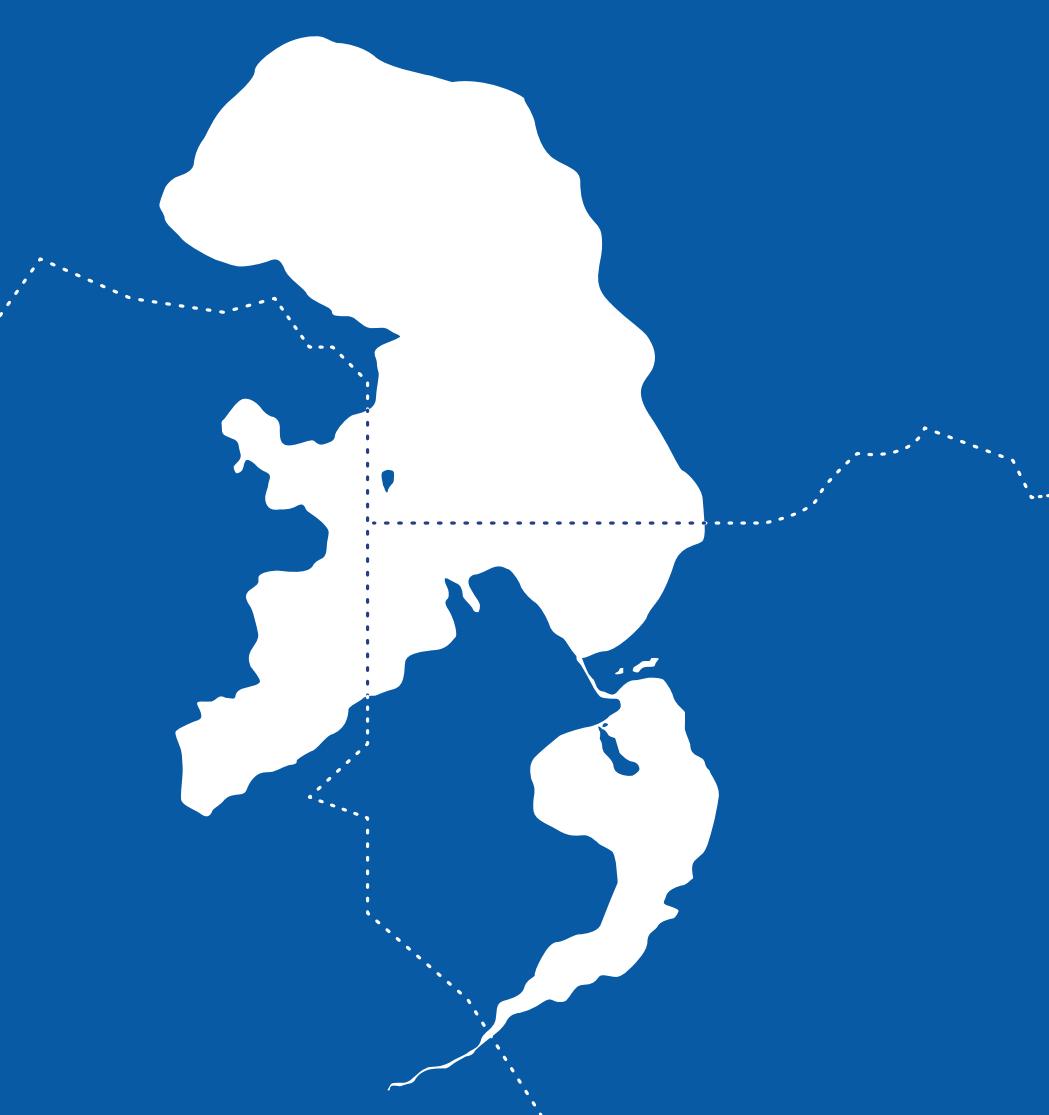


Scientific Journal of the Observatory of Mediterranean Basin.
UNECE Center of excellence / Co-PLAN Institute.

Intersecting Landscapes

Finding New Spatial Visions for the Cross-Border Region
of Prespa Lakes and the case of Pustec Municipality –
Albania.

A Project of the
Joint International PhD Program IDAUP
POLIS University Albania / University of Ferrara Italy



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Besnik Aliaj, Sotir Dhamo Gent Avdija and Skender Luarasi are the scientific responsible of the PhD Program workshop organized in the frame of the IDAUP - International Doctorate Program in Architecture and Urban Planning - between POLIS University of Tirana Albania, and the Department of Architecture of Ferrara University, Italy. In this publication they have also contributed in terms of contents and introduction, including interventions in some chapters, conclusions and in the elaboration of the index structure. The publication collects practical and theoretical experiences elaborated within the context of the "Scientific Research Department" and the research unit "Observatory of the Mediterranean Basin" (OMB). The publication collects practical and theoretical concepts gathered and elaborated in structured and thematic contributes by PhD student from IDAUP Program. Chapter 3 collects the IDAUP PhD researchers' contributions, which have undergone a process of double-blind review.

List of historical publications

- (2024) OMB No. 9 Re-Inventing Phoeniciae (Finiq) [See here](#)
- (2023) OMB No.8 Post Pandemic City. [See here](#)
- (2021) OMB No.7 Rethinking Gjirokastra. [See here](#).
- (2020) OMB No.6 Rurban Sequences. Dropull. [See here](#).
- (2019) OMB No.5 Prishtina New European Capital. [See here](#).
- (2018) OMB No.4 Projecting Shkodra. [See here](#).
- (2017) OMB No.3 When A River Flows. Seman [See here](#).
- (2016) OMB No.2 Albanian Riviera. [See here](#).
- (2015) OMB No.1 Durana Albania's New Sustainable Image. [See here](#).

Originating work:

- (2014) Regionalization of Albania! [See here](#).
- (2013)Albania 2030 Manifesto! [See here](#).
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Intersecting Landscapes

Finding New Spatial Visions for the Cross-Border Region of Prespa Lakes and the case of Pustec Municipality - Albania.

Issue 1

A project developed in the framework of the
International Doctorate in Architecture and Urban Planning IDAUP
POLIS University, Albania / University of Ferrara, Italy

Preface

This scientific journal publication is a research outcome of the Joint International PhD Program (Double Degree) between Polis University, Tirana Albania; and Ferrara University, Italy. For more than one decade (starting from year 2012) both universities are working together to coordinate their own research program and strategies, with a strong social responsibility dimension towards local communities and authorities especially in Albania (struggling to join EU), but also in Italy. The origin of such work stays with 2 initial document documented at <https://press.universitetipolis.edu.al/omb-scientific-journal/> : i) Albania 2030, a Spatial Planning and National Development vision; and ii) The Regionalization of Albania – The Governance, Administrative and Territorial Reform that Albania needs on a Regional Level; both assisted by our research institute Co-PLAN Institute for Habitat Development.

Since than our PhD Program has selected: a region, or a municipality, or a territorial thematic strip; and has been focused to elaborate further professionally and scientifically the developmental policies, plans and designs in favor especially to local authorities and communities in need. Albania has been reducing in population due to rapid decline of demographic trends, as well as emigration of brain and young people. So the main dilemma and question mark remains how to stop such process, and encourage a development trend that gives hope to local residents to better explore in a sustainable and resilient way the rich menu of the resources in their own local/regional territory. Combined this with growing trends of tourism, energy and agriculture it can bring back life to the abandoned peripheral regions, where most of resources stays. This is also a reverse process of massive emigration towards capital region Tirana. However, there is no Albania without the amazing peripheries and regions. Since then our program has provided at least visions for 9 regional puzzles , while 2 latest are under process. This is a direct contribution to society (Third Mission of Universities) that our universities and our PhD Program is materializing every year.

This year the focus has been the cross border region of Prespa lakes, one of the most beautiful regions between Albania, Northern Macedonia and Greece. However the developmental problems are growing, and visions are missing. Especially the Albanian part appears to be disadvantaged economically due to the accumulated problems of the past. Cross border

infrastructure is problematic among Greece and Northern Macedonia. Tourism potentials are not coordinated among three countries, minimizing the benefit of local communities. This stimulates a negative culture towards environmental aspects, climate change, as they remain treated fragmented while the habitat is one. These specific two issues of the "OMB Scientific Journal" packed in one annual journal aim to document the work done during the international workshop at Polis University (including field trip to Prespa region in three countries), and then the one year independent work of students and staff with their individual research. The issue 1/2025 focuses "Policy Based Aspects"; while the issue 2/2025 concentrates on the "Project based Aspects". Hopefully it will be a reference now and in the future, when Albania and Northern Macedonia will join EU.

We must thank especially local and regional authorities, such as: the Mayor and Municipality of Prespa Albania; the representative of the Regional Cultural Heritage Office of Bitola; and deputy mayor of Florina Greece, that welcomed us in the filed and their own institutions providing a lot of hints and feedback for the process of research. Without them it would have been impossible to implement such project and publication. Special thanks goes to the "Faculty of FKZH/FR&D" and "OMB Research Unit" and "Polis-Press Unit" at "IF Innovation Factory / POLIS University" (Dr. Gent Avdija, Prof. As. Skender Luarasi, Prof. As. Lazar Kumaraku, Prof. Emeritus Pantoleon D. Skayannis, Prof. Theo Zaffagnini, Prof. Roberto Di Giulio, Sadmira Malaj, etc. and many other staff that contributed via lectures, advices or consultation and support), and University of Ferrara / IDAUP. Without them it woold have been impossible.

We hope it will be useful vision document and methodology towards local and regional authorities, to students, professionals, researchers and academic staff.

Thank you to all whom contributed!

Prof. Dr. Besnik ALIAJ

Prof. As. Dr. Sotir DHAMO

POLIS University, Tirana

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Intersecting Landscapes: Finding New Spatial Visions for the Cross-Border Region of Prespa Lakes and the case of Pustec Municipality, Albania.

Prof. Dr. Besnik ALIAJ,

Assoc. Prof. Sotir DHAMO,

Assoc. Prof. Skender LUARASI,

Dr. Genti AVDIJA

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Introduction

Intersecting Landscapes: Finding New Spatial Visions for the Cross-Border Region of Prespa Lakes and the case of Pustec Municipality, Albania.

Prof.Dr. Besnik ALIAJ, Prof As. Sotir DHAMO, Prof. As. Skender LUARASI, Dr. Genti AVDIJA
Polis University, Tirana, Albania.

NOTE: International PhD Workshop-Project (13th – 24th November 2023)

Team: Prof. Emeritus Pantoleon Skayannis, Prof. As. Lazar Kumaraku, Dr. Ledian Bregasi, Dr. Malvina Istrefaj, Dr. Genti Avdja, Dr. Doriana Musaj, Dr. Kejt Dhrami, Ark. Marsela Demaj

Advisors: Prof. Roberto Di Giulio; Prof. Theo Zaffagnini

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Introduction

This Workshop is a research activity organized under the framework of the International "Double Degree" PhD by POLIS University (Tirana Albania) & Ferrara University (Italy), in the fields of Architecture and Urban Planning. This interdisciplinary workshop builds on the previous and ongoing research work undertaken under the Department of the Scientific Research within the Faculty of Research and Development, and the Observatory of the Mediterranean Basin (OMB) research unit, at POLIS University. The workshop focuses on the rehabilitation, preservation, transformation, and reinvention of the built environment on a regional, urban, and architectural scale. This workshop of the 39th PhD cycle, will focus on the Cross-Border Region of the Prespa Lakes and Pustec Municipality framing the latter as the intersection of infrastructural, environmental, cultural and habitation landscapes. Each year the research activity promoted by the workshop is aimed at a specific topic, which is articulated critically and speculatively by the PhD students individually, in order to develop their capacity for operating within a given planning context by developing theoretical tools, and by generating design processes and new research paths. The research initiative is organized in 3 moments throughout the first academic year.

A. The 2 weeks annual Workshop in Tirana-Albania/Polis, after 2 preparatory weeks in Unife Ferrar Italy, which concludes with strategic drawings and concepts with regard to the selected site.

B. The annual research project after the workshop, where PhD researchers work independently on individual articles.

C. The summary of work via an annual publication/journal: OMB Journal of Polis/Unife.

In the times we live ourselves, scientific research in the disciplines of architecture and urban planning has been shifting more and more towards the intersection of many other disciplines which are directly affected in the inhabited space and built environment. In fact, after the decline of the great "metanarratives" (Lyotard 1979), where the "great architectures of thought" that structured the state of knowledge were disintegrated, we are in the presence of a fragmentation and mixing of different "languages" and disciplines.

The interdisciplinary character on which the organization of this workshop is based seeks to address the problem of space by interweaving a series of interventions that are influenced by the different "languages" on which knowledge is raised in the postmodern period.

Pustec Municipality: local condition, problematics and potentials: The municipality of Pustec is part of the district of Korça and is located at the north-eastern end of the district. The municipality shares borders to the west with the municipalities of Pogradec and Maliq, while on the northwest and east with the Republic of Northern Macedonia and on the south and southeast by Greece. The center of the municipality is the town of Pustec, which is located 25 km from the city of Korça.

The municipal administration is organized with 9 villages, which are: Pustec itself, Shulin, Leska, Zarashka, Cerje, Goricë e Madhe, Goricë e Vogël, Diellas, Gollomboc, which extend over a length of 45 km.

The territory of the municipality covers an area of 1363.8 ha. The population density is 94 inhabitants/km². The largest village in terms of area is the center of the municipality, Pustec; as well as the village of Gorica e Madhe. These villages together, represent 35% of the territory of the municipality.

Pustec Municipality

Is the case study of this annual workshop, - and one of the newest municipalities of Albania dominated by the Northern Macedonian minority in Albania, and established in the 2015-th by the latest territorial-administrative reform. It has a strong rural and natural character and is not a much-known region, due to its geographic location. However, in the last years there has been an ever-growing interest in the region, thanks to the growing tourism from within and outside the national borders. Tourism is slowly but surely becoming the main local economy in addition to that of agriculture.

Pustec has very distinct characteristics and a high potential of development, due to the rich natural and cultural resources, the mix of ethnical population; and its strategic geographic location. Despite these potentials, there also exist several territorial, social, and environmental problems, related to isolation, shrinking, migration and emigration, and natural erosion.

The theme of the workshop is captured in two key-words:

- *Landscape - which is probably the first thing that comes to mind, due to its beautiful nature and picturesque views, and*
- *Intersection - which derives from the position at the edge of Albania's border with Northern Macedonia and Greece (EU). In the spirit of intersection, we would like to expose in a transversal way the potentials and problematics of the study area.*

In this workshop, we identify four landscapes:

1. Infrastructure: The accessibility of the whole region (from the Albanian side), happens through a singular access point that connects it via Korca Municipality (the regional center), which is the most important city of the region. The connection between the settlements also presents serious issues, such

as the amortization of the infrastructure as a whole and lack of potable water service. This results from a lack of decisive infrastructural interventions and upgrades over the years.

2. Nature: More than 97% of the territory of Pustec consists of uncontaminated nature. It unfolds like a Greek or Roman natural theatre where the base is the "National Park of Prespa" and the stage is Prespa Lake. Most of the settlements are positioned on the lakeside. The National Park hosts a large variety of flora and fauna, and so does the lake. The area is prone to natural erosion, being in a highly rainy region.

3. Culture: Pustec Municipality is home to the largest Northern Macedonian community in Albania, providing therefore a particular cultural mix through the centuries. Aside from the natural attractions, from the cultural heritage standpoint, we can mention the buildings of the old Pustec town hall on the shores of Lake Prespa, from the 13th and 14th centuries, as well as the island of Maligrad (natural monument); or Saint Mary's Church (cultural monument), etc. A peculiar characteristic of the area consists of several isolated churches carved in stone, positioned around the Prespa Lake, in Albania, Northern Macedonia and Greece. Several adjacent municipalities also host some of oldest archaeological sites and monuments in the region.

4. Dwelling: The municipality is sparsely populated in the 9 settlements that constitute it. There is aggressive emigration of the residents during the last 3 decades after 4-5 decades of self-isolation. The settlements are rural, and the population relies mainly on agriculture, fishing and farming. The agricultural territory, adjacent to the settlements results as fragmented, as the settlements themselves. These historical settlements provide an opportunity for the future development of the municipality.

As we can see, the issues and opportunities are vast, and of different kinds and scales. We would like to imagine Pustec municipality not as a confined territory, but as a point where different landscapes intersect, and which, in turn, potentially re-connect Pustec with the territorial tissue of Albania, Northern Macedonia and Greece. This issue will become more critical after the EU joining of the first two countries. We see Pustec as a point of convergence and territorial reference, capable of valorizing the potentials and mitigating the problematics. Starting from the issues of accessibility, infrastructure and fragmentation and the potentials of Pustec's nature, culture and dwelling, the aim is to propose a vision for the future development of the area: a contemporary and all-encompassing vision of development capable of putting Pustec on the map. In order to achieve such a vision, the areas of inquiry of this workshop are sustainability, heritage, agriculture, and tourism. The convergence of all political-socio-economic factors will actualize itself in the modification of the territory through the development of strategies (via Territorial Planning), the integration of settlements (via Urban Planning), and spatial modifications and ad-hoc interventions (via Architecture and other disciplines).

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Objectives

The main objective of this international PhD workshop, since 2014, is to collect and frame multi-and inter-disciplinary know-hows in an architectural and urban/planning epistemological framework, to consolidate a group of researchers and professionals with a capacity to accept new complexities and challenges of resilience and future urban crises. In relation to the above transformations, potentials, and problematics, outlined in the introduction above, this research workshop aims to find and propose settlements that respond to these specific transformations/problematics and valorize the potentials for the envisioning of future sustainable development in the Albanian context. The aim of this workshop is to propose solutions and conceptual frameworks for the problems listed in the introduction. The main objective is to find strategic and spatial solutions that enable urban regeneration and future sustainable development. This objective encompasses three different proposals:

I) Proposals for regenerative strategies at the level of urban planning – where infrastructure, services and natural systems can be included;

II) Proposals at the urban level - for the Municipality of Pustec and for the settlements that surround it;

III) Proposals and specific projects - for each settlement/village taken in particular. Each of the groups will address its respective categories – those of Infrastructure, Nature, Culture and Dwelling in the three scales above: the territorial, urban and architectural scale.

Questions

Given the lack of perspective visioning for an area with great potentials like Pustec, and the general direction of the global and local trends of develop-



Fig 1 / Pustec View
source / author



ments towards sustainability, heritage and tourism, the purpose of this project is to provide a vision for the future sustainable development, at the strategic and spatial level.

The workshop encourages to develop soft strategies of expansion and transformation of the settlements and acupunctural interventions. The main questions that this workshop tackles can be summarized as such:

Which is the urban and territorial character of Pustec, and which are its issues and problematics that need to be addressed?

In which way can we operate to develop new sustainable strategies for the transformation of the settlements and the future modification of the region, in respect to the rich environmental assets?

In what ways do these transformations and problematics intertwine with city-making in the Pustec municipality context and neighboring municipalities/countries?

In what ways will the society operate within urban/living environments in the future? What about houses, leisure activities, public space, mobility, and work environments?

What lessons will architects, planners and city experts draw on their role for city making, landscaping and generative local economic activities?

What about the impact for education and research in these professions? What about the new models of cities space and life?

Methodology

From a methodological standpoint, this workshop proposes landscape as an instrument of urban and territorial reading and transformation. Parallel to the five rigid and separated systems of planning (nature, agriculture, water, infrastructure, urban), a new reading is required, which intersects these systems in four qualitatively different and transversal categories: Infrastructure, nature, culture, and dwelling. The research questions of this workshop positioned above relate to finding innovative strategies and urban and architectural answers that provide spatial solutions to urban problems generated precisely by the transformations/problematics, and the potentials of the future development listed above (paragraph 1). Specifically, the main research question of the project, which synthesizes the questions posited above, is: *How should we plan and design to provide a future sustainable development in a multi-scalar way?*

To answer the above question, the workshop is organized into several steps that are not necessarily sequential but may overlap with each other.

The first step - is to gather information at a theoretical level that is directly related to theoretical studies and innovative and sustainable practices. In parallel with this step, detailed analyses will be made at a territorial and urban level in the case of the Pustec

Municipality/Region, emphasizing the risks and dangers to which this Municipality is exposed.

The second step – is to process the data extracted above within the workshop. Beyond the analyses made in the first step, this workshop is expected to give specific proposals at a theoretical and practical level to answer the research question posited at the beginning of the paragraph. There will be four groups of researchers with members with expertise from different fields. Participants will focus on three scales: i) planning strategies in a territorial scale; ii) urban strategies in a city scale; iii) urban projects in an architectonic scale.

The third step – of this research is related to the detailed research for each of the scales mentioned above where each participant in the workshop is expected to develop a theoretical and practical contribution for proposing new strategies or spatial models in favor of the sustainable/resilient future development of the region.

The workshop is structured in a way that promotes the merger of different expertise to address the diverse aspects related to Pustec as a town/center and its municipal territory in general. The following steps will be used as a pragmatic approach to combine theoretical knowledge, physical environment and existing data: 1) - Introduction to the Area; 2) - Theoretical Lecture + Case studies; 3) - Site Visit and fieldwork; 4) in class work + Project discussion.

Expected Results

Regarding the objectives, research activities, and methodology, it is expected that from this workshop will emerge a series of concrete proposals:

1) for the case of Pustec Municipality;
2) for the national and regional/cross-border and international contexts, that have a similar character. Each of the four groups that will deal with one of the categories of Infrastructure, nature, culture, and dwelling will propose concrete/specific scientific and graphic proposals on the sustainable/resilient future development of Pustec and the larger cross-border region, in a territorial, urban and architectural scale.

The results of the project are expected to be announced by participating researchers in various conferences and other research activities. They are expected to be published in conferences, congresses or other national and international research activities. The final product of this project will be dedicated to the annual publication of OMB Journal. The findings are made in this project on new spatial instruments and models that are able to respond to the transformations and problematics mentioned above.

The Organization of the Workshop:

The workshop will take place in Tirana, Pustec Municipality, as well as in the Northern Macedonian and Greek part of Prespa lakes, between the 13th – 24th November 2023.

In total, 24 researchers are involved, 15 of them from the PhD Program, and other professors and assistants from POLIS University and UNIFE. Four research groups by 4-5 members with mixed back-

grounds will be established. A group of academic staff from Polis University will lead the workshop (coordination by Prof. Besnik Aliaj; Prof. As. Skender Luarasi; Dr. Genti Avdija; Dr. Malvina Istrefaj), while many others will assist daily or with selected interventions/presentations, including Prof. Pantelis Skayannis, Prof. Roberto di Giulio, Prof. Theo Zafagnini, Prof. As. Sotir Dhamo, Prof. As. Lazar Kumanraku, Dr/ Ledian Bregasi, etc.

Participants will be paying special attention to three main dimensions: i) planning and territorial scale ii) urban scale iii) and architectonic scale in a multidisciplinary contact. The Teams/Groups are:

1. Group 1 – Topic | Infrastructure and facilities: Doriani Musaj – Sadmira Malaj; Gregor Andoni; Caterina Rondina; Lisa Mensi.

2. Group 2 – Topic | Environmental Systems: Kejt Dhrami – Anila Gjika; Francesco Axel Pia; Karla Cavallari; Alessandro Delli Ponti.

3. Group 3 – Topic | Culture and Heritage: Marsela Plyku-Demaj – Kejsi Veselagu; Daniele Romagnoli; Maristella De Fabrizio.

4. Group 4 – Topic | Settlements, Public Spaces and dwelling: Malvina Istrefaj – Julian Begiri; Dejvi Dauti; Andrea Sterpin; Christin Erdman Goldoni.

