Agonistic Remembrance."

[206] Imber, "Izmir and the Levantine World, 1550–1650. By Daniel Goffman (Publications on the Near East, No. 5.) Pp. Xv236 30 Illus, I Fig., 3 Maps Seattle and London, University of Washington Press, 1990. US $25.00."

[207] Tagliaferri, "In the Process of Being Levantines. The 'Levantinization' of the Catholic Community of Izmir (1683–1724)."

[208] Agos, "Izmir of Once upon a Time."

[209] Zakarya Mildanoğlu, "The Armenians of 'Infidel Izmir (Gâvur Izmir'in Ermenileri)."

[210] İnalcık, "The Yörüks."

[211] Cech and Heinschink, *Sepečides-Romani*.

[212] Saraçoğlu, *City, Middle Class, and Kurds (Şehir, Orta Sınıf ve Kürtler)*.

[213] Vesek and Suğur, "Urban Life Experiences of Syrians in Turkey."

[214] It is claimed that the Levantines brought football to Anatolia. Anadolu Ajansı, "Turkey's Last Levantines Are Trying to Preserve Their Culture."

The Bornova Valley hosts the Yeşilova and Yassıtepe mounds, shedding light on the city's 8,500-year history. It also includes the Homer Valley and caves, believed to be the setting for the writing of the Iliad and the Odyssey epics. With its museums and numerous historical sites, it will form a corridor. Through this project, which aim to encompasses Levantine history research, gastronomy, and historical mansions, the historical values of Bornova will be promoted, and events will be organized to about Levantine culture.

Peynircioğlu Streambed

Another layer of heritage in Izmir is its coastal infrastructure. This includes the ports, docks, industrial sites and filled coastal areas which served as vital economic, recreational and residential hubs (see Figure 20). These infrastructures not only facilitated international exchange[215] but also fostered dialogues among various cities and countries, enriching Izmir's networks in global connectivity.

The heritage aspect of this case among Izmir's coastal infrastructure is the low altitude filled areas of Izmir coast. These areas are filled with coastal heightening and expansion projects to gain space. These areas are used such as coastal recreational areas which are also very important for laid-back living habits of Izmir people connect to the coastal Bay. However, these areas of coastal infrastructure are vulnerable to climate change and pollution. Rising sea levels, coastal erosion, and storm surges pose risks to these coastal infrastructures and waterfront communities.

[215] Collaço, *Prints and Impressions from Ottoman Smyrna. The Collection de Costumes Civils et Militaires, Scènes Populaires, et Vues de l'Asie-Mineure Album (1836-38) at Harvard University's Fine Arts Library. With Historical Comments by Evangelia Balta & Richard Wittmann. (Memoria. Fontes Minores Ad Historiam Imperii Ottomanici Pertinentes, Vol. 4)*.

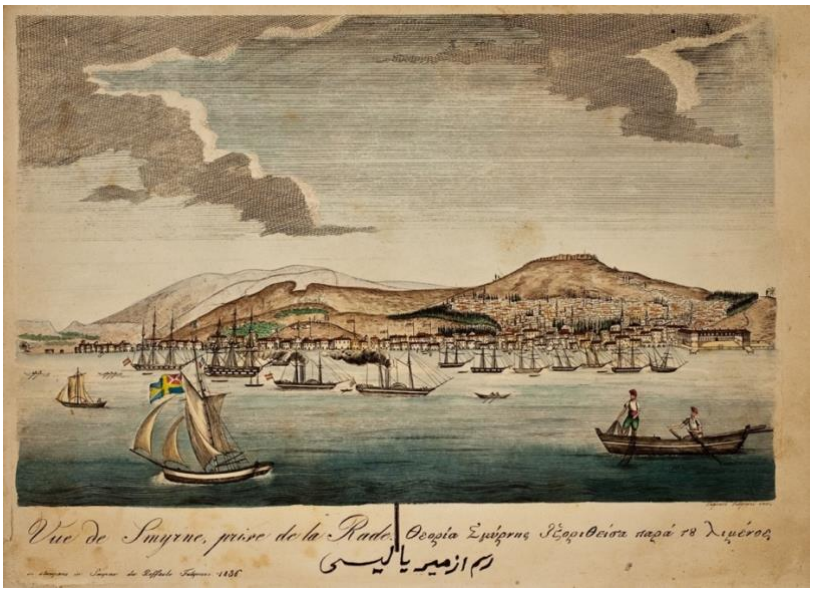

Figure 20. "View of Smyrna from the harbor," 1836. Fulgenzi Album, Plate 2. [216]

One area of concerns is the Peynircioğlu Streambed located in the Karşıyaka district, which has recently been heavily affected by coastal flooding. It serves as the demonstration site for the IMM's nature-based solutions (NBS) project, encompassing both river restoration efforts and the establishment of a flamingo park behind sea walls.

Sea Level Rise and Coastal Floods

Being a coastal town, the Izmir metropolitan area is also threatened by sea-level rise. According to the flood risk map published for the study region in 2007, the southern coastlines of Izmir appeared to be less vulnerable to projected sea-level rise compared to the northern coastlines.[217] On the north, the Menemen Delta along the Gediz River and settlements, such as Karşıyaka are at high risk, with vulnerability expected to increase by the next century.[218] Although a decrease

[216] The engraving of Smyrna not only reveals its place of publication, but primarily reveals that the scenes it contains show the setting and the society of Smyrna, that cosmopolitan Mediterranean trade-port. Besides, the image representing the city was not chosen accidently. It depicts its port, the key feature of the city's identity. Collaço, 27.

[217] Demirkesen et al., "Coastal Flood Risk Analysis Using Landsat-7 ETM+ Imagery and SRTM DEM."

[218] Hasan Nüzhet Dalfes and Sedat Avcı, "Lost Shores in Istanbul and Izmir: Sea Level Rise and Potential Impacts."

in yearly rainfall has been seen, the irregular nature of this fall has created grave consequences in Izmir as can be seen in the floods of 1995 in Karşıyaka district, with 63 fatalities.

Among various types of flooding, Izmir mainly deals with coastal flooding with wave overtopping[219] and pluvial floods. Izmir has the vulnerability to climate change, exacerbated by its coastal location especially in low lying areas. Rapid urban development in Izmir had a direct effect on rainwater stream processes and potential pluvial flooding. During intense rainfall events, overflooding of stream flowing through the urban fabric are common in Izmir. The modification of land surface impacted runoff processes by covering the land surface with impervious roofs and roads. The infiltration capacity of these covered areas is low resulting in an increase of storm runoff rates.[220] Furthermore, losing coastal marshes and destruction of natural stream systems in particular cripple the storm water retention capacity. That results in flooding and contamination of aquatic systems.

During my second site visit to Izmir in December 2023, I observed that this vulnerability was further compounded by a cloudburst causing the wave overtopping where sea overflow into the urban areas. This posed challenges for urban infrastructure. On the last week of November 2023, a heavy rain caused the sea to overflow into in several districts, including the historical port area and the city's most important recreational areas (see Figure 21).[221] This November flood affected mainly coastal recreation areas.

[219] Kisacik, Tarakcioglu, and Baykal, "Stilling Wave Basins for Overtopping Reduction at an Urban Vertical Seawall – The Kordon Seawall at Izmir."

[220] Salata et al., "Adapting Cities to Pluvial Flooding."

[221] Parks and Gardens Department Expert, Personal Interview 17 Izmir Metropolitan Municipality Parks and Gardens Department.

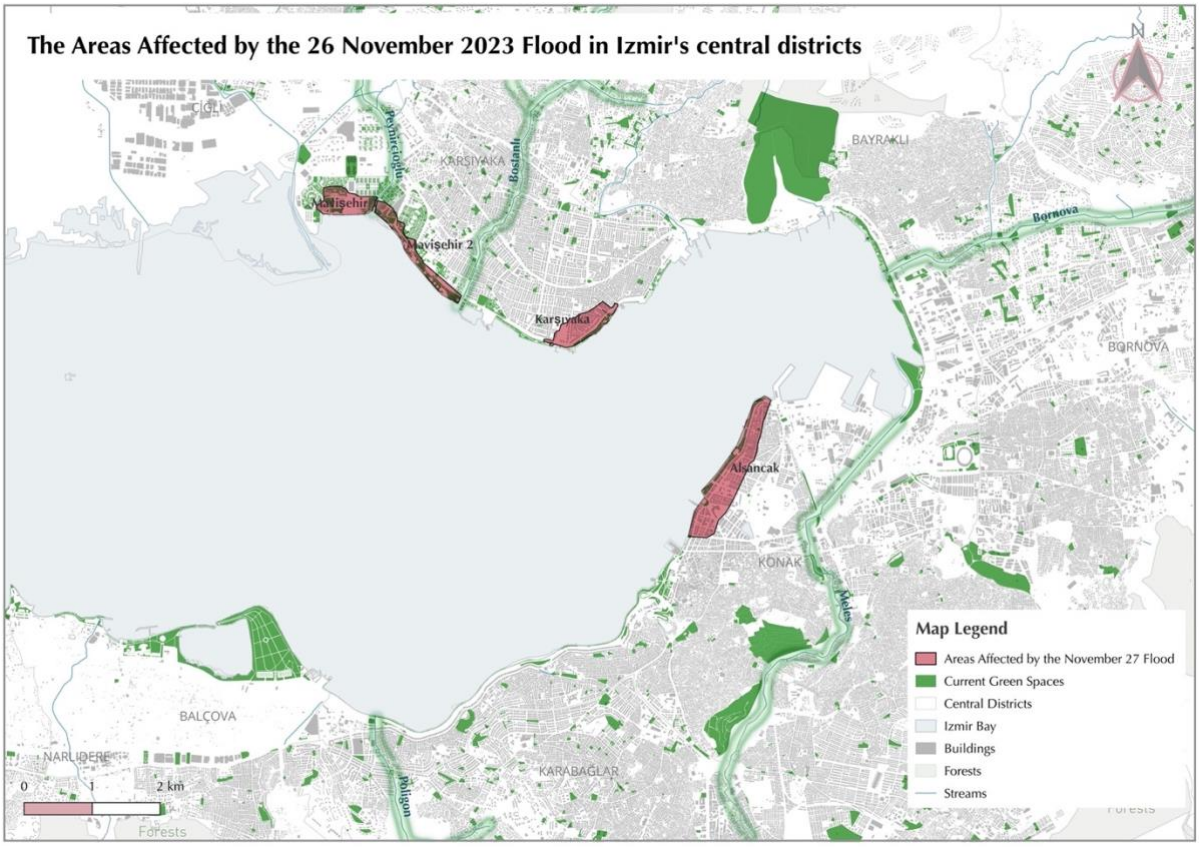

Figure 21. The areas affected by the flood on November 26, 2023.[222]

On the November floods, the same problem has occurred not only in the Karşıyaka coasts but also in the district Alsancak, which is in between the old port and new port city area. Two of the areas affected from the flooding in Karşıyaka Constitution Squareand in Alsancak is the Republic Square and Gündoğu Square. These areas host Kemalist architectural and monumental heritage. The establishment of the Turkish Republic was a significant moment in Izmir. It was era of modernization, secularization, and nation-building with secular republic and its Kemalist principles.[223] The ideological legacies of modernism and Kemalism have played significant roles in shaping Izmir's urban landscape and civic identity during the early 20th century. Especially after the 1922 fire in Izmir, the influence of modernist and Kemalist

[222] Mavişehir, Karşıyaka port area and Alsancak were the most affected areas. Akkaya, "The Areas Affected by the Flood on November 26, 2023, in Izmir's Central Districts. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Parks and Gardens Department and OpenStreetMap Contributors."

