

Title

CLIMATE HERITAGE ADAPTATIONS: International Graduate Student Workshop ISP 3 Intensive Programmes for Higher Education Learners

Organized by

TOBB University of Economics and Technology, Ankara-Türkiye (September 4-13, 2023)

Organization Committee Pelin Gürol Öngören, Sibel Acar, Aslı Özbek (TOBB ETU)

Opening Panel and Site Visits Hosted by Cappadocia University in Nevşehir (KUN)

Design I Cover Photograph Pelin Gürol Öngören

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e-CREHA: Education for Climate Resilient European Heritage Architecture ERASMUS KA203-Strategic Partnership for Higher Education Project

Partners

Eindhoven University of Technology (TU/e) (Coordinator) TOBB University of Economics and Technology (TOBB ETU) Universita degli Studi del Molise (UNIMOL) Sofia University "St. Kliment Ohridski" (SU) National des Sciences Appliquees Strasbourg (INSA) Norsk Institutt for Kulturminneforskning (NIKU) Beeldland























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PARTICIPANTS		

This booklet presents posters of presentations delivered in the international workshop, "Climate Heritage Adaptations", organized by the Department of Architecture at TOBB University of Economics and Technology. The workshop took place from September 4-13, 2023 in Nevşehir and Ankara, Türkiye. This workshop was conducted as one of the teaching/learning/training activities of the e-CREHA (Education on Climate Resilient Heritage Architecture) project, funded by the European Commission (Erasmus+ KA203).

This project aims to produce an innovative e-learning course and methodology focusing on developing climate resilience for built heritage across Europe. The project partners are Eindhoven University of Technology (TU/e) (Project Coordinator), TOBB University of Economics and Technology (TOBB ETU), Institut National des Sciences Appliques Strasbourg (INSA), Universita degli Studi del Molise (UNIMOL), Sofia University "St. Kliment Ohridski" (SU), Norsk Institutt for Kulturminneforskning (NIKU), and Beeldland.

INTRODUCTION



Bey Deresi, Mustafapaşa- Nevşehir



Education for Climate Resilient European Heritage Architecture

WORKSHOP: CLIMATE HERITAGE ADAPTATIONS

SEPTEMBER 4-13, 2023

Organized by TOBB UNIVERSITY OF ECONOMICS AND TECHNOLOGY, ANKARA- TÜRKİYE

The workshop, entitled "Climate Heritage Adaptations," was centered around an exploration of the intricate relationship between climate change and cultural heritage. It actively engaged master's students from diverse universities in the development of climate-resilient design solutions for cultural heritage. The imperative for such endeavors stems from scientific modeling studies, including the IPCC report, indicating that Türkiye is anticipated to experience heightened temperatures, increased aridity, and precipitation pattern instability in the near future. The workshop purposefully selected the Cappadocia Region, specifically focusing on sites within the "Göreme National Park and the Rock Sites of Cappadocia" in Nevşehir, a UNESCO World Heritage site with significant vulnerabilities to climate change. Moreover, the workshop has strategically identified Avanos, a riverside settlement nestled in Cappadocia region along the Kızılırmak River, as one of the sites of the study.

Cappadocia region boast archaeological, natural, and built/urban landscape elements of immense cultural value. However, the region faces critical challenges due to climate change, with a high risk of erosion, rock falls, and cave collapses. The vulnerabilities also include a medium-low risk of floods and water inundation. These risks prompted a focused approach on adaptive strategies to mitigate potential damage.

1

¹ https://webdosya.csb.gov.tr/db/iklim/editordosya/uyum stratejisi eylem plani EN(2).pdf

² https://whc.unesco.org/en/list/357/

The 10-day workshop brought together 21 students and 16 tutors from various universities, emphasizing a collaborative, interdisciplinary approach. Participants, primarily from e-CREHA partner universities such as TOBB ETU (workshop host), Sofia University "St Kliment Ohridski" (SU), Universita degli Studi del Molise (UNIMOL), Institut National des Sciences Appliquees Strasbourg (INSA), and Eindhoven Technical University (TU/e), represented diverse backgrounds, including architecture, urban planning, civil engineering, software engineering, management information systems, and social sciences. Beyond our esteemed project partners, the workshop welcomed participants affiliated with Gdańsk University of Technology, University of Valencia, Gazi University, Istanbul Technical University (ITU) and Cappadocia University (KUN), as well as independent scholars. This inclusive blend of backgrounds and expertise fostered a dynamic and enriching exchange of ideas, creating an atmosphere where diverse voices harmonized to shape a truly comprehensive and impactful learning experience.

The workshop's focus extended to cultural heritage sites listed on the UNESCO World Heritage List, with particular emphasis on "Göreme National Park and the Rock Sites of Cappadocia" and the Kızılırmak basin, specifically Avanos. The working structure involved dividing participants into groups, each assigned to address different case sites within Cappadocia. The selected sites included Göreme, Çavuşin, Avanos, and Bey Deresi, each presenting unique challenges at various scales.

Participants delved into heritage vulnerability and mitigation/adaptation tools, applying acquired knowledge to formulate climate change adaptation³ strategies. The workshop incorporated site visits, fieldwork, studio-based learning activities, expert presentations, and student presentations, fostering a comprehensive understanding of climate-resilient design solutions.

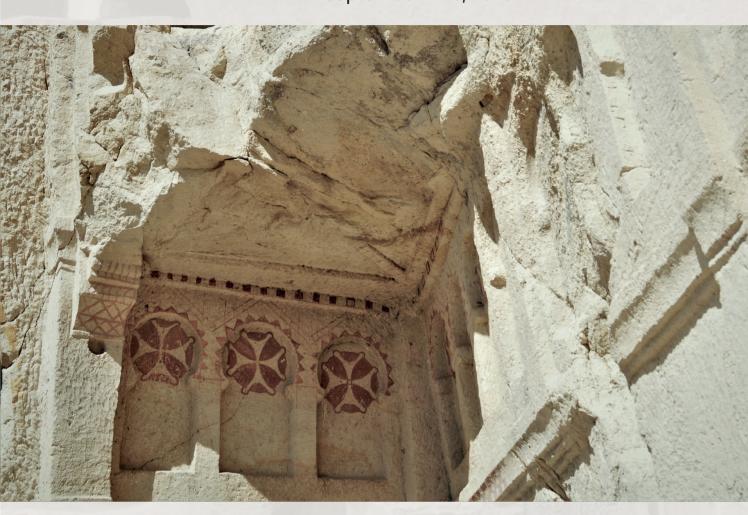
³ Adaptation in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate. https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Annex FINAL-1.pdf





CLIMATE HERITAGE ADAPTATIONS - INTERNATIONAL GRADUATE STUDENT WORKSHOP

Organized by TOBB UNIVERSITY OF ECONOMICS AND TECHNOLOGY ANKARA - TÜRKİYE September 4-13, 2023



Climate Heritage Adaptations is an international workshop in which master's students from each e-CREHA partner university will explore the relationships between climate change and cultural heritage and seek climate-resilient design solutions for cultural heritage. Students will learn about heritage vulnerability and mitigation/adaptation tools and will apply the acquired knowledge by developing strategies for climate change adaptation.*

During the 10-day workshop, students from different disciplines (e.g., civil engineering, architecture and urban design, planning, tourism sciences, computer sciences, and social sciences) will work together in a studio-based learning environment.

This workshop will focus on cultural heritage sites (archeological, natural, built/urban landscape) located in the Cappadocia region, which are particularly vulnerable to climate change.** The workshop will include site visits, fieldwork, studio-based learning activities, expert, and student presentations. Students will also discover the sites included on the World Heritage List.