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2.1

Crossing Borders, Building Trust The Prespa Lakes as a Living Laboratory for Integrated Transboundary Governance

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Interdisciplinary exchanges

Crossing Borders, Building Trust

The Prespa Lakes as a Living Laboratory for Integrated Transboundary Governance

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Abstract - *The Prespa Lakes basin, spanning Greece, Albania, and North Macedonia, offers a strong example of evolving transboundary governance. What began as civil society-led cooperation has gradually moved toward more formal structures, most notably with the creation of the Prespa Park Management Committee following the 2010 trilateral agreement. Despite the area's rich ecological and cultural assets, balancing conservation with development remains a persistent challenge amid shifting political contexts.*

In response, local authorities have proposed forming a European Grouping of Territorial Cooperation (EGTC) for the region. Backed by EU legislation, this model could provide the legal and operational framework needed to manage joint efforts across borders. By aligning ecological preservation with regional strategies, like ecotourism and enhanced public services, the EGTC offers a pathway to integrated, long-term governance.

Comparative examples, such as the Lake Constance region, show the value of lasting institutions, inclusive governance, and multi-level coordination. A Prespa EGTC could follow this path, offering a legally grounded platform for collaboration among municipalities, communities, and NGOs to manage both environmental and socio-economic priorities.

This study adds to policy and academic conversations by showing how EGTCs can help close governance gaps in complex ecological regions. However, success will depend on addressing legal inconsistencies between countries and securing political and financial commitment. As a real-world testbed, Prespa illustrates the promise of integrated territorial governance for fostering stewardship, cohesion, and sustainable progress in shared landscapes.

Keywords - *Transboundary Governance, European Grouping of Territorial Cooperation (EGTC), Integrated Territorial Development, Multi-level Collaboration, Cross-border Conservation*

Introduction

The governance and planning of transboundary landscapes like the Prespa Lakes region offer a valuable lens through which to explore the intersections of environmental conservation, local development, and cross-border collaboration. Increasingly, such areas are seen not only as ecological frontiers but also as testing grounds for multi-level governance, socio-spatial integration, and landscape-focused planning. The key challenge lies in translating these intersections into meaningful institutional, territorial, and design frameworks that are particularly relevant in Southeast Europe's evolving governance context. The creation and management of transboundary protected areas (TBPA) are central to advancing global conservation goals, fostering regional cooperation, and promoting sustainable development. Scholars have identified these areas as critical zones for ecological protection, economic integration, and political engagement (Ali, 2007; Sandwith et al., 2001). Still, research reveals significant gaps,

particularly in governance models, community participation, integrated development planning, and long-term sustainability, especially in regions like Southeast Europe, where ecological sensitivity and political complexity intersect (Vasilijevic et al., 2015; Lockwood et al., 2010). The shift from informal cooperation to formal governance remains underexplored.

The Prespa Lakes basin, shared by Greece, Albania, and North Macedonia, illustrates both the promise and the fragility of cross-border collaboration. It reflects the difficulty of balancing environmental goals with the socio-economic realities of peripheral rural areas rich in cultural and ecological value. Established in 2000 as an informal, civil society-led initiative for environmental protection and sustainable territorial development, Prespa Park showcases both the opportunities and the constraints of managing a shared ecological resource (Christopoulou & Roumeliotou, 2006; Katsaros, 2008). Yet, ongoing political shifts,

divergent national agendas, and governance challenges have tested its durability (Dimopoulos et al., 2010).

This paper addresses these gaps by tracing the trajectory of Prespa's transboundary governance, from early informal efforts to more structured institutional frameworks, and toward the proposed creation of a European Grouping of Territorial Cooperation (EGTC). The recent proposal by the four mayors of the Prespa municipalities to establish a Prespa Basin EGTC marks a potentially transformative development. This initiative, under the EU's EGTC framework, would grant the cross-border municipal alliance legal standing and operational authority, thus offering a vehicle to institutionalize co-operation, implement joint initiatives, and ensure consistency in conservation and development efforts. Critically, it would empower municipalities to co-manage environmental and socio-economic issues with greater autonomy and continuity than is typical in intergovernmental or externally driven models. Realizing this potential, however, hinges on ensuring legal alignment, particularly in Albania and North Macedonia, where enabling legislation remains underdeveloped, and crafting a mandate that balances environmental, social, and economic priorities (European Committee of the Regions, 2018; Gualini, 2018).

The paper's central aim is to evaluate how formal governance tools like the EGTC can enhance cross-border cooperation, promote regional sustainability, and reinforce ecological resilience. It further explores the relevance of integrated territorial approaches aligned with EU cross-border cooperation strategies. The urgency of this inquiry lies in the need to understand how institutional evolution in TBPAAs can support more coherent, inclusive, and adaptive governance systems across similar ecologically significant, politically nuanced regions. By offering empirical insight into how structured governance mechanisms function in a TBPA context, the study contributes to ongoing academic and policy debates. It also highlights how integrated strategies and inclusive participation can improve both conservation outcomes and regional development.

The structure of this paper follows a clear and

coherent progression, moving from conceptual framing to empirical analysis and forward-looking reflection. The **Introduction** outlines the research rationale and objectives, positioning the Prespa Lakes region as a valuable case study in the evolution of transboundary governance. **Section 1** examines broader European experiences with transboundary protected areas (TBPAAs), presenting key governance typologies and foundational principles that shape cooperative management frameworks. **Section 2** traces the historical trajectory of the Prespa Park initiative, with particular attention to the transition from informal civil society efforts to treaty-based institutionalization, culminating in the establishment of the Prespa Park Management Committee. **Section 3** introduces the methodological approach, which employs comparative qualitative analysis. It details the primary tools used, including document analysis and benchmarking against established cases. **Section 4** offers comparative insights by exploring governance models from other European transboundary lake regions, particularly Lake Constance, drawing out lessons relevant to the Prespa context. **Section 5** focuses on the European Grouping of Territorial Cooperation (EGTC) as a novel governance mechanism. It evaluates cases such as Alpi Marittime–Mercantour and Duero–Douro to assess the potential contribution of the proposed Prespa Basin EGTC. **Section 6** addresses cross-cutting themes, including stakeholder engagement, regional economic integration, and institutional innovation, identifying key conditions that support long-term cross-border collaboration.

The **Conclusion** synthesizes these findings and outlines the main policy implications, arguing that EGTCs hold strategic value in embedding inclusive, multi-level governance in ecologically and administratively complex transboundary regions.

Governance Structures of Transboundary Protected Areas in Europe

Governance of European TBPAAs spans a broad spectrum: from informal networks to formalized treaties. A longstanding tradition of cross-border conservation exists, notably the early 20th-century

collaboration between Italy and Switzerland in the Alps. The EU's Natura 2000 network further accelerated cross-border cooperation, prompting countries to align conservation goals and link national parks across borders. Today, most European nations are involved in multiple TBPAAs, typically by connecting adjacent protected areas.

Formal governance often takes the shape of bilateral or multilateral bodies. The Wadden Sea, shared by Germany, the Netherlands, and Denmark, operates under a Trilateral Cooperation structure supported by national park designations and a shared Secretariat (Wadden Sea Secretariat, 2014; Tatenhove & Leroy, 2003). River basins like the Danube and Rhine are managed through international commissions under EU water directives (ICPDR, 2021; Bernauer & Moser, 1996). These frameworks offer stable platforms for planning and decision-making, fostering clarity and political backing. However, intergovernmental mechanisms may struggle when they lack strong enforcement tools or mutual trust (Voogd et al., 2022).

Effective TBPA governance requires institutional clarity paired with adaptability. Prespa Park illustrates this evolution. Founded in 2000 by a joint declaration from the Prime Ministers of Greece, Albania, and North Macedonia, it became the Balkans' first transboundary protected area. Early cooperation, guided by the Prespa Park Coordination Committee (PPCC), brought together government, local, and NGO actors alongside international observers. This informal arrangement, driven by goodwill and project-based collaboration, laid the groundwork for deeper institutionalization. In 2010, a formal agreement, also including the EU, was signed, entering into force in 2019. It established the Prespa Park Management Committee (PPMC), a multilateral body with a wide membership, including central governments, local communities, NGOs, and observers like MedWet. Initial evaluations suggest that such inclusive, multi-level governance enhances coordination on key priorities like water regulation and habitat conservation. Yet, the nearly decade-long delay between signing and ratification highlights the vulnerability of high-level commitments without consistent political engagement (de Koning & Avramoski, 2021; Catsadorakis & Roumeliotou, 2021).

Other regions have taken similar paths. Lake Constance, shared by Switzerland, Germany, and Austria, demonstrates enduring trilateral cooperation. Since 1959, the International Commission for the Protection of Lake Constance (IGKB) has led integrated lake management. Thanks to coordinated investment in sewage treatment, phosphorus levels dropped from 87 mg/m³ in 1979 to about 12–13 mg/m³ by the early 2000s, making it a widely cited example of successful lake restoration (Eder & Koch, 2018). Additionally, the International Lake Constance Conference (IBK) offers a platform for dialogue on development, infrastructure, and environmental concerns among bordering states and cantons. These arrangements exemplify how long-term, legally supported, and multi-level coordination fosters effective TBPA governance, even when not bound by formal protected-area treaties (International Lake Constance Conference, 2019).

Tools and Methodology

This paper adopts a context-sensitive and practice-informed approach, grounded in the authors' close involvement with transboundary governance processes in the Prespa Lakes region. Drawing on institutional experience and access to current policy developments, including the ongoing establishment of the Prespa Basin EGTC, the analysis reflects both insider knowledge and the broader policy environment shaping regional cooperation.

The study is primarily based on the synthesis of secondary sources, including official cooperation agreements, strategic plans, legal instruments, and practitioner literature produced by local and international stakeholders. Special attention is given to documents emerging from the Prespa Park Coordination Committee, the Society for the Protection of Prespa (SPP), PrespaNet, and the broader Ramsar and MedWet networks.

In addition, the paper integrates comparative reflections from other European transboundary lake regions, notably Lake Constance, Alpi Marittime–Mercantour, and Duero-Douro, selected for their relevance to the institutional challenges and opportunities present in the Prespa context. These examples are used illustratively rather than evaluatively, to draw attention to governance design elements and collaborative mechanisms that may offer useful analogies or lessons.

Rather than following a fixed theoretical model, the methodology emphasizes interpretive synthesis, grounded comparison, and applied policy learning. It reflects the paper's dual aim: to contribute to the broader discourse on transboundary protected area governance in Europe, and to offer practical insights for policy and institutional development in the Prespa Basin.

Comparative examples

Transboundary Lakes in Europe: Prespa Park and Lake Constance as Comparative Examples

The Prespa Lakes region is frequently cited as a real-world laboratory for transboundary governance that connects environmental protection with socio-economic development. Ecologically, it functions as a single watershed encompassing Macro and Micro Prespa Lakes, surrounding wetlands, and mountainous habitats that support numerous endemic species and internationally important bird populations, most notably the Dalmatian pelican (Catsadorakis & Malakou, 1997). Yet administratively, the area is split among Greece, Albania, and North Macedonia, making unilateral conservation efforts inadequate.

Prespa's governance story began with local civil society. Organizations like the Society for the Protection of Prespa (SPP) and WWF-Greece played a central role in advocating for a tri-national park, culminating in the 2000 Prime Ministers' Declaration. The interim Prespa Park Coordination Committee (PPCC), created shortly thereafter, achieved meaningful progress during the 2000s, including the development of a Strategic Action Plan and securing a UNDP-GEF project for integrated ecosystem management. What made the PPCC especially unique was its participatory structure: government agencies, NGOs, and local community representatives worked as equals. This inclusive

model fostered trust among previously isolated actors and helped cultivate a shared sense of purpose around Prespa's natural and cultural values. Over time, stakeholders began to see that ecological preservation and traditional livelihoods, such as fishing and agriculture, were inherently linked, and that collaboration served their mutual long-term interests (Christopoulou & Roumeliotou, 2006). The

2010 trilateral Agreement, which came into legal effect in 2019, provided a more formal institutional base for this cooperation. It led to the formation of the Prespa Park Management Committee (PPMC), which by 2022 had become operational alongside a specialized Working Group on Water Management. This marked the first instance in which official joint bodies met to coordinate policy—on water levels, for example, across the full Prespa basin. One early success was the implementation of synchronized monitoring, such as coordinated bird counts among the three countries, which had never occurred at this scale before. While the formal governance process was slow to launch, Prespa's case underscores how effectiveness can evolve: from informal collaboration to a treaty-based framework, with civil society still playing a central role, SPP continues to serve in the PPMC's secretariat (Catsadorakis & Roumeliotou, 2021).

Looking ahead, the planned Prespa EGTC is expected to complement existing structures. The EGTC would institutionalize municipal-level cooperation around cross-border development projects, such as tourism, infrastructure, and service delivery, ensuring they align with environmental management efforts led by the PPMC.

Lake Constance (Bodensee) Region: In contrast, Lake Constance offers a long-established model of cross-border integration that goes beyond conservation. Though not designated as a single protected area, the lake and its surrounding region serve as a hub for environmental governance, economic cooperation, and spatial planning across Switzerland, Germany, Austria, and Liechtenstein (as an observer). The International Water Protection Commission (IGKB) focuses on water quality and fisheries, while the International Lake Constance Conference (IBK), established in 1972, convenes regional governments to coordinate across sectors: planning, transport, environment, and culture. Under IBK's umbrella, joint spatial development plans and initiatives like "Bodensee Agenda 21" have advanced sustainability goals at the regional scale. Economic integration is strong: daily cross-border commuting is widespread, and residents benefit from shared public services such as an integrated transit system and coordinated tourism promotion, including a unified "Bodensee" tourism brand and visitor card. Environmental governance, such as lake water quality maintenance, has been foundational to the region's economic success, especially tourism and water supply. In turn, these economic interdependencies have reinforced cooperation.

Multi-stakeholder involvement is another pillar of Lake Constance's model. NGOs like the Lake Constance Foundation engage in cross-border conservation efforts, and academic collaboration is well-established, now formalized through the Science Network EGTC. This institutional infrastructure creates a resilient system where both

top-down and bottom-up initiatives can thrive. While often cited as a success story, Lake Constance also faces challenges, including competing interests between upstream and downstream users and the need to address climate-related shifts in lake levels. Nonetheless, the region's permanent governance structures enable regular negotiation and conflict resolution.

In summary, Lake Constance illustrates a mature form of transboundary governance where environmental management is one piece of a broader integration framework. Compared to the more biodiversity-driven cooperation seen in Prespa, it highlights how embedding conservation in regional economic and political frameworks can broaden stakeholder involvement and long-term stewardship.

EGTC's that Facilitate Environmental Protection

The European Grouping of Territorial Cooperation (EGTC), established under EC Regulation 1082/2006 and amended by 1302/2013, is a legal tool designed to facilitate cross-border, transnational, or interregional cooperation. By granting legal personality, it enables authorities from different countries to form a joint institution that can manage projects, hire staff, and access EU funding, helping to overcome administrative and legal hurdles in cross-border initiatives.

Although EGTCs are commonly used in areas like transport, public services, and regional development, and of course territorial cohesion, their role in managing protected areas and environmental cooperation is still emerging. However, pioneering examples highlight their growing relevance.

▪ [ZASNET EGTC](#) (est. 2010) unites Portuguese and Spanish municipalities (Bragança and Zamora) to foster sustainable development in a cross-border area rich in natural and cultural heritage. It played a pivotal role in the creation of the Meseta Ibérica Transboundary Biosphere Reserve, designated by UNESCO in 2015. Its mandate goes beyond economic development to include biodiversity conservation and environmental planning. The EGTC is governed by a General Assembly of member authorities and operates via a technical secretariat that manages funding, coordination, and stakeholder engagement, functioning under EU Regulation 1082/2006.

▪ [Alpi Marittime–Mercantour EGTC](#) (est. 2013) formed the first transboundary protected-area EGTC, connecting France's Mercantour National Park and Italy's Alpi Marittime Natural Park. The EGTC provides a formal framework to undertake joint operations, from wildlife monitoring and habitat management to sustainable tourism promotion. Building on collaboration dating to the 1980s, this EGTC coordinates joint operations such as species reintroduction (e.g. ibex, vultures), habitat management, and ecotourism. In its initial years, it delivered 29 projects with €25 million in investments and positioned the region for potential UNESCO World Heritage status as the "Mediterranean Alps."

▪ [Duero-Douro EGTC](#) (est. 2009) links municipalities in Spain's Castilla y León and northern Portugal along

the Duero-Douro river corridor. It focuses on cross-border management of protected landscapes, including the Arribes del Duero and Douro International Natural Parks, both part of Natura 2000 network of protected areas. The Duero-Douro EGTC aims to facilitate integrated management of these transboundary protected areas through joint conservation planning, ecotourism development, and coordinated EU project implementation. Its structure includes a General Assembly, Executive Council, and Permanent Secretariat, enabling integrated conservation, rural development, and joint project implementation under EU programs like INTERREG and LIFE.

These cases show that EGTCs can effectively bridge the gap between conservation and development. By bringing municipalities, national parks, and other actors into a unified legal structure, they offer a governance model capable of streamlining decision-making and securing long-term support for cross-border projects.

Prespa Basin EGTC Initiative: Building on two decades of Prespa Park cooperation, the municipalities of Resen (North Macedonia), Prespes (Greece), and Pustec and Devoll (Albania) signed a memorandum in late 2024 to establish an EGTC for the Prespa region. This step aims to turn the basin into a model for cross-border innovation and sustainable development.

The initiative outlines key goals: environmental protection, climate adaptation, cultural heritage, and enhanced local services. Economic integration is also central, particularly promoting Prespa as a unified ecotourism destination and managing natural resources jointly. Supported by the EU Delegation, the initiative aligns with EGTC regulations and is seen as a major opportunity to professionalize regional cooperation.

If successfully implemented, the Prespa EGTC would formalise existing partnerships, fill longstanding coordination gaps, and enable legally backed, multi-level governance with dedicated project teams across all three countries.

Important Governance Issues

Stakeholder Participation and Multi-Level Collaboration

A recurring theme in the literature is that effective stakeholder participation is crucial to the success of transboundary environmental governance. European experience consistently shows that TBPAAs function more effectively when local communities, NGOs, and other non-state actors are meaningfully involved alongside national authorities. The EUROPARC Transboundary Parks Programme, which certifies cross-border parks meeting specific "Basic Standards", explicitly includes participatory management as a requirement. It encourages parks to develop joint education initiatives, community outreach efforts, and local-level conflict resolution mechanisms (EUROPARC Federation, 2021). This approach is grounded in the understanding that communities on either side of a border often share deep historical and cultural connections to the land, and that their engagement and knowledge are vital to effective management.

In Prespa, a participatory ethos has been embedded in governance practices from the outset, forming a

cornerstone of the region's collaborative model. In the Greek part, local stakeholders including fishers, farmers, and tourism actors are regularly engaged in the development and revision of management plans. A key mechanism for this is the annual stakeholder assembly, organized jointly by the Municipality of Prespes and Society for the Protection of Prespa, where pressing management issues such as water level regulation, fisheries policy, and watershed planning are discussed collectively. The outcomes of these discussions are then submitted as recommendations to the relevant national authorities, ensuring that community perspectives are formally integrated into decision-making processes. NGOs have played key roles in mediating resource-use disputes at the community level, such as regulating water abstraction and wetland usage. The Prespa Park Management Committee itself is composed of representatives from local municipalities and environmental NGOs, alongside national park authorities, central government ministries, and European Commission officials. PrespaNet, a collaborative network of NGOs from the three countries, exemplifies this bottom-up engagement, complementing official governance frameworks and facilitating cross-border cooperation on environmental issues.

A similar model can be seen in the Neusiedl-Fertő Lake region between Austria and Hungary, where a joint national park committee includes local mayors and landowners. This inclusive body has successfully aligned conservation goals with traditional grazing practices and regional wine tourism strategies, demonstrating how multi-stakeholder frameworks can generate mutually beneficial solutions.

Lake Constance, though not centered on a protected area, also illustrates the value of multi-level stakeholder coordination. Fisheries associations from across the region participate in the development of fishery regulations within the International Water Protection Commission (IGKB). Meanwhile, regular "Lake Forums" bring together diverse interest groups, including those from tourism, agriculture, navigation, and environmental sectors, to deliberate on lake management issues. Such broad-based participation has ensured that policies remain both practical and enforceable. The dramatic reduction in phosphorus levels around the lake, for example, was not achieved through top-down mandates alone but also through widespread public backing of wastewater infrastructure and farmers' willingness to adopt fertilizer restrictions. The newly established Bodensee Science EGTC further enhances stakeholder inclusion by linking academic research with regional policy needs.

Taken together, these examples highlight how robust stakeholder involvement leads to more informed decision-making and boosts the legitimacy of conservation measures. By encouraging shared ownership of both challenges and solutions, whether through co-designing wetland restoration efforts or marketing cross-border hiking routes, participation strengthens the overall governance system. A common shortfall in earlier TBPA models was their tendency toward top-down structures, often excluding local voices. Over the past three decades, however, European practice has increasingly shifted toward more inclusive governance frameworks, reflecting broader international commitments such

as the Aarhus Convention on public participation and access to environmental information.

That said, challenges remain. Sustaining stakeholder engagement over time can be difficult, and ensuring that all relevant groups, especially marginalized communities, are adequately represented remains an ongoing concern. The literature emphasizes that building long-term participation requires targeted capacity-building initiatives, such as training local actors in conservation skills, and maintaining open channels of communication to keep stakeholders actively involved.

Interplay of Governance, Economic Integration, and Participation

Transboundary environmental governance in Europe is deeply intertwined with broader processes of regional integration. Rather than existing in isolation, it is both shaped by and contributes to social and economic dynamics. Several scholars suggest that transboundary protected areas (TBPA) can act as engines for regional development and even peace-building. The term “peace parks” has been used to describe how shared stewardship of natural heritage can foster better interstate relations and support local livelihoods. Within the European context, where political stability is relatively high, the focus tends to be on regional cohesion and sustainable growth.

The goals of the Prespa Park initiative explicitly include improving the economic and social well-being of local communities, alongside ecological conservation. This dual focus is evident in activities such as the promotion of nature-based tourism, including birdwatching infrastructure and cross-border hiking trails, as well as efforts to develop a regional identity around Prespa-branded products like beans and fish. The planned Prespa Basin European Grouping of Territorial Cooperation (EGTC) is expected to advance this integration further by coordinating tourism promotion and potentially facilitating cross-border mobility. One concrete step in this direction is the reopening of a long-closed border crossing with EU support, which is set to ease travel for both trade and tourism. These developments point to a virtuous cycle, where improved livelihoods reduce pressure on natural resources, and a well-conserved environment provides the foundation for a resilient local economy. Lake Constance, by contrast, illustrates a long-standing model of strong economic interdependence that has helped reinforce environmental cooperation. The region's shared identity is captured in the marketing phrase “Dreiländersee,” or “three-country lake.” Cross-border ferry operations, interconnected cycling routes, and coordinated responses to environmental issues such as invasive species or algal blooms reflect the harmony between economic use and environmental management. A study by ESPON (2021) found that border lake regions like Lake Constance have achieved what it terms “functional cross-border integration,” characterized by shared visions and services. Institutions such as the International Lake Constance Conference (IBK) ensure that environmental considerations are incorporated early in economic planning processes. When a new lakeside development is proposed, for instance, environmental assessments are part of

the transboundary spatial planning framework. In the reverse direction, conservation projects often include socio-economic benefits. The regeneration of wetlands in the Rhine delta has enhanced biodiversity, improved flood protection, and created recreation zones that directly benefit surrounding communities.