[223] Dragoş Mateescu, "The Swan Song of Secular Turkey?"

ideologies became more evident in architecture during the construction of new public spaces.[224] In architecture, Kemalist ideology has been reflected in the city's landmarks such as the Republic Square and Constitution Square to promote national identity and modernization.

Consequently, the floods affected not only the recreational areas, infrastructure, republic heritage and buildings but also the image of the city administration. Several news outlets have observed criticism of the situation.[225] The current mayor Soyer defended himself, stating that "The consequences of climate change in distant lands, which we used to only watch on our television screens, have now arrived at our doorstep. Izmir has become one of the coastal cities most affected by the uncertainties of climate change".[226]

Nature Behind the Sea Walls

Similar flood disasters like the one mentioned above are frequently occurring in Izmir. [227] Izmir Metropolitan Municipality (IMM) has developed a nature-based solution approach and a sponge city regulation[228] aimed at reducing flood problems and increasing surface water absorption.[229] [230] In light of the aforementioned issues, two projects in the Peynircioğlu Streambed have adopted these approaches.

Mavişehir located on the watershed areas of the Peynircioğlu Stream, once a part of the Gediz Delta's rich wetland ecosystem. The area has undergone significant transformation due to rapid

[224] Furthermore, the legacies of modernism and Kemalism can also be observed in the city's collective memories, such as street names and statues dedicated to prominent figures of the era, as well as in cultural events like the Izmir Culture Park and International Fair (Izmir Enternasyonal Fuarı), which symbolize the city's commitment to create relations with other countries.

[225] NTV, "Izmir hit by heavy rain and storm: Coastal areas underwater!"

[226] Tunç Soyer, "Soyer's Post about 26 November Floods."

[227] Kisacik, Tarakcioglu, and Baykal, "Stilling Wave Basins for Overtopping Reduction at an Urban Vertical Seawall – The Kordon Seawall at Izmir."

[228] The Sponge City regulation is one of Izmir's strategies for sustainable water urban drainage. In addition, in 2022, the Izmir Institute of Technology, in partnership with a Dutch architecture and landscape company, prepared a study on "Izmir Sponge City" to support the Izmir Metropolitan Municipality's efforts in combating the global climate crisis.

[229] Izmir Metropolitan Municipality, "Sponge City Applications Regulation."

[230] Izmir Metropolitan Municipality, "Izmir's Strategy for Living in Harmony with Nature 2021-2030."

urbanization, resulting in the loss of its natural heritage. Today, it was nearly impossible to discern that the area was once an old delta. A very large housing project was constructed in the delta. It was not a coincidence that the housing site is named *Mavişehir*, meaning "blue city," since the lagoon areas of Izmir were used for housing development.

Figure 22. Peynircioğlu Stream and apartments in Mavişehir.[231]

In response to this environmental degradation, IMM initiated a project aimed at reimagining and re-designing the wetland areas that have faded from the city's collective memory. The project called Flamingo Nature Park. In fact, IMM is trying to revitalize Peynircioğlu Streambed with coastal parks close to the lagoon areas by including them to IzHeritage route. Flamingo Nature Park will be one of the nodes of this route.

[231] Akkaya, *Peynircioğlu Stream and Apartments in Mavişehir*.

IMM created this park to embrace the ecological diversity of the lagoon areas. Situated a lost part of the Gediz Delta, the park aims to integrating site-specific natural and cultural elements into its design. Flamingo Nature Park design philosophy draws inspiration from both nature and ancient construction methods.[232] By using modern and traditional techniques such as those used in old Homa fisheries. With features such as saline wetlands, Dalyan fishing, and bird habitats, the park will simulate the region's biodiversity while fostering environmental awareness among visitors. Moreover, its recreational amenities, including visitor centers, nature puzzles, and bird observation towers, invite individuals to engage and learn.

However, this park was located in a reclaimed sea area. The floods on November 26 caught the park in the project phase. The park experienced a heavy influx of salty water.

River Restoration

"Urban Green Up Nature-Based Solutions" project, under the European Union's grant program HORIZON 2020, was selected among 39 international projects in 2017, earning a grant of 2.3 million euros. Thus, IMM, along with the cities of Liverpool in the UK and Valladolid in Spain, became a pioneer and implementer city.[233] In Izmir case the project covered the area from the city center of Karşıyaka to Çamaltı Salt Lake. Models were researched to reduce carbon emissions, increase biodiversity, decrease the heat caused by intense urbanization, increase green space, reduce flood risks, and improve quality of life for the residents.[234]

[232] Izmir Metropolitan Municipality, "Mavişehir Flamingo Nature Park is counting down the days to meet with the people of Izmir."
[233] URBAN GreenUP, "About URBAN GreenUP."
[234] Parks and Gardens Department Expert, Personal Interview 17 Izmir Metropolitan Municipality Parks and Gardens Department.

As part of the Urban Green Up Nature-Based Solutions project, funded by a 2.3 million euro grant under the European Union's HORIZON 2020 program, an ecological corridor implementation was completed in the coastal section the Peynircioğlu Streambed.[235]

Around the stream, a total of 26,500 square meters of green space was created, including 15,000 square meters of carbon-absorbing plants. Within the project scope, 1,150 trees suitable for the Mediterranean climate, 250,000 shrubs, and ground covers were planted.[236] A soil-carrying system was established by removing some of the concrete surfaces on both sides of the 800-meter-long stream. In these sections, 16,000 bird's-foot trefoil plants were planted. Seeds were sown in the soil to further green the stream banks. Five wooden sunbathing terraces and seating units were established. Ten pollinator (insect) houses were also placed to provide resting places for bees and insects that travel long distances to collect pollen. [237] 90-square-meter fruit wall was also constructed, using blackberries and grapes.

However, this implementation was ending meters before reaching the sea. In this section, low concrete barriers had encased the stream. While reinforcing the sea fillings in this area, on 26 November flood saltwater had reached between the Peynircioğlu Stream, the coastal parks, and even to the Flamingo Park. The saltwater flowed into recreation areas and residential areas.[238]

[235]URBAN GreenUP, "URBAN GreenUP in Izmir."

[236] Izmir Metropolitan Municipality, "The rehabilitation project in Peynircioğlu Stream has been completed."

[237] Parks and Gardens Department Expert, Personal Interview 17 Izmir Metropolitan Municipality Parks and Gardens Department.

[238] Parks and Gardens Department Expert.

Findings: (Mis)uses of Heritage for Climate Action

After examining the climate change and heritage nexus through the lens of targeted international heritage organizations and the Izmir Metropolitan Municipality (IMM), as well as studying the water bodies of Izmir, this chapter synthesizes the findings of this research. These findings highlight the challenges and current potential pathways for future approaches.

The Future of Our Pasts or the Future is not the Past

The first chapter demonstrated that climate change and heritage nexus is influenced by paradigm shifts within international heritage institutions. These shifts are not abrupt changes but rather a cumulative process of constructing agendas and priorities by adding new paradigms to existing ones. Examples of these heritage paradigms include environmentalism, universality, diversity, sustainability, and resilience.

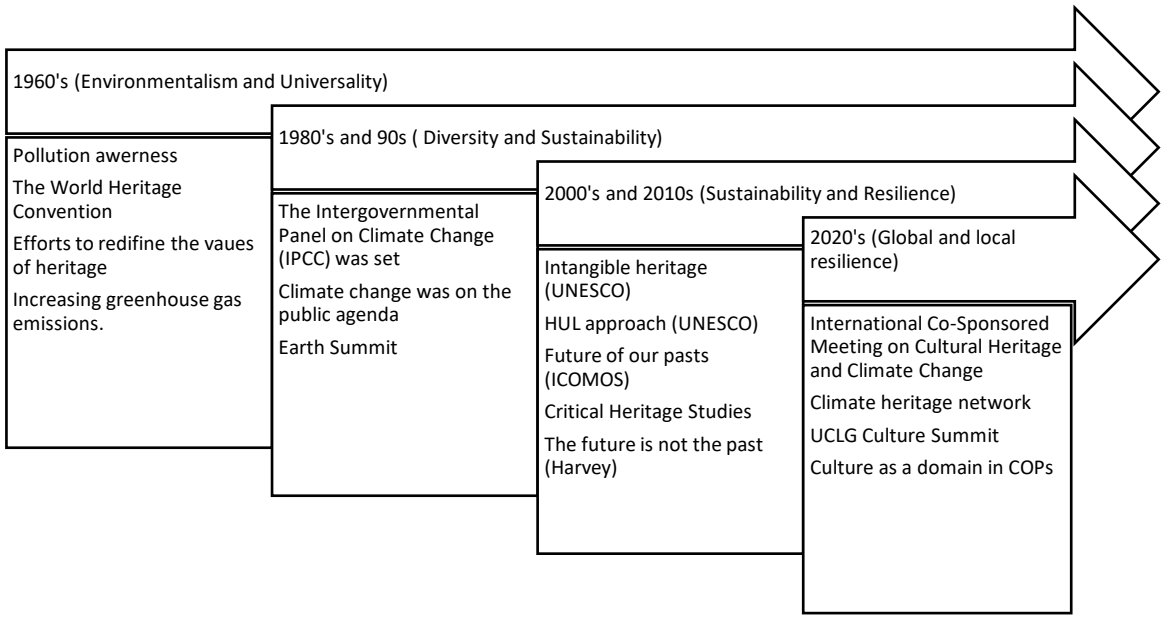

Figure 23. Path to climate change – heritage action.

To synthesize my analysis in response to uncertainty that climate change for the future, I would say two main idea dominating the discourses one is 'the future of our pasts' and the one 'the future is not the past'. [239] [240] Basically, one perspective advocates for preserving our heritage for the future, while the other suggests extracting the beneficial aspects of heritage and moving forward with them.

The first part of this thesis illustrates how the perspective of 'the future of our pasts' has emerged. The concept of heritage has become subject of climate change staring from 60s. I've revealed that the discourse on heritage as a vulnerable asset has been embedded in climate change thinking for a long time. I delved into the evolving interpretations of heritage, exploring its interplay with climate change and the environment, as manifested in the diverse perspectives presented by various national and international heritage and environment institutions. My analysis of policy documents and elicited that the 'traditional heritage canon' [241] ignored the significance of climate change until it began impacting an increasing number of heritage sites and properties. After that international organizations started to integrate climate change debate to cultural heritage. In the urban context, the state of art knowledge of climate change and heritage nexus are discussed around the *UNESCO Historic Urban Landscape (HUL)*[242] *approach.* The HUL approach suggests a holistic approach to urban heritage for resilience. Apart from this, heritage networks actively generate ideas in the field of climate and heritage. One of these *ICOMOS's Climate Action Working Group* who have been working almost a decade to put culture and heritage domain in the center of climate debates. When considering the magnitude of issues related to heritage and climate change, it becomes evident to

[239] ICOMOS Climate Change and Cultural Heritage Working Group, *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*.
[240] Haboucha, "The Future of Heritage as Climates Change."
[241] Gentry and Smith, "Critical Heritage Studies and the Legacies of the Late-Twentieth Century Heritage Canon."
[242] UNESCO, "Recommendation on the Historic Urban Landscape."

international heritage organizations that this situation cannot be addressed solely by institutions such as ICOMOS and UNESCO. Therefore, the decentralization of climate heritage action to the local level is of utmost importance. In fact, the initiative of ICOMOS to enhance capacity building at the local level with the Preserving Legacies Project serves as evidence of the significance of this situation.