* Adaptation in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

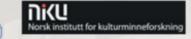
https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Annex_FINAL-1.pdf

** The IPCC report and other national and international scientific modeling studies demonstrate that Turkey in near future will get hotter, more arid and unstable in terms of precipitation patterns. https://webdosya.csb.gov.tr/db/iklim/editordosya/uyum_stratejisi_eylem_plani_EN(2).pdf















September 4-5, Opening Panel and Site Visits Hosted by Cappadocia University in Nevşehir

DAY 1: Cappadocia/Nevşehir (September 4, 2023 / Monday)

Venue: Cappadocia University, Madrasa Building, Mustafapaşa- NEVŞEHİR 09.30-10.00 Registration

10.00-10.30 Welcoming Speech

10.30-11.15 Introductory talk by Asst. Prof. Şükran Ünser (KÜN) "Cappadocia through the ages"

11.15-12.00 Introductory talks by Assoc. Prof. Leila Akbarishahabi (KÜN)

"The impacts of Climate change on Cappadocia"

12.00-12.15 Introduction to the Workshop & Group Forming 14.00-19.00 Field Trip (Göreme Open Air Museum)

19.00 Transfer to hotel and overnight in Ürgüp or Mustafapaşa.

DAY 2: Cappadocia/Nevsehir (September 5, 2023 /Tuesday)



September 6-13, Studio Works and Seminars Hosted by TOBB ETU in Ankara

DAY 3: Ankara (September 6, 2023 / Wednesday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-11.30 Organization and Programming

11.30-12.30 Guest Lecturer: Assoc. Prof. Fatma Gül Öztürk Büke (Çankaya University) 14.00-18.00 Studio Work

DAY 4 Ankara (September 7, 2023 /Thursday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

14.00-15.00 Guest Lecturer: Assoc. Prof. Aktan Acar (TOBB ETU)

15.00-18.00 Studio Work

DAY 5 Ankara (September 8, 2023 /Friday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-10.00 Groups Meeting

10.00-11.30 Lecture by Yıldıray Lise (Nature Conservation Center) and Ferdi Akarsu (Author and Consultant - Environmental Services and Sectoral Sustainability)

11.30-12.30 / 14.00-18.00 Studio Work

DAY 6 Ankara (September 9, 2023 /Saturday)

DAY OFF

DAY 7 Ankara (September 10, 2023 /Sunday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

14.00-16.00 Videogame Test

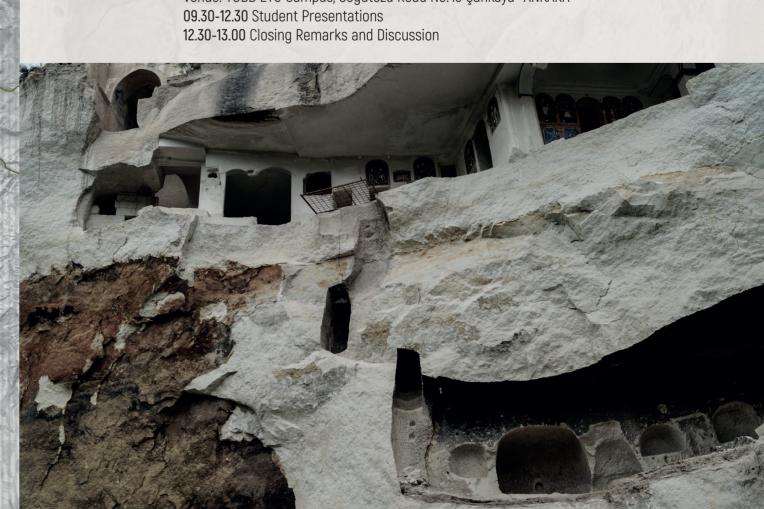
DAY 8 -9 Ankara (September 11-12, 2023 /Monday-Tuesday)

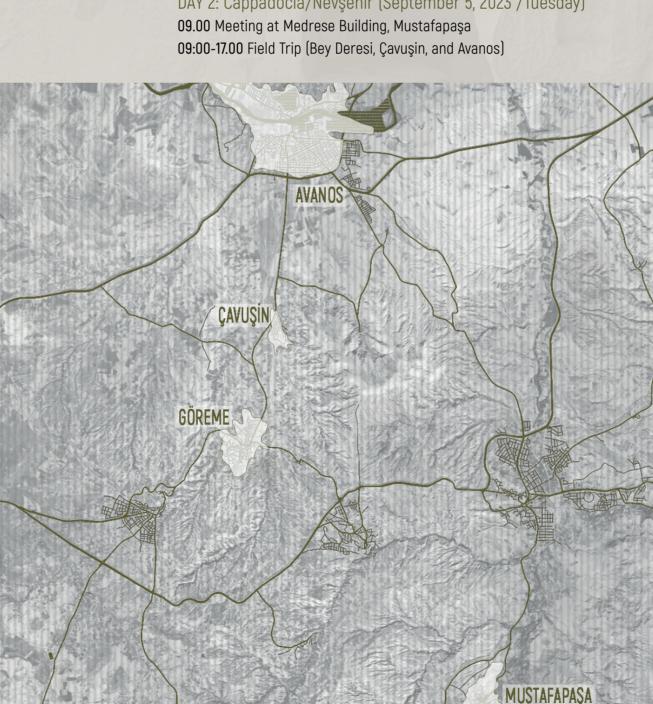
Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 / 14.00-18.00 Studio Work

DAY 10 Ankara (September 13, 2023 / Wednesday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA







WORKSHOP: CLIMATE HERITAGE ADAPTATIONS

SEPTEMBER 4-13, 2023

Organized by TOBB UNIVERSITY OF ECONOMICS AND TECHNOLOGY, ANKARA-TÜRKİYE

WORKSHOP PROGRAM

DAY 1: Cappadocia/Nevşehir (September 4, 2023 /Monday)

Hosted by Cappadocia University in Nevşehir

Venue: Cappadocia University, Madrasa Building, Mustafapaşa- Nevşehir

09.30-10.00 Registration

10.00-10.30 Welcoming Speech

10.30-11.15 Introductory talks by Asst. Prof. Dr. Şükran Ünser (Cappadocia University) about Cappadocia through the ages

11.15-12.00 Introductory talks by Assoc. Prof. Dr. Leila Akbarishahabi (Cappadocia University) on the impacts of Climate change on Cappadocia

12.00-12.15 Introduction to the Workshop & Group Forming

12:15-14:00 LUNCH at Mustafapaşa

14.00- 19.00 Field Trip (Göreme Open Air Museum)

19.00 Transfer to hotel and overnight in Ürgüp or Mustafapaşa.

DAY 2: Cappadocia/Nevşehir (September 5, 2023 /Tuesday)

Hosted by Cappadocia University in Nevşehir

09.00 Meeting at Medrese Building, Mustafapaşa

09.00-17.00 Field Trip (Bey Deresi, Çavuşin and Avanos)

17.00-21.00 Departure from Nevşehir and arrival at Ankara

DAY 3: Ankara (September 6, 2023 / Wednesday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-10.00 Meeting (at TOBB ETU, Technology Center)

10.00-11.15 Presentation of the Sites (at TOBB ETU, Technology Center)

11.15-11.30 Coffee Break

11.30-12.30 Guest Lecturer: (Online) (at TOBB ETU, Technology Center)

Assoc. Prof. Dr. Fatma Gül Öztürk Büke (Çankaya University)

12.30-14.00 Lunch Break

14.00-17.00 Studio Work

17.00-18.00 Guest Lecturers

DAY 4 Ankara (September 7, 2023 /Thursday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

12.30-14.00 Lunch Break

14.00-15.00 Guest Lecturer: (at TOBB ETU, Technology Center)

Assoc. Prof. Dr. Aktan Acar (TOBB ETU) "Tactical Pop-ups for Climate Emergency"

15.00-18.00 Studio Work

DAY 5 Ankara (September 8, 2023 /Friday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30 Meeting

10.00-11.30 Guest Lecturers: (at TOBB ETU, Technology Center)

Yıldıray Lise (*Nature Conservation Center*) and Ferdi Akarsu (Author and Consultant - Environmental Services and Sectoral Sustainability) "The 'natural' significance of Türkiye and Cappadocia Region in a rapidly changing climate"

11.30-12.30 Studio Work

12.30-14.00 Lunch Break

14.00-18.00 Studio Work

DAY 6 Ankara (September 9, 2023 /Saturday)

DAY OFF

^{* 17.00-18.00} Transnational Meeting for the Project Partners

DAY 7 Ankara (September 10, 2023 /Sunday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

12.30-14.00 Lunch Break

14.00-15.00 Course Module on Adaptation through Moodle Platform (at TOBB ETU,

Technology Center)

15.15-17.15 Videogame Test

DAY 8 Ankara (September 11, 2023 / Monday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

12.30-14.00 Lunch Break

14.00-18.00 Studio Work

DAY 9 Ankara (September 12, 2023 /Tuesday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Studio Work

12.30-14.00 Lunch Break

14.00-18.00 Studio Work

19.00-22.00 Meeting with a Lunch for the Project Partners & Tutors

DAY 10 Ankara (September 13, 2023 / Wednesday)

Venue: TOBB ETU Campus, Söğütözü Road No:43 Çankaya- ANKARA

09.30-12.30 Student Presentations

12.30-13.00 Closing Remarks and Discussion

13.30-14.30 Refreshments

WORKSHOP

Field Trip

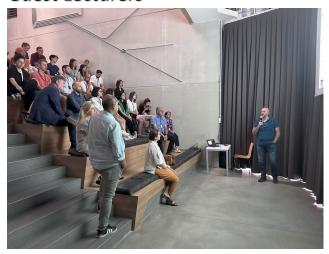


Göreme Open Air Museum, Nevşehir



Bey Deresi, Mustafapaşa- Nevşehir

Guest Lecturers



Yıldıray Lise (Nature Conservation Center)