A key dimension of this relationship is the role of multi-level governance, connecting local, national, and EU-level efforts. The European Union has played a significant part in facilitating this cooperation. Funding programs like INTERREG and LIFE have supported a wide range of cross-border projects, from habitat restoration to shared visitor centres, providing incentives that help maintain collaborative momentum. EU directives, such as the Water Framework Directive and the Natura 2000 network, also offer shared targets and a common policy vocabulary, which align national actions toward collective goals.

Nonetheless, the diversity of legal and administrative systems across countries still poses challenges. This is where mechanisms like the EGTC become particularly valuable, by offering a legal structure that enables joint operations under a unified framework. The experience of the Mercantour-Alpi Marittime EGTC demonstrates the complexities of aligning administrative procedures across borders, especially in areas like procurement rules and employment regulations. However, once such hurdles are overcome, joint project execution becomes far more streamlined and effective.

Moreover, inclusive governance and stakeholder engagement have their own economic benefits. When local actors see that transboundary institutions respond to their needs, such as when fishermen are involved in setting quotas, or farmers are consulted about grazing practices, they are more inclined to support conservation efforts. This cooperation, in turn, can attract additional investment and tourism by presenting the region as politically stable and well-managed. In Prespa, for example, the collaborative governance framework helped secure major international funding, including a €15 million Global Environment Facility (GEF) project. It also positioned the region as a symbol of cross-border unity, a quality that can be a powerful asset for nature tourism marketing.

Rethinking Transboundary Governance: Insights, Innovations, and Institutional Futures

A few key considerations emerge when evaluating European experiences with the governance of transboundary protected areas. Multi-level governance frameworks have proven especially valuable. By combining international agreements, regional institutions, and local stakeholder networks, these systems can effectively address the ecological and administrative complexities inherent in TBPA. Europe's politically diverse landscape means there is no universal model. Instead, governance arrangements must be adaptive. Examples such as the Prespa Park's lengthy journey toward a formal treaty-based structure, and Lake Constance's deeply institutionalized integration, each offer distinct but successful pathways.

Although relatively few in number, EGTCs present a

promising instrument for enhancing transboundary conservation. When applied effectively, they can create permanent operational structures with legal personality, going beyond the advisory role that most existing committees play. EGTCs offer a legal basis for the direct participation of subnational actors, such as regions and municipalities, which is essential for issues like land-use planning and local development, often outside the jurisdiction of national environment ministries. The Alpi Marittime–Mercantour EGTC has already demonstrated that pooling resources and speaking collectively to donors yields tangible results. In similar fashion, the proposed Prespa EGTC could overcome coordination challenges by institutionalizing joint funding, staffing, and project implementation, while reinforcing the role of municipal authorities.

Increased use of EGTCs for TBPAs could lead to more professional, resilient governance systems that persist even when national political agendas shift. However, significant gaps remain. Many TBPAs still operate through ad-hoc projects with limited funding and no formal structure. The literature calls for clearer guidance and stronger support from the EU to help countries transition toward lasting transboundary governance models. Challenges persist in harmonizing legal frameworks, ensuring equitable cost and benefit sharing, and monitoring the effectiveness of governance interventions. Measuring ecological outcomes, in particular, remains complex. Improvements such as those observed at Lake Constance evolved over decades, and tracing them directly to governance interventions demands careful, long-term study. Stakeholder participation, though improved, also requires further strengthening. Future research could explore how to better involve private sector actors, such as sustainable tourism operators or local agri-businesses, and how to sustain broad-based participation beyond initial engagement phases. Climate change will undoubtedly increase the demand for wider-scale cooperation. As species ranges shift and water regimes evolve, already evident in the Macro Prespa Lake region, transboundary areas will likely need to connect across larger landscapes, potentially coordinating wildlife corridors or shared watershed management frameworks that span multiple borders.

What three decades of European experience show is that TBPAs have the potential to evolve beyond conservation tools into platforms for regional integration and collective identity. Effective governance in these areas depends on three key elements: structures aligned with ecological boundaries, meaningful stakeholder participation, and bridging mechanisms that facilitate cooperation across jurisdictions. The EGTC framework offers a practical tool for achieving these aims, reducing barriers that typically complicate cross-border governance.

Prespa exemplifies the gradual alignment of institutional structures with ecological realities and community engagement. Lake Constance illustrates the broader possibilities that emerge when environmental and economic governance are pursued together. Lessons from both cases suggest that carefully designed tools, such as EGTCs, and a commitment to collaborative structures

can substantially improve the governance of transboundary protected areas. In doing so, they not only protect nature but also generate shared benefits for the people who depend on these landscapes and their cross-border connections.

Conclusions

The Prespa Lakes region offers more than a case study, it reflects a deeper transformation in how borders, ecosystems, and communities interact. Prespa's trajectory reveals that genuine progress in transboundary governance cannot rest solely on sound environmental strategies or institutional architecture. It must also be rooted in inclusive, durable, and locally embedded cooperation. The evolving Prespa EGTC initiative exemplifies how legal innovation can translate community trust, ecological interdependence, and political coordination into a functioning cross-border governance framework.

What distinguishes the EGTC model is its capacity to transcend administrative fragmentation by granting legal personality to a multi-actor entity. With this structure, municipalities, NGOs, and local stakeholders are empowered not only to participate, but to lead. It enables the implementation of long-term projects in areas ranging from habitat management to tourism development, embedding sustainability within a flexible and resilient governance system. Far from a procedural formality, the Prespa EGTC has the potential to become a living institution that operationalizes shared responsibility and gives real voice to those living in the landscape.

Translating the lessons of Prespa into broader policy action requires supportive frameworks and targeted reforms. The following priorities emerge as especially relevant for replicating and scaling this model across Europe's border regions:

- Promote the EGTC model as a strategic tool for protected areas: The EU should actively support EGTCs as governance platforms for cross-border Natura 2000 sites and similar landscapes, ensuring legal visibility, technical assistance, and integration within territorial cooperation policies.
- Empower local governments with legal and financial tools: National and EU frameworks must equip subnational actors, who are closest to local challenges and opportunities, with the autonomy, resources, and legal standing to co-manage cross-border initiatives effectively.
- Institutionalize stakeholder participation as a core governance function: Moving beyond symbolic inclusion, participation should be embedded through formal roles, long-term funding for facilitation, and joint mechanisms for monitoring, learning, and adaptive planning.

In an era marked by environmental volatility and geopolitical tension, Prespa stands as a powerful example of what transboundary cooperation can achieve. From its beginnings in grassroots activism to its present institutional maturity, and now its move toward EGTC-based collaboration, Prespa shows that governance grounded in place can endure and adapt. By linking ecosystems with institutions and communities, Prespa, besides

protecting a landscape, is quietly building a model of shared stewardship that others in Europe and beyond can learn from.

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"Vision Making" in cross-borderer regions dominated by natural assets

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Abstract - This article explores methodological approaches to ecological transition-oriented conceptual frameworks and operational protocols for vision-making. In particular, it tries to answer one question: Which specific features should the process of Vision-making have when applied to a cross-border region which is both rich in natural assets as deprived of urban development oriented infrastructures? To answer reference is made to a cross-disciplinary frame of references, from the fields of Environmental philosophy, geographic economy and planning. This choice is based upon the need for strategic thought and anticipatory visioning to base assumptions upon an holistic frame of reference, convening those disciplines that inform our understanding of the urban and environmental phenomena.

Context of the research

This article is the outcome of a research process initiated by an expedition conducted in November 2023. The focus of the exploration was the geographical area of Lake Ohrid - UNESCO World Heritage Site and part of EU's Natura 2000 protected areas network. The expedition provided a first-hand, intimate connection to a geographic area which can be considered an "Earth's Witness territory" given its preservation state and its defining features: an extreme landscape, one of the world's oldest and deepest lakes, with a maximum depth of 288 meters, an average depth of 155 meters, and a surface area of 358 square kilometers, its inland ecosystem is a unique biodiversity hotspot, with over 200 endemic species. The research involved a collective geographical inquiry, during which information and visual documentation of the area's landscape systems and ecosystem components were gathered. Additionally, interviews were conducted with local institutional representatives and experts from Macedonia, Greece, and Albania, providing insights into the ongoing socio-economic and environmental dynamics.

Method and goals

This article dwells upon research and literature reviews that dealt with Urban-oriented visioning in EU urban contexts and North America, as well as on contextual knowledge gathered during the research-by-design, in situ phase of the inquiry, and on the authors' previous Vision-making experiences in cross-border regions characterized by extreme environmental conditions and social inclusion issues [1], [2]. The article, moving off the beaten track of Growth-oriented Planning, explores the emergent conditions a Visioning process should address—and embody when dealing with the future of naturalistic contexts. Promoting an evolutionary, cooperative and adaptative transformation of territories. I.e., a process of gradual deepening and strengthening of co-evolutive relations between living communities and their territory that is based on the "absorptive capacity" (C. Garner, D. J. Cohen & D. A. Levinthal) of the local natural and social systems and not on the exogenous application of economic boosters.

The article is structured in two parts :

(1) The introduction presents the notion of Vision Making, its relation to the Planning discipline and the constraints imposed by cross-border contexts dominated by natural assets. (2) The notes for Vision-Making address various aspects of the epistemic and methodological transition in planning practices. Part 2 is articulated in a general framework - illustrating the operational transition from the dominance of "The project paradigm", towards a "Care oriented process", followed by thematic Protocols for the enactment of a Vision Making process.

Keywords - spatial justice, cross-border areas, transboundary governance, socio-economic disparities, Prespa Lake, environmental sustainability

Introduction

Visioning as a tool to navigate an uncertain future.

The process of Visioning became popular in the aftermath of second world war in all those domains (economy, military studies, geopolitics and climate sciences) that implied the strategic foresight and anticipation of the future in order to prepare pathways for action. The interest for this emergent practice was popularized by futurologists such as De Jouvenal in France (*Les Futuribles*) and in USA by the Rand Corporation (A. Colonomos). In a moment in which Science had proved to be capable of making the difference in assessing world power dominance, Visioning could be read as a tentative to build a "scientific" approach to the definition of strategic action, replacing the primacy of political-economic guidance that had characterized early modernity. Nevertheless, the production of Visions is not relevant for its potential "pseudo-scientific" claims but rather because of the need to orient the collective action when dealing with our actions through time.

As such Visioning, it should not be understood as the project of an author for a plausible future but as a complex process informed by multiple actors, influenced by different frameworks of understanding of reality, and defined by the intelligence-s that are mobilized in an attempt to foresee potential futures and draw action upon these presumptions. As Davoudi et al. (2018, p. 101), notes: 'Spatial imaginaries are deeply held, collective understandings of socio-spatial relations that are performed by, give sense to, make possible and change collective socio-spatial practices. They are produced through political struggles over the conceptions, perceptions and lived experiences of place. They are circulated and propagated through images, stories, texts, data, algorithms and performances. They are infused by relations of power in which contestation and resistance are ever-present'.

Yet Visioning is often relegated to an ancillary role in the processes of strategic planning, corresponding to a phase of spatialized and visual communication (often presented as

democratization) and idealization of strategic choices developed in previous opaque technical and administrative processes. As V. Balz and V. Lingua note – this resolves in the confirmation of hegemonic geographical perceptions, confirming existing planning regimes or biases. In order to move beyond this condition, we should imagine the future "as a cultural fact" to be understood through the interaction of three fundamental human urges : imagination, anticipation, and aspiration (Appadurai 2013). These three aspects are also key to the construction of Visions in planning processes and suggest that the Visioning phase, within the scope of a broader planning process, should be charged with more relevance, being solicited throughout the process, starting from its early stages of reflection.

Vision Making in Urban Planning

Vision-making allows us to move into the future, within our minds, at first, and - as a consequence - within physical reality through our actions. If we take a step aside from practice in order to observe Vision Making from an epistemic point of view, we can recognize that the Vision Making process is articulated in the successive phases that characterize any "design process" : attention, intention, action. Yet, Vision Making, by transforming the creative act of projection into a process expands these steps in various dimensions. In terms of time, it structures successive stages of elaboration, revision, feedback, and implementation. In terms of authorship – it integrates different strategic intelligences, involving discussion and negotiation. In terms of space, it integrates elastic and broader perimeters, enabling us to imagine complex systemic relations.

The operative notion of Vision-Making in planning has been the object of many litterature reviews and comparative studies, involving process in EU [3] and North America [4]. Based on the analysis of this corpus of studies, we observe that Vision Making can take on different roles depending on the operational context in which it is understood. We can affirm that the elaboration of a Vision can play a different role in the planning process depending on the contextual operative conditions, respectively constituting [5]. A complement to

planning processes already underway, there where the plan has been constituted as a fragmented aggregation of disparate instances in search of a unified readability, of an a-posteriori "coherence" or, as french would say, a "mise-en-récit" to transform spatial intentions into a federating and motivating political message.

A sketchy anticipation of the long term, allowing for the hinging of the processes of "plan review" in tracks of shared goals and pre-identified spatial themes. A tool that complements and accompanies the supra-ordinate, large-scale planning process, focusing on local-scale spot-strategies. This happens in those contexts in which a large-scale, long-term strategic plan is allready available and what is needed is rather to integrate strategies for smaller areas to be developed on a fast schedule without compromising the time frame of the supra-ordinate plan (Aachen Kompas - KH STUDIO & RHA). Visioning can be used to produce and compare multiple and alternative future Visions, in order to inform policymaking with an anticipatory and predictive comparative tool. We can recall the numerous experiences conducted in EU in recent years, concerning for example : the future of the Raandstaadt (C. Salewski, L. Boelens), the Ateliers for the Grand Paris (AIGP), the more recent Ateliers for the Phase out of Lusatia in Germany (Leibnitz Institute, KH STUDIO). These and other experiments resulted in collective laboratories of strategic inventiveness, allowing to compare different Scenarios and Ideas of the future, stemming from very different interpretations of territorial identities and potentials.

Vision Making in cross-border contexts dominated by natural assets

Applying the culture of Vision-Making to nature-based contexts presents both the opportunity to draw upon a vast body of experiences and the challenge of tailoring these approaches to the unique characteristics and complexities of local territories.

In cross-border realities dominated by natural assets, and more specifically along the borders of the post-war opposing geopolitical blocs, borders have separated and isolated communities, slowing down the usual development phenomena. This has defined a condition in which different country sequences correspond to different levels of development and complexity in economic and social phenomena. In these contexts, however, the low critical mass of infrastructure and urbanization has left room and relevance for the preservation of natural systems of elevated environmental value. This contextual condition renders traditional economic and spatial planning methods ineffective or even dangerous in terms of preserving subsistent environmental values. In fact, policies of infrastructure and expansive development, aimed at creating a virtuous circle of accessibility-growth-investment, often promoted with the contribution of international bodies (such as EU funds), risk increasing the phenomenon of polarization and territorial shrinkage, encouraging the migration of entire social clusters instead of creating new ones (QUOTE!!!). In addition, infrastructure policies embedded in contexts of structural laxity also risk compromising local environmental values and encouraging speculative and uncontrolled development, resulting in significant damage to large-scale environmental systems. To avoid the tyranny of a reductive economic perspective, it is helpful to develop alternative methods of Vision Making. These methods must help synthesize the complexity and uniqueness of local realities,



Fig 1 / Pustec View
source / author



addressing specific strategic questions :
Should territories that differ from urban realms evolve beyond the traditional growth-dependent models? How can we identify and experiment with forms of development that prioritize local autonomy, robustness and resilience?

How can shared systemic perspectives that go beyond the limits of sectoral policies for expansive infrastructure be supported and substantiated

How can spatial policies be coordinated among neighboring countries? Which role can the environment play? How can we foster horizontal integration and improve the governance of territorial dynamics?

How can territorial integration (EU policies and funding) be coordinated with the self-determination needs of local communities? How can we ensure a socially just and equitable transition, empowering local endogenous voices to inform proposals for supra-ordinate governance levels?

How to make Local autonomy (food, energy, digital) an advantage for regional and national systems ?

Notes for Vision Making

Adapting Visioning to cross-border areas dominated by natural assets requires a methodological and conceptual transition, a change in our perspective, which prepares the shift in our operative protocols. This transition can be broken down into a series of interconnected steps, each representing different facets of the same framework of understanding. These steps are not organized hierarchically but are complementary aspects of a unified perspective, much like the faces of a prism.

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From the project to the process of care

Dealing with living territories

The very notion of "project" is inadequate to describe the multi-actorial, expansive and integrative heuristic dynamic of Visioning applied to natural areas. The term "Project", in its latin Ethimology, restitutes the idea of "throwing – beyond", illustrating the ambition to overcome a current "situation" with a "designed-desired one", in which human intelligence blueprints the image of a desired future. In the Urban world, we transform existing areas via new infrastructures, new programmatic offers, and new flows. Though we might just be experimenting the illusion of self-realizing prophecies, this process fits in the administrative and edificatory machinery of cities. Yet, in naturalistic "Milieus", using the ordinary lenses of Design Strategies risks neglecting the proper comprehension of contextual values and compromising local long-lasting capitals and resources.

Nature does not stand as a "tabula rasa" to the project, it can be rather recognized as a project in itself, or, as a "juridical Subject", offering a radical constraint to our actions (M-C. Maffei), one that could almost push us to imagine the very exclusion of the human presence, reduced to the condition of carefull visitor, a bit like we witness it today in the Pustec area, on the Albanian side of lake Ohrid. Vision Making here demands to tune in with a long-term chain of causes and consequences, which built systemic relations among different living communities, and represents a form of "contextual intelligence" grounded in a long term memory of natural systems. Visions should thus emerge from the understanding of territorial co-evolutions of humans and milieus, understanding transformation as an enhancement of the robustness and complexity of these systems of relations (S. Conti, C. Magnaghi, C. Younés).



Fig 2 / Lake of Pustec

What was once identified as a Project thus comes to resamble to an act /process of "Care giving" or "Territorial Curatorship", focused on the attentive observation, selection, preservation of what is "all ready there" and on the enhancement of existing assets as condition for the habitability of the territory for the vast community of the living community.

Reading Vision-Making as a process of Care enacts what the philosopher Hans Jonas defined as the "Principal of Responsability", an idea that also lies at the core of the Burtland Report (1987). This idea is not only an ethical principle, to which one might adhere or not, but a practical guidance to move into the future, in which each action corresponds to a chain of consequences.

From Fragments to the Whole

Making ground for coherent action, there where frontiers have fragmented communities and cultures.

The notion of "Whole" has often been used by planners to identify the frame of reference, the scene of action onto which the vision of the future is projected. It defines a domain, selecting and excluding the "other from itself", and at the same time it federates, unites elements, into a coherent ensemble.

Historically, this notion has been associated with the finitude of the city, with its walls and moats, opposing the human-designed world, the ideal Babel, to the wild world of the outskirts. A binary opposition, radical and simple. In the last century, the scope of "wholeness" has expanded as did the epistemic relationship between humankind and the environment. With the emergence of models of planetary ecology, such as Lovelock's "Gaia hypothesis," Michel Serres's "Bio-Gea" or B. Ward and Buckminsterfuller's "space-ship earth," the notion of "wholeness" has been increasingly employed to think of humans in a larger system in which their "projecting" faculties encounter the limits dictated by other forces and intelligences at work.

The human project is no longer sufficient unto itself; in order to think about the future and operate in the

"age of complexity" (T. Jörg), tools are needed to relate to an overall, emerging "project" that cannot be fully understood and mastered, but requires dialogue, negotiation, and care.

In cross-border contexts, defining the reference sphere of "wholeness" is a starting point for any strategic effort. Identifying spatial and cultural commons helps bridge spatial and socio-economic fragmentation. Defining a cross-border regional "wholeness" built upon specific environmental features encompasses an integrative and collaborative approach. The romantic image of a "Lake as Microcosm" as delivered by S. A. Forbes in 1887, considering the lake as "a world in itself", helps us look prospectively at the Ohrid lakes system as a public space defined by its natural assets, a territorial unit, in which diverse actors could express themselves, recognize their shared membership in a living community, and find a common voice. The concept of "Wholeness" can also be defined, from the perspective of economic geography, recurring to Friedmann's and Weaver understanding of territorialized systems. Here the Whole emerges from the intricate interplay between spatial and physical data intersecting with various abstract spaces. Each of these spaces represents a distinct dimension of economic and social organization. Specifically, we encounter:

Common Cultural Space: A shared cultural context that shapes perceptions and behaviors.

Common Political Space: The arena where political processes unfold and decisions are made collectively.

Common Economic Space: The domain of economic activities and transactions.

These dimensions, like sectorial domains, coexist and interact within a territory. It is through their overlapping interactions that we discern the natural and historical essence of a territorialized community.

Tracing and articulating these dimension in a coherent whole makes the site visible – it makes it exist – it defines a palimpsest on which future visions can be built.



source / author

Builiding a “Knowledge Landscape”

The contribution of immaterial assets and tacit knowledge to make the whole robust and resilient.

When defining a cross-border territory and endowing it with a strategic Vision, it is essential to reconstruct its intangible background, identifying and enhancing the history of socio-cultural human presence on site.

This multilayered process can be articulated in different domains, in order to understand and illustrate the way local communities inhabit the land, their economies of scale, their interdependence with natural and urban surroundings.

A process of orderly recollection of multidomain knowledge referred to a same context allows to augment our comprehension of “the whole” under other key aspects, describing the many dimensions of co-evolution and inter-dependence of local communities with local ecosystems. Under the apparent image of a fragmented territory, a palimpsest of cross-boarder coherence, continuity and relationality emerges.

As an example we can mention how unveiling common threads and techniques in building traditions can unify our understanding of cross-boarder societies, as well as prove the strong relation of building materials with local geology. We can observe how different communities and different traditions use natural assets and agricultural techniques to sustain local autonomy and develop regional economies. Even cultural and cultural traditions can follow a similar path for recollection and analysis.

“Wholeness” is thus configured as a mental and knowledge landscape, the structuring of which makes it possible to define new material and immaterial commons, as well as to define capitals whose value lies in the ability to represent the memory of local social presence.

Assessing “systemic intelligence” – for a trans-scalar and inter-policy approach

Using complexity in order to optimize the impact of emergent strategies.

Traditional public policies and urban plans delineate specific spatial perimeters and thematic boundaries for action (e.g., social, education, green areas). While necessary, this approach alone falls short in governing complexity and is generally used to foster growth-oriented strategies aiming the performative augmentation of specific quantitative indicators. This approach to policy definition seems based on the mechanic destrukture of complex issues into linear mono-thematic protocols for action.