Second perspective is 'the future is not the past'. Today, naturally the international cultural heritage communities recognize that climate change is currently one of the most important and fastest growing threats to humans and their heritage worldwide. If heritage is not protected/safeguarded/conserved from the impact of climate change some aspects of heritage will be lost. However, the very big challenge here is how is it possible to safeguard the current and future forms of heritage from the effects of climate change? Do we have enough resources to save all forms of heritage? Secondly, current assets of heritage should be adapted to climate change. How is possible for heritage to learn and to be more resilient and integrate climate adaptation? And lastly, current and future forms of heritage carry a potential to mitigate and adapt the climate chance. How can we use heritage's potential for climate action? My arguments were not meant to offer comprehensive coverage of climate change heritage nexus with all periods, world regions and heritage categories—an impossibility in this paragraph. But these broad questions revealing the ongoing uncertainty and give us insight about how the position of heritage in the Anthropocene is quite blurry. 'The future is not the past' approach emerged from these similar findings and arguments. This means that the heritage that we defined might not have a place in the future.

However, when I started to look in the practices of IMM, I understood that these two approaches have a common flaw. They lack clear, ambitious, and predictable actions for cities facing urgent challenges from global warming. Local heritage authorities, authorized at present, are in dire

need of concrete solutions. Moreover, I've highlighted the necessity to localize the universalist concept of heritage to effectively address the climate change discourse in urban settings. Given the temporal challenges posed by climate change, current formal heritage institutions are likely to persist into the predictable future. Consequently, there is an urgent need to support these official local heritage bodies. It is crucial to initiate a discourse on the transformation of these institutions, which hold sway over heritage structures, in response to the challenges of climate change. Neglecting this transformative process may lead to the perpetuation of formal heritage institutes as mere extensions of outdated authoritative heritage discourses, thereby utilizing heritage in implementing inequitable measures against climate change.

Hybrid Heritage of Planetary Urbanism

Evidence gathered so far, employing an urban water metabolism approach, highlights the different aspects of heritage linked with Izmir's waterbodies. It also raises the question about the uses of contemporary categories of heritage for climate-heritage action.

As revealed in the climate heritage case of Izmir's waterbodies, the area encompasses a diverse array of interconnected features. The dynamic nature of the streams, influenced by both natural processes and human interventions throughout history, underscores its significance. These include such as fragile natural landscapes, threatened species, wastewater management, historical remnants of an old river, fishing culture, and saltworks in Çiğli case. It is evident that these are not only natural landscapes, but also industrial and infrastructural landscapes in the case of Çiğli, archaeological and memory landscapes in the cases of Meles and Bornova, and coastal landscapes in the case of Peynircioğlu. These highlight the complex relationship between human intervention, climate action, environmental preservation, and heritage conservation.

There were numerous anthropogenic influences within the Çiğli Wetland, despite its classification as a nature protection site, which encompass natural, cultural, agricultural, industrial, infrastructural, urban, non-urban and toxic elements of heritage. The area is 'operationalized'[243] to function the city of Izmir. The expansion of the Çiğli WWTP and saltworks within the nature protection area raises questions about its potential inclusion in the nature category of the World Heritage Site list. Based on my data analysis, I would define the area as a nature-culture heritage intertwined with industrial heritage site including the 'toxic heritage'[244] of sewage sludge and an urban infrastructural landscape.

In conclusion, this section highlights the complex nature of urban environments, as demonstrated through urban water metabolism approach in Izmir cases. It became evident that there exists a gap between heritage studies and urban studies, indicating the need for tighter integration to effectively address the complexities inherent in both "urban" and "heritage" domains.

History and Memory

In all cases explored, IMM was using historical narratives to support its projects. In the Çiğli wetland, the narratives involved the old riverbed, lagoons and fisheries. In the second case, the Meles narratives focused on ancient river, seeds, and plants. In Bornova, the emphasis was on reconstructing a cultural route, while the last case Peynircioğlu dealt with the reconstruction of wetlands.

[243] "The spaces of the non-city have been continuously operationalized in support of city-building processes throughout the global history of capitalist uneven development." Brenner, "The Hinterland Urbanised?," 123.

[244] Kryder-Reid and May, *Toxic Heritage*.

However, it became evident that the authenticity of these narratives by IMM was often unclear. For example, in the case of Çiğli, we still do not know which lagoon areas are human influenced and reconstructed as fisheries and which of them are actually natural landscape elements. These narrative refereeing to historical reconstructions has potential to support grounded urban climate imaginaries better understanding the nature. However, in Izmir case it was more nostalgic approach to history. Drawing from lessons learned from the Izmir cases and Carey's[245] critical insights into climate history three aspects of history could create a base to climate heritage action. The first is to consider the existing historical knowledge about climate and its impact on Izmir, the second is scrutinizing the factors contributing to failure or success in responding to earlier climate events, and the last one assessing if others profited from the catastrophes faced by cities in the past.

Creating historical reconstructions to revive ecological memories[246] and ecological awareness. In all cases, there were histories and memories to support these reconstructions. In Çiğli, the memories of fertile fisheries were emphasized. In Bornova, the focus was on the histories of Homer and the Levantines. The last case, Peynircioğlu, dealt with the narratives of ancient construction methodologies. Following these evidences, I argue that the water bodies in Izmir should be considered as sites of memory[247].

In the Bornova Stream case the commodification of heritage and memory support to reconstruct a recreational space for the city, intertwining historical significance of Levantines with a poor historical narrative.

[245] Mark Carey, "Climate and History."

[246] Sun and Ren, "Ecological Memory and Its Potential Applications in Ecology."

[247] There are lieux de memoire, sites of memory, because there are no longer milieux de memoire, real environments of memory." This quote is a famous statement made by the French historian Pierre Nora in his book "Realms of Memory: Rethinking the French Past". Nora was reflecting on the concept of collective memory and the ways in which societies remember and commemorate their past. Nora and Kritzman, *Realms of Memory*.

Climate heritage actions have the potential to be integrated into community-oriented projects, as the Izmir Levantine community did. They wanted to be part of a green-cultural corridor. On one side, there was a living park project referring to Homer, while on the other side of the corridor, there were the remains of pre-historic settlement Yesilova. In the Bornova case including Levantines. However, integration with these sites constructed by 'official memory'[248] with a strong emphasis on Levantines role in the Turkish nation-building process. Many non-Muslim communities faced challenges, such as the wealth taxes imposed on non-Muslims, and their settlements became government property at nation-building process. Levantines, redefined as Christian Turks, were included in these reconstruction narratives and naturally included in the green-cultural corridor.

Sites of memory is also intertwined with the memory of earthquake disasters. The climate heritage case of Meles revealed that disaster memory makes people vulnerable to the manipulations of climate-heritage actions. The memory of the earthquake in Izmir is not something as uniform. I revealed at least three different dimensions how this memory formed. The first type of memory is that which is created by past historical disasters, representing the knowledge derived from historical resources. The second type of the memory is the memory of people who have first-hand experienced the recent earthquake in Izmir. Third, there were people who confronted the disaster in media channels, newspapers, TV and social media. As this memory formed, it turned into anxiety, especially in low-quality living environments with risky buildings such as Meles Stream Corridor.

As revealed in the Meles case removing *gecekondu* areas are the agenda of all governmental levels. The gecekondu interpreted as a problem, since it was creating risky environments.

[248] Jović, "'Official Memories' in Post-authoritarianism."

Moreover, the *gecekondu* attacked the image of the current management of IMM. So, some departments of IMM perceive the *gecekondu* is a living form to be sterilized. This is where urban transformation projects supported by climate heritage actions such as the Horticulral Expo 2026 takes the role. The gecekondu could be interpreted as a difficult heritage since it was creating risky environments, but also serves as living spaces for marginalized communities (minorities, urban poor, migrants, women, LGBTQI). Parallel to this statement, my observations in these gecekondu neighborhood and my interviews with IMM's Cittaslow Department experts have proved me that there are counter memories that defines *gecekondu* as a living space.[249]

Therefore, I came to this conclusion that climate heritage actions should consider the counter memories. However, in all climate heritage cases of Izmir there is not enough agency assigned to *counter memories*. Beyond that, since the earthquake has deepened the inequalities and insecurities, one of climate heritage actions conscious or unconscious result could be the loss of places of memory.

Actors, Local Communities and Climate Urgency Perception

The idea that Izmir does or should converge on identifiable climate actions and green solutions are being promoted as a generative dialog of both international heritage organizations and IMM. The case studies revealed important findings influence of local governments as incubators of alternative ideas to climate heritage action. However, Izmir's diverse habitats and communities face these generative ideas within unequal power dynamics, different perceptions of urgency and anxiety.

[249] Cittaslow Project Expert, Personal Interview 8 with Cittaslow Izmir Unit of Izmir Metropolitan Municipality.

This research revealed that not every climate heritage context perceives global warming urgency in the same way. In Izmir case there were contrasted power dynamics between local and central governments. Politicians set targets based on different time frames. For instance, although the Paris Agreement targets 2050, Turkey decided to align its goals with 1453, aiming for 2053 instead (see pg. 36). Izmir targets 2050 to be carbon neutral. This demonstrates that official institutions can have varying perceptions of time, which may be based on heritage. This could be referred to as authorized climate-heritage urgency perception.

In the Meles case, the alignment of authorized climate-heritage urgency perception with the goals of the Horticultural Expo 2026 is evident. The deadline of 2026 signifies a collaboration between the municipality and the international expo authority. However, the expo deadline has been used as a mean to urgently expropriate land. Gecekondu settlements are not recognized as heritage; rather, they are perceived as obstacles to be removed in order to sterilize the area for the expo and subsequent use as green space and for other purposes.

International financial actors have also reinforced this sense of urgency. The Çiğli case exemplifies a climate heritage initiative that necessitates financial resources beyond the current financial capabilities of the IMM, including international loans to complete the projects. Thus, heritage discussions support municipal climate actions by facilitating access to international loans. Similarly, the Peynircioğlu case represents a climate heritage effort incorporating nature-based solutions with support from European Union funds. It revealed the actual cost of climate-heritage might not be undertaken by municipalities and shows the dependency to financial institutions.

In addition to authorized climate-heritage urgencies, there is also a community urgency perspective. This perception within communities may or may not be aligned with international, national, or municipal urgencies. For example, in Izmir, people were more concerned about the

immediate threat of an earthquake than climate change. As a result, actions, uncertainties, and fears were more earthquake-oriented. Although gecekondu lands are part of the gecekondu community's heritage, the fear of earthquakes facilitates the exchange and expropriation of land. While climate change is an urgent issue, the perceived immediacy of an earthquake shifts the priority for different communities.

Izmir demonstrates that one aspect of the climate heritage nexus is that different institutions and communities interpret time and urgency uniquely. The perception of climate urgency is shaped by complex interplay of actors, local communities, and political frameworks. Understanding who sets these perceptions and when they are due involves both conscious and unconscious influences. This raises the question of whether these urgencies represent a form of tyranny imposed on cities or a necessary political framework that coevolves with future needs. Local communities often interpret climate urgency differently, influenced by immediate concerns and historical contexts. Meanwhile, policymakers and other actors establish targets and frameworks that may or may not align with these local perceptions. This dynamic can create tension, but it also offers an opportunity participatory and community-oriented climate-heritage perspectives. In Izmir case this could include to be more prepared to further risks such as the upcoming earthquake and create bottom-linked interactions.

Sick City and Toxic Heritage

In the context of climate heritage, wastewater and wastewater sludge can be conceptualized as a form of ‘toxic heritage’ of Izmir. This perspective highlights the reliance on wastewater in the conservation efforts of stream corridors and the toxicity that the sludge creates.