Assoc. Prof. Dr. Aktan Acar (TOBB ETU)

Studio Work



Group 3: Avanos



Group 1: Göreme

FOUR PROPOSALS

Integrated Plan of Heritage and Eco-Tourism Routes in Göreme

Çavuşin: Re-Initiate

Avanos: Anatolia Avanos

Bey Deresi 2.0

INTEGRATED PLAN OF HERITAGE AND ECO-TOURISM ROUTES IN GÖREME

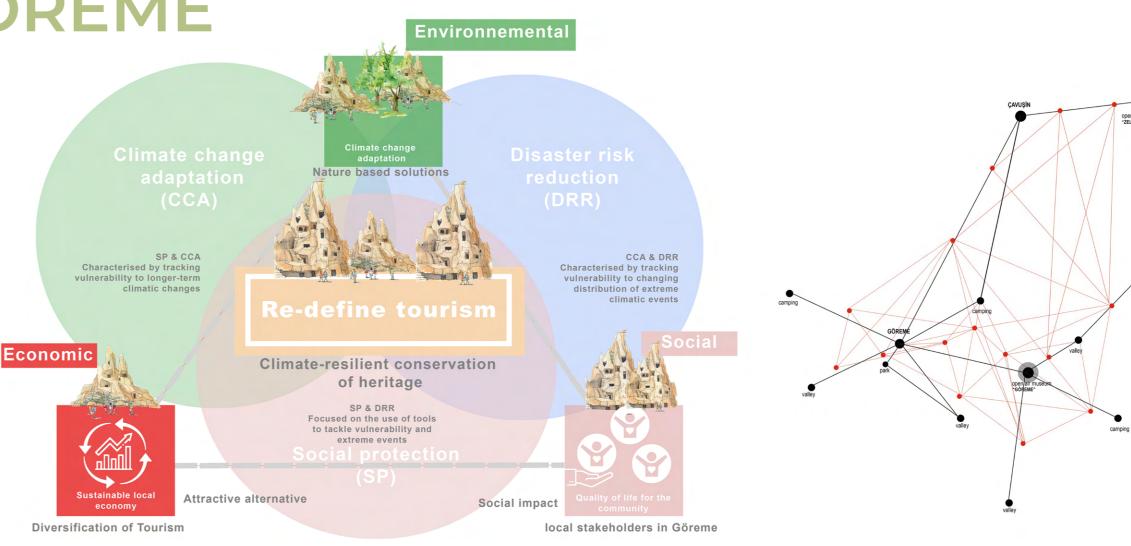


Göreme on the map

-OCATION AND APPROACH

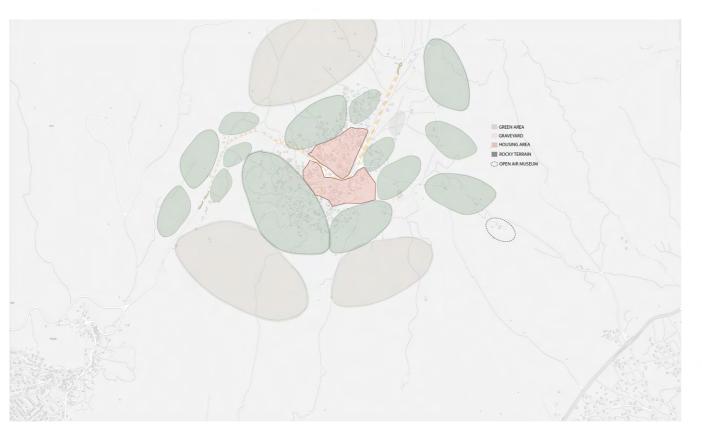
SOLUTIONS

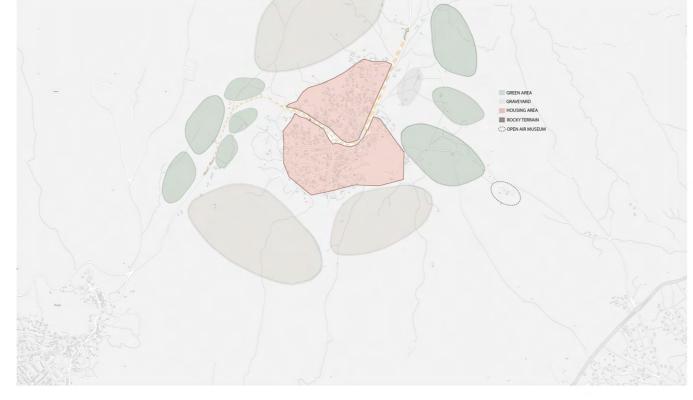
Göreme is a settlement located in the Cappadocia region of Turkey. Cappadocia is situated in the Central Anatolia Region and is part of Nevşehir province.

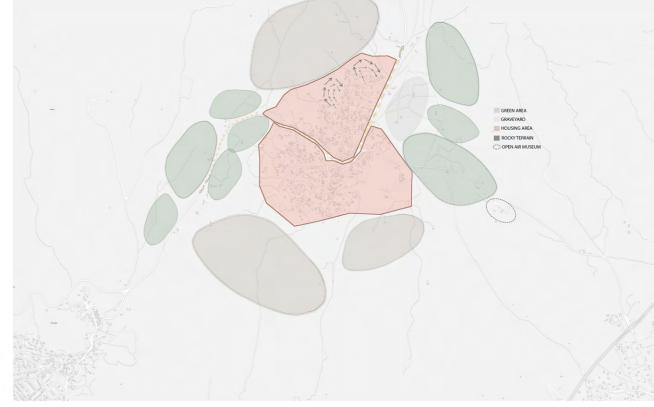


Concept diagram

Re-define tourism for climate-resillient conservation of the heritage, to create an attractive alternative for the sustainable local economy and quality of life for the community of local stakeholders in Göreme.