Cross boarder territories and their ecosystems though, require to use a different logic. Quoting R. Ackoff, we can say they demand to move from an “Age of machines”, to an “age of systems” in which the retroactive impact of human actions on nature and viceversa are taken into account – assessing the circular interdependence between the observers/designers and the complex systems they act upon. Relationality becomes the key : between particular and general, between local and global, between distinct themes and goals. In this framework, Vision-Making processes can significantly impact reality when grounded in systemic intelligence, providing tools to go beyond the binary logic of spatial and disciplinary enclosed perimeters. By reasoning in terms of trans-scalar goals, it is possible to read and design local action (whether active or veto) in relation to its impact on larger systemic scales of space and time. Citing our case-study we can imagine scenarios that apply systemic intelligence in Transcalar terms – thinking beyond spatial perimeters : Limiting groundwater pollution on the Macedonian front, allows a return on investment that benefits the entire water supply chain of a vast territory in Albania. This implies to locally restructure landscapes and water cycles. Structuring local mobility in a soft, local network of corss-boarder pathways and roads allows to drastically reduce new transit-flow, defining key points for shared services and protecting pristine

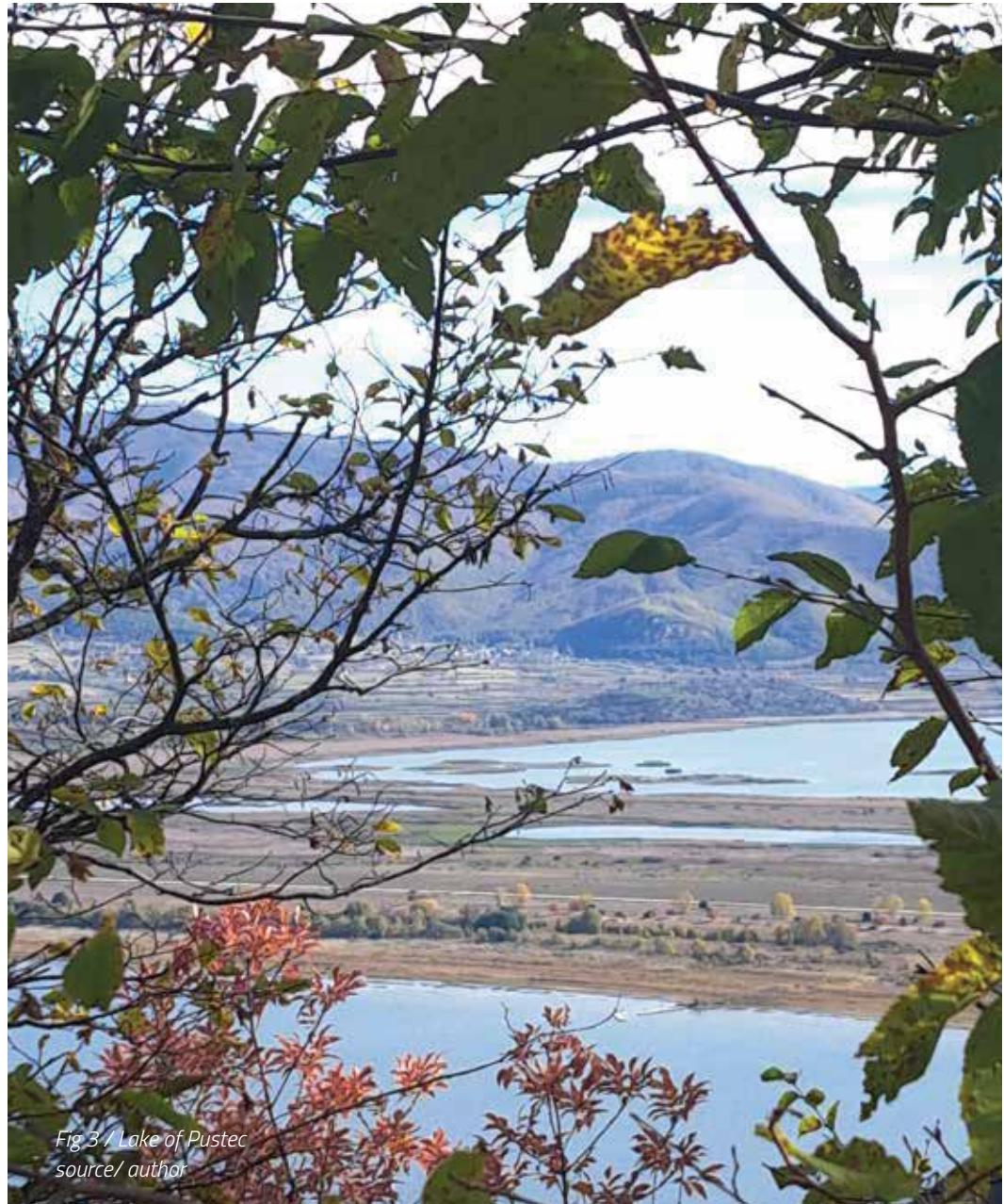
territories from speculative development and suburbanization.

Similarly, when thinking in terms of cross-policy optimization we can envision transformative actions that allow 1+1 to equal 3. Transforming local landscapes can be a way to implement, with one investment, a new public space structure, local mobility, local water management, and new economies derived by agricultural diversification. On another level, when facing the challenge of programming areas inhabited by a different populations in different moments of the year – "sharing oriented" multifunctional service hubs can serve the needs of local communities for educational purposes, visitors service hubs, university congress facilities. Adopting "Systemic intelligence" in a care-oriented framework means to cooperate with the force (and inertia) of nature to maximize the positive impact of human led action.

Scenario-based strategies, a parliament of ideas for an open future

Defining a strategic direction while insuring adaptability and collective decision taking.

K. Popper used the metaphor of Clocks and Clouds, to refer to the unpredictable nature of complex system, a notion particulary usefull to define the epistemic condition of the Planning and Vision-making effort when applied to the anticipation of territorial dynamics. Following his metaphore we can recall that clocks are neat, orderly systems that can be understood through reductionist methods. They are predictable and can be taken apart and reassembled, much like a mechanical clock. Clouds - in contrast, represent complex, irregular, and unpredictable systems. They cannot be easily reduced to simple components or rules. Popper used this metaphor to illustrate the challenge of scientific prediction and the limits of knowledge. While some aspects of the world can be predicted with precision (clocks), others remain inherently unpredictable and complex (clouds). This distinction is crucial in his philosophy of science, particularly in the context of his principle of falsifiability, which is a criterion for distinguishing scientific theories from non-scientific ones. The "future as cloud" concept suggests that the future is inherently uncertain and unpredictable, much like the ever-changing shapes and movements of clouds. It emphasizes the idea that while we can make educated guesses about what might happen, the complexity of variables



*Fig 3 / Lake of Pustec
source/ author*

involved makes it impossible to predict the future with absolute certainty.

For this reason, Visions should not be seen as blueprints, but as dynamic and adaptable compasses to navigate through time. In order to grant flexibility and responsiveness to uncertainty, it becomes necessary to assess Visions on a palette of optional futures, and to constantly update these forecasting and anticipatory hypothesis through the dialogue process. Working with Scenarios allows this open navigation. Scenarios can be mobilized in Co-design initiative and help qualify the Vision Making process as a permanent "parliament of ideas" – a tool that accompanies actors and communities in the definition of their territory through time, defining a vision, realizing it in part, updating through time. Confrontation with opportunities, challenges and potentials is an effort that is better done constantly, than the episodic result of political epiphanies, elections or the opening of financial lines. Care and strategic design can ally in this process by recurring to the tool of comparative Scenarios. Scenario-planning allows to :

Compare alternative answers/futures to predictable challenges.

Compare the risk impact and desirability of alternative lines of development and transformation. articulate programs, ecosystemic changes, mobility and housing transformation in synthetic territorial visions that organize a hierarchy of objectives and pathways for project enactment.

Asses the impact and responsibility of specific actors in the development of processes.

Scenarios are used in medicine, war studies, economic geography, and all those disciplines that envision the control of complex systems through time from a perspective of what the american political scientist H.A. Simon defined as "Bounded Rationality", i.e. the perspective of a planning or decision-making observer who faces limitations in terms of : Inherent complexity of the challenges – such as dealing with natural systems evolution; Cognitive capability - human intelligence having finite cognitive resources; Time constraints – decision makers operating within time limitations. For this reason, scenarios should be seen as a process oriented tool, in which, through time, anticipated futures are (1) evaluated following different (divergent) frames of references; (2) serve as guidelines in specific time-frames; (3) actualized, corrected or radically revised during a constant follow-up processes.

Institutional intermediaries – mobilizing actor-relational intelligence

A project-oriented cross-border Governance.

As P-C. Palermo points out, the real opportunity that visioning could offer to planning processes lies in the ability to coordinate the strategic views of entities and social bodies operating in the same territories but at different spatial and administrative levels (Palermo 2020). Visioning could thus be used as a tool to redefine governance of complex phenomena in the absence of a pre-established political or governmental frame of reference. When the institutional scenario is fragmented, vision making can allow to envision and anticipate the strategic potentials of governance rescaling – reshaping.

In the past, some emblematic experiences have been conducted to envision strategies related to

territorial entities that had no precise administrative or political status. This is the case of the Ateliers International du Grand Paris and the Ateliers Laustiz Raumlabor 2050, two processes dealing with territories whose dynamics are well identifiable but which are not framed by a corresponding territorial authority or by a limited perimeter of competence. These processes, though deprived of a direct administrative implementation, have served as test models that inspired other European urban institutions to launch similar processes (Grand Genève, Grand Luxembourg, Rheinisches Revier post-coal region, etc.). Like vast metropolitan areas, cross-border territories are also characterized by a form of political and governance "indeterminacy". In the previously mentioned cases, specific intermediary organisations, NGOs, or inter-actorial associations are set up to carry out the visioning process, acting as the hub of an inter-institutional dialogue involving the different levels of government of the territory and, together, those of an open community of potential actors. This intermediary action creates a platform for cooperation and co-creation of strategies that anticipates the possible evolution of government institutions in a context of political experimentation.

Defining a shared "event horizon" for planning actions allows to define, through balancing and negotiations, the governing configuration which can most effectively "make it real". As V. Balz and V. Lingua recall :

"Governance rescaling (...) can imply the redistribution of responsibilities, roles and resources among actors and changes in horizontal and vertical cooperation. It can also be reflected in the redefinition of territories, which cover small or large portions of land and where hard statutory regulation or softly defined planning guidance applies."

Co.design–mobilize collective intelligence and knowledge

Mobilizing social energy and intelligences for a just transition.

In order for Vision Making to incarnate a process towards a just transition, it is key to integrate local populations and external actors in a common "prospective framework" allowing to build a common dialogue on desires, expectations, fears and opportunities. Co-design is an effective tool to organize collective decision making when dealing the transformation of space. Multiple international experiences have proven the capacity of such kind of process to build social bond and responsiveness in contexts of extreme natural and social conditions [2] making local communities feel empowered and responsible for their decision making process. Co-design approaches are also often used in Strategic Vision-Making in the EU context allowing to :

- develop a shared prospective diagnose.
- share a same operative framework for "cost-impact-responsibility" circularity.
- develop, and evaluate alternative potential futures.
- motivate, negotiate and engage all actors via one same process.

Co-Design methodologies enable a collective process of learning, decision-making and enactment. In this regard it is key to involve local communities from the earliest stages of Vision-Making processes, integrating them, for example, in the processes of building cognitive frameworks through "Citizen Science" and participatory processes. The opportunity is that of collecting and turning explicit, the body of Tacit knowledge communities and actors consider as a given. This allows contextual knowledge and sensitivities to

impact on the project.

In this framework planning experts are no longer authors of a vision, but maieutic guides that orient and articulate collective inputs.

Starting from Landscape – a tool for co-evolution

The “care paradigm” making space.

In order to make Vision Making more effective, numerous experience suggest to augment its discursive, dialogical and political dimension, with hands on experiences. It is the case of many projects of urban and territorial transformation (Europen, Ateliers des territoires, Post-coal Zukunftagentur, etc) in which the enactment of collective actions on public space give a spin and activate real trasformative processes by showing that - yes, it is possible to bring a change. From this perspective, Landscape can represent a key ally.

Landscape is a notion, by which man synthetizes the image of natural ecosystems and of human-to-nature relations. Thinking territorial evolutions under the guidance of landscape can thus focus on the environmental performativity of human led actions. Starting from Landscape helps assessing the holistic dimension of the Vision, it integrates the notion of Care in all phases of the Vision-Making effort: from its conceptualization – as projection of an adaptative metamorphose of inherited values, to its actual enactment, through the programming of maintenance strategies and service provision. Landscape-based strategies offer a tool to integrate the very different temporalities of the (slow) evolution of natural systems with the (fast) transformations of social ensembles and built units. Planning through landscape holds the double advantage of being a fast tool to make and show change, boosting confidence while kickstarting processes, while, also securing the progressive co-evolution of new interventions with the overall context, through different stages of maturation. In specific cases, such as the Ohrid area, Landscape care, is also a competency locally available, given the cultural and productive agricultural background of local populations. This enables for a direct mobilization of local forces in the transformative project.

When it comes to the identification of specific spaces and areas of intervention, it is recomendedable to focus on those areas that hold an ecosystemic protective and connective capacity by transforming which it is possible to enhance the robustness of the overall environmental system. Some general considerations can be made on specific connective landscapes, in particular:

The reinforcement of Buffer areas, their complexification and extension, allows to better protect the core of ecosystemic units, and accompany their potential adaptations. Buffers, if considered as linear systems can also serve as biodiversity corridors.

Agricultural fields rescaling through the insertion of pathways and plantational grids is a way to valorize existing pathways. This allows to use the agricultural grid as a system of public shaded pathways, to define smaller units, and give a new inhabitable, hybrid scale to previously monofunctional areas.

The agricultural lands diversification allows to move from mono-cultures to a richer palette of products, with the double advantage of enriching the soil and fostering a wider palette of local products. This implies to move away from industrial models and embrace bio-sourced practices.

Villages limits and inner areas are characterized by the informal presence of green areas and plantation.

Augmenting and enhancing the porosity of the soil, and the presence of vegetation in these areas has both a micro-climate advantage as a the capacity to bring organic coherence to the image of informal semipublic spaces via the qualification of placettes and meeting points as of the linear margins of built areas – defining them.

Landscape systems can also integrate a technical dimension: natural water-management systems, soil regeneration reservoirs, authonomous energy devices, augmenting the provided services.

Conclusions

Our methodological exploration illustrates that Vision-making, when applied to cross-boader contexts dominated by natural assets, demands to develop original methods and protocols.

The methods configure the act of forecast and anticipation as a collective, care-oriented, process, based on the mobilization of latent endogenous ressources and values.

Under these conditions, vision making processes constitute a form of “politics by design”. Holding the capacity to indicate a new actorial horizon for governance reshaping. In the absence of pre-existing governance bodies, this demands for the identification of intermediary institutions capable of orienting actorial energy and multylayered institutional dialogue.

The dimension of ecosystemic relations, and consequently, of landscape-based strategies, as envisionned in the protocols, lie at the core of the project of space and are used to federate the material and immaterial dimensions of the territory. The Frameworks and protocols presented in this article are an euristic model, the application of such methods shall allow to update, correct and expand this hypothesis.

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3.1

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Workshop Reports

Reimagining the Future of the Lake Prespa Region

A Cross-Border Perspective

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Abstract - *This report is a result of the workshop held by the PhD students, and provides a report of the Lake Prespa region, a distinctive transboundary area encompassing Albania, North Macedonia, and Greece. The project seeks to transform Lake Prespa into an abstract infrastructure network creating connections among places, utilizing its natural and cultural resources to generate sustainable tourism, improve cross-border connection, and strengthen socio-economic resilience. The study used a landscape-focused methodology, to analyse Lake Prespa and its surrounding landscape as an interconnected common. This approach proved essential in establishing a comprehensive, state-of-the-art assessment of the area, enabling a clearer understanding of the spatial relationships among key features distributed around the lake. The research underscores the significance of digital infrastructure and real-time data systems in improving tourist experience and facilitating long-term regional planning. Proposed interventions encompass the establishment of cross-lake corridors, nature-inspired mobility solutions, and multipurpose public spaces that embody the region's cultural legacy and ecological importance.*

This proposal envisions Lake Prespa as an interconnected ecosystem that serves as a cultural and traditional commons, disregarding political boundary divides and positioning the lake as a pivotal node within the broader network of the Western Balkans. This vision aligns with regional objectives for sustainable development and cross-border collaboration, establishing a framework for integrating conservation with economic advancement in transboundary areas.

Keywords - Cross-Border Connectivity, Landscape Segmentation, Sustainable Tourism, Infrastructure networks, Cultural and Natural Heritage

Introduction

The municipality of Pustec occupies a distinctive cross-border region at the intersection of Albania, North Macedonia, and Greece, centered around the transnational water body of Lake Prespa. This area forms part of a broader transboundary hydrological and ecological system, recognized for its exceptional natural and cultural heritage [1]. Encompassing mountain ranges, the interconnected basins of Lake Ohrid and the Prespa Lakes, as well as ancient and medieval settlements, the region is designated as a UNESCO World Heritage site due to its unique biodiversity and historical significance [2]. Lake Prespa today represents a unique geographic and ecological entity, simultaneously serving as a traditional common and a politically segmented water body, shared administratively by North Macedonia, Albania, and Greece [3]. Despite the inherent challenges of tripartite governance, small lakeside settlements have persisted, primarily sustaining themselves through agriculture [4]. However, their peripheral location, distant

from major urban centers and economic hubs, has led to pronounced challenges, including youth outmigration, limited mobility, and a shortage of professional opportunities [5]. Regions of natural interest typically encompass less populated and economically disadvantaged areas, particularly those that are mountainous [6]. Local communities encounter a dilemma: they are deeply committed to traditional land uses, which are typically sustainable regarding the regeneration capacity of natural resources and have enabled survival in challenging conditions. Conversely, they anticipate new forms of development. The heritage associated with their traditions constitutes a significant aspect of local identity, intertwining collective memory of the past with contemporary elements, including innovative applications of natural resources and emerging opportunities such as leisure and tourism in various forms and intensities [7]. The values of a protected area encompass various components, including natural

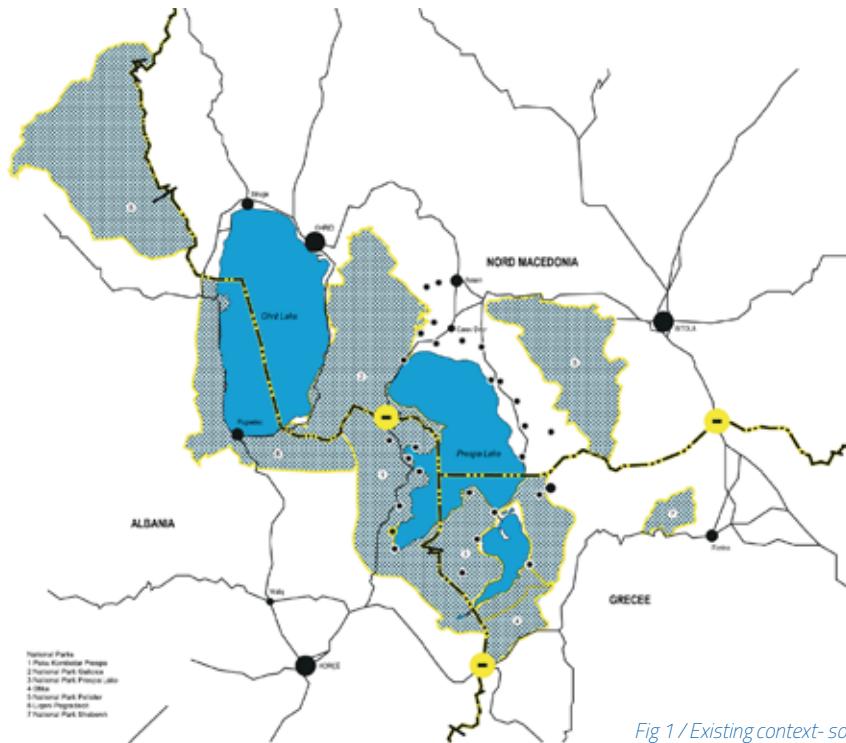


Fig 1 / Existing context- source/ Catrina Rondina

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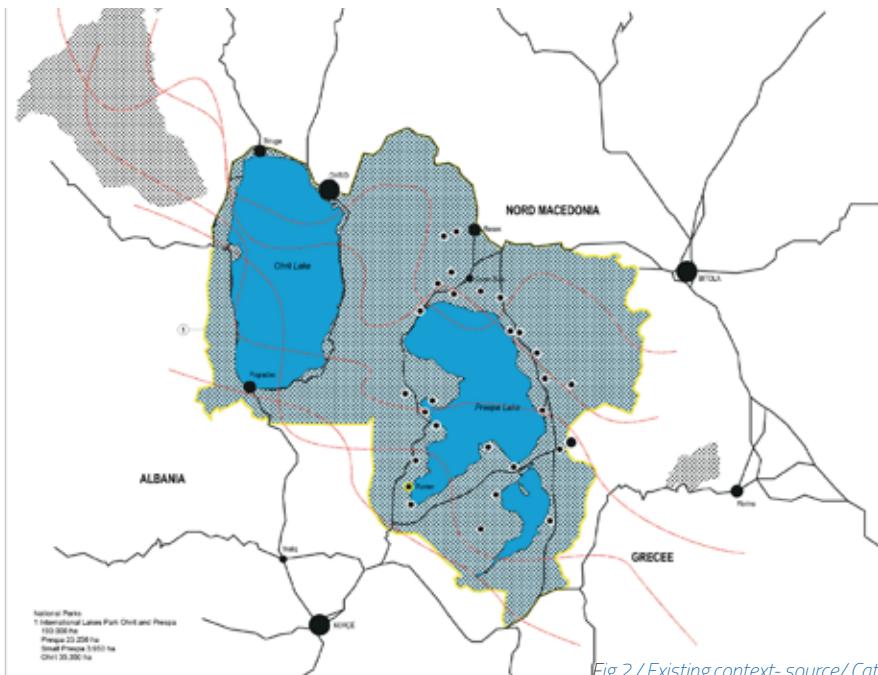


Fig 2 / Existing context- source/ Catrina Rondina

features and human modifications, biodiversity and aesthetic qualities, traditional and contemporary resource uses, local perspectives and external expectations, as well as preservation and transformation proposals [8].

The vision

The territorial realignment following the 1913 border demarcation disrupted long-established, interdependent communities that had coexisted until that time [9]. During the 20th century, this partitioning led to considerable depopulation and the decline of traditional transboundary networks. Political upheavals, such as the Balkan Wars and World War II, exacerbated these divides, undermining infrastructural and

social cohesion throughout the region [10]. In response to these persistent cross-border issues, a group of PhD students conducted a collaborative workshop aimed at crafting a forward-looking development framework for the region. This initiative sought to leverage the untapped touristic potential of the Prespa basin's natural parks while enhancing infrastructural and social connectivity across national boundaries [11]. Central to this approach was the recognition that, despite their separate cultural identities, the three bordering nations share significant environmental assets—traditional commons—whose ecological integrity inherently transcends administrative and political boundaries [12]. The project thus reframed the notion of cross-border interaction, moving beyond the conventional

lens of geopolitical coordination to embrace a more fluid, place-based approach that acknowledges shared geographies and everyday practices [13]. Tourism, within this framework, was identified as a catalytic sector, capable of generating new economic flows, stimulating inter-community exchange, and reversing the region's demographic decline by encouraging the return of former residents and attracting new populations [14].