"In the sick city and with its toxic heritage, everything is considered a resource. In the sick city, rivers do not flow. However, there is no need to worry; the sick city has human waste, urine,

shower water, and laundry water, which can revive its streams." Let me rewrite my site observation notes based on the Çiğli and Meles case in an academic tone. In the sick city, rivers cannot support water flow due to human interventions. However, the circularity of water, including sewage, can be utilized as a resource for stream revitalization. This aspect of circularity for revitalization represents a duality where human interventions are necessary to address problems caused by human activity, such as the destruction of riverbeds, overexploitation of water resources, and pollution.

Even if using treated water for river and lagoon revitalization is beneficial for the ecosystem, there remains a need for facilities to treat the water. This is especially pertinent in the case of Izmir, where the Çiğli WWTP and the projected Karabağlar WWTP raise concerns about their proximity to residential and ecologically sensitive areas. This means that the consequences of urban pollution disproportionately impacting low-income neighborhoods. In the case of Meles, the placement of the Karabağlar WWTP in *gecekondu* (slum) areas exemplifies how solutions often target the places where low-income people live.

Conversely, in the case of Çiğli, the solution addresses a natural area where non-human species have the power to react. Previously, sludge used to be stored in the Çiğli Wetland. Today, the sludge is no longer stored there due to its toxicity, and wastewater sludge has started to be utilized for economic activities, with known practices of reusing it in concrete production. There might be a possibility to reuse the old toxic sludge stored in the Çiğli Wetland in the future. This dual nature of pollutive elements in Çiğli Wetland characterizes it as a case of toxic heritage.

In conclusion, this part suggests that the current practices of managing four waterbodies in Izmir could benefit from reconsideration through the lens of toxic heritage.

Protecting, Releasing and Circularity

In Izmir case there are adapted harmful aspects that serve as urban heritage as a physical space or a resource to regenerate. That means to continue to some practices of urban heritage will harm to water ecology. I will give to two examples from Peynircioğlu Streambed and Meles Stream corridor.

The sea landfills and the coastal space that it created might not be conceptualized as toxic heritage, but they are heritage sites that have a negative impact on the coastal environment. While they provide space for city recreation and space for commemorating cultural and national memories, filled sea areas pose significant harm to sea ecology, as evidenced in the Peynircioğlu case. Izmir has expanded its coastline to create recreational areas, with a significant percentage of the areas affected by flooding being coastal fill zones. Another vulnerable area includes low-lying regions, which are urban areas built on former delta lands. Additionally, areas along the extension of the Peynircioğlu River are at risk. To prevent flooding in these coastal, for the high-risk areas, which include built heritage sites, a sea barrier is constructed. However, implementing such barriers would increase pressure on the coastal site's already compromised ecology, which has been affected by pollution and human interventions. In the case of Izmir, I observe the same phenomenon in IMM, such as highlighting the Horticulture Expo 2026 and aiming to revive the Meles Streams cultural landscape with treated water circularity.

Within the heritage sector, there is growing recognition that climate change and other factors require reevaluating the care of vulnerable places.[250] Heritage organizations are developing new

[250] DeSilvey et al., "When Loss Is More."

methods to identify future threats and allocate resources accordingly. [251] This thesis does not aim to measure the cost and benefit of re-use of water for revitalizing streams. However, in Izmir case there were strong evidences that these revitalizing approaches are unsustainable for communities and nature.

'Adaptive release' refer to a proactive management option for heritage sites affected by environmental changes, particularly flood and coastal erosion.[252] It involves acknowledging that some heritage assets may not be able to be preserved in their current state due to environmental threats and instead focuses on managing their transformation within the landscape context. The concept suggests that, in certain cases, it may be necessary to allow heritage assets to undergo change or decline, while still considering their significance and value.

In conclusion, various aspects such as sea walls or wastewater serve as both resources and sources of Izmir's heritage in waterbodies. There are evidences that urban heritage practices to neglect broader environmental concerns to project heritage which makes heritage unsustainable practice. In such cases the current practices of managing waterbodies in Izmir could benefit from the adaptive release framework.

Inseparable (Non)human, (Non)urban and (In)tangible

Reviving the layers about climate change, heritage and recent municipal policies of Izmir's central districts thus far, I analyzed Izmir's urban heritage and climate change relation as a dynamic process with inseparable components blending culture and nature, tangible and intangible aspects, as well as past, current, and future imaginaries. When I contrast Izmir's

[251] DeSilvey et al.

[252] Sefryn Penrose and Nadia Bartolini, "Adaptive Release: Guidance Framework for Sites Affected by Coastal Erosion and Flood Management."

heritage with the traditional urban/suburban/rural distinctions, I observe blurry boundaries between urban, periphery, and rural areas, all interconnected within a broader planetary context instead of rigid borders framing heritage. I see a diverse array of both visible powerful agencies and unpowerful invisible individuals. I perceive forgotten and remembered communities coexisting within the urban fabric. I observe the migration pattern active contribution to the city- heritage- making processes. Izmir's urban heritage is both exclusive and inclusive for its citizens. Izmir's heritage is highly politicized, and the divergent political perspectives surrounding its values create tensions among various groups.

In this research, I established the inseparable connection between climate-heritage strategies, projects, imaginaries, and practices with urban infrastructure. Drawing from both my site visits and Scaramelli's observations, it became evident that the ecology of the Çiğli Delta is intricately intertwined with its water treatment infrastructure. [253] Similarly, the ancient Meles Stream is closely linked with Izmir's Big Canal project. The ecology of Peynircioğlu is deeply embedded within sea walls and recreational areas, while the Bornova Stream is intricately connected to Izmir's transportation infrastructure.

Furthermore, I observed that these infrastructures give rise to new ecological realities. For instance, in the case of Çiğli, the saltworks have transformed into the habitat of flamingos. Additionally, these infrastructural developments foster the emergence of new communities. For example, in Peynircioğlu, the construction of Mavişehir led to the middle-class becoming neighbors with wetland system including fishers.

[253] Caterina Scaramelli, "Salt, Seeds, and Flamingos: On the Politics of Infrastructural Ecology in Turkey."

(Mis)uses of Heritage for Climate Action

In the changing climate of the world, among various forms of cultural, political and technical responses heritage has unique position and mobilized for future making. Reflecting on the findings of this thesis I revealed that these positions can be characterized by five themes:

- Impact of climate change on cultural heritage.
- Solutions in heritage for climate action
- Cultural heritage as a resource for climate action
- Cultural heritage as an instrument for climate action
- Heritage is a process in climate action

In the first position, 'impact of climate change on cultural heritage' is in the negative affected site from the direct or indirect effect of climate change. The escalating negative impacts of climate change such as flooding, sea level rise, and pollution have led to the emergence of the first perspective.

Second theme, 'solutions in heritage for climate action' informs heritage to mitigate its impact on climate change and environment. It mainly refers to climate-awareness in heritage practices such as providing solutions in heritage that are energy-efficient, circular and resource-efficient.

The third theme, 'cultural heritage as a resource for climate action' suggests that heritage is not only affected by climate change but also contributes to climate mitigation and adaptation through its different forms, values and assets. For example, a natural heritage site can act as a carbon sink, and traditional knowledge can inspire new ideas for climate action. In this position, cultural heritage serves as a 'role model'. [254]

[254] Gabriel, *The Soft Power of Heritage: History and Uses 2023/24 Winter Course*.

'Cultural heritage as an instrument for climate action' refers to the manipulated role of heritage in climate action. This involves heritage institutions over-idealizing heritage to promote powerful agencies' agendas and using heritage narratives to shape public attention and support. This also involves using heritage as some sort of propaganda material. Consciously or unconsciously, these institutions fail to recognize the limitations of our current understanding of heritage and the inadequacies of the targeted heritage form in addressing the scale of the climate change problem.

The forth theme, ‘heritage is a process in climate action’ does not take heritage for granted as a sustainable approach. Instead, it recognizes that heritage can change, disappear, adapt, recreated, or be reimagined for a fairer and more resilient future.

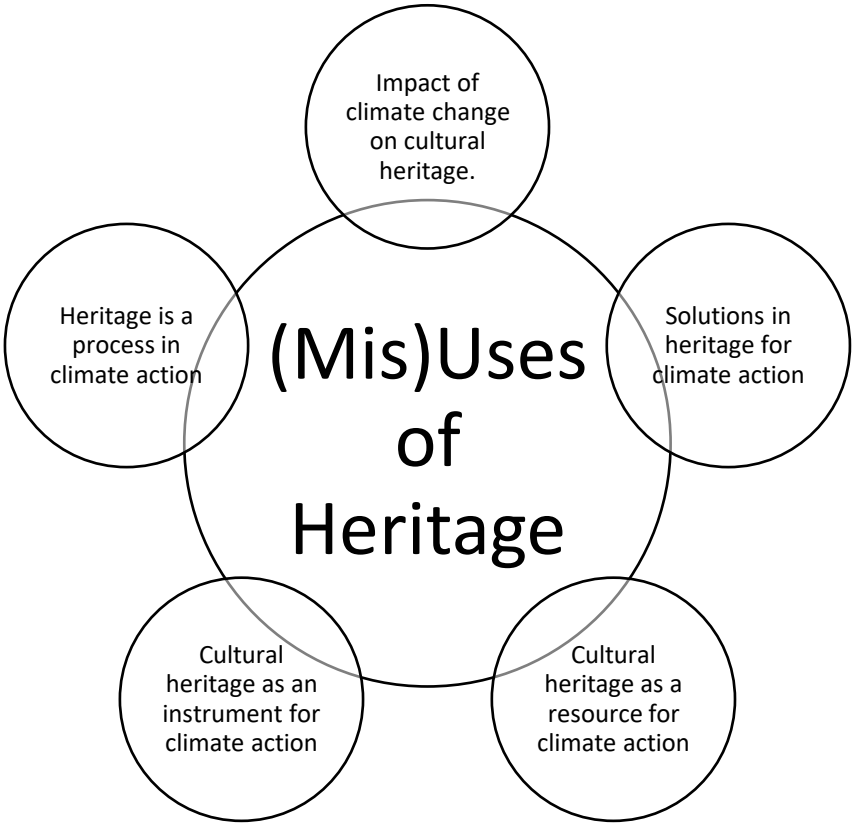

Figure 24. (Mis)uses of heritage for climate action.

Conclusion

This thesis' academic contribution lies in conceptualizing these discussions within the framework of 'critical heritage urbanism' that connects urban and heritage phenomena in addressing emerging urban issues of the Anthropocene. In this thesis, I reframed climate change as a cultural phenomenon and delved into the dynamics of water streams, wastewater flows, and treated water flows within the municipal climate heritage context, while also exploring the path to establishing a climate heritage nexus on an international scale. By investigating these interactions at both local and global levels, the research had knowledge contribution to intricate complexities inherent climate change and urban cultural heritage nexus in Mediterranean context.

This study demonstrated that a deeper understanding of the climate change–heritage nexus necessitates critical interdisciplinarity. To do that, I referred to this interdisciplinarity as critical heritage urbanism and in this framework, I integrated the selected ideas and concepts from critical urban theory, critical heritage studies, and environmental history. It became clear that heritage studies and urban studies are methodologically distinct, underscoring the need for closer integration in order to navigate the complexities evident in both "urban" and "heritage" phenomena. This emphasizes why focusing on water is an essential theme for my research. Second, in light of the problems posed by climate change, I incorporated critical heritage urbanism into Izmir's waterbodies. Focusing the climate heritage discourse to water—that is, streams, wastewater, and treated water—facilitated to critically examine how heritage is used in Izmir's climate action.