Past 1985

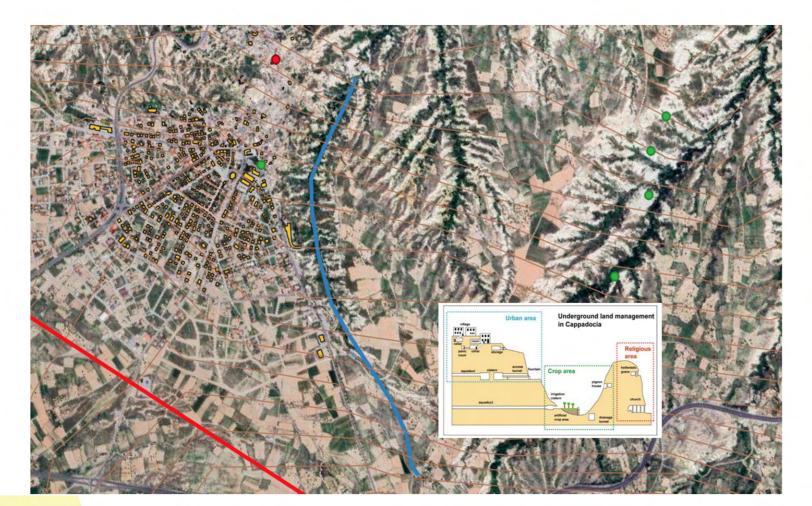
Now 2023

transition

Future 2050

short term

long term



Recovery of underground water tunnels

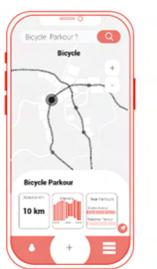


Network in GFRP (Glass Fiber Reinforced Polymer) composite material

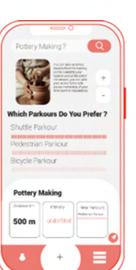






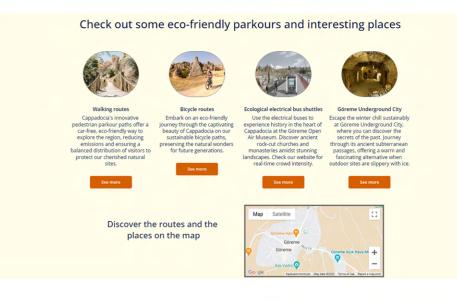






"Sustainable tourism Göreme": A digital platform

















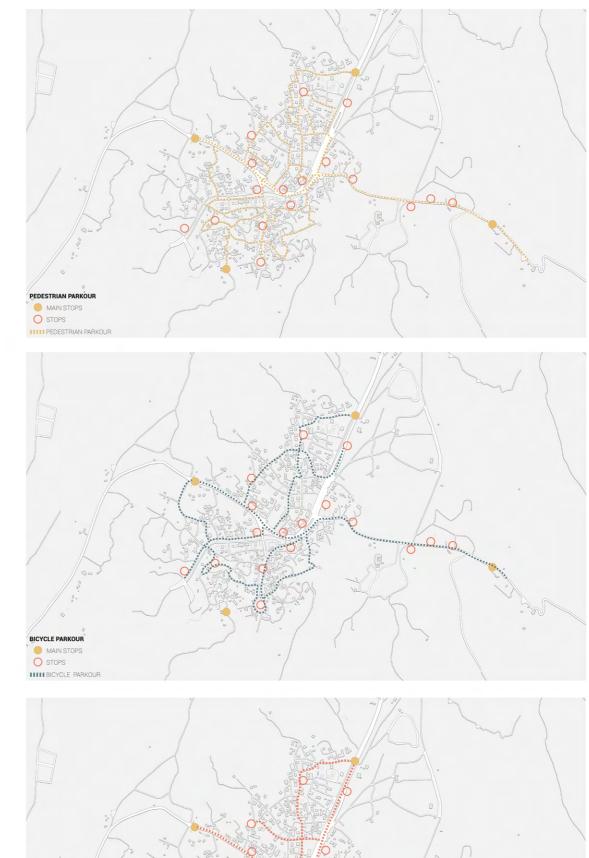




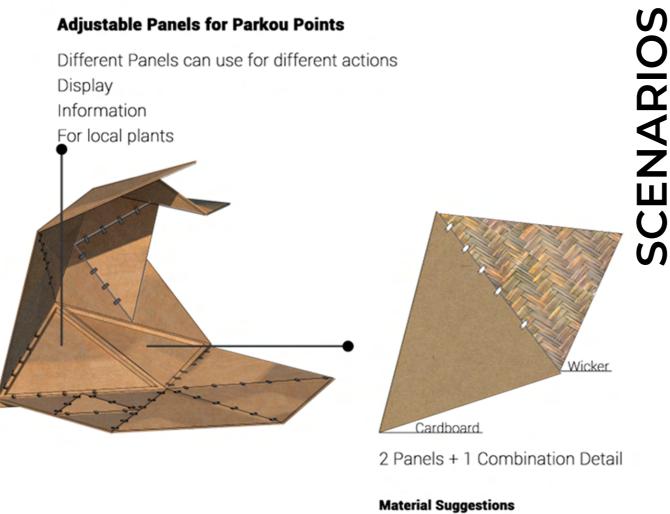
INTEGRATED PLAN OF HERITAGE AND ECO-TOURISM ROUTES IN GÖREME

LEGEND Valleys Green Areas











Cardboard







DESIGN

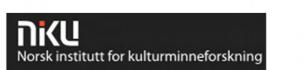
POINT

PARKOUR













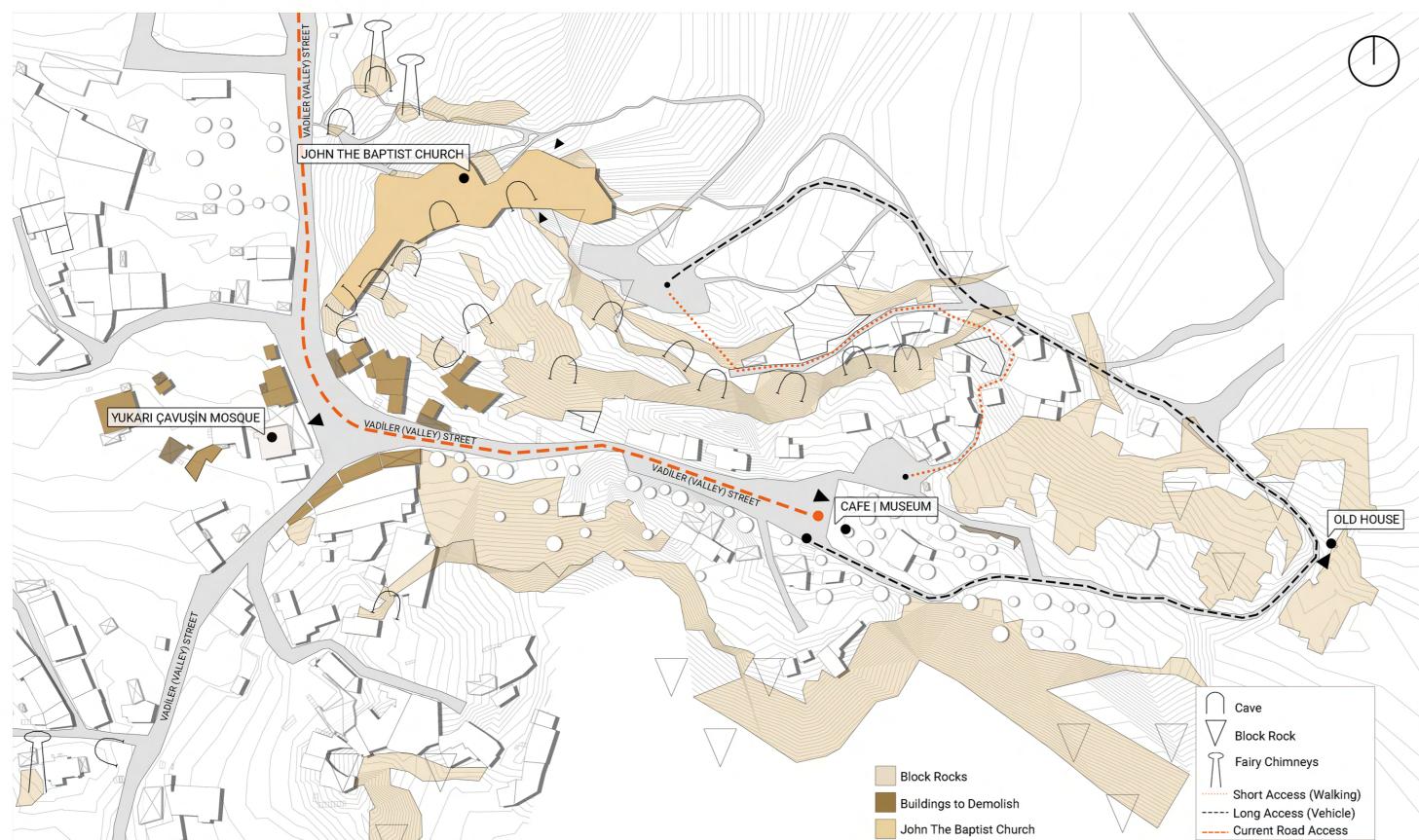






ÇAVUŞİN: RE-INITIATE

THE CURRENT SITUATION MAP

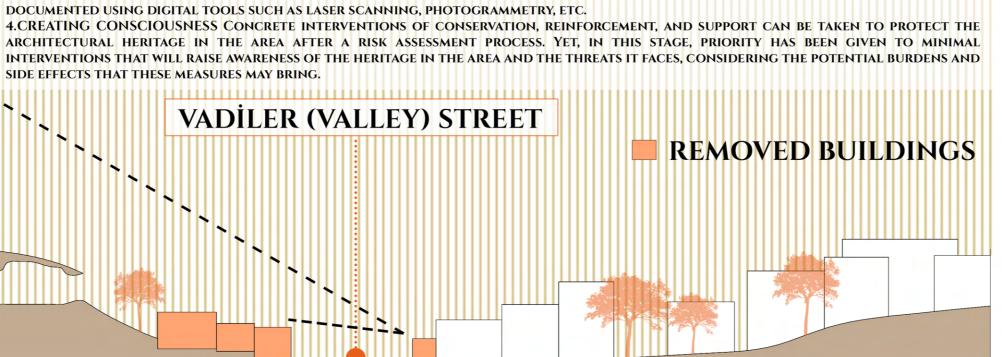


ÇAVUŞIN, A VILLAGE IN THE AVANOS DISTRICT OF NEVŞEHIR IN THE CAPPADOCIA REGION, IS BUILT ON AND AROUND A HILL. IT IS A VULNERABLE SITE, WHICH HAS SUFFERED FROM ROCK FALLS AND CAVE COLLAPSES DUE TO WEATHERING. IT HOSTS A SIGNIFICANT CULTURAL HERITAGE CONSISTING OF TWO **DIAGRAMATIC SECTION** ROCK-CUT CHURCHES AND MASONRY HOUSES THAT ARE EXPOSED TO THE EFFECTS OF CLIMATE CHANGE. TO PROTECT ÇAVUŞIN'S CULTURAL AND ARCHITECTURAL HERITAGE, IT IS CRUCIAL TO MITIGATE THE IMPACT OF CLIMATE CHANGE AND OTHER STRESSORS ON THE SITE. IT IS ALSO ESSENTIAL TO JOHN THE BAPTIST CHURCH DEVELOP STRATEGIES THAT INCREASE AWARENESS ABOUT THE SITE'S HISTORICAL SIGNIFICANCE AND THE RISKS IT FACES. THESE STRATEGIES SHOULD AIM TO HIGHLIGHT THE VALUE OF THE SITE. TO THIS END, THE AREA WAS DIVIDED INTO TWO MAIN ZONES: THE CULTURAL HERITAGE ZONE AND THE INTERACTION ZONE. BASED ON THIS DIVISION, FOUR BASIC ADAPTATION STRATEGIES HAVE BEEN DEVELOPED.