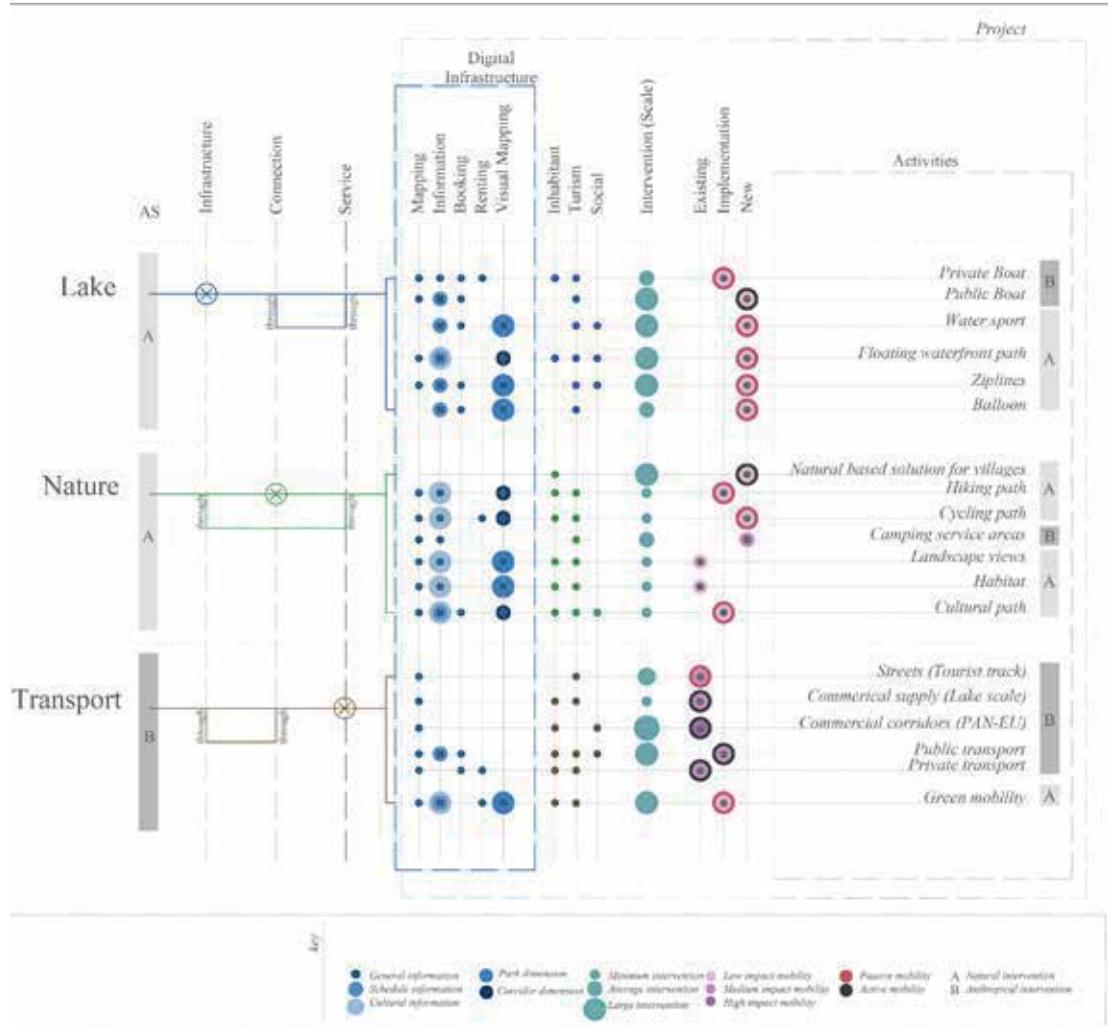
Objectives:

This research aims to develop a hypothetical scenario for enhancing cross-border interactions by leveraging Lake Prespa as a central infrastructural asset, while assessing its potential socio-spatial impact on nearby villages and the surrounding hinterland [15]. Special focus was placed on developing a comprehensive strategy aimed at fostering sustainable and integrated mobility in the Lake Prespa region, including: Enhancing low-mobility services by promoting transport solutions tailored to both residents and tourists, in order to reduce vehicular traffic and discourage mass tourism [16]; Promoting green and nature-based mobility, leveraging natural paths and ecological corridors to connect key cultural and ecological sites [17]; Encouraging tourism-oriented activities

by envisioning the lake as multifunctional infrastructure, supporting uses such as water sports, adventure tourism, floating promenades, and flexible transport systems [18]; Reconceptualizing connectivity beyond physical infrastructure, by including visual and perceptual connections across the lake, emphasizing panoramic landscape continuity [19]; Developing a smart digital layer, including a mobile application designed to provide real-time service information and enhance the visual and experiential engagement with the lake, thus supporting exploration and interaction [1]. The central hypothesis of this project explores the potential of reimagining the lake as a form of infrastructure—physical, digital, and perceptual—serving as a connective element across territorial, cultural, and experiential dimensions [2].

Methodology

A deeper analysis of Lake Prespa and its surrounding landscape as an interconnected common proved essential in establishing a comprehensive, state-of-the-art assessment of the area [3]. This approach enabled a clearer understanding of the spatial relationships among key features distributed around the lake. The study first focused on identifying cultural and heritage



landmarks, natural sites, and ecologically significant areas, effectively mapping the region into distinct elevation zones, including higher (mountains and hills) and lower (fields and lake) terrains [4]. To capture the complexity of these spatial dynamics, the concept of the "segment" was employed as an analytical tool, facilitating the identification of connective pathways and interactions among various landmarks, fluxes, and critical sites within the Prespa basin [5]. This conceptual framework generated a "net" of connections, which was then systematically compared to the existing infrastructure, including primary road networks, agricultural tracks, hiking trails, and informal natural paths [6]. This comparison allowed for a detailed typological analysis, revealing gaps and opportunities for enhancing connectivity while preserving the unique ecological and cultural character of the region [7]. As a foundational component, the project emphasized the primacy of nature and its organic, rather than political, borders [8]. This led to the proposal of an "International Prespa Park"—a unified, transnational conservation area encompassing all three lakes—as a central node within the broader Western Balkans network. Such a park would strategically bridge two critical Pan-European transport corridors: Corridor VIII (linking

the Adriatic Sea via Durrës, Albania to the Black Sea ports) and Corridor X (connecting Austria, via North Macedonia to the Greek port of Thessaloniki) [9]. With Albania's internal infrastructure now extending from the Adriatic port of Durrës to the city of Korçë, the Prespa region stands well-positioned to capitalize on these emerging regional linkages [10]. However, a significant challenge remains in establishing integrated infrastructural corridors that connect key cities around the lake—such as Korçë (Albania), Bitola (North Macedonia), and Florina (Greece)—to support economic diversification, sustainable tourism, and long-term regional stability [11]. Addressing these infrastructural gaps is a central objective of this project, reflecting a commitment to fostering resilient, interconnected communities within the broader Western Balkans context [12]. Moreover, the existing patterns of low mobility within the Prespa region present a unique opportunity for the development of sustainable tourism models [13]. Such approaches prioritize the preservation of the natural environment while promoting cross-border collaboration based on ecological continuity, rather than rigid political boundaries [14]. This strategy aims to foster the growth of slow tourism, nature-based experiences, and innovative transboundary partnerships, reinforcing the region's long-term socio-economic stability and ecological resilience [15]. By focusing on sustainability, these models can help mitigate the environmental impact of tourism, support local livelihoods, and enhance the cultural and natural heritage that defines the Prespa landscape [16]. The approach taken in the Prespa study draws on established landscape assessment methodologies, integrating both spatial analysis and cultural landscape mapping [17]. This combination enables a comprehensive understanding of landscape structure, function, and connectivity. For instance, the use of segments as analytical units is reminiscent of the methodology applied in the assessment of the Alpine Arc and the Dolomites in Italy, where landscape segmentation is used to map ecological corridors, cultural routes, and heritage sites in complex mountainous terrains [18]. Practically, this means stacking geographical data to distinguish between distinct functional zones and terrain kinds [19]. For instance, in the Dolomites, researchers charted ancient towns, agricultural valleys, and mountain passes to grasp the spatial logic of human-nature interactions across millennia [1]. In the Prespa setting, this strategy enabled the identification of important corridors and nodes enabling human mobility as well as natural flows, hence stressing possible synergies between conservation activities and economic growth [2]. The next phase was finding the interaction points between the existing infrastructure and the lake, and evaluating how these nodes are, or may possibly be, interconnected [3]. After mapping these contact points, it became feasible to visually associate the principal locations around the lake, facilitating a clearer comprehension of which areas are already interconnected, which necessitate additional infrastructural development, and which may remain linked primarily through visual or perceptual continuity [4]. The design process adopted a conceptual framework that regarded the lake as a connected space rather than a barrier, envisioning it as "absent" and concentrating exclusively on the linear logic of the links [5]. This abstraction facilitated the creation of a theoretical infrastructure network focused on functional links, rather than being limited by the lake's physical existence [6].

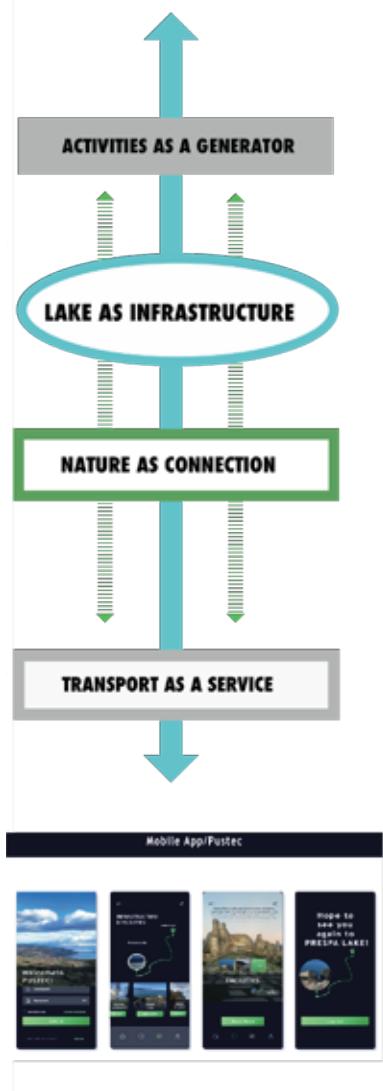


Fig 4 / Framework structure

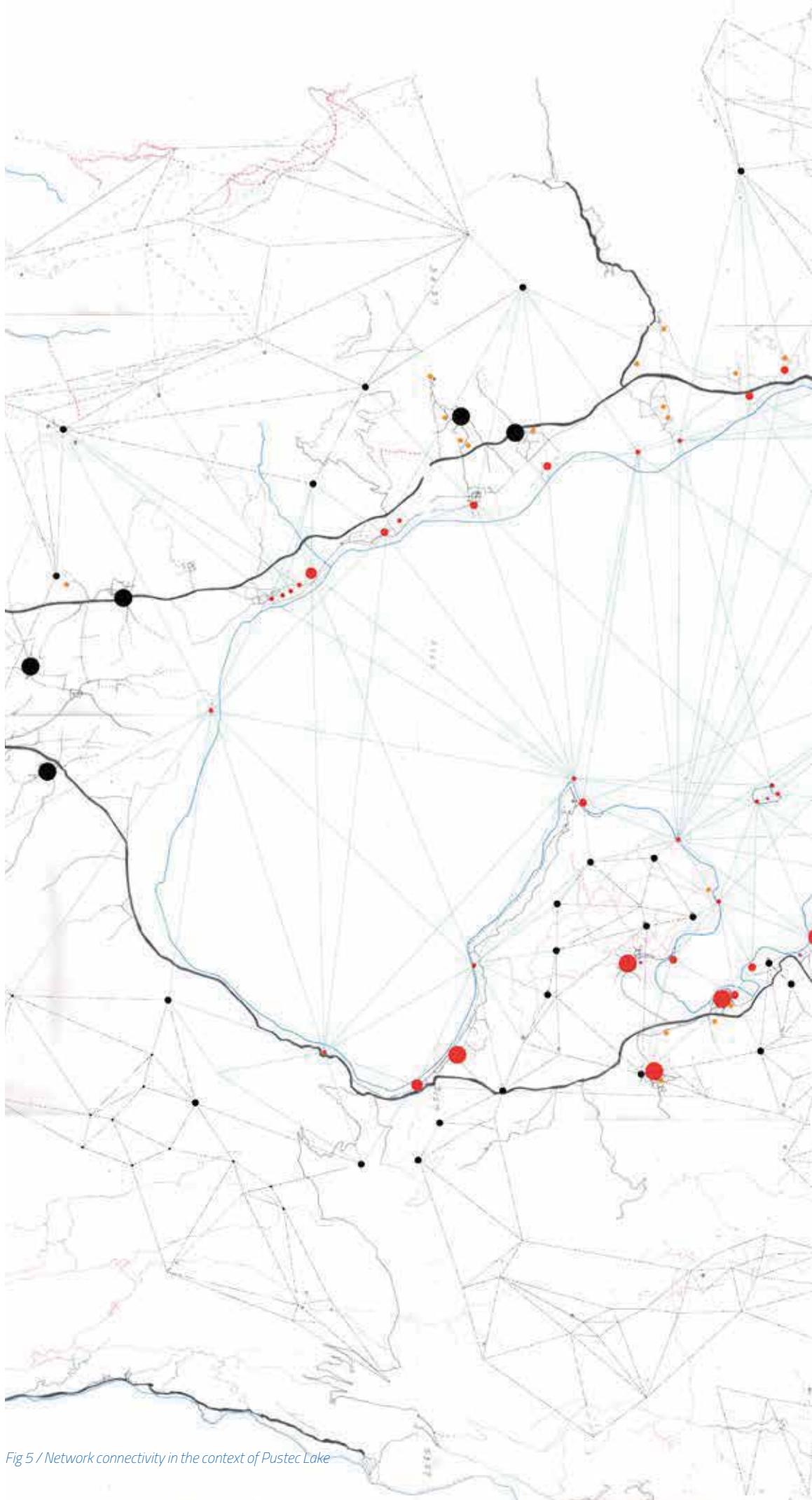
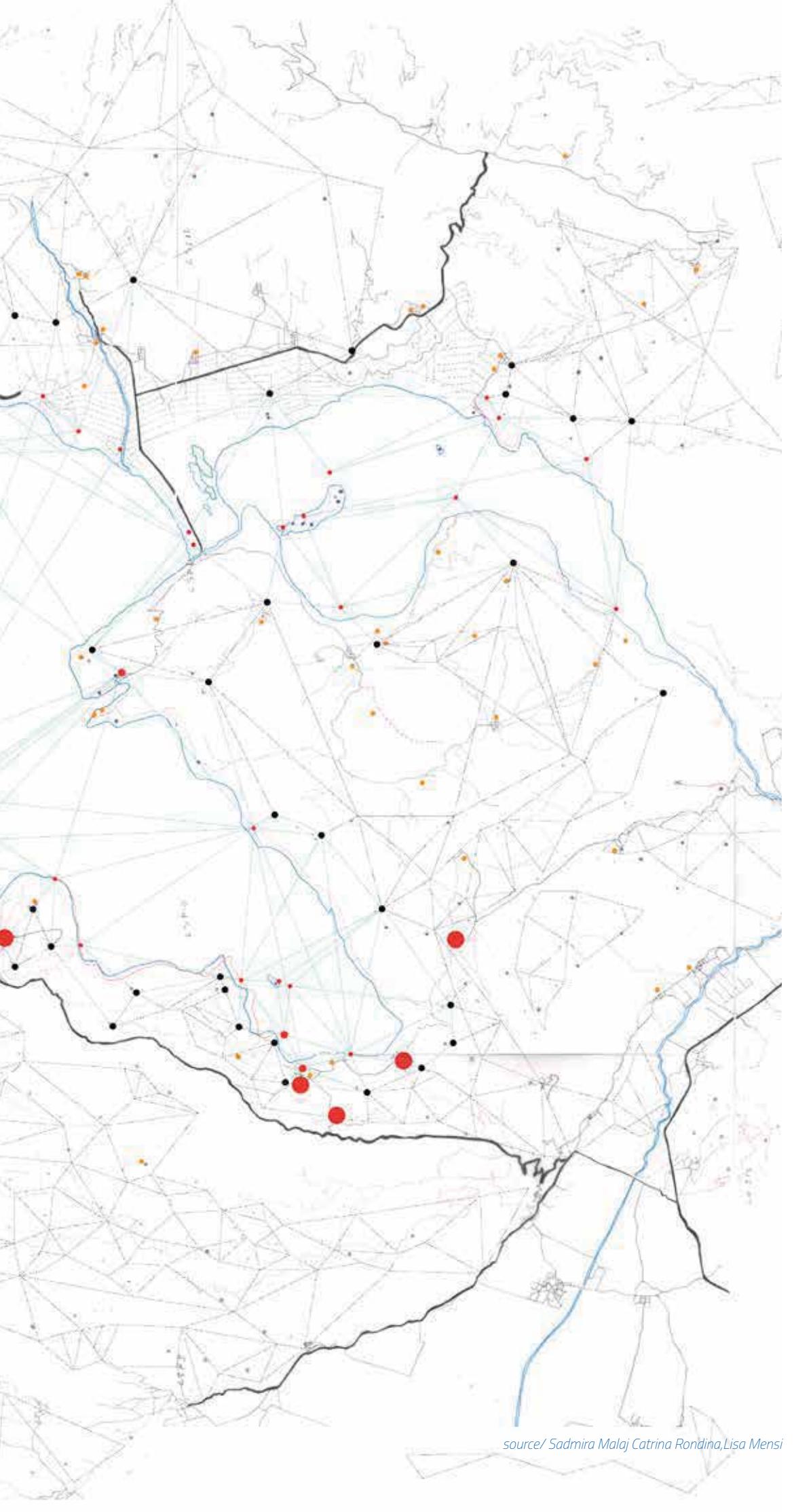


Fig 5 / Network connectivity in the context of Pustec Lake



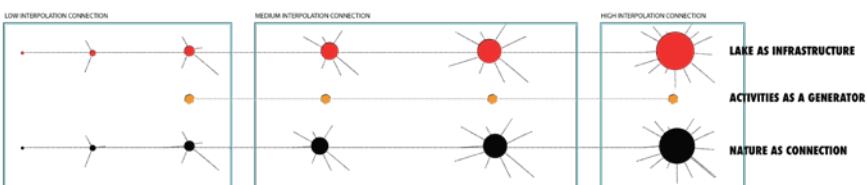
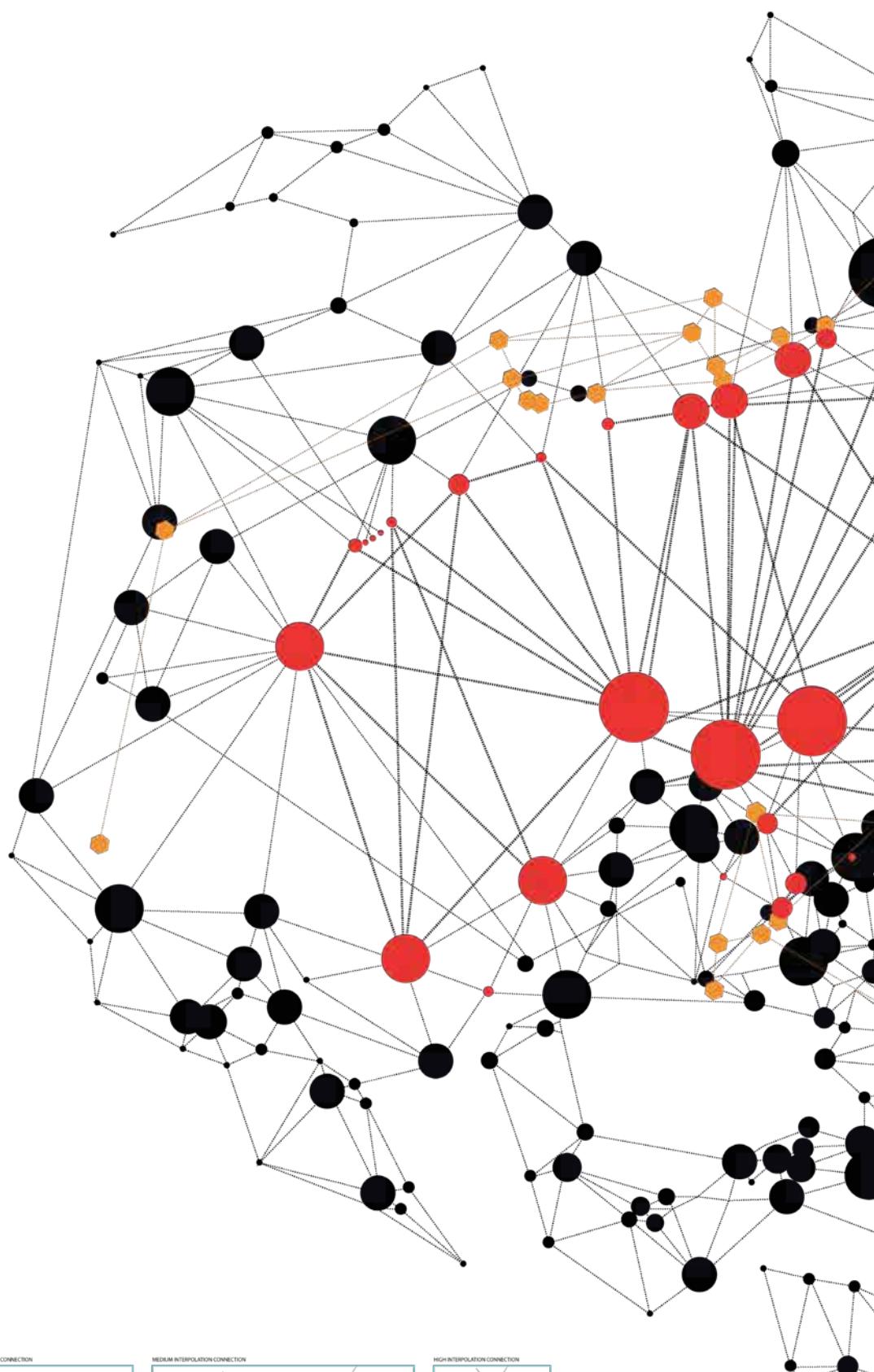


Fig 6 / Network of interpolation in the context of Pustec Lake



Results

This mapping exercise revealed significant discontinuities in the border areas, currently manifested as infrastructural gaps—both in terms of terrestrial connectivity and lake-based infrastructure [7]. To address this, a series of visualizations were developed to explore potential cross-border connections via natural corridors and existing low-impact road networks [8]. The objective was to identify opportunities for integration that do not rely on large-scale infrastructural interventions, thereby preserving the distinctive rural character and ecological integrity of the region. This approach prioritizes minimal intrusion while fostering accessibility and cross-border interaction through existing landscape assets [9].

Ultimately, this process highlighted the potential of natural infrastructure as a more flexible and accessible medium for connectivity compared to conventional forms of infrastructure [10]. As a result, four distinct cross-lake corridors were identified, originating from the national shorelines and extending toward points of higher spatial significance—these being areas with a greater concentration of intersections and thus higher potential for attractivity. These intersections emerged from a combination of factors: visual alignments between surrounding mountain peaks, junctions where the lake meets the mainland, and the spatial distribution of cultural heritage sites. Together, these layers inform a network that aims to integrate natural, cultural, and built infrastructures [11]. Each corridor follows a distinct directional logic, as the connections between key nodes were not the result of artificially imposed design, but rather emerged from the organic extension of existing natural and infrastructural paths [12]. These axes were not conceived through a conventional top-down planning approach, but instead stemmed from an interpretative reading of the territory—uncovering latent continuities and spatial potentials inherently present within the landscape [13]. With the network of connections clarified, the next phase of the process involved identifying potential interventions at the masterplan scale. This stage particularly emphasized the implications of such connections for the mainland, considering what it would mean for these links to function as "infrastructure" in the broader, more abstract sense of the term—that is, as systems enabling flows of people, knowledge, culture, and ecology across borders and landscapes [14]. To address this question, four interrelated keywords were defined to guide the development of intervention scenarios: Lake as infrastructure; Nature as connection; Activities as generator; Transport as service.

Building upon the principles and analyses developed throughout the research, these keywords were used to structure a matrix of potential interventions. This matrix served as a tool for envisioning future scenarios and assessing their possible impacts on the mainland territory [16].