Heritage is increasingly seeking recognition within the cultural domain. On the international stage, there is a pressing need to acknowledge the cultural pillar in climate action. This

paradigm shift could facilitate the integration of heritage into climate strategies at both national and international levels, thereby enriching climate thinking and policy development. I presented an evaluation of the climate change and heritage nexus using a linear timeline. I found that international heritage organizations have significantly intensified their efforts to incorporate urban heritage into the climate context over the past decade. Promising developments, such as the Historic Urban Landscape approach, have emerged. However, in the Izmir case, there is still no practical implementation of this approach, with site-based heritage methods continuing to set limitations.

The decentralization of climate heritage actions to the local level is becoming increasingly important. The Izmir case revealed important findings significance of local governments as incubators of alternative ideas to climate heritage action. However, in the case of the Izmir Metropolitan Municipality, these actions were primarily driven by a strong mayor who was supported by international networks. There appears to be a lack of sufficient consortium at both the municipal and community levels, making it challenging to sustain these perspectives and ensure continuity amid political shifts.

There are, in my estimation, two key perspectives driving the climate heritage nexus. One is 'the future of our pasts' and the other is 'the future is not the past'. Basically, one perspective advocates for preserving our heritage for the future, while the other suggests extracting the sustainable aspects of heritage and moving forward with them. The first perspective is more conservative, viewing heritage as an inherent driver for sustainability. Conversely, the second perspective is more provocative, suggesting that in some cases, heritage can pose a burden to sustainability.

I highlighted that heritage institutions tend to idealize or, in some cases, leverage heritage for climate action. I acknowledge the potential of intangible heritage and traditional knowledge in

climate adaptation, and I also recognize that protected natural areas can serve as reserves for bio diversity and carbon sinks. However, it is important to recognize the limitations of our current understanding of heritage and its inadequacies in addressing the scale of the climate change problem. It is also important to understand unsustainable heritage practices that has economic, social, environmental impacts.

The cases in Izmir demonstrated that current heritage categories do not accurately represent the ground realities. Consequently, it is challenging to create grounded and realistic climate-heritage imaginaries. A striking example is the Çiğli Wetland. On one hand, Çiğli is defined as a natural heritage area on the UNESCO process. On the other hand, I define Çiğli as a nature-culture heritage site intertwined with urban infrastructural landscape and industrial heritage, including the 'toxic heritage' of sewage sludge. Thus, there is a pressing need to develop more hybrid categories that integrate cultural, environmental, and socio-economic dimensions to manage and rehabilitate these areas.

Urban infrastructures create new heritage realities as in the Çiğli case, such as the living industrial heritage site of saltworks has become the habitat of the flamingos. Pollution was an important problem in every case. However, the technical approaches to dealing with pollution also create new forms of heritage. This was evident in the Meles case, where conservation efforts for the cultural landscape of the Meles corridors were supported by treated water.

Financing has a significant role of in climate adaptation projects. I revealed some of the actual cost of climate actions in Izmir, which cannot be undertaken by municipality alone. Thus, heritage narratives played a crucial role in supporting large municipal projects for climate action. This highlight that climate heritage action is costly and requires public support.

However, there is a tendency for community and heritage to be constructed as mutually exclusive entities. The findings indicate that not every community perceives the need for action with the same urgency. Climate change, pollution, and other disaster risks disproportionately impact marginalized communities, exacerbating social inequalities. Climate heritage action risks displacing communities and erasing collective memory.

I emphasize the importance of environmental history in climate heritage projects to counter the misuse of history. Counter memory plays a crucial role in constructing better opportunities for communities by challenging dominant historical narratives. By creating historical reconstructions, we can revive ecological memories and provide a more comprehensive understanding of the past. This approach encourages thinking and remembering through counter memories that go beyond national narratives, fostering multifaceted collective memory.

With these findings, I rethink, then categorize the changing roles of heritage into five roles: Impact of climate change on cultural heritage; solutions in heritage for climate action; cultural heritage as a resource for climate action; cultural heritage as an instrument for climate action; heritage is a process in climate action. I sought to improve our understanding of the climate change-heritage nexus and the role of heritage in global warming with these five categories.

In the changing climate of the world, among various responses for climate change heritage proved its unique position which inspired this thesis. City making and the heritage making processes continue while global warming extents its discussions. The concepts of climate, climate change, urban environments, urban heritage, and heritage are inherently complex and subject to continual conceptual shifts. These shifts have great potential to enhance our understanding of each phenomenon, offering new insights and contributing to a deeper comprehension of their interrelations. It is imperative that we continue to view urban and

heritage phenomena not as isolated entities, but rather as interconnected components within a planetary continuum.

Bibliography

Agos. “Izmir of Once upon a Time.” Agos, October 13, 2012. https://www.agos.com.tr/tr/yazi/2857/bir-zamanlarin-izmir-i.

Ahmet Karataş, Erol Kesici, and Levent Erkol. “Assessment of Izmir Gediz Delta According to UNESCO World Heritage Criteria.” Doga Dernegi, December 2017. https://dogadernegi.org/wp-content/uploads/2017/12/izmir-gediz-deltasinin-unesco-dunya-doga-mirasi-kritelerlerine-gore-degerlendirilmesi.pdf.

Akkaya, Batuhan. *Children Play Amidst the Ruins of Helleno-Roman Smyrna in Kadifekale*. July 17, 2023. Photograph.

Akkaya, Batuhan *Çiğli Wastewater Treatment Plant*. 2023. Photograph.

Akkaya, Batuhan. *Expropriated Areas, Gecekondus, and Meles Stream.* July 19, 2023. Photograph.

Akkaya, Batuhan. “Izmir’s Location among Mediterranean Countries. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality GIS Directorate and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. “Izmir’s Natural Areas and Green Spaces in and around the Central Urban Areas. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Parks and Gardens Department; Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks; and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. “Lagun Islands in 1953 Compare to 2023. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. *Pelicans and Other Bird Species in Çiğli, Gediz Delta*. July 17, 2023. Photograph.

Akkaya, Batuhan. *Peynircioğlu Stream and Apartments in Mavişehir*. 2021. Photograph.

Akkaya, Batuhan. “The Areas Affected by the Flood on November 26, 2023, in Izmir’s Central Districts. Cartographer Batuhan Akkaya. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Parks and Gardens Department and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. “The Different Layers of IMM’s Strategies in the Context of Heritage and Climate Action. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality; Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks; and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. “The Different Level of Urban Transformation Areas in Izmir’s Central Districts. Map Data Obtained and Copyrighted by Izmir Metropolitan Municipality Urbanization and Zoning Department and OpenStreetMap Contributors.” Vienna, 2023.

Akkaya, Batuhan. *The Hyperdense Urban Environment of Izmir’s Central Districts*. 2023. Photograph.

Akkaya, Batuhan. *The Section of the Meles Stream Where the Proposed Karabağlar WWTP Will Release Treated Water*. December 5, 2023. Photograph.

Akkaya, Batuhan. *Three Layers within the Ege Neighborhood*. July 17, 2023. Photograph.

Akkaya, Batuhan. *Wooden Structures in Çamaltı Saltworks*. December 4, 2023. Photograph.

Akkaya, Batuhan, Gökçe Kuzey Özdemir, Ceyda Aydın Yılmazdoğan, Ahmet Altun, and Alp Arısoy. “Cultural Heritage as a Resource for Resilience in the Climate Crisis (İklim Krizinde Dayanıklılık için Kaynak Olarak ‘Miras’).” Istanbul: Union of Historical Towns, 2022.

https://www.tarihikentlerbirligi.org/yayinlar/#flipbook-iklim-krizinde-dayaniklilik-icin-kaynak-olarak-miras-arastirma-raporu-2022/1/.

Anadolu Ajansı. "Turkey's Last Levantines Are Trying to Preserve Their Culture," 2019. https://www.aa.com.tr/tr/yasam/turkiyenin-son-levantenleri-kulturlerini-yasatmaya-calisiyor/1372220.

Binbir Gıda. "About." Coorparate Web Page. Binbir Gıda, 2024. https://www.binbirgida.com/kurumsal/hakkimizda.

Brenner, Neil. "The Hinterland Urbanised?" *Architectural Design* 86, no. 4 (July 2016): 118–27. https://doi.org/10.1002/ad.2077.

Brenner, Neil, and Christian Schmid. "Towards a New Epistemology of the Urban?" *City* 19, no. 2–3 (May 4, 2015): 151–82. https://doi.org/10.1080/13604813.2015.1014712.

Bristow, Tom, and Thomas H. Ford. In *A Cultural History of Climate Change*. Routledge Environmental Humanities. London: Routledge, Taylor & Francis group, 2016.

Calvin, Katherine, Dipak Dasgupta, Gerhard Krinner, Aditi Mukherji, Peter W. Thorne, Christopher Trisos, José Romero, et al. "IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (Eds.)]. IPCC, Geneva, Switzerland." First. Intergovernmental Panel on Climate Change (IPCC), July 25, 2023. https://doi.org/10.59327/IPCC/AR6-9789291691647.

Carey, Mark. "Beyond Weather: The Culture and Politics of Climate History." In *The Oxford Handbook of Environmental History*, edited by Andrew C. Isenberg. Oxford Handbooks. Oxford ; New York: Oxford University Press, 2014.

Casler, Clark L., Elsie E. Esté, and Elsie E. Este. "Caribbean Flamingos Feeding at a New Solar Saltworks in Western Venezuela." *Waterbirds: The International Journal of Waterbird Biology* 23 (2000): 95. https://doi.org/10.2307/1522152.

Caterina Scaramelli. "Salt, Seeds, and Flamingos: On the Politics of Infrastructural Ecology in Turkey," 2017. https://www.academia.edu/37090723/Salt_Seeds_and_Flamingos_On_the_Politics_of_Infrastructural_Ecology_in_Turkey.

Cech, Petra, and Mozes F. Heinschink. *Sepečides-Romani*. Languages of the World Materials 106. München [i.e.] Unterschleissheim: LINCOM Europa, 1996.

Çiğdem Kılıçarslan and Bülent Özkan. "From Past to Extant The River Meles." *Journal of Bartın Faculty of Forestry* 8, no. 9 (2006): 51–59.

Cittaslow International. "Cittaslow: International Network of Cities Where Living Is Easy," 2019. https://www.cittaslow.org/sites/default/files/content/page/files/246/cittaslow_2019_brochure_1.pdf.

Cittaslow Project Expert. Personal Interview 8 with Cittaslow Izmir Unit of Izmir Metropolitan Municipality. Interview by Batuhan Akkaya, July 19, 2023.

Cittaslow Turkey. "Cittaslow Metropolis." *Cittaslow Turkey* (blog), June 8, 2022. https://cittaslowturkiye.org/en/csm/.

Climate Change and Zero Waste Department Expert. Personal Interview 11 Izmir Metropolitan Municipality Climate Change and Zero Waste Department. Interview by Batuhan Akkaya, n.d.

Climate Heritage Network. "Press Release 'Group of Friends of Culture-Based Climate Action' Launched at COP 28 in Response to Global Campaign by Cultural Voices." Climate Heritage Network, 2023. https://www.climateheritage.org/jwd.

Collaço, Gwendolyn. *Prints and Impressions from Ottoman Smyrna. The Collection de Costumes Civils et Militaires, Scènes Populaires, et Vues de l'Asie-Mineure Album (1836-38) at Harvard University's Fine Arts Library. With Historical Comments by Evangelia Balta & Richard*

Wittmann. (Memoria. Fontes Minores Ad Historiam Imperii Ottomanici Pertinentes, Vol. 4). Bonn: Max Weber Stiftung, 2019. https://perspectivia.net/publikationen/memoria/collaco_smyrna.