> 1. MONITORING CLIMATE CHANGE IT IS ESSENTIAL TO ESTABLISH A MONITORING SYSTEM TO TRACK CLIMATE IMPACTS AND CREATE A CENTER TO RECORD AND DEMONSTRATE THE RESULTS. 2.DECREASING LOCAL PRESSURE ROUTES AND SIGHTSEEING SPOTS HAVE BEEN REDEFINED TO PREVENT SENSITIVE PARTS OF THE SITE FROM BEING STEPPED ON AND REDUCE CONGESTION AND PRESSURE CAUSED BY VISITORS AND LOCALS. FOR A BETTER PERCEPTION AND EXPERIENCE OF THE SITE

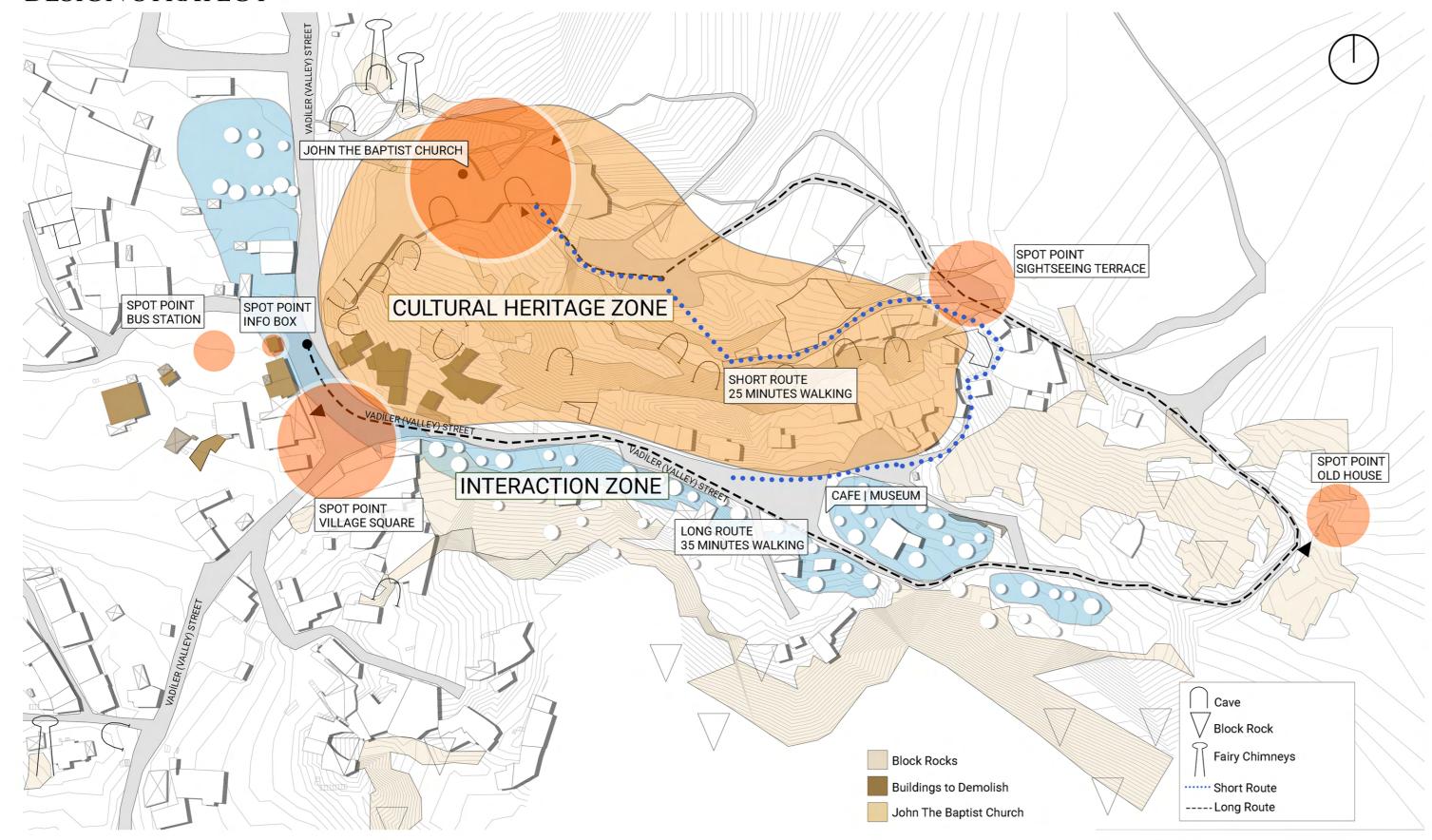
> FROM A DISTANCE, NON-HISTORICAL BUILDINGS ARE PROPOSED TO BE REMOVED AND TRANSFERRED TO ANOTHER PLACE. PARTIAL GREEN AREAS WERE UNITED ACROSS THE HERITAGE ZONE FOR LOCALS AND TOURISTS AS AN INTERACTION ZONE AND SIGHTSEEING ROUTES WERE CREATED. 3. DOCUMENTING VALUES TO PRESERVE CULTURAL AND ARCHITECTURAL HERITAGE, THE EXISTING STATE OF THE SITE SHOULD BE RECORDED AND DOCUMENTED USING DIGITAL TOOLS SUCH AS LASER SCANNING, PHOTOGRAMMETRY, ETC.

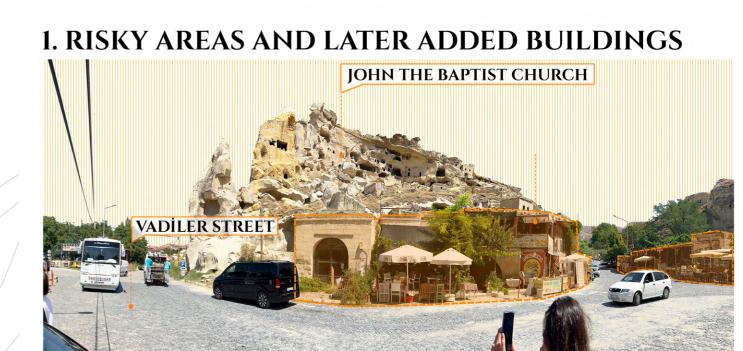
SIDE EFFECTS THAT THESE MEASURES MAY BRING.