Conclusions and Recommendations

The intervention matrix outlines the specific actions proposed under each of the four guiding categories, establishing connections between tourism-generating activities and the supporting infrastructure systems [17]. Particular emphasis was placed on identifying how sustainable tourism initiatives could be integrated with both physical and digital infrastructures [18]. A detailed analysis was conducted on the digital infrastructure, categorizing the types of services

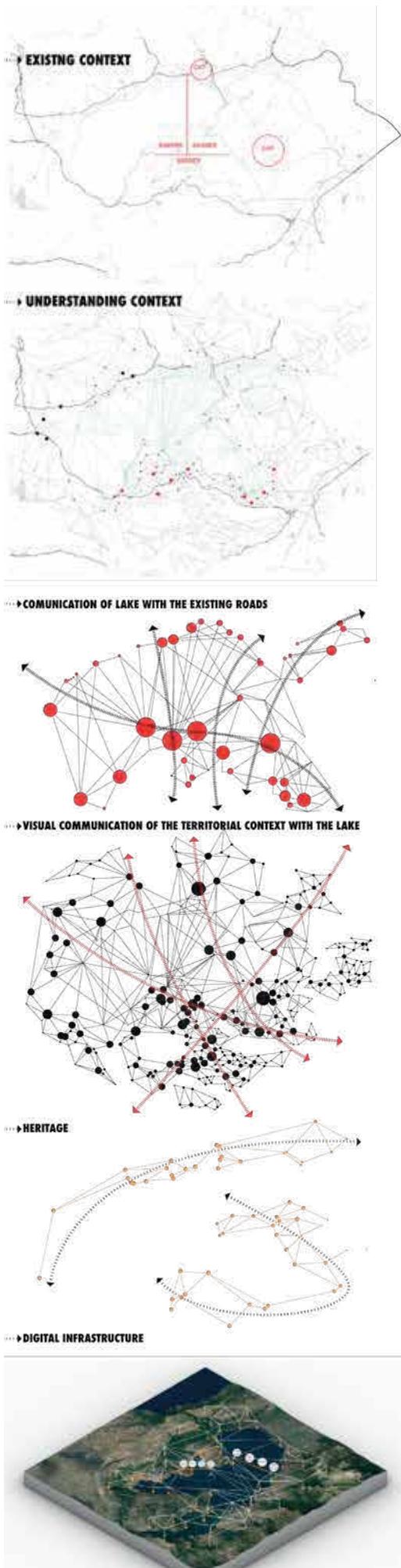
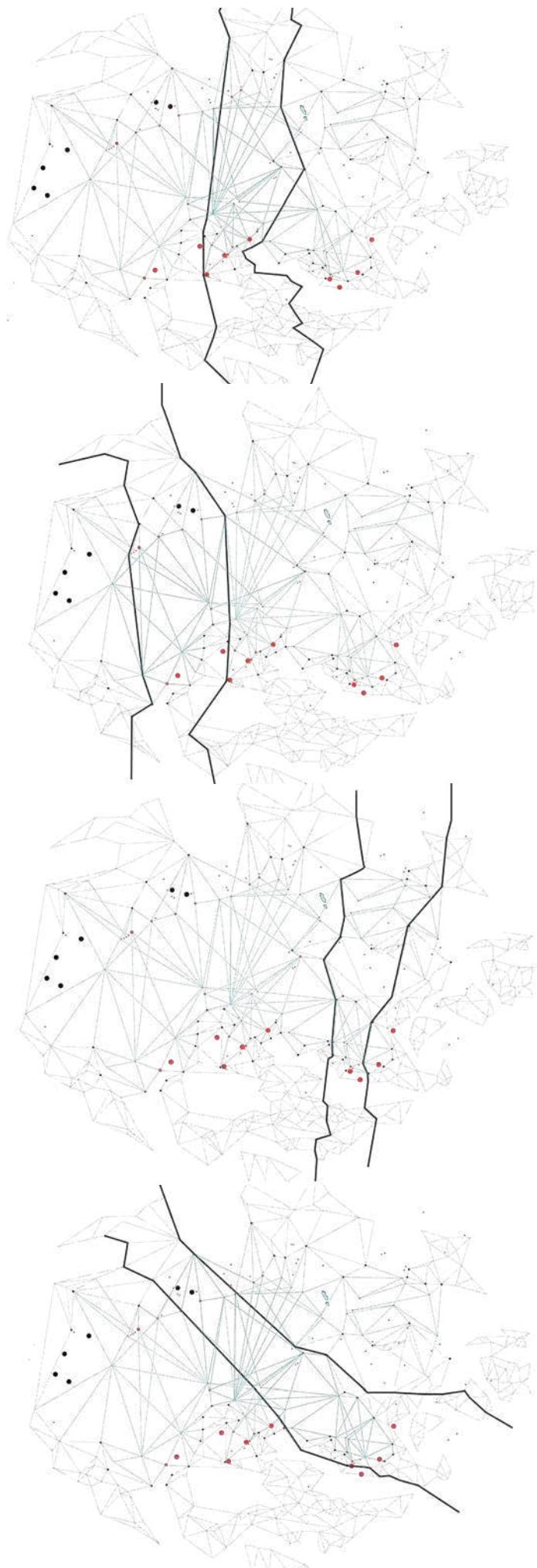
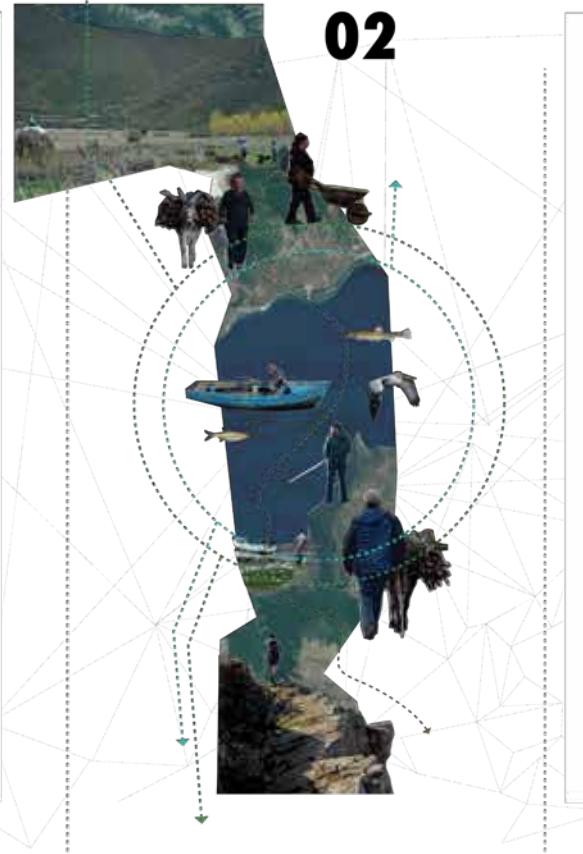
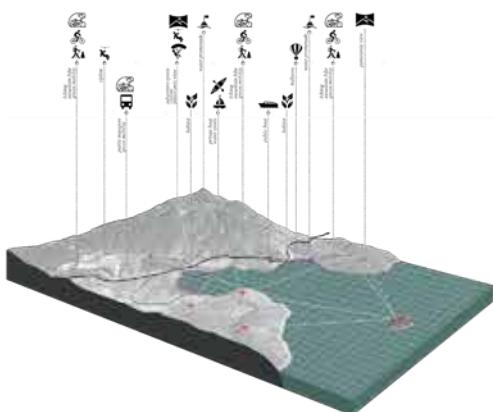


Fig. 7 / Analysis of defining the main corridors

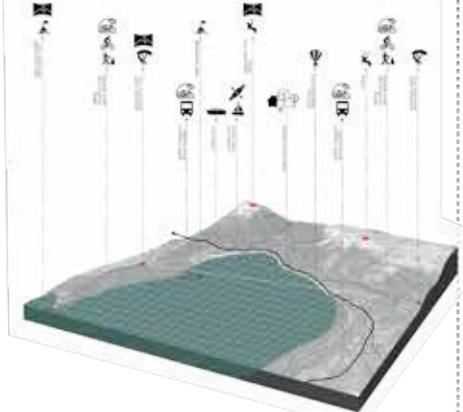




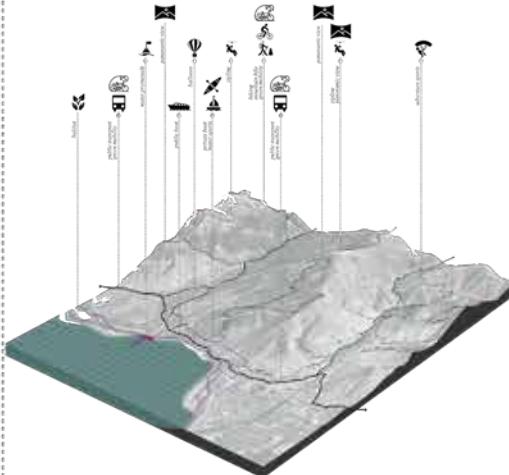
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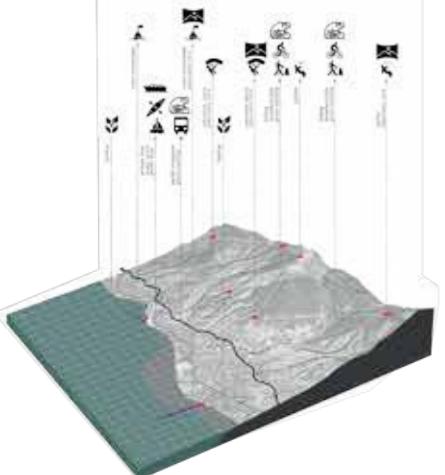
CORRIDOR 01 / ACTIVATION IMPACT



CORRIDOR 02 / ACTIVATION IMPACT

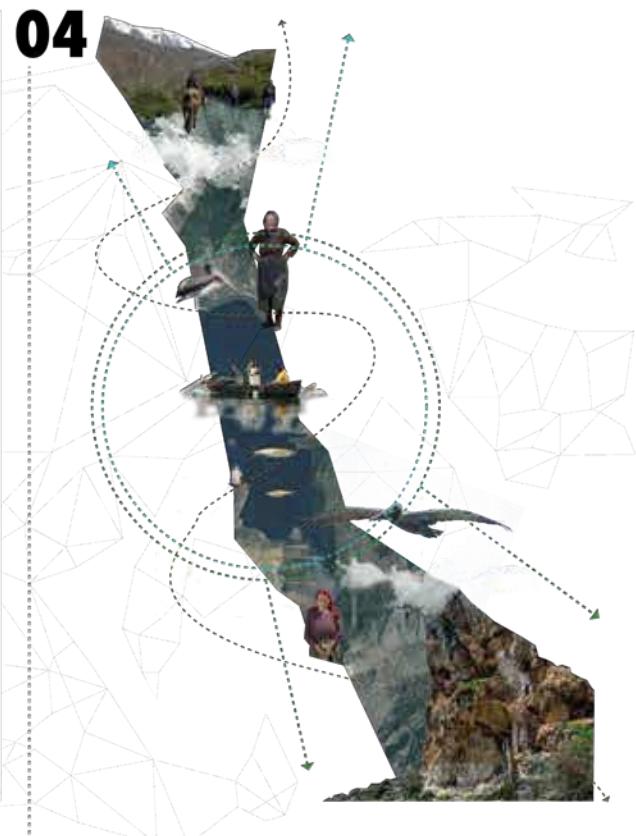


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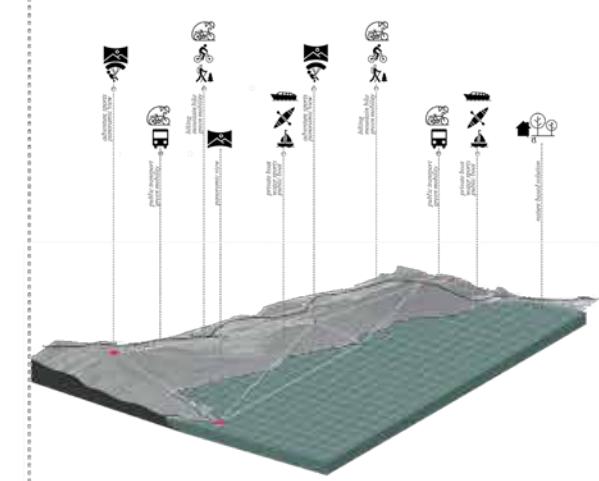
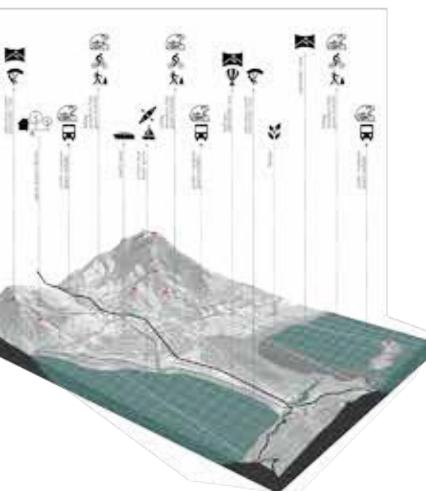
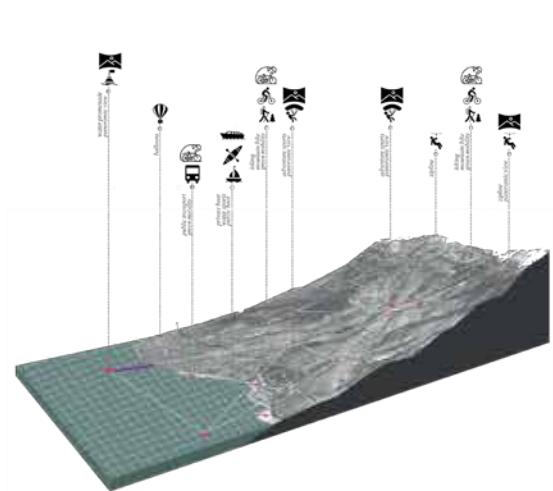


CORRIDOR 02 / ACTIVATION IMPACT

Fig 8 / Implementation of the matrix - accordingly to the corridors

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**CORRIDOR 03 / ACTIVATION IMPACT****CORRIDOR 04 / ACTIVATION IMPACT****CORRIDOR 03 / ACTIVATION IMPACT****CORRIDOR 04 / ACTIVATION IMPACT**

and the corresponding informational scales they would operate on. This included the development of visual mapping tools designed to inform tourists about available activities at both the Park and Corridor scales. For each activity featured in the digital application, it was also necessary to determine the physical interventions required to enable or enhance the visitor experience [19]. As such, a graduated scale of intervention was established, based on varying degrees of mobility—ranging from low, medium, to high impact—and distinguishing between passive and active impacts. These classifications were then aligned with the typologies of infrastructure that either require implementation or could function without new construction, allowing for a more context-sensitive and sustainable approach to territorial development [1]. Once the strategic framework was established, the final phase focused on activating the mainland by designing targeted interventions along the identified corridors—serving as the case study for the research [2]. This phase aimed to spatialize the impact of proposed activities, translating them into tangible design actions that support sustainable tourism development around Lake Prespa [3]. Each national shoreline was analyzed individually to determine the most appropriate services and interventions for enhancing sustainable tourism potential. The following pages present the masterplans for the four corridors, each integrating the proposed activities as defined in the intervention matrix [4]. The first corridor, identified as the most dynamic, features the highest concentration of tourism-related activities. It offers a comprehensive range of services and programs, making it a key area for testing the multifunctional role of infrastructure in the Prespa region [5]. This project investigated a prospective scenario in which Lake Prespa is reimagined and utilized as a form of infrastructure—both physical and conceptual—with the aim of fostering sustainable cross-border tourism through the creation of an international park [6]. At the regional scale, the proposal envisions a unified transboundary park, recognized by UNESCO and strategically situated between two major PAN-EU corridors, thus emphasizing its geopolitical and infrastructural relevance [7].

At the lake scale, the project outlines a framework for implementing tourism-supportive infrastructure through services and activities, while also introducing a digital infrastructure designed to enhance transnational connectivity and visitor experience across all three countries [8]. Special attention was given to the four identified corridors—recognized as the most attractive areas—where targeted interventions were proposed [9]. The intervention matrix serves as both a planning tool and a strategic roadmap, enabling adaptable implementation based on future scenarios, evolving demands, and policy developments [10]. Ultimately, positioning the lake as an infrastructural backbone—guided by the principles and analyses developed throughout the project—offers a powerful strategy to promote regional tourism, strengthen cross-border collaboration, and dissolve the invisible barriers that continue to divide this shared landscape [11].

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Intersecting Landscapes: New Spatial Visions for the Cross-Border Region of the Prespa Lakes

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Abstract - This article presents a research-by-design contribution for the Prespa–Ohrid lake region, with a focus on Pustec Municipality (Albania). It integrates three inseparable components—method, diagnostics, and design hypothesis—into a single narrative. Methodologically, it advances a “sensitive exploration” that manages attention and meaning through planning by walking and by reading the area as a living, trans-scalar system. Diagnostically, it reframes the region as a planetary-scale “witness territory,” identifies five strategic understandings (ten-million-years system; secret geography; trans-scalar articulator; three horizons—many strings; and the fiord-like coastline), and proposes an epistemic transition away from mobility-led, growth-first templates toward ecosystemic logics and cross-border cooperation. The design hypothesis translates this stance into two scales of action: (1) a cross-border strategy articulated through three national sequences and time-phased goals; and (2) a local prototype in Pustec—the Agro-field as connector of landscapes and biotopes—linking knowledge facilities, buffer landscapes, water management, and productive planting into a shared civic and ecological infrastructure. The proposal aligns with a broader vision-making approach that treats future-making as a care-oriented, adaptive process rather than a fixed blueprint.

Keywords - Cross-Border Connectivity, Landscape Segmentation, Sustainable Tourism

Method: A Sensitive Exploration (Managing Attention and Meaning)

Epistemological premise

The premise is simple yet demanding: to plan, one must first learn how to observe. The Ohrid–Prespa system is not a neutral support awaiting programs; it is an ancient, living milieu whose long memory requires a different kind of attention. The method begins with a sensitive exploration, a protocol that slows perception, suspends routine categories, and allows the territory to emerge as an intelligible whole. Attention is organized as a sequence, attention-intention-action, and expanded across time, space, and authorship through iterative feedback, multiple viewpoints, and inter-actor dialogue.

Planning by walking—exploring the horizon in our minds

Fieldwork adopted planning by walking to inhabit, rather than merely visit, the area. Pathways, strings, loops, and lines function simultaneously

as physical traces and cognitive devices structuring memories, encounters, and perspectives. Walking generates a layered atlas of images: from wide lacustrine horizons to compressed coves and inlets; from the agricultural plain’s repetitive grid to intimate micro-habitats along buffer ecotones. This image-walk acts as a diagnostic instrument that registers rhythms of speed and slowness, reveals how topography and vegetation curate perception, and identifies where the region is already stitched together by use rather than infrastructure.

From project to process: vision-making as care

In fragile, high-value milieus, conventional project-based approaches risk triggering self-fulfilling growth dynamics. Design is therefore interpreted as territorial curatorship: selecting, preserving, and enhancing existing qualities; strengthening co-evolutionary relations among human and

more-than-human communities; and sequencing actions so that learning and doing evolve together. This stance reflects a shift from machine logics to systems logics, and from growth to robustness through adaptation and cooperation.

Diagnostics: Five Strategic Understandings and a New Strategic Gaze

This diagnostic section reframes the Prespa-Ohrid region not as a peripheral borderland but as a strategic landscape whose value derives from deep time, ecological integrity, and relational capacity. The five understandings outlined below function simultaneously as analytical lenses and as projective constraints: they describe what the territory is, what it can become, and what it must not lose.

The Ohrid-Prespa lake system constitutes what can be defined as an Earth's witness territory: a rare landscape where water has persisted continuously for approximately ten million years, generating an exceptional degree of endemism, stratified ecological memory, and evolutionary depth. In planetary terms, such territories are not renewable assets but irreproducible archives of life processes. Their value lies not only in biodiversity counts but in the integrity of long-duration interactions between geology, hydrology, climate, and living species. This deep-time perspective demands a radical shift in planning logic. The lakes, their catchments, wetlands, agricultural plains, and downstream river systems form a single hydrological ecological continuum. Interventions whether infrastructural, agricultural, or urban cannot be assessed locally or sectorally, but must be evaluated in relation to systemic thresholds: nutrient loading, water

balance, habitat fragmentation, and cumulative effects across borders and generations. In this sense, the ten-million-year system establishes non-negotiable limits for transformation, within which any form of development must be inscribed.

A secret geography, Eden for escape

The Prespa-Ohrid region has been unintentionally preserved by a combination of topography, historical marginality, and political borders. Major mobility infrastructures bypass the basin, tracing faster regional loops while leaving the inner territory relatively insulated. This condition has produced what can be described as a "secret geography": a landscape of retreat, refuge, and delayed exposure to mass development.

Rather than interpreting this isolation as a deficit to be corrected, the diagnostic reframes it as a strategic asset. In an era of acceleration and overexposure, the capacity to remain slow, selective, and experiential becomes a form of territorial capital. Connectivity here is not measured by throughput or speed, but by encounter: encounters between people and landscapes, between seasonal rhythms and daily practices, between visitors and resident communities. Prespa-Ohrid thus emerges as a slow territory, where ecological, social, and psychological values of slowness attention, care, learning, and duration, are central to both quality of life and long-term resilience.

Ecological systems operate across scales that systematically exceed administrative jurisdictions. Water flows, nutrient cycles, species migration, and climatic processes connect villages to lakes, lakes to plains, and plains to distant downstream systems. In Prespa-Ohrid, local agricultural practices affect lake ecology; lake health influences regional biodiversity; and regional dynamics

From development clusters - to “Blu Albania”



From mobility



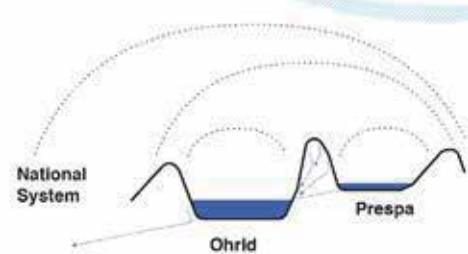
Fig 1 / From the mechanics of the performance to the environment driven cooperations

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resonate at national and international levels. This condition positions the region as a transscalar articulator: a territory where local decisions acquire supra-local consequences and where governance must align with ecological logic rather than political convenience. The diagnostic identifies a critical opportunity to construct a shared regional identity grounded in environmental valorisation and collective stewardship. Such an identity would not erase national differences, but coordinate them around a common object the lake system as a shared commons capable of fostering cross-border cooperation in policy, monitoring, maintenance, and cultural representation.