Corumluoglu, Ozsen, and Ibrahim Asri. "The Effect of Urban Heat Island on Izmir's City Ecosystem and Climate." *Environmental Science and Pollution Research* 22, no. 5 (March 2015): 3202–11. https://doi.org/10.1007/s11356-014-2874-z.

Currie, Paul Klugman, and Josephine Kaviti Musango. "African Urbanization: Assimilating Urban Metabolism into Sustainability Discourse and Practice." *Journal of Industrial Ecology* 21, no. 5 (October 2017): 1262–76. https://doi.org/10.1111/jiec.12517.

Dabanli, Ismail. "Drought Risk Assessment by Using Drought Hazard andVulnerability Indexes." Preprint. Hydrological Hazards, June 11, 2018. https://doi.org/10.5194/nhess-2018-129.

Demirkesen, A. C., F. Evrendilek, S. Berberoglu, and S. Kilic. "Coastal Flood Risk Analysis Using Landsat-7 ETM+ Imagery and SRTM DEM: A Case Study of Izmir, Turkey." *Environmental Monitoring and Assessment* 131, no. 1–3 (June 22, 2007): 293–300. https://doi.org/10.1007/s10661-006-9476-2.

Derin, Zafer. "Human Existence in Smyrna during the Pre-Historic Era." In *A Journey to the Homeric Landscape Smyrna*, by Ayşe Yetişkin Kubilay. Bucharest: Troas Publishing, 2022.

DeSilvey, Caitlin, Harald Fredheim, Hannah Fluck, Rosemary Hails, Rodney Harrison, Ingrid Samuel, and Amber Blundell. "When Loss Is More: From Managed Decline to Adaptive Release." *The Historic Environment: Policy & Practice* 12, no. 3–4 (October 2, 2021): 418–33. https://doi.org/10.1080/17567505.2021.1957263.

Dragoş Mateescu. "The Swan Song of Secular Turkey? A Perspective from Izmir." Veridica, September 22, 2023. https://www.veridica.ro/en/editorials/the-swan-song-of-secular-turkey-a-perspective-from-izmir.

Edis Koru. "Artemia and It's Importance in Çamaltı Saltworks (Izmir, Turkey) Ecosystem." *E.U. Journal of Fisheries & Aquatic Sciences* 21, no. 1–2 (2004): 187–89.

Ekşioğlu Çetintahra, Gözde, and Neslihan Karataş Ünverdi. "Reflections of the Socio-Economic Structure of Izmir Neighborhoods on Space from the Ottoman Period to the Present (Osmanlı'dan Günümüze İzmir Mahallelerinin Sosyo-Ekonomik Yapısının Mekana Yansımaları)." *Bilecik Şeyh Edebali University Journal of Social Sciences* 3, no. 1 (June 1, 2018): 39–55. https://doi.org/10.33905/bseusbed.392612.

Europa Nostra. "'Group of Friends of Culture-Based Climate Action' Launched at COP 28 in Response to Global Campaign by Cultural Voices." Europa Nostra, December 9, 2023. https://www.europanostra.org/group-of-friends-of-culture-based-climate-action-launched-at-cop-28-in-response-to-global-campaign-by-cultural-voices/.

European Investment Bank Institute. "When Culture Meets Climate." EIB Institute, December 13, 2023. https://institute.eib.org/2023/12/when-culture-meets-climate/.

Gabriel, Isabelle Anatole-. *The Soft Power of Heritage: History and Uses 2023/24 Winter Course*. Central European University, 2024.

Gentry, Kynan, and Laurajane Smith. "Critical Heritage Studies and the Legacies of the Late-Twentieth Century Heritage Canon." *International Journal of Heritage Studies* 25, no. 11 (November 2, 2019): 1148–68. https://doi.org/10.1080/13527258.2019.1570964.

Giorgi, Filippo, and Piero Lionello. "Climate Change Projections for the Mediterranean Region." *Global and Planetary Change* 63, no. 2–3 (September 2008): 90–104. https://doi.org/10.1016/j.gloplacha.2007.09.005.

Gönlügür, Emre, and Devrim Sezer. "Therapeutic Forgetting, Agonistic Remembrance: Conflicting Memories of Izmir's Kültürpark and Contested Narratives in Contemporary Turkey." *Memory Studies* 14, no. 2 (April 2021): 395–421. https://doi.org/10.1177/1750698020921432.

Guzman, Paloma, and Daly Cathy. “Cultural Heritage in Climate Planning; The HiCLIP Pilot Project for Understanding the Integration of Culture into Climate Action.” A report on the Climate Heritage Network WG4 HiCLIP project. ICOMOS, 2021.

Haboucha, Rebecca. “The Future of Heritage as Climates Change: Loss, Adaptation, and Creativity, Edited by David C. Harvey and Jim Perry,” July 1, 2017. https://doi.org/10.17863/CAM.33776.

Harrison, Rodney. “Beyond ‘Natural’ and ‘Cultural’ Heritage: Toward an Ontological Politics of Heritage in the Age of Anthropocene.” *Heritage & Society* 8, no. 1 (May 2015): 24–42. https://doi.org/10.1179/2159032X15Z.00000000036.

Harvey, D. C., and Jim Perry, eds. *The Future of Heritage as Climates Change: Loss, Adaptation and Creativity*. Key Issues in Cultural Heritage. London New York: Routledge, 2015.

Hasan Nüzhet Dalfes and Sedat Avcı. “Lost Shores in Istanbul and Izmir: Sea Level Rise and Potential Impacts.” Ankara: Global Balance, 2023. https://www.denizseviyesi.com/raporlar.

Healthy City Project Office. “Izmir City Health Profile.” Izmir: Izmir Metropolitan Municipality, 2009. https://skpo.izmir.bel.tr/content.aspx?MID=93.

Hepcan, Serif, Cigdem Coskun Hepcan, Cigdem Kilicaslan, Mehmet Bulent Ozkan, and Nurhan Kocan. “Analyzing Landscape Change and Urban Sprawl in a Mediterranean Coastal Landscape: A Case Study from Izmir, Turkey.” *Journal of Coastal Research* 29, no. 2 (November 6, 2012): 301. https://doi.org/10.2112/JCOASTRES-D-11-00064.1.

Heritage Futures: Comparative Approaches to Natural and Cultural Heritage Practices. London: UCL Press, 2020.

Heymann, Matthias. “The Evolution of Climate Ideas and Knowledge” 1, no. 4 (2010): 581–97. https://doi.org/10.1002/wcc.61.

Hüttl, Reinhard F., Karen David, and Bernd Uwe Schneider. “Historic Gardens and Climate Change.” In *Historische Gärten Und Klimawandel*, edited by Reinhard F. Hüttl, Karen David, and Bernd Uwe Schneider, 399–407. De Gruyter, 2019. https://doi.org/10.1515/9783110607772-035.

ICOMOS. “Charter for the Preservation of Quebec’s Heritage (Deschambault Declaration) - 1982.” ICOMOS. Accessed January 11, 2024. https://www.icomos.org/en/support-us/179-articles-en-francais/ressources/charters-and-standards/192-the-deschambault-charter.

ICOMOS. “Charter of Cultural Tourism,” 1976. https://www.icomosictc.org/p/1976-icomos-cultural-tourism-charter.html.

ICOMOS. “ICOMOS Climate Action Working Group.” ICOMOS. Accessed January 12, 2024. https://www.icomos.org/en/what-we-do/disseminating-knowledge/icomos-working-groups?start=6.

ICOMOS. “ICOMOS Coordinates New Global Initiative to Safeguard Heritage from Climate Change.” ICOMOS, 2023. https://www.icomos.org/en/89-english-categories/home/121976-icomos-coordinates-new-global-initiative-to-safeguard-heritage-from-climate-change.

ICOMOS. “ICOMOS Releases ‘Future of Our Pasts’ Report.” ICOMOS, 2019. https://www.icomos.org/en/77-articles-en-francais/59522-icomos-releases-future-of-our-pasts-report-to-increase-engagement-of-cultural-heritage-in-climate-action.

ICOMOS Australia. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 2013*. Burwood, VIC, Australia: Australia ICOMOS Incorporated, 2013.

ICOMOS. “The Florence Charter 1982.” Accessed January 10, 2024. https://www.icomos.org/en/what-we-do/focus/179-articles-en-francais/ressources/charters-and-standards/158-the-florence-charter.

ICOMOS Australia. “Burra Charter & Practice Notes | Australia ICOMOS.” Australia ICOMOS, December 13, 2013. https://australia.icomos.org/publications/burra-charter-practice-notes/.

ICOMOS Australia. *Heritage and Sustainability 1: Built Heritage Practice Note*. Version 01. ICOMOS Australia, 2019.

ICOMOS Climate Change and Cultural Heritage Working Group. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*. Paris, France: ICOMOS, 2019.

İkizer, İhsan. "Weakening the Strong Mayor: Partisan Division and Presidential Intervention in Istanbul." *State and Local Government Review* 54, no. 1 (March 2022): 32–51. https://doi.org/10.1177/0160323X211045356.

Imber, Colin. "Izmir and the Levantine World, 1550–1650. By Daniel Goffman (Publications on the Near East, No. 5.) Pp. Xv236 30 Illus, I Fig., 3 Maps Seattle and London, University of Washington Press, 1990. US $25.00." *Journal of the Royal Asiatic Society* 2, no. 2 (July 1992): 276–77. https://doi.org/10.1017/S1356186300002595.

İnalcık, Halil. "The Yörüks: Their Origins, Expansion and Economic Role." *Cedrus* 2 (June 30, 2014): 467–467. https://doi.org/10.13113/CEDRUS.201406472.

International Society of City and Regional Planners (ISOCARP). "Climate Heritage Mobilization at Global Climate Action Summit 2018 Heritage." ISOCARP. Accessed January 11, 2024. https://isocarp.org/news/climate-heritage-mobilization-global-climate-action-summit-2018-heritage/.

IZDOGA Expert. Personal Interview 1 with IZDOGA (Izmir Metropolitan Municipality Environmental Protection, Improvement, Consultancy, and Project Services Trading and Industry Inc.). Interview by Batuhan Akkaya, July 17, 2023.

IZFAS Expert. Personal Interview 5 with IZFAS Izmir Fair Services Culture and Art Works Trade. Inc. of Izmir Metropolitan Municipality). Interview by Batuhan Akkaya, July 19, 2023.

Izmir Development Agency . "Izmir Regional Plan 2014 - 2023." Izmir: Izmir Development Agency, 2015. https://izka.org.tr/wp-content/uploads/2021/06/Strplan_Izmir.pdf.

Izmir Development Agency. "Strong Economy." Invest in İzmir. Accessed May 1, 2024. https://investinizmir.com/why-izmir/strong-economy/.

Izmir Foundation. "8500 Years in a Single Day." Visit Izmir. Accessed March 22, 2024. https://www.visitizmir.org/en/Content/184.

Izmir Metropolitan Municipality. "Homer Valley Living Park." Accessed May 4, 2024. https://yasayanparklar.org/park/homeros-vadisi.

Izmir Metropolitan Municipality. "Izmir Green City Action Plan 2021-2030." Izmir, 2020.

Izmir Metropolitan Municipality. "Izmir Metropolitan Municipality Strategic Plan 2020-2024." Izmir Metropolitan Municipality, 2020. https://www.izmir.bel.tr/CKYuklenen/Dokumanlar_2020/Stratejik%20Plan2024.pdf.

Izmir Metropolitan Municipality. "Izmir's Strategy for Living in Harmony with Nature 2021-2030." Izmir, 2021. https://aiph.org/wp-content/uploads/2022/08/IzmirinDogaileUyumluStratejiPlani-EN.pdf.