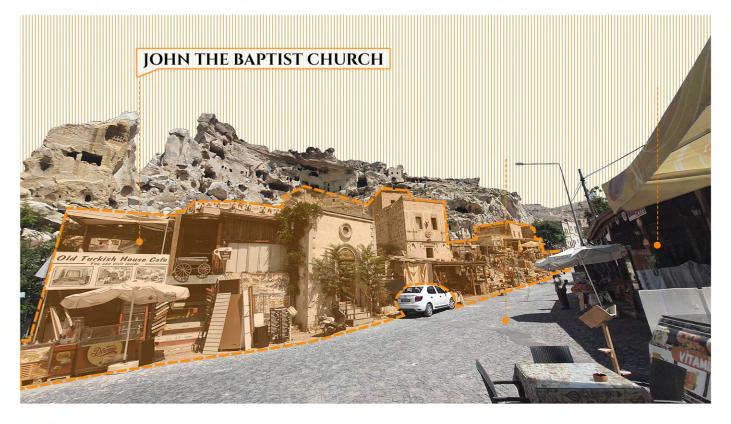


DESIGN STRATEGY

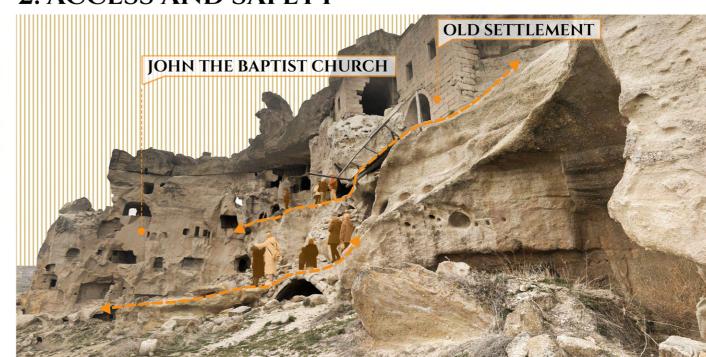
OLD SETTLEMENT

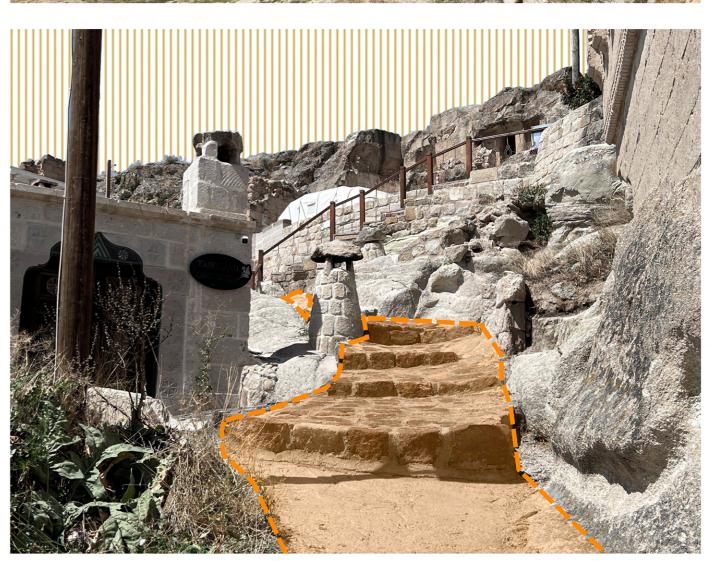






2. ACCESS AND SAFETY





3. PROBLEMS



















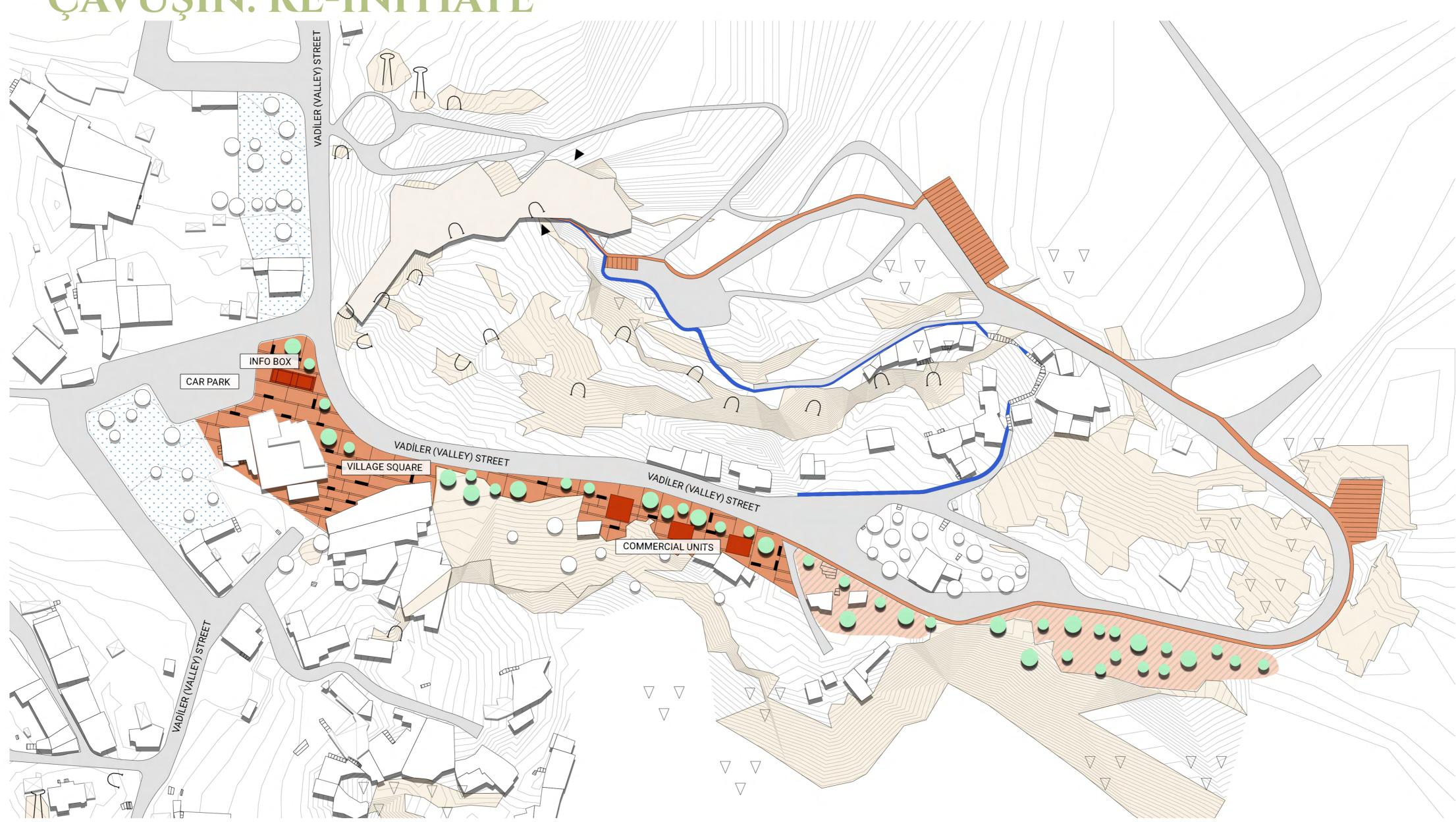
































SIGHTSEEING TERRACE

Co-funded by the Erasmus+ Programme of the European Union



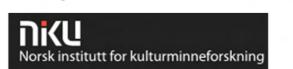








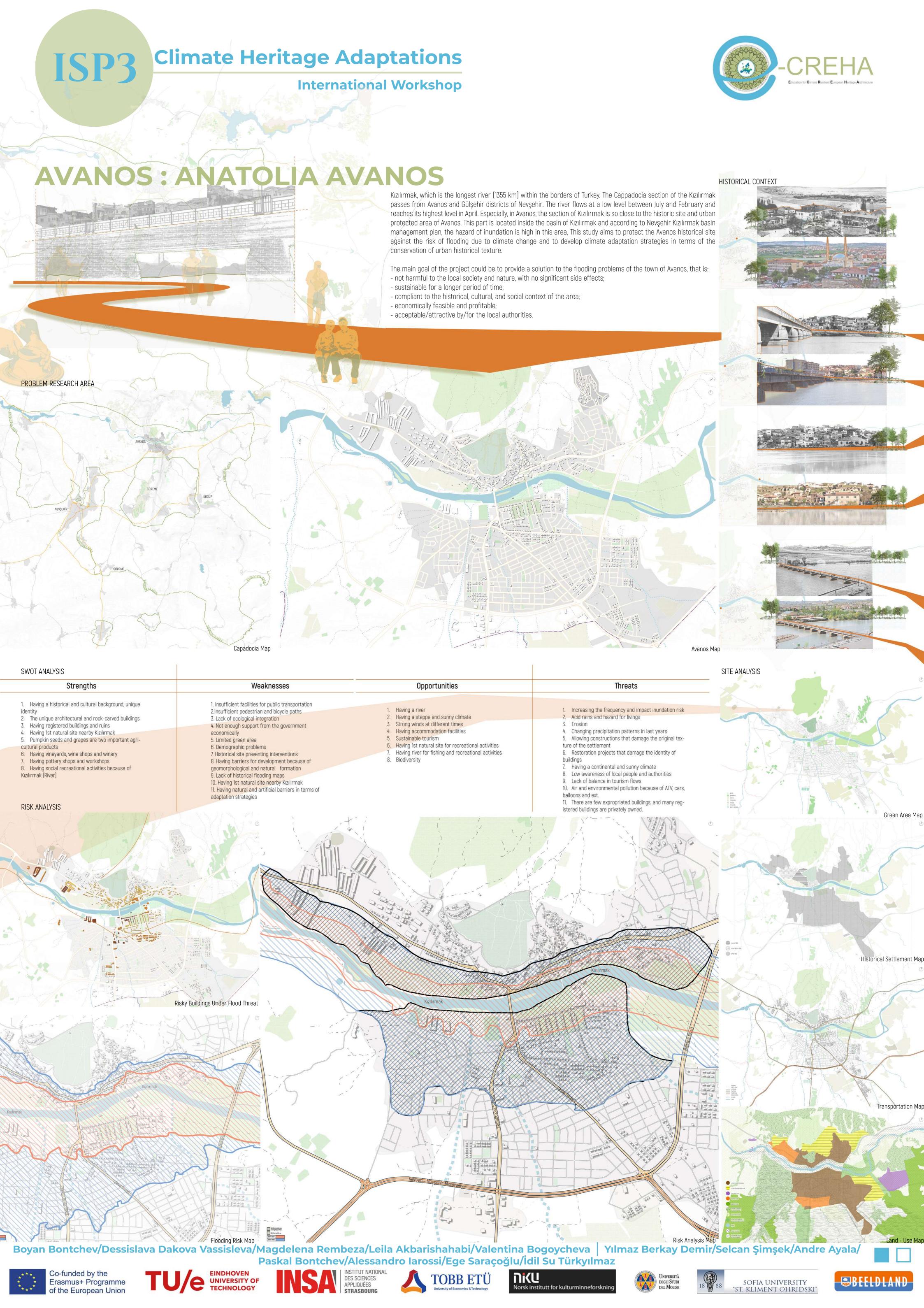