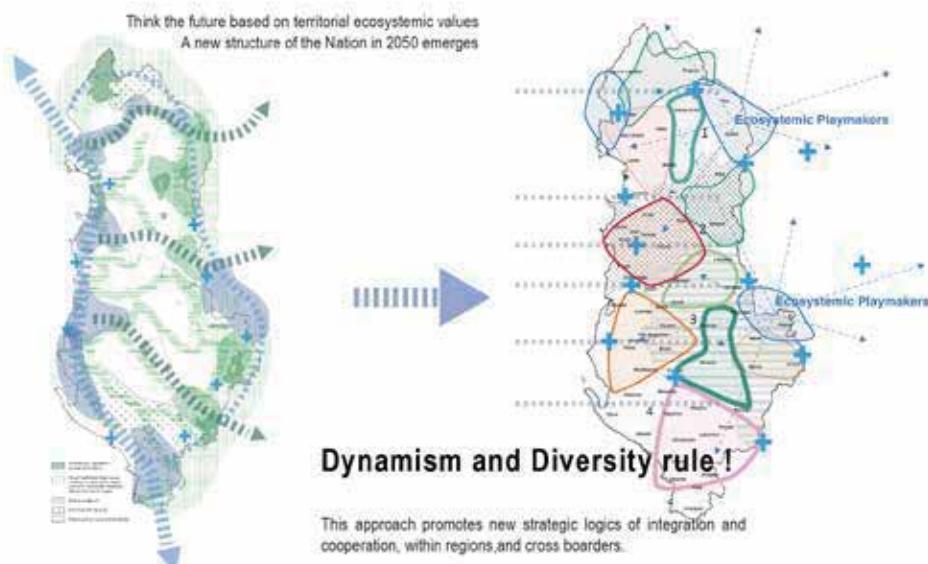
Perceptually and functionally, the region is structured by three dominant flat horizons: Lake Prespa, Lake Ohrid, and the Korça agricultural plain. Each constitutes a humid landscape with its own microclimate, agricultural repertoire, settlement pattern, and cultural itineraries. Prespa's enclosed basin supports mosaic agriculture and intimate shoreline ecologies; Ohrid's larger expanse hosts more established cultural routes; the Korça plain operates as a productive “third lake,” defined by irrigation grids and seasonal labour.

These horizons are not isolated surfaces but components of a single landscape system, interconnected by multiple “strings”: shaded pedestrian and cycling paths, hedgerows, water channels, field margins, and knowledge trails. These linear elements weave together everyday life, seasonal work, ecological processes, and slow discovery. The diagnostic thus shifts attention from nodes and centres to connective tissues, recognising that territorial coherence emerges less from monumental infrastructures than from the cumulative density of small, continuous links.

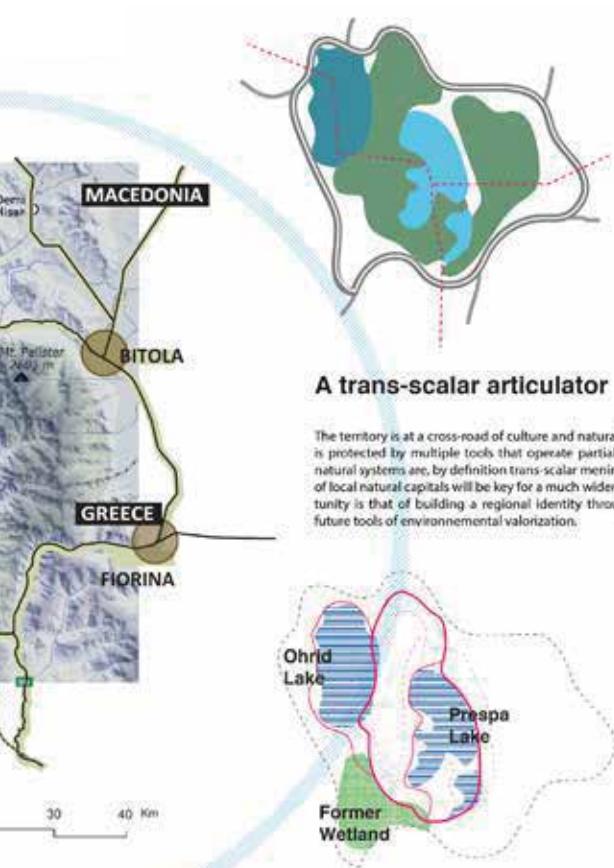


Integrated Ecosystems and buffer areas

Driven growth - to local territorial valorization

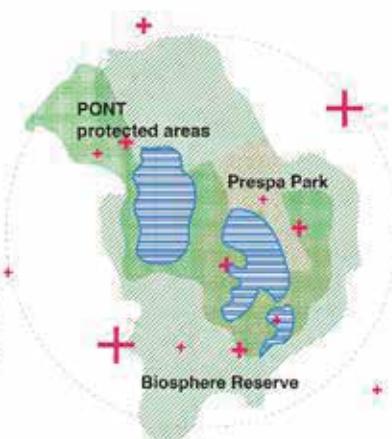


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A secret geography - Eden for Escape

Natural topography, as well as political boundaries have protected lake Prespa and its coasts from the fluxes of man-made mobility. A wider mobility loop keeps the inner area reserved for a different quality of speed and time appreciation. The lake's region will be a slow, inner-bond territory, in which connectivity is not meant as a performative capacity concerning car infrastructures, but as a deeper, social, ecological, and psychological opportunity to encounter nature and other living communities.

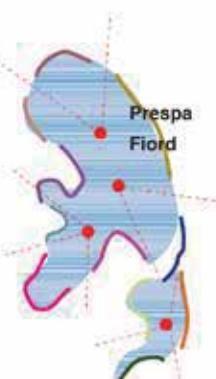


A trans-scalar articulator

The territory is at a cross-road of culture and natural Ecologies. Its nature is protected by multiple tools that operate partially cross-border. The natural systems are, by definition trans-scalar meaning that the protection of local natural capitals will be key for a much wider territory. The opportunity is that of building a regional identity through the existing and future tools of environmental valorization.

Three Horizons - many strings

Lake Prespa, Lake Ohrid and the agricultural bonified Plain of Korça represent three plain horizons. Three humid Environments which can be understood as a landscape system combining different kinds of agricultures, different typology of pedestrian and bike cultural pathways. Each offers a specific perception of mountain chains and of the horizon.



10 Million Years of history 1 integrated system

Witness of History of earth, here the water presence dates 10 million years. We can count approx. 20 other places on earth with similar geological and naturalistic features. This makes the area a unique pearl at planetary scale. The system is the head of a blue-natural axis that connects not only the two lakes but also the northern water courses reaching Skodra. As such it is key to protect the area from environmental danger - a damaging action here impacts the system as a whole.

A Fiord ? An attractor ! Neverending panoramas

The coast/line of lake Prespa is an articulated geometry, this determines a variety of setting and perspectives that make it impossible to grasp the whole coast line at once. This is a great opportunity, since each setting represent a different image of the lake, multiplying its image and identities. Only moving through the lake we can understand it visually. This experience resembles the exploration of a fiord.

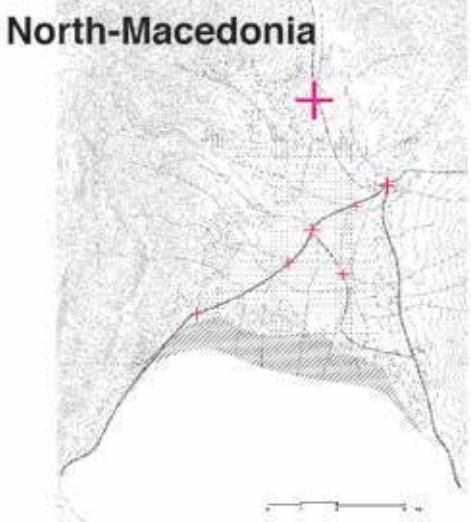


Fig 3 / Three sequences, three agendas
source/ authors (2023)

A fiord-like coastline as attractor

Prespa's shoreline is characterized by an articulated geometry of inlets, promontories, shelves, and coves that resists panoramic mastery. Unlike linear or uniform lake edges, this fiord-like morphology requires movement to be understood. Perception unfolds sequentially, through walking, boating, and cycling, producing a series of spatial "rooms," each with its own atmosphere, scale, and ecological specificity. This kinesthetic condition transforms the coastline into a didactic landscape. The act of moving along the shore becomes a mode of learning: visitors and residents alike are invited to read ecological transitions, seasonal variations, and human traces through embodied experience. As an attractor, the coastline does not rely on spectacle or concentration, but on duration, repetition, and care qualities aligned with low-impact tourism, environmental education, and everyday stewardship.

At the national scale, Albania's planning frameworks remain largely shaped by a mobility-first, growth-oriented paradigm. Polycentric development models privilege networks of growth poles connected by high-performance infrastructure, while environmental systems are often treated as constraints to be mitigated rather than as structuring principles. The Prespa–Ohrid diagnostic calls for an epistemic transition toward what is here termed Blu Albania: a water-centric, ecosystem-based territorial vision in which lakes, rivers, valleys, and catchments organize spatial strategy. In this model, diversity and dynamism arise from endogenous assets landscape quality, agricultural knowledge, cultural practices, and ecological integrity rather than from infrastructural expansion. Such a shift aligns national planning with post-growth perspectives and creates the conditions for genuine cross-border coordination grounded in shared ecological responsibility.

Design Hypothesis: From Cross-Border Strategy to Pustec Prototyping

From Cross-Border Strategy to Pustec Prototyping

If diagnostics define what the Prespa–Ohrid territory is and what it cannot afford to lose, the design hypothesis articulates how action can occur within those limits. Design is not conceived as the projection of a final form, but as a structured process of care, learning, and coordination across scales. The hypothesis operates through two interlocked arenas: a cross-border strategic framework for the lake system as a whole, and a local prototype in Pustec that translates strategy into spatial, ecological, and civic practice.

Cross-border strategy: three sequences, specific agendas, three temporalities

The Prespa–Ohrid region is shared by Albania, North Macedonia, and Greece, three national contexts with different institutional capacities, planning cultures, and stages of environmental management. Rather than seeking uniform solutions, the strategy is built

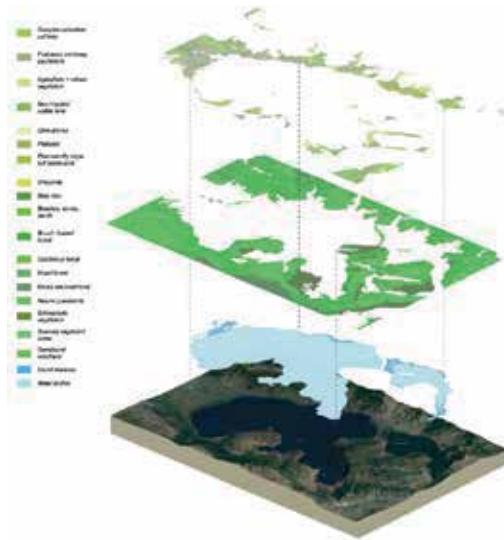


Fig 4 / Integrated eco-systems and buffer areas

source/ authors (2023)

on the principle of complementarity. Each national sequence is understood as operating within a specific temporal horizon short, medium, and long term, while contributing to a synchronized regional trajectory.

Albania: constellation of communities and self-sustaining cultures

In the Albanian sector, the design hypothesis prioritizes village-scale autonomy and landscape-led development. In the short term, the agro-field is reframed as a multi-service public landscape: a connective tissue that frames settlement edges, hosts slow mobility, captures and treats rainwater, and supports diversified agro-ecological practices. In the medium term, this landscape infrastructure becomes the support for knowledge facilities field laboratories, agro-didactic hubs, and small university clusters capable of anchoring learning-based economies related to health, care, and agro-biodiversity. In the long term, the same agro-

infrastructure functions as a growth-regulating device, guiding and limiting urban expansion while stabilizing a high-quality rural-lacustrine public realm.

North Macedonia: linear development and ecological repair

In North Macedonia, where agricultural intensification and linear settlement patterns exert pressure on water quality, the strategy focuses on ecological repair and spatial rewiring. In the short term, agricultural grids are transformed into green public space through hedgerows, windbreaks, infiltration swales, and shaded paths that connect villages while filtering runoff. In the medium term, a shift toward bio-agriculture is supported by certification systems, micro-processing facilities, and joint branding that monetizes ecosystem stewardship. In the long term, inner parks and the generous coastline are connected through continuous biodiversity corridors that double as cultural and educational itineraries.

Greece: care, communication, and inspiration

In the Greek sector, where protection and valorisation practices are comparatively advanced, the design hypothesis emphasizes communication and cultural leadership. In the short term, ecological processes are made legible through narrative landmarks, interpretation centres, and curated event horizons. In the medium term, monitoring systems, research infrastructures, and soft mobility networks are harmonized with neighbouring countries through shared datasets and protocols. In the long term, the trinational region is positioned as a European exemplar of lacustrine stewardship, experiential learning, and care-oriented territorial governance. Taken together, these three sequences replace competition with playmaking. The lake system acts as an environmental backbone that distributes opportunities, synchronizes tempos, and increases systemic robustness across borders rather than

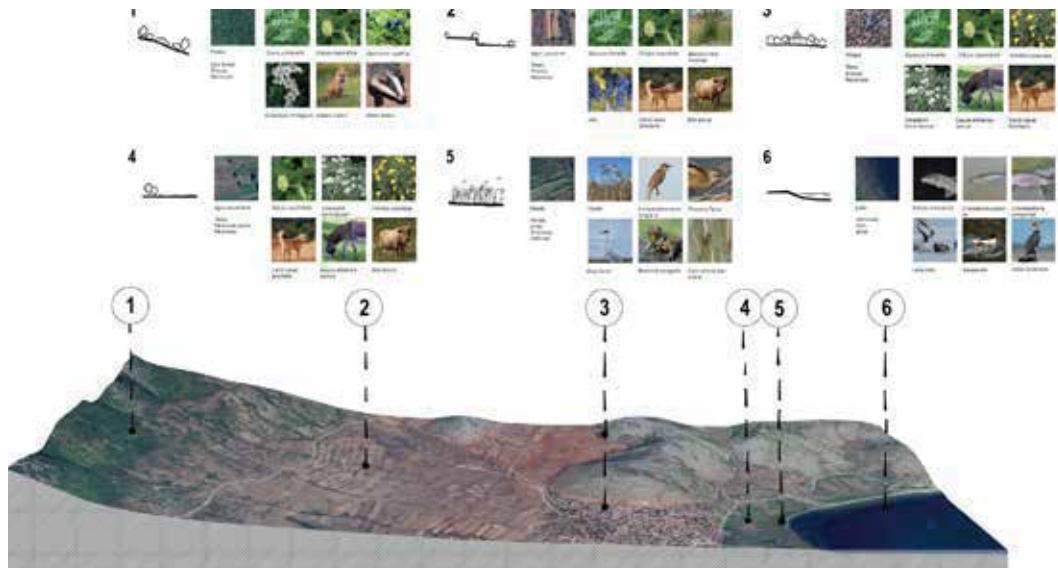


Fig 5 / Connecting communities and non-human intelligences

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concentrating growth in isolated nodes

Local prototype, Pustec: the agro-field as civic and ecological infrastructure

While cross-border strategy provides coherence, the local scale is where learning, testing, and adjustment occur. In Pustec, the design hypothesis is materialized through a landscape-first prototype: the agro-field as connector of landscapes, biotopes, and communities. This agro-field is not a residual agricultural zone but a multifunctional civic infrastructure operating simultaneously as

public space, ecological buffer, water management system, and economic incubator.

Spatial supports: framing continuity and limits

The public agro-field forms a continuous, walkable, workable belt that binds villages to the lake edge and to one another. By aggregating public and private open spaces, courtyards, orchards, common meadows it produces a legible spatial system at eye level. Planting grids and hedgerow frames operate as a multi-scalar scaffold: shading paths, structuring microclimates, prefiguring future

Knowledge Facilities

- . Knowledge Economy .experimental ground for bio/cultivation
- . Local empowerment and educational spaces. University clusters .
- . Flexible activity incubator for the communities and temporary visitors.

Spatial supports

- . The agrofield as a public space connected to the public/private open spaces of the villages.
- . New cultivations for a new local economy of health, experience, and learning in nature.
- . Experimental fields for nomads and healing minds. Caring for landscapes of care.

The Agro-field as a connector of communities and competencies

Ideas for Pustec / Agro.connection

Valorizing buffer areas

- . On the basis of topography, and along the lake, where one ecosystem encounters the others, the buffer area shall be qualitatively treated, as a deeply meaningful space.

Water management

- . Expanding rain water retention, treatment and stock can help authonomize the villages from the usage of the lake's water and fight against climate change.

Framing / scales of plantations axis

- . framing urban growth and qualifying intermediate spaces through landscape allows to prepare and treat future urban evolutions, setting a limit to land consumption while valorizing space.

The Agro-field as a connector of landscapes and biotopes

growth limits, and creating habitat continuity for pollinators, birds, and small mammals. At ecological transitions, buffer landscapes are thickened into places of meaning, hosting micro-wetlands, reedbeds, observation hides, and didactic decks. The agro-field supports an economy grounded in knowledge rather than extraction. Agro-didactic fields host trials in bio-cultivation, seed conservation, and soil regeneration. Local empowerment hubs seasonal classrooms, maker-sheds, and small processing labs enable value addition, digital storytelling, and community-led

entrepreneurship. Satellite university clusters and field stations attract students and researchers in ecology, landscape architecture, agro-forestry, and mental health, transforming Pustec into a learning destination rather than a peripheral settlement. Experimental fields for therapeutic horticulture and nature-based learning further expand the territory's role as a landscape of care.

Water management is integrated into the spatial structure of the agro-field. Rainwater retention basins, swales, and soil-sponges reduce pressure on lake waters while supporting seasonal irrigation.

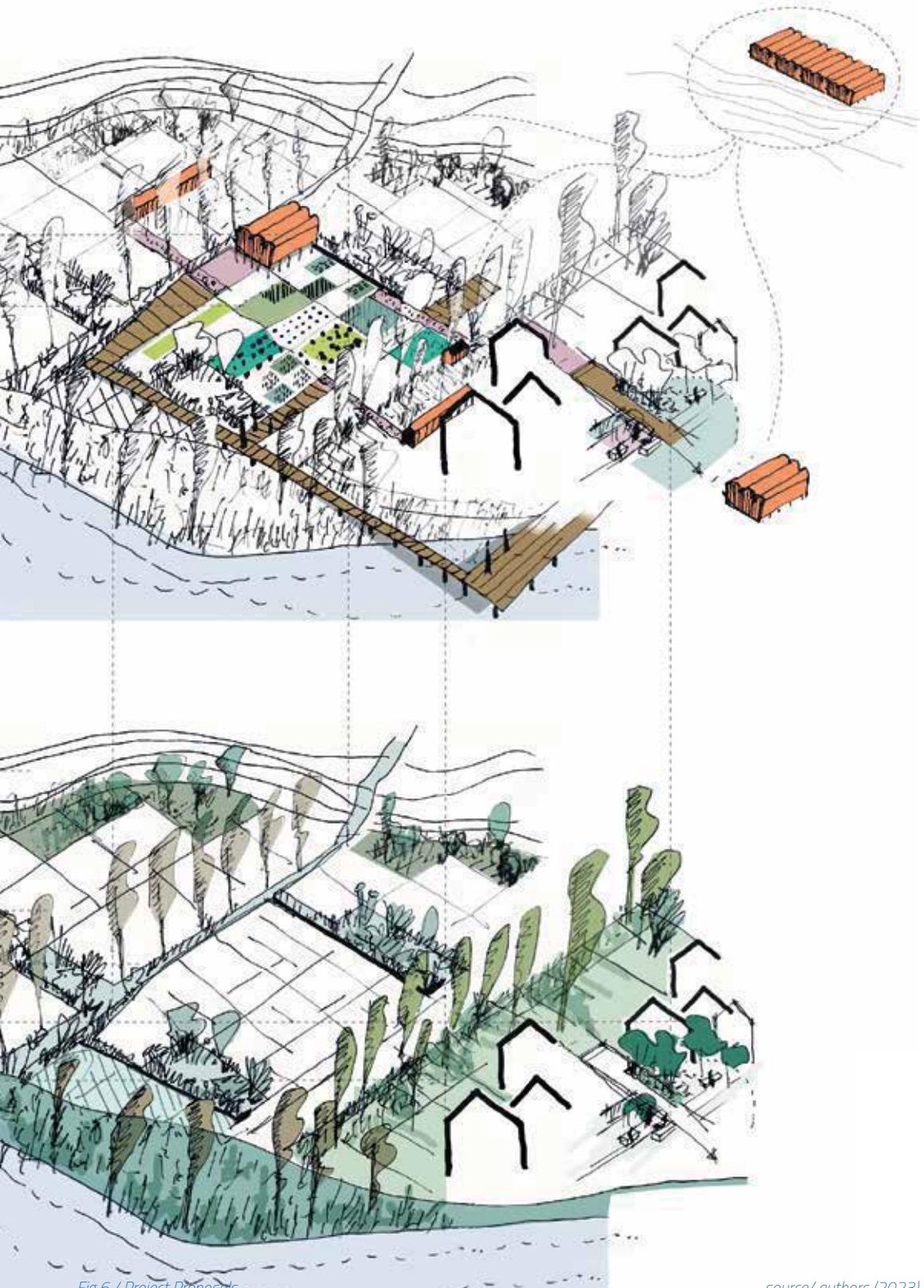


Fig 6 / Project Proposals

source/ authors (2023)

Reedbed polishing systems and distributed micro-infrastructure, roof water capture, permeable tracks, infiltration ditches increase village water autonomy and climate resilience. Rather than hidden technical installations, these elements are designed as visible, didactic components of the public landscape.

Productive planting strategies prioritize diversification and resilience. Agro-forestry alleys, heritage grains, legumes, and medicinal plants reduce dependence on single commodities and enhance soil health. Planting lines and micro-orchard belts prefigure settlement evolution, converting intermediate voids into qualitative spaces rather than residual lots. Biodiversity corridors link riparian habitats to inland mosaics, forming a continuous multi-species infrastructure that supports both ecological and social connectivity.

The Pustec prototype generates a shared public realm legible through paths, hedges, and water edges, fostering everyday encounters and stewardship. New livelihoods emerge around care eco-guiding, field schools, processing micro-enterprises reducing pressure for speculative construction. Crucially, the agro-field functions as a scalable module: as practices stabilize locally, similar systems can be negotiated across borders, transforming agricultural grids into a trinational network of inhabited connective ecosystems.

The Pustec agro-field operationalizes the cross-border strategy by embodying systemic intelligence. In strategic terms, the prototype demonstrates how cooperation can outperform competition and how robustness can replace throughput as the primary measure of territorial success.

Conclusions

This research has deliberately refused to separate method, diagnostics, and design into autonomous domains. Instead, it has treated them as one continuous process in which observation, interpretation, and spatial action recursively inform one another. By doing so, Intersecting Landscapes positions design not as a terminal solution but as an epistemic practice: a way of knowing, testing, and caring for territory over time. The Prespa–Ohrid lake system has been framed as a living, integrated “witness territory,” whose value derives from deep ecological time, trans-boundary continuity, and accumulated cultural practices. Recognizing this condition fundamentally alters the planning horizon. Development can no longer be justified through short-term growth metrics or sectoral optimization, but must be evaluated against systemic thresholds and long-duration resilience. In this sense, the region operates simultaneously as a local habitat and as planetary capital, demanding forms of stewardship that exceed administrative borders and political cycles. The design hypothesis articulated through cross-border strategy and the Pustec prototype demonstrates that an alternative territorial logic is both possible and operative. By privileging environmental systems, agro-landscapes, and

knowledge-based economies, the proposal shifts the focus from mobility-led expansion toward care-oriented connectivity. Slowness, encounter, and learning are reframed as strategic resources rather than residual conditions, capable of generating social cohesion, ecological robustness, and diversified livelihoods without triggering speculative dynamics. At the local scale, the agro-field in Pustec exemplifies how landscape can function as civic infrastructure. Acting simultaneously as public space, ecological buffer, water-management device, and economic incubator, it embodies a systemic intelligence in which single interventions generate multiple benefits. Importantly, this prototype is not conceived as a site-specific exception but as a scalable module, capable of informing a trinational network of inhabited connective ecosystems. From a governance perspective, the research advances a playmaker model of cross-border cooperation. Rather than competing for growth or visibility, Albania, North Macedonia, and Greece are invited to synchronize their distinct capacities around a shared environmental backbone—the lake system as a commons. Such an approach replaces uniformity with complementarity and replaces throughput with robustness as the primary measure of territorial success. Ultimately, Intersecting Landscapes argues for a shift in how futures are made in fragile, high-value territories. Vision-making is understood as a form of care: adaptive, iterative, and collective. Landscape becomes both the medium and the teacher, guiding action through its limits, rhythms, and affordances. In this sense, the Prespa–Ohrid region is not presented as a blueprint to be replicated, but as a parliament of places walked, cultivated, observed, and negotiated capable of renewing itself over time through shared stewardship and cross-border imagination.