Izmir Metropolitan Municipality. "Mavişehir Flamingo Nature Park is counting down the days to meet with the people of Izmir." Izmir Metropolitan Municipality, December 31, 2024. https://www.izmir.bel.tr/tr/Haberler/mavisehir-flamingo-doga-parki-izmirliler-ile-bulusmaya-gun-sayiyor/49732/156.

Izmir Metropolitan Municipality. "Sponge City Applications Regulation." Izmir Metropolitan Municipality, October 10, 2022. https://sungerkent.izmir.bel.tr/images/pdf/yonetmelik.pdf.

Izmir Metropolitan Municipality. "The Izmir Bird Paradise." Izmir Metropolitan Municipality. Accessed April 23, 2024. https://www.izmir.bel.tr/tr/Projeler/izmir-kus-cenneti/1297/4.

Izmir Metropolitan Municipality. "The rehabilitation project in Peynircioğlu Stream has been completed." Izmir Metropolitan Municipality, October 8, 2020. https://www.izmir.bel.tr/tr/Haberler/peynircioglu-deresi-ndeki-islah-projesi-tamamlandi/44155/156.

IZSU. "Ciğli Wastewater Treatment Plant." Accessed April 23, 2024. https://www.izsu.gov.tr/tr/TesisDetay/1/80/1.

IZSU Expert 2. Personal Interview 13 with IZSU (Izmir General Directorate of Water and Sewerage Administration). Interview by Batuhan Akkaya, December 4, 2023.

IZSU Wastewater Treatment Unit Expert. Personal Interview 2 with IZSU (Izmir General Directorate of Water and Sewerage Administration). Interview by Batuhan Akkaya, July 17, 2023.

Jokilehto, Jukka. "Definition of Cultural Heritage References to Documents in History." ICCROM Working Group "Heritage and Society," 2005.

Jović, Dejan. "'Official Memories' in Post-authoritarianism: An Analytical Framework." *Journal of Southern Europe and the Balkans* 6, no. 2 (August 2004): 97–108. https://doi.org/10.1080/1461319042000242001.

Jukka Jokilehto. "The Context of the Venice Charter (1964)." *Conservation and Management of Archaeological Sites* 2, no. 4 (January 1998): 229–33. https://doi.org/10.1179/135050398793138762.

Kaba, Bahar. "Lifestyle migration from İstanbul to Izmir." PhD Dissertation, Aegean University, Institute of Social Sciences, Department of Geography, Human and Economic Geography Department, 2023. https://tez.yok.gov.tr/.

Kisacik, Dogan, Gulizar Ozyurt Tarakcioglu, and Cuneyt Baykal. "Stilling Wave Basins for Overtopping Reduction at an Urban Vertical Seawall – The Kordon Seawall at Izmir." *Ocean Engineering* 185 (August 2019): 82–99. https://doi.org/10.1016/j.oceaneng.2019.05.033.

Kryder-Reid, Elizabeth, and Sarah May. *Toxic Heritage: Legacies, Futures, and Environmental Injustice*. 1st ed. London: Routledge, 2023. https://doi.org/10.4324/9781003365259.

Levantine Heritage Foundation. *19th Century Engraving of the Valley of Bornova Stream*. n.d. http://www.levantineheritage.com/note54.htm.

Levantine Heritage Foundation. *Aqueduct from the Brian de Jongh Collection.* n.d. http://www.levantineheritage.com/yesildere.htm.

Lionello, Piero. *The Climate of the Mediterranean Region: From the Past to the Future*. 1st ed. Elsevier Insights. London Waltham, MA: Elsevier, 2012.

Luthy, Richard G, David L Sedlak, Megan H Plumlee, David Austin, and Vincent H Resh. "Wastewater-effluent-dominated Streams as Ecosystem-management Tools in a Drier Climate." *Frontiers in Ecology and the Environment* 13, no. 9 (November 2015): 477–85. https://doi.org/10.1890/150038.

Mark Carey. "Climate and History: A Critical Review of Historical Climatology and Climate Change Historiography." *WIREs Climate Change* 3, no. 3 (May 2012): 233–49. https://doi.org/10.1002/wcc.171.

Mehmet Akif Erdoğdu. "Bornova as a Place of Different Religions, Peoples, and Cultures." City and Memory, 2021. http://www.kentvebellek.com/farkli-dinler-halklar-ve-kulturlerin-yeri-olarak-bornova_37.html.

Mehmet Sıkı. "The birds of Gediz Delta (İzmir Bird Paradise)." *Ekoloji Çevre Dergisi* 11, no. 44 (2002): 11–16.

Mersin, Denizhan, Ayse Gulmez, Mir Jafar Sadegh Safari, Babak Vaheddoost, and Gokmen Tayfur. "Drought Assessment in the Aegean Region of Turkey." *Pure and Applied Geophysics* 179, no. 8 (August 2022): 3035–53. https://doi.org/10.1007/s00024-022-03089-7.

Ministry of Culture and Tourism. "Historical and Cultural Places: Aqueducts and Bridges." Republic of Türkiye Ministry of Culture and Tourism. Accessed May 4, 2024. https://izmir.ktb.gov.tr/EN-243128/aqueducts-and-bridges.html.

Ministry of Environment and Urbanisation. "Turkey's National Climate Change Adaptation Strategy and Action Plan 2011–2023." Ankara: Republic of Turkey Ministry of Environment and

Urbanization, 2012. https://webdosya.csb.gov.tr/db/iklim/editordosya/file/eylem%20planlari/uyum_stratejisi_eylem_plani_EN_Final.pdf.

Morack, Ellinor. "Expropriating the Dead in Turkey: How the Armenian Quarter of İzmir Became *Kültürpark*." *European Review of History: Revue Européenne d'histoire* 28, no. 2 (March 4, 2021): 240–59. https://doi.org/10.1080/13507486.2020.1832051.

Morel, Hana, William Megarry, Andrew Potts, Jyoti Hosagrahar, Debra Roberts, Yunus Arikan, Eduardo Brondizio, et al. *Global Research and Action Agenda on Culture, Heritage and Climate Change*. Charenton-le-Pont, France & Paris, France, 2022. https://openarchive.icomos.org/id/eprint/2716/1/ICSM%20CHC-Global%20Research%20and%20Action%20Agenda%20on%20Culture%2C%20Heritage%20and%20Climate%20Change.pdf.

Moser, Susanne C. "Communicating Climate Change: History, Challenges, Process and Future Directions." *WIREs Climate Change* 1, no. 1 (January 2010): 31–53. https://doi.org/10.1002/wcc.11.

Municipal Finance Expert. Personal Interview 8 with Financial Services Department. Interview by Batuhan Akkaya, December 5, 2023.

Neil Brenner's Harvard GSD Open House Lecture. Harvard GSD Open House Lecture, 2015. https://www.youtube.com/watch?v=z6crlf9gh_M.

Nicholas P., Simpson, Scott Allan Orr, Salma Sabour, Joanne Clarke, Maya Ishizawa, R. Michael Feener, Christopher Ballard, et al. *ICSM CHC White Paper II: Impacts, Vulnerability, and Understanding Risks of Climate Change for Culture and Heritage: Contribution of Impacts Group II to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change*. Charenton-le-Pont, France & Paris, France: ICOMOS & ICSM CHC, 2022. https://openarchive.icomos.org/id/eprint/2718/1/ICSM%20CHC%20White%20Paper%20II-%20Impacts%2C%20vulnerability%2C%20and%20understanding%20risks%20of%20climate%20change%20for%20culture%20and%20heritage.pdf.

Nora, Pierre, and Lawrence D. Kritzman, eds. *Realms of Memory: Rethinking the French Past*. European Perspectives. New York: Columbia University Press, 1996.

NTV. "Izmir hit by heavy rain and storm: Coastal areas underwater!" Accessed May 5, 2024. https://www.ntv.com.tr/galeri/turkiye/izmiri-saganak-ve-firtina-vurdu-kiyi-seridi-su-altinda,dUPm_4eMFkeAXFdzFNSVmA.

Nuran Talu, Sinan Özden, Serdar Özgün, William Dougherty, and Amanda Fencl. "Enhancing the Capacity of Turkey to Adapt to Climate Change: Participatory Vulnerability Analysis." Ankara: T.R. Ministry of Environment and Urbanization, 2010. http://www.mdgfund.org/sites/default/files/ENV_STUDY_Turkey_Participatory%20Vulnerability%20Analysis.pdf.

Obad Šćitaroci, Mladen, Bojana Bojanić Obad Šćitaroci, and Ana Mrđa, eds. *Cultural Urban Heritage: Development, Learning and Landscape Strategies*. The Urban Book Series. Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-10612-6.

Orlove, Ben, Neil Dawson, Pasang Sherpa, Ibidun Adelekan, Wilfredo Alangui, Rosario Carmona, Deborah Coen, et al. *ICSM CHC White Paper I: Intangible Cultural Heritage, Diverse Knowledge Systems and Climate Change. Contribution of Knowledge Systems Group I to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change.* Charenton-le-Pont, France & Paris, France: ICOMOS & ISCM CHC, 2022. https://openarchive.icomos.org/id/eprint/2717/1/ICSM%20CHC%20White%20Paper%20I-%20Intangible%20Cultural%20Heritage%2C%20Diverse%20Knowledge%20Systems%20and%20Climate%20Change.pdf.

Ozkul, Sevinc. “Assessment of Climate Change Effects in Aegean River Basins: The Case of Gediz and Buyuk Menderes Basins.” *Climatic Change* 97, no. 1–2 (November 2009): 253–83. https://doi.org/10.1007/s10584-009-9589-z.

Öztürk, Özkan. “Environmental Discourses and the Course of Environmental Movements in Turkey.” *Journal of History Culture and Art Research* 6, no. 2 (April 6, 2017): 441. https://doi.org/10.7596/taksad.v6i2.804.

Öztürk, Sevinç, and Thomas Reilly. “Assessing Centralization: On Turkey’s Rising Personalist Regime.” *Southeast European and Black Sea Studies* 24, no. 1 (January 2, 2024): 167–85. https://doi.org/10.1080/14683857.2022.2137899.

Parks and Gardens Department Expert. Personal Interview 17 Izmir Metropolitan Municipality Parks and Gardens Department. Interview by Batuhan Akkaya, n.d.

Ping, Li, Gang Zhao, Xiaohu Lin, Yunhui Gu, Wei Liu, Haihua Cao, Juwen Huang, and Jingcheng Xu. “Feasibility and Carbon Footprint Analysis of Lime-Dried Sludge for Cement Production.” *Sustainability* 12, no. 6 (March 23, 2020): 2500. https://doi.org/10.3390/su12062500.

“Places, Explore Our Cultural and Natural Heritage Sites across the Globe.” Preserving Legacies Places. Accessed January 13, 2024. https://www.heritageadapts.org/sites/cartagena-de-india#middle-anchor.

Plass, Gilbert N. “The Carbon Dioxide Theory of Climatic Change.” *Tellus* 8, no. 2 (May 1956): 140–54. https://doi.org/10.1111/j.2153-3490.1956.tb01206.x.

Potts, Andrew. “The Role of Culture in Climate Resilient Development.” Barcelona: UCLG Committee on Culture Reports, nº10, and Climate Heritage Network (Working Group 5), November 5, 2021. https://agenda21culture.net/sites/default/files/files/documents/en/report_10_-_culture_and_climate_resilient_development_-_en_2.pdf.

Preserving Legacies. “About Preserving Legacies.” Accessed January 12, 2024. https://www.heritageadapts.org/about.