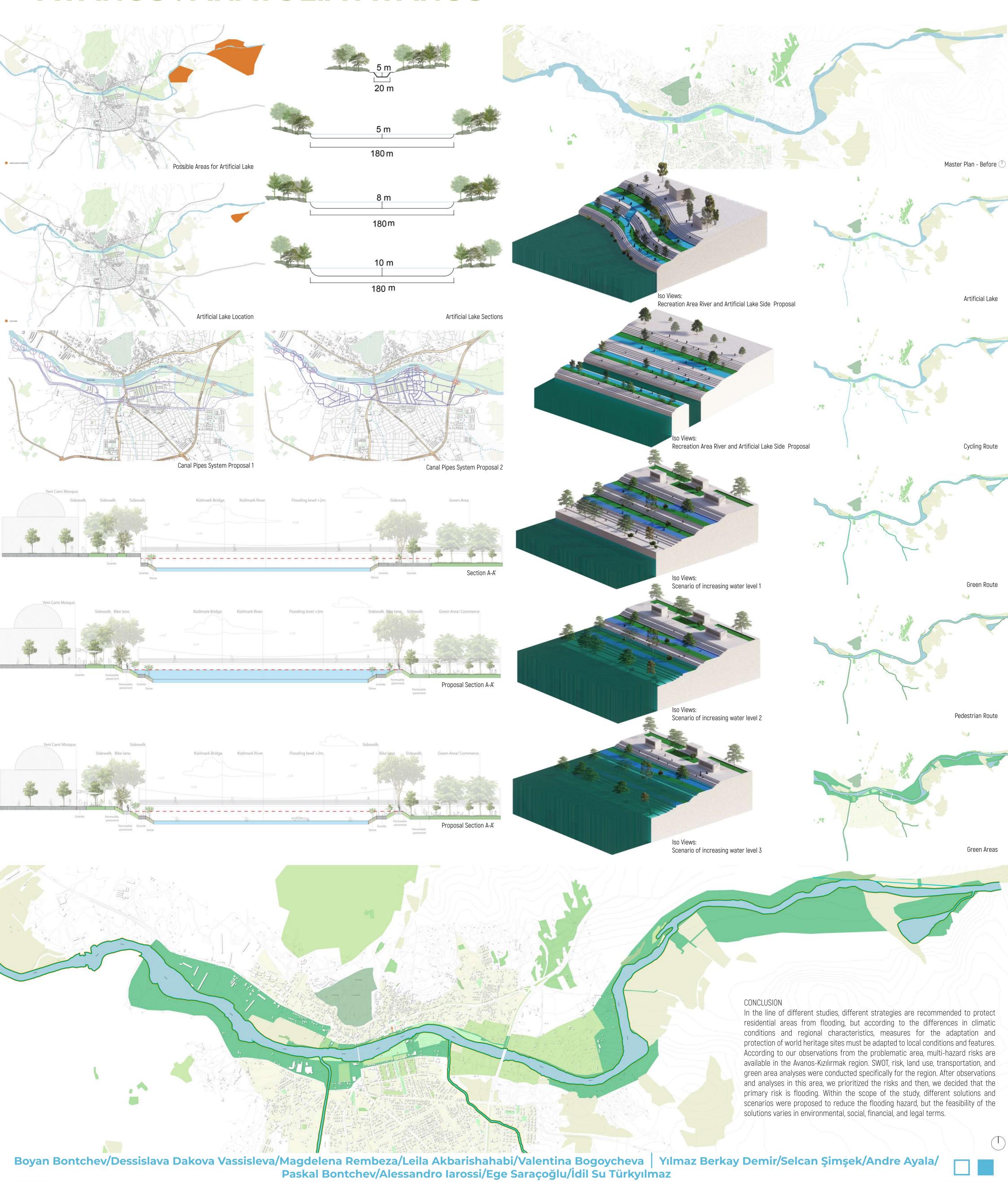






AVANOS: ANATOLIA AVANOS

Co-funded by the Erasmus+ Programme of the European Union TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY



Norsk institutt for kulturminneforskning

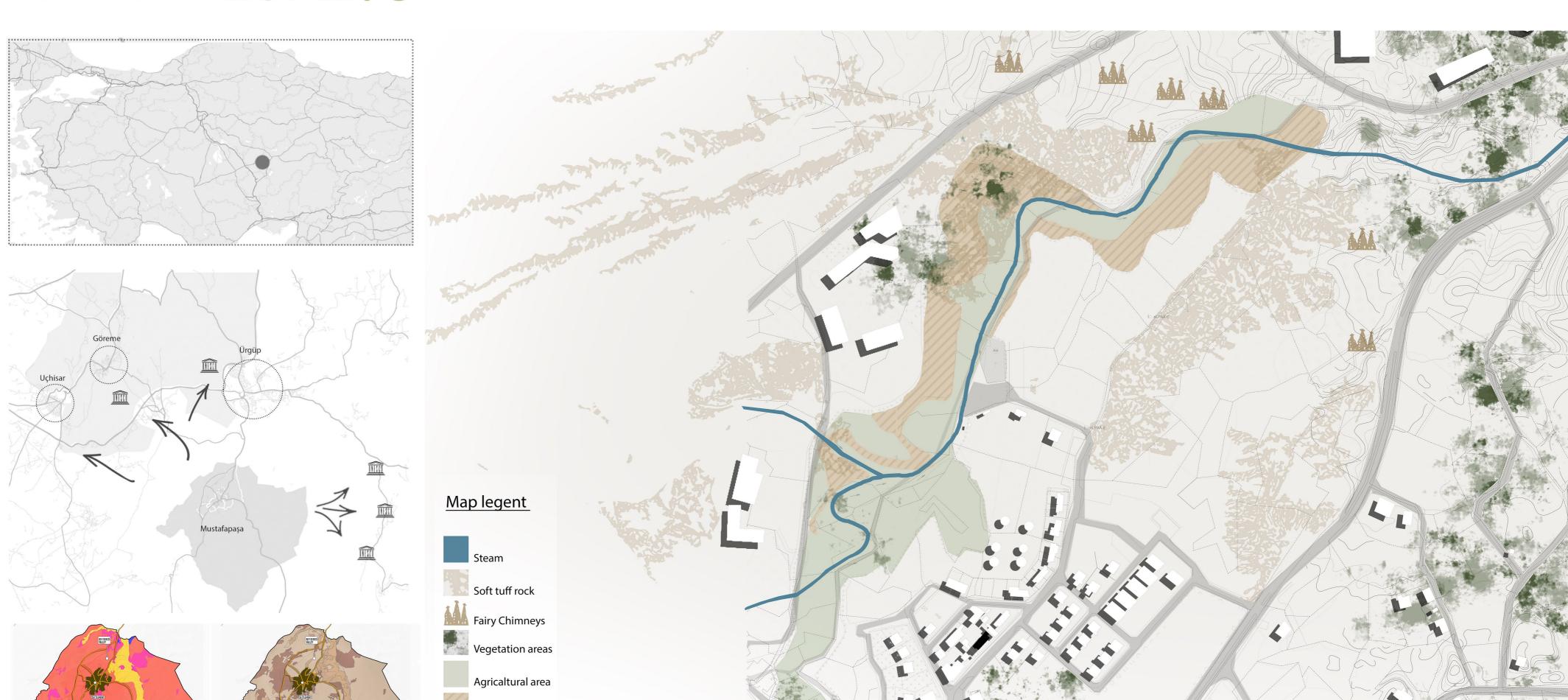
Università degli Studi del Molise

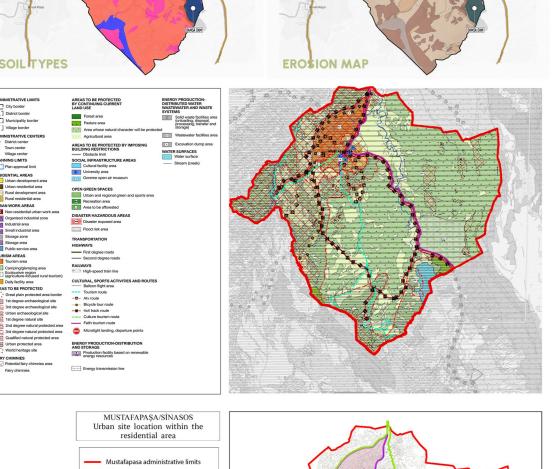
■BEELDLAND

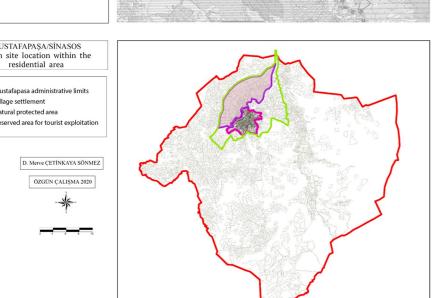
sofia university "st. kliment ohridski" Rockfall Hazard