Presidency Of The Republic Of Turkey. “‘We plan to achieve the net zero emission target by 2053.’” Presidency Of The Republic Of Turkey, 2023. https://www.tccb.gov.tr/en/news/542/150390/-we-plan-to-achieve-the-net-zero-emission-target-by-2053-.

Rachel Wakefield. “Expo 2026 İzmir Promises to Connect Its Past with a ‘Nature-Based’ Future.” International Association of Horticultural Producers (AIPH), 2022. https://aiph.org/latest-news/expo-2026-izmir-promises-to-connect-its-past-with-a-nature-based-future/.

Rodney Harrison. *Heritage: Critical Approaches*. Milton Park, Abingdon ; New York: Routledge, 2013.

Rogers, Ayesha Pamela. “Historic Urban Landscape Approach and Living Heritage.” Accessed November 9, 2022. https://www.academia.edu/35050776/Historic_Urban_Landscape_Approach_and_Living_Heritage.

Salata, Stefano, Koray Velibeyoğlu, Alper Baba, Nicel Saygın, Virginia Thompson Couch, and Taygun Uzelli. “Adapting Cities to Pluvial Flooding: The Case of Izmir (Türkiye).” *Sustainability* 14, no. 24 (December 8, 2022): 16418. https://doi.org/10.3390/su142416418.

Saraçoğlu, Cenk. *City, Middle Class, and Kurds: From Denial to ’Exclusion by Recognition (Şehir, Orta Sınıf ve Kürtler: Inkâr’dan “Tanıyarak Dışlama”Ya)*. 1st edition. Research, Investigation Series 255. Cağaloğlu, İstanbul: İletişim, 2011.

Sefryn Penrose and Nadia Bartolini. “Adaptive Release: Guidance Framework for Sites Affected by Coastal Erosion and Flood Management.” Research Report, n.d. https://historicengland.org.uk/research/results/reports/85-2022.

Selahattin Varan. “Urban Transformation Practices of the Ministry of Environment and Urbanization.” E/17/06. Chamber of Civil Engineers of the Union of Chambers of Turkish Engineers and Architects, 2018. https://eskiadana.imo.org.tr/ekutuphane/index.php?yayinkod=1309.

Şerif Hepcan, Gülden Gökçen, Yusuf Kurucu, Koray Velibeyoğlu, Baha Kuban, Ali, Serdar Atalay, and Jose Fermoso. "URBAN GreenUP Report on the Diagnosis of Izmir," 2019. https://www.urbangreenup.eu/insights/deliverables/d4-1---report-on-the-diagnosis-of-izmir.kl.

Shepherd, Nick, Joshua Benjamin Cohen, William Carmen, Moses Chundu, Christian Ernsten, Oscar Guevara, Franziska Haas, et al. *ICSM CHC White Paper III: The Role of Cultural and Natural Heritage for Climate Action: Contribution of Impacts Group III to the International Co-Sponsored Meeting on Culture, Heritage and Climate Change*. Charenton-le-Pont, France & Paris, France: ICOMOS & ISCM CHC, n.d. https://openarchive.icomos.org/id/eprint/2719/1/ICSM%20CHC%20White%20Paper%20III-%20The%20Role%20of%20Cultural%20and%20Natural%20Heritage%20for%20Climate%20Action.pdf.

Simsek-Caglar, Ayse, and Nina Glick Schiller. *Migrants and City-Making: Dispossession, Displacement, and Urban Regeneration*. Durham: Duke University Press, 2018.

Smith, Laurajane. *Uses of Heritage*. Repr. Heritage Studies. London: Routledge, 2006.

Sun, Zhongyu, and Hai Ren. "Ecological Memory and Its Potential Applications in Ecology: A Review." *Ying Yong Sheng Tai Xue Bao = The Journal of Applied Ecology / Zhongguo Sheng Tai Xue Xue Hui, Zhongguo Ke Xue Yuan Shenyang Ying Yong Sheng Tai Yan Jiu Suo Zhu Ban* 22 (March 1, 2011): 549–55.

Tağil, Şermin, Çağan Alevkayali, and Berkay Aytan. "Assessment of Shoreline Evolution and Erosion Sensitivity Along the Gediz Delta Wetland (Gediz Deltası Sulak Alanı Boyunca Kıyı Şeridi Evrimi ve Erozyon Hassasiyetinin Değerlendirilmesi)." *Ege Coğrafya Dergisi*, August 31, 2023. https://doi.org/10.51800/ecd.1322803.

Tagliaferri, Filomena Viviana. "In the Process of Being Levantines. The 'Levantinization' of the Catholic Community of Izmir (1683–1724)." *Turkish Historical Review* 7, no. 1 (April 12, 2016): 86–112. https://doi.org/10.1163/18775462-00701002.

The Council of Europe. "European Charter of the Architectural Heritage, Adopted by the Council of Europe in Amsterdam, 21-25 October 1975.," 1975. https://rm.coe.int/090000168092ae41.

The Disaster and Emergency Management Authority (AFAD) of Turkey. "Türkiye Earthquake Hazard Map," 2019. https://www.afad.gov.tr/turkiye-deprem-tehlike-haritasi.

Tunç Soyer. "About Me: Tunç Soyer." Tunç Soyer, 2023. https://tuncsoyer.com.tr/en/about-me.

Tunç Soyer. "Soyer's Post about 26 November Floods," November 26, 2023. https://x.com/tuncsoyer/status/1728726363899654339.

Turkish Statistical Institute (TURKSTAT). "Address-Based Population Registration System Results, 2023." Accessed March 17, 2024. https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2023-49684.

TURKSTAT. "Urban-Rural Population Statistics, 2022," 2022. https://data.tuik.gov.tr/Bulten/Index?p=Urban-Rural-Population-Statistics-2022-49755&dil=2.

Uluturhan Suzer, Esin, Aynur Kontaş, and Elif Can Yılmaz. "Assessment of Heavy Metal Pollution of Surface Sediments from Lagoon Areas of Gediz Delta (Izmir Bay)." *Ege Journal of Fisheries and Aquatic Sciences* 32, no. 2 (November 30, 2015): 79–87. https://doi.org/10.12714/egejfas.2015.32.2.04.

UNESCO. "Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage." Accessed December 26, 2023. https://ich.unesco.org/en/basic-texts-00503.

UNESCO. "Questions and Answers." UNESCO World Heritage Centre. Accessed January 11, 2024. https://whc.unesco.org/en/faq/39.

UNESCO. "Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2016 Edition." UNESCO, 2016. https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts-_2016_version-EN.pdf.

UNESCO. “Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2022 Edition.” UNESCO, 2022. https://ich.unesco.org/en/convention.

UNESCO. “Convention Concerning the Protection of the World Cultural and Natural Heritage.” UNESCO, November 16, 1972. https://whc.unesco.org/archive/convention-en.pdf.

UNESCO. *Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar 1971*, 1994. https://www.unesco.org/en/legal-affairs/convention-wetlands-international-importance-especially-waterfowl-habitat.

UNESCO. “Draft Programme and Budget, 2004-2005: Fascicules 1-17,” 2003. https://unesdoc.unesco.org/ark:/48223/pf0000129597?posInSet=362&queryId=15a4f745-160b-4e67-9e55-62b3d42c7ff0.

UNESCO. “Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat Known as the Paris Protocol Adopted at the Extraordinary Conference of the Contracting Parties, Paris, France, 2-3 December 1982.” UNESCO, 1982. https://www.ramsar.org/sites/default/files/documents/library/paris_protocol_e_0.pdf.

UNESCO. “Recommendation on the Historic Urban Landscape.” United Nations Educational, Scientific and Cultural Organization, 2011. https://whc.unesco.org/uploads/activities/documents/activity-638-98.pdf.

UNESCO. *Records of the General Conference, 19th Session, Nairobi, 1976*. Paris: United Nations Educational, Scientific and Cultural Organization, 1976.

UNESCO. *Records of the General Conference, Twelfth Session, Paris, 1962*. United Nations Educational, Scientific and Cultural Organization, 1963. https://unesdoc.unesco.org/ark:/48223/pf0000114582.page=142.

UNESCO. *Records of the General Conference Twentieth Session, Paris, 24 October to 28 November 1978: [Resolutions, Reports and Proceedings]*. Paris: Unesco, 1979.

UNESCO. “The Hangzhou Declaration: Placing Culture at the Heart of Sustainable Development Policies,” 2013. https://unesdoc.unesco.org/ark:/48223/pf0000221238.

UNESCO. “The Historical Port City of Izmir.” UNESCO World Heritage Centre. Accessed April 29, 2024. https://whc.unesco.org/en/tentativelists/6471/.

United Nations. “Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972.” New York: United Nations, 1973. https://digitallibrary.un.org/record/523249?ln=en.

United Nations. “United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992.” United Nations. United Nations. Accessed January 13, 2024. https://www.un.org/en/conferences/environment/rio1992.

United Nations. “United Nations, Conferences, Environment and Sustainable Development.” United Nations. United Nations. Accessed January 13, 2024. https://www.un.org/en/conferences/environment.

United Nations Climate Change. “High Level Ministerial Dialogue for Culture-Based Climate Action.” United Nations Climate Change, 2023. https://unfccc.int/event/high-level-ministerial-dialogue-for-culture-based-climate-action.

URBAN GreenUP. “About URBAN GreenUP.” URBAN GreenUP, 2017. https://www.urbangreenup.eu/about/about.kl.

URBAN GreenUP. “URBAN GreenUP in Izmir.” URBAN GreenUP. Accessed May 6, 2024. https://www.urbangreenup.eu/izmir/urban-greenup-in-izmir.kl.

Veldpaus, Loes, and Ana Pereira Roders. “Urban Heritage: Putting the Past into the Future.” *The Historic Environment: Policy & Practice* 4 (February 1, 2013): 3–18. https://doi.org/10.1179/1756750513Z.00000000022.

Vesek, Sait, and Nadir Suğur. “Urban Life Experiences of Syrians in Turkey: The Cases of Gaziantep and Izmir.” *Journal of Humanity and Society (Insan & Toplum)* 11, no. 1 (2021): 169–208. https://doi.org/10.12658/M0512.

White, Sam, Qing Pei, Katrin Kleemann, Lukáš Dolák, Heli Huhtamaa, and Chantal Camenisch. “New Perspectives on Historical Climatology.” *WIREs Climate Change* 14, no. 1 (January 2023): e808. https://doi.org/10.1002/wcc.808.

Wilson, Lynn A., and Carolyn N. Stevenson, eds. *Building Sustainability Through Environmental Education:* Advances in Environmental Engineering and Green Technologies. IGI Global, 2019. https://doi.org/10.4018/978-1-5225-7727-0.

Winter, Tim. “Clarifying the Critical in Critical Heritage Studies.” *International Journal of Heritage Studies* 19, no. 6 (September 2013): 532–45. https://doi.org/10.1080/13527258.2012.720997.

Zafer Tosunoğlu. “The Coastal Fisheries of Izmir.” In *Fishing in Izmir (İzmir Balıkçılığı)*, edited by H. Tuncay Kınacıgil, Zafer Tosunoğlu, Şükran Çaklı, Erhan Bey, and Hakan Öztürk, Birinci baskı., 147–54. İzmir: Izmir Metropolitan Municipality, 2017. https://www.izmir.bel.tr/YuklenenDosyalar/Yayinlar/0_08022018_053047_izmir-balikciligi.pdf.

Zakarya Mildanoğlu. “The Armenians of ’Infidel Izmir (Gâvur İzmir’in Ermenileri).” Agos, November 17, 2012. https://www.agos.com.tr/tr/yazi/3319/gvur-izmirin-ermenileri.