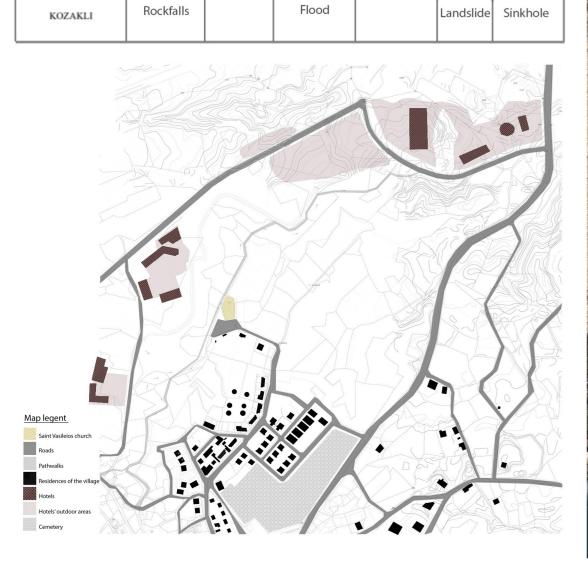
BEYDERESi 2.0







	AFET TÜRLERİ						
NEVŞEHİR/MERKEZ	Rockfalls	Cave collapse	Flood				
ACIGÖL	Rockfalls	Cave collapse	Flood				
AVANOS	Rockfalls	Cave collapse	Flood				
DERİNKUYU	Rockfalls	Cave collapse	Flood				
GÜLŞEHİR	Rockfalls	Cave collapse	Flood	Geometical			
HACIBEKTAŞ	Rockfalls	Cave collapse	Flood				
ÛRGÛP	Rockfalls	Cave	Flood	Geometical	Landslide	Sinkhole	

















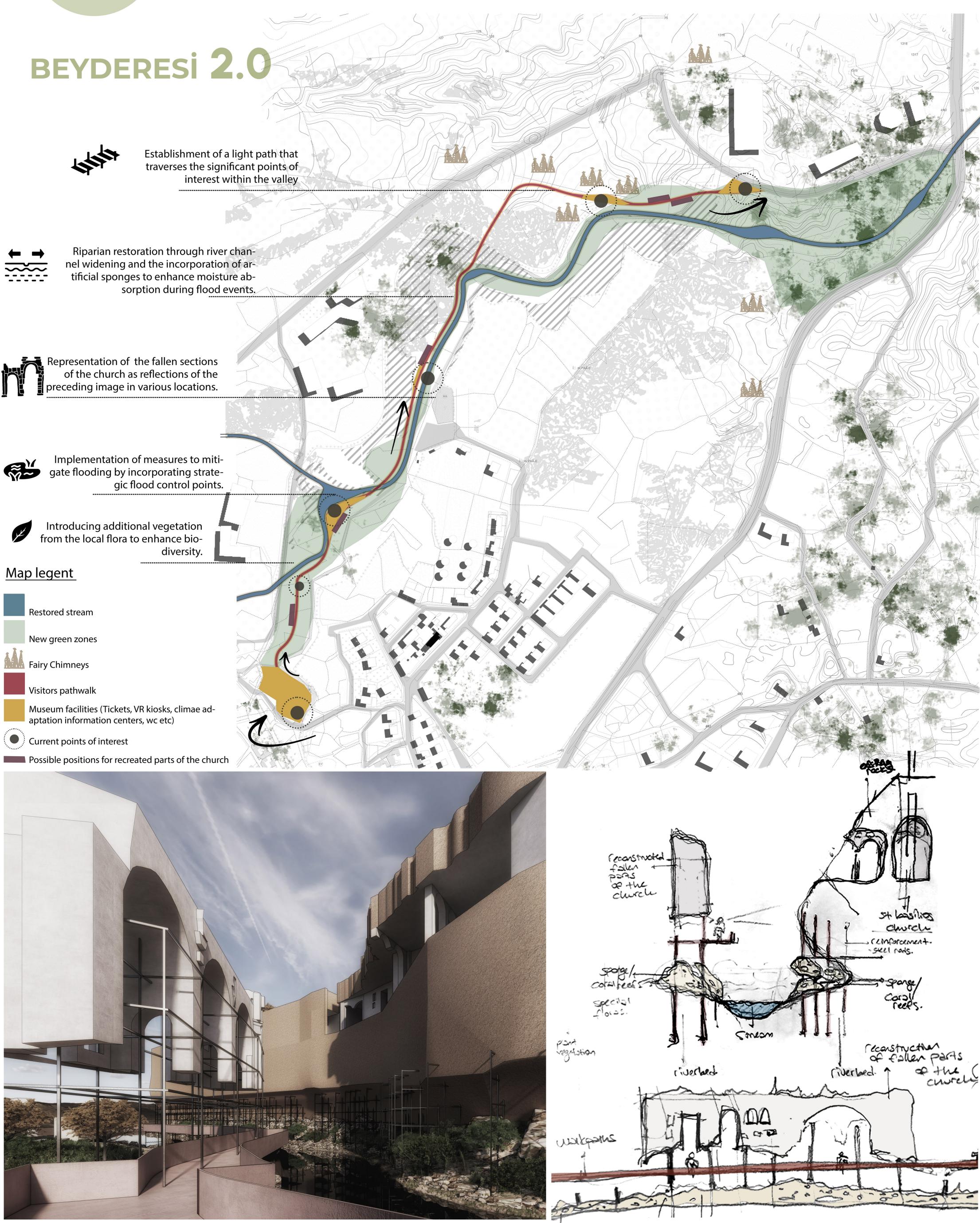




















Rosella Nocera/Giovanni Ottaviano/Luciano De Bonis/Aktan Acar | Alper Hasan Kızık/Aisyah Rahman/Utku Doğanay/Christina Georgia Dreliosi/Yoana Boncheva









PARTICIPANTS

Workshop organization by TOBB ETU

Pelin Gürol Öngören Sibel Acar Aslı Özbek

Opening Panel (Hosted by KUN)

Pelin Gürol Öngören (TOBB ETU) Sinan Akıllı (KUN) Leila Akbarishahabi (KUN) Şükran Ünser (KUN)

On-site Presentations (Hosted by KUN)

Şükran Ünser (KUN) Leila Akbarishahabi (KUN)

Guest Lecturers

Fatma Gül Öztürk Büke (Çankaya University) Aktan Acar (TOBB ETU) Yıldıray Lise (Nature Conservation Center)

Tutors

Rossella Nocera (UniMol)
Luciano de Bonis (UniMol)
Giovanni Ottaviano (UniMol)
Boyan Bontchev (SU)
Dessislava Dakova Vassileva (SU)
Valentina Todorova Terzieva-Bogoycheva (SU)
Florence Rudolf (INSA)

Haifa Mahmoud (INSA)

Leila Akbarishahabi (KUN)

Ayşe Ege Yıldırım (Terra Mudurnu Inc.)

Magdalena Rembeza (Gdansk University of Technology)

İrem Küçük (Gazi University)
Aktan Acar (TOBB ETU)
Aslı Özbek (TOBB ETU)
Sibel Acar (TOBB ETU)
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Students

Aisyah Rahman (INSA)

Alessandro Iarossi (UniMol)

Alper Hasan Kızık (SU)

Andre Ayala (INSA)

Ayşe Selcan Şimşek (TOBB ETU)

Christina Georgia Dreliosi (INSA)

Ege Saraçoğlu (TOBB ETU)

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İldem Çınar (TOBB ETU)

Neda Haşemi (TOBB ETU)

Neslihan Efsa Özçelik (TOBB ETU)

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Roberta Cipriano (UniMol)

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Todor Stoyanov Dobrev (SU)

Utku Doğanay (TOBB ETU)

Yang Mei Frings (TU/e)

Yılmaz Berkay Demir (ITU)

Yoana Boncheva (University of Valencia)



Last Day of the Workshop