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4.1

Invisible Infrastructure - Rethinking Mobility Services for Rural Accessibility in Prespa Lake Region

Caterina RONDINA

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Proposals for planning and settlement models.

Invisible Infrastructure

Rethinking Mobility Services for Rural Accessibility in Prespa Lake Region

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Abstract - In recent years, Albania has experienced significant demographic shifts, particularly affecting rural areas due to population decline driven by emigration, progressively, this trend has intensified accessibility challenges, affecting well-being and mobility. Sparse populations and long travel distances hamper effective public transportation, worsening inequalities, and isolation, particularly for vulnerable groups. Urgent action is required to implement sustainable and inclusive rural mobility solutions, especially amidst the pressing climate crisis. Through the examination of current international policies and a brief comparative analysis of successful European case studies, this contribution focuses on the case study of the Prespa Lake Region in Albania, aiming to outline potential mobility services to enhance the territorial accessibility of this region. Albania's ongoing accession negotiations with the European Union and alignment with global development priorities underscore the importance of combating climate change and promoting sustainable transport. While urban areas typically receive more attention, addressing mobility in rural and remote areas is essential for inclusive growth and territorial accessibility. However, challenges persist, including the cultural reliance on private cars and limited transportation services for vulnerable populations. Collaborative efforts within communities of practice are vital for addressing accessibility needs and fostering inclusion. Embracing sustainable mobility practices and the sharing economy can further mitigate environmental impacts and enhance accessibility. Efforts to improve rural mobility should prioritise local contexts, such as the Prespa Lake Region, to address unique challenges and leverage innovative solutions to enhance quality of life and economic opportunities.

Keywords - Infrastructure, Transport Justice, Accessibility, Mobility Services

Introduction

Prespa Lake, situated on the borders of Albania, North Macedonia, and Greece, stands as an untouched oasis of nature and traditional livelihoods at the margin of the European Corridors infrastructure. Today, Corridor VIII is under construction and these investments are crucial, yet a comprehensive strategy is essential, integrating both transport and social justice to safeguard the well-being of the region's inhabitants and unlock the potential of rural area's landscapes. The purpose of this paper is to explore the socio-spatial "Invisible Infrastructure" composed of capillary transport services tailored for rural areas essential for economic activities, mobility, and social cohesion, diverging from conventional narratives on traditional transportation systems and in contrast with the monopole of heavy infrastructure, which capture all the investments and support the private car paradigm reinforcing social disparity to understand if and what alternative solutions respond better to rural accessibility needs of this region.

In recent years, Albania's demographic landscape has undergone significant changes, particularly impacting rural areas. The country has witnessed a population decline, driven by emigration trends. As rural areas make up a substantial portion of Albania's territory, they are particularly vulnerable to the impacts of depopulation. Rural areas face numerous accessibility obstacles, impacting both objective and subjective well-being [1][2][3]. Contrary to stereotypical notions of rural tranquillity [Figure 1], many residents lead hypermobile lifestyles, spending considerable time travelling to access activities [4]. Rural areas, typically dependent on private transportation, encounter difficulties due to long travel distances, sparse local populations, and the fluctuating presence of temporary residents. These factors impede the establishment of efficient public transportation services as viable substitutes for private vehicles. Consequently, rural residents experience longer travel durations in comparison to urban counterparts, leading to isolation and service inadequacies for those unable to travel. The

combination of limited access to essential services, a heavy reliance on cars for mobility, and ineffective traditional public transport exacerbates inequality, disproportionately impacting vulnerable groups [5]. Despite these obstacles, urgent action is needed to identify and implement sustainable, socially inclusive, and economically viable rural mobility solutions in response to the pressing climate crisis [6]. The ongoing Albanian accession negotiations with the European Union initiated in 2003, and now in the screening report phase, are expected to raise standards for combating climate change, aligning with global development priorities. By 2030, crucial decarbonisation goals are targeted, driven by technological advancements and widespread adoption of green technologies. Sustainable transport is fundamental to achieving multiple Sustainable Development Goals related to food security, health, energy, economic growth, infrastructure, and urban development. The transport sector plays a significant role in climate action, with a quarter of energy-related global greenhouse gas emissions originating from transportation, projected to rise substantially [7]. The European Union aims to become the first climate-neutral continent by 2050 [8], proposing the "Fit for 55" package to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. While urban areas receive considerable attention, the future of mobility lies in peripheral and remote regions, where technological efficiency and sustainability are paramount. Enhancing territorial accessibility and promoting inclusive growth in these areas is crucial to prevent exclusion and ensure sustainable mobility solutions. Accessibility needs are fulfilled not only through independent individual mobility but also through people's interdependence [9]. This is organised within "communities of practice" [10] i.e., interactive networks of people sharing concerns for accessibility-related needs and activating collaborative forms and services based on relational proximity networks inscribed within wider networks of opportunities [11]. The nature and characteristics of communities of practices influence how rural/inner areas dwellers can meet their accessibility needs, a relational and interdependent dimension that is usually overlooked but essential for their

well-being and inclusion.

Although private car ownership remains a status symbol in Albania due to historical reasons, there is hope that younger generations will embrace more sustainable mobility lifestyles. The sharing economy, driven by advancements in technology, is transforming various sectors including transportation. This model emphasizes sharing, renting, and borrowing goods and services rather than ownership. Enabled by social networking and location-based services, the sharing economy offers diverse options for travel and resource access, reshaping traditional trip generation patterns. Prespa Lake Region represents an example of this very remote area, at the margin of the infrastructure, almost left out from the investments, a rare gem stuck between three countries where the population suffers from the lack of services. Where villages are constantly ageing and depopulating this land needs to be addressed concerning their traditions but also with innovative solutions that can boost the quality of life and the economy of the region.

Literature review

The Albanian test base for the EU goals

Albania in 2017 reported a total population of 2,876,591 million people. In 2018, Albania's elderly population accounted for 11.9%, while children and adolescents covered 18.5%. The country has experienced significant demographic changes over the past two decades, marked by a declining population as Albanians continue to emigrate. Birth rates have also decreased, with a 2.3% decline in births recorded in 2017 compared to the previous year [12]. Albania covers an area of 28,748 km² and the rural areas represent the largest part of the national territory. Of the total area, 42.8% is agricultural land while forests cover 28.16 % and arable land is 22.4%. Over 46.5% of the total population lives in rural areas, but at the same time rural depopulation is an increasing problem in Albania and regions are increasingly facing the negative effects of this development [13].

Albania is establishing a formal definition of rural areas in collaboration with the Ministry of the Interior and INSTAT, basing eligibility for rural development support on beneficiary characteristics



Fig 1 / Beato Angelico, *Tebaide*, 1420 ca, Galleria degli Uffizi, Florence, Italy.

rather than just residential location. These areas are identified by population density, with fewer than 150 people per km² according to the standard OECD definition. However, rural areas face challenges with unsustainable mobility solutions due to high individual motorization rates. Public transport is primarily used for essential services such as schooling, healthcare, work, and leisure activities. The rural and mountainous regions, significantly distant from urban centres, require a shift in perspective to address accessibility issues exacerbated by depopulation and ageing, which have led to the closure of local services and increased dependence on urban centres, perpetuating a cycle of further depopulation and underdevelopment [14] [6].

Bus lines are under local Government and Municipalities are responsible for city transport and licensing processes for inter-city transport within and between circuits, whereas the private transport operators are contracted by municipalities to provide public transport services. In Albania, the organization of the transport services is delegated to each Municipality [13]. However, it is no longer sufficient to suggest solutions at the municipal level; instead, it is necessary to study territorial network systems. This is particularly true for local and metropolitan public transportation, considering the territorial scale. For instance, the complexity of the Prespa Region lies in the strong political borders that separate the hall natural environment, the territory and the villages are united around Lake Prespa but at the same time, they are divided between different states. The passage between one state and another is controlled by trade, which slows down flows and discourages transit, and the lack of basic infrastructure, such as between Greece and Albania, makes circumnavigation difficult, if not impossible.

Albania's commitment to improving rural infrastructure and mobility services is evident through a range of financial support mechanisms at various government levels. Municipalities annually allocate funds for the transport sector, supplemented by unconditional transfers from the central government. These funds are utilized for local infrastructure interventions, primarily road projects, with larger investments relying on transfers

from the central budget or external funds like the Albanian Development Fund. The government plays a crucial role in maintaining and constructing local roads, often collaborating with entities like the Albanian Road Authority and the Albanian Development Fund. In addition, Albania's Inter-Sectoral Rural Development Strategy (ISRDSA) [17] aims to enhance rural socio-economic conditions by boosting agricultural productivity, preserving the environment, and eradicating poverty.

Additionally, Albania has embraced joint declarations with the European Commission and actively participates in regional initiatives like the Western Balkans and the Vienna Summit, demonstrating its commitment to improving public transport infrastructure. Several aspects of the Agenda 2030 align with the theme of sustainable transportation, notably Goal 9, which emphasizes the need to build resilient infrastructure, promote sustainable industrialization, and foster innovation. Investments in infrastructure and sustainable industrial development are crucial for economic growth, social development, and climate action. Furthermore, Goal 11 focuses on creating inclusive, safe, resilient, and sustainable cities and human settlements, highlighting the importance of universal access to safe, green, and public spaces, especially for vulnerable groups such as women, children, older persons, and individuals with disabilities [7]. Moreover, the United Nations Framework Convention on Climate Change (UNFCCC) recognizes the significant role of the transport sector in addressing climate change, as a quarter of energy-related greenhouse gas emissions originate from transportation activities. Therefore, sustainable transportation practices are essential for achieving the goals outlined in Agenda 2030 and mitigating the impacts of climate change. Overall, there is the need to shift from the current mentality of slight changes towards a radical transformation. The scenarios underlying the strategy, common to those supporting the plan for the 2030 climate objective, demonstrate that, with the right level of ambition, the combination of policy measures outlined in this strategy can lead to a 90% reduction in transport sector emissions to enable the EU to become a climate-neutral economy by 2050, while simultaneously working



source/ Open Source, Wikimedia Foundation

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towards zero pollution [7]. To achieve this systemic change, we must: make all modes of transportation more sustainable, make sustainable alternatives widely available in a multimodal transportation system, and put in place the right incentives to drive the transition. The landscape of sustainable transport planning changes completely when it comes to urban peripheries, rural areas, and remote regions. Mobility in such areas is still predominantly supported by motorized private vehicles, whereas the existent supply of public transport and New Mobility Services are not sufficient to cover present and future travel demand. Travel distances tend to be longer compared to urban areas, and this makes the context of active modes as a means for door-to-door travel different [15]. Transport decisions have been typically made based on traditional economic approaches, including monetary cost and efficiency. However, the primary consideration of economic aspects tends to neglect the social, environmental, and health issues of transport services. Only in recent years, social and environmental considerations have become a key factor in transport-related decision-making, at least in urban areas.

Nevertheless, most European countries have not yet developed relevant policies or set clear targets for sustainable rural mobility. It is paramount to adapt and broaden the concept of infrastructure to enhance accessibility in rural and remote areas, where the population is ageing, youth are leaving, resources are scarce, and communities are at the margins of the infrastructure itself. Transport justice stipulates that everyone should have the right to move freely to access services and work [16]. However, some areas are poorly equipped in this regard due to their peripheral location. The weak and scattered mobility demand in these areas makes traditional public transport inadequate and inefficient. As a result, many areas have seen cost-cutting measures that have led to reduced efficiency and service levels. This has worsened social inequality, especially for vulnerable groups who lack access to private transportation due to physical limitations, age, or financial constraints. Improving connectivity between urban and rural areas is essential for ensuring equal access to services and opportunities and promoting social justice. While digital services can reduce isolation,

physical access to major centres remains crucial for territorial development. Physical accessibility can help stimulate local economies and improve the quality of life for people with limited access to services and opportunities [14].

Conventional rural public transport systems face challenges in meeting diverse traveller needs due to their inflexibility. Limited exploration of tailored mobility solutions for rural areas has hindered efforts to enhance sustainability and inclusivity. Additionally, the economic viability of such solutions remains underexplored. Addressing social inclusiveness requires recognition of diverse user needs, including both permanent and temporary residents. Innovative solutions like demand-responsive transport (DRT) and shared mobility are gaining momentum, offering sustainable alternatives to private cars, and improving transport accessibility. However, it is crucial to identify the true beneficiaries and prioritize individualized services to ensure maximum freedom of movement according to user needs, even in digitally advanced scenarios.

The Hard Infrastructure

In the most common sense, the term "infrastructure" refers to socio-technical systems capable of supporting various productive activities. Roads, railways, power lines, water pipelines, and sewage systems, form the complex network of infrastructure that decisively shapes urban life in cities and territories [18]. Transport plays a critical role in facilitating economic activities and ensuring social well-being and cohesion among populations. It enables people to move about daily and is essential for the production and distribution of goods. These infrastructures transform nature, make resources and places available, and commodify them. Designed to provide efficient and universal services and follow advanced engineering models, the techno-scientific apparatus of infrastructure impacts territories by often imposing standardized solutions that simplify or obscure contexts, and sometimes generate conflicts and exclusion. Decision-makers at governmental and international levels face various challenges in their efforts to improve transportation. These challenges include physical barriers like inadequate infrastructure, bottlenecks, missing links, and financial constraints

hindering their removal. Addressing these issues requires coordinated action among governments, both domestically and internationally, to implement effective solutions. Massive infrastructure investments from Europe are currently transforming the Albanian landscape through the construction of an extensive transportation network that will span the entire country. Corridor VIII [Figure 2], which is part of the Pan-European Transport Corridors, was identified and defined in various Pan-European Transport Conferences, including Prague (1991), Crete (1994), and Helsinki (1997) [19]. It was designed as a multimodal transport system that would link Southern Italy to the Black Sea, incorporating maritime and river ports, airports, multimodal ports, roads, and railways. It covers a total of 1,270 km of railways and 960 km of roads, running from the southern Italian ports of Bari and Brindisi to the Albanian ports of Durrës and Vlora, passing through the capitals of Tirana, Skopje, and Sofia, and extending through Plovdiv to the Bulgarian ports of Burgas and Varna on the Black Sea. Heavy infrastructure like highways and motorways may only reach a few cities, leaving others excluded from the system. Moreover, it is not enough to simply improve transportation infrastructure and promote more flexible transportation services. It is also important to enhance the local territorial capital by bringing services, knowledge, social interactions, and other resources to these areas [20]. To be effective, the infrastructure must be widespread, enabling people to access services and move freely across the territory. For instance, the European Corridor VIII, which is important for trade and industry, cannot be the only infrastructural investment for the Albanian territory, as it does not meet the needs of most of the territory, which is remote and rural, such as the Prespa Lake Region.

The current transportation infrastructures and services are insufficient to meet the demands of these remote regions. Due to the dispersed nature of their populations, providing transportation is economically challenging and hardly justifiable in terms of expenses. Furthermore, optimizing transportation solutions becomes even more challenging due to the seasonal flows that are associated with tourism [14]. The towns and hamlets of Prespa Region are dispersed over a wide mountain territory, some of them being far from the main road axis of the valley. Most trips are made by car, and the current public transport system fails to meet the needs of the few who rely on it.

The responsibility for accessibility planning has been assigned to the local authorities, which implies that accessibility goals are not a concern of national transportation planning. This further suggests that significant investments in transportation infrastructure and services, which have a long-term impact on accessibility patterns and contribute to persistent accessibility injustices at the local level, are not considered part of national accessibility planning. Usually, transportation planners and engineers follow a set of professional procedures to analyze the transportation system's current state and determine solutions to address issues like traffic congestion, air pollution, rising costs, and low service levels. However, the actual impact of these solutions on different people and the systematic way in which they affect people's lives are often disregarded in the field of transport planning [16]. The investment in infrastructure should not accentuate the disparity between rich and poor [21].

Conventionally, the infrastructures discussed are the result of large, centralized projects. However, a

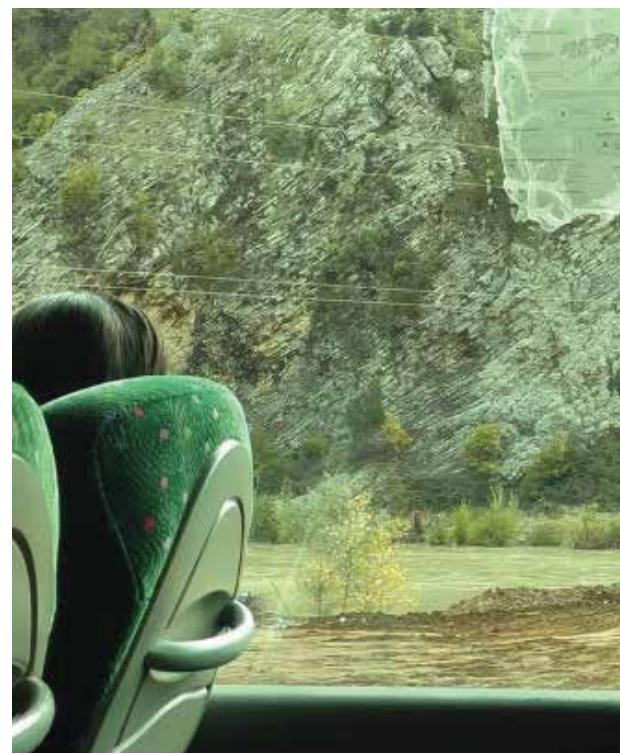


Fig 2 / The Hard Infrastructure, Corridor VIII construction in the Shkumbin River.

closer look reveals something else: the existence of micro-infrastructure processes and self-produced infrastructures. Considering social innovation and its evolutionary trajectories, it is observed that, before reaching maturity and the realization of dedicated infrastructures, there is a phase of self-infrastructure, in which groups of creative and enterprising individuals modify the meaning and use of what they find in the infrastructure necessary for what they propose to do. Thus, an abandoned plot of land can become a garden, a busy street a bike path, a parking lot a space for tables, a residential building a cohousing, and so on. This happens before the decisions necessary to transform the self-generated infrastructures into fully legitimate and consolidated infrastructures are made [11].

The Invisible Infrastructure

Traditionally, private transport has historically been the primary mode of mobility in regions with low population density. The mobility requirements of rural populations are diverse. Permanent residents usually travel for work, education, healthcare, socialization, and leisure, with working-age adults travelling independently [Figure 3]. Additionally, temporary rural residents, including second-home owners and tourists, travel in rural areas for leisure, maintenance, and socialization, and often rely on private transport during holiday periods to travel within their destination and the surrounding area. However, certain demographic groups such as younger children and older adults may require assistance with travel due to limited mobility or rights to independent travel. These individuals contribute to the diverse mobility needs within rural communities, necessitating flexible and inclusive transportation solutions [6]. The preference for private cars is driven by convenience, limited alternative options, emotional attachments, and the perception of car ownership as a symbol of freedom and status. However, private transport fails to align with sustainable mobility principles, posing environmental and equity concerns. The economic shock underscores the need for affordable and



source/ Photo by the Author. Miraké, Albania (November, 2023)

equitable mobility. Despite increased connectivity in the transportation sector, mobility remains costly for low-income individuals and inaccessible for people with disabilities or limited digital literacy. Ensuring free access to mobility for all is essential, especially in rural, peripheral, and remote areas. Efforts to reduce car usage often prioritize initiatives that cater to car owners, perpetuating inequalities in mobility and accessibility. Sustainable transport planning can unconsciously reinforce these disparities by prioritizing travel demand and allocating new transport infrastructure, exacerbating differences in travel patterns among various population groups [16]. We need to shift away from traditional models of unlimited expansion and adopt mindful approaches that recognize the finite nature of natural resources and the importance of ecological balance. Additionally, integrating ethical considerations and social equity into all aspects of territorial planning is crucial, promoting social inclusion, fair access to resources, and equitable distribution of benefits from planning and management efforts. Transport and mobility planning has been going through a fundamental paradigm change, from conventional approaches focusing on physical and economic dimensions to minimizing the generalized cost of travel towards more sustainable approaches also incorporating social dimensions [22]. An approach focused on sustainable practices profoundly influences how we perceive and design our environment. This requires a collective commitment to adopting policies that prioritize social equity, environmental sustainability, and community well-being. Socially, extending public transport services ensures access to essential functions for all citizens. Economically, balancing community resources and service costs is crucial for long-term viability. Environmentally, efforts to minimize pollutant emissions include fleet modernization, alternative fuel usage, and electrification where feasible. Integrating public transport within an intermodal framework promotes a modal shift and reduces overall environmental impact. The invisible

infrastructure comprises multiple complex layers, not all of which are physical, including person accessibility, landscape potential opportunities, and new public mobility systems. Infrastructure, including roads and public spaces, becomes more than just functional elements but also fosters social interaction and community engagement. These spaces serve as vital nodes for cultural exchange and economic activity, contributing to the vibrancy of both urban and rural areas. Recognizing the multifaceted nature of these spaces emphasizes their role in promoting inclusivity, creativity, and resilience within communities [11]. Identifying the needs, aspirations, and challenges of rural and inner areas dwellers is essential for developing effective strategies to overcome barriers to accessibility-related well-being [Figure 4]. By implementing innovative approaches such as improving transportation infrastructure, introducing shared mobility solutions, and enhancing digital connectivity, it is possible to address these challenges and improve personal accessibility for residents. Person accessibility is a characteristic attributed to individuals, indicating whether they have access to specific locations whereas place accessibility pertains to activity locations, indicating whether they are accessible to certain individuals or from specific other locations. A justice-oriented approach to transportation planning should prioritize individuals, as justice demands equitable treatment for people rather than locations [16] [Figure 5]. In rural areas, social infrastructure often compensates for the lack of formal services by fostering dense networks of relationships. This sense of community leads to the creation of a genuine sharing economy, where informal practices address structural deficiencies in the transportation system. For instance, initiatives like carpooling and volunteer rides enable citizens to assist vulnerable community members, such as the elderly, by offering transportation to medical facilities or delivering goods. In the context of the Prespa Region, Lake Prespa stands out as a prominent yet often overlooked feature. Despite its significance, it has the potential to function as the invisible infrastructure that connects all the surrounding areas [Figure 6] [Figure 7]. The perception of the untouched water basin in the Prespa region is widespread. However, water itself can serve as infrastructure. Lake transportation offers an opportunity to improve connectivity, given its prominent presence in the landscape [Figure 8]. Establishing easy and efficient linkages across the water basin can facilitate the movement of people and goods between lake cities. However, leveraging this potential poses challenges, including balancing transportation needs with preserving the landscape's beauty and safeguarding the lake ecosystem from human activities. Sparking from the existing lifeline that already connects people in remote areas, new public transport can be envisioned [Figure 9]. In the next paragraph, there is an outline of different possibilities to be implemented in rural areas that are now spreading all over Europe and that suggest how new mobility services are changing and evolving to provide as much accessibility as possible. This evolution must prioritize inclusivity, ensuring universal access to mobility, improved connectivity in rural and remote regions, accessibility for individuals with disabilities, and the provision of favourable social conditions, opportunities for skill development, and attractive employment prospects within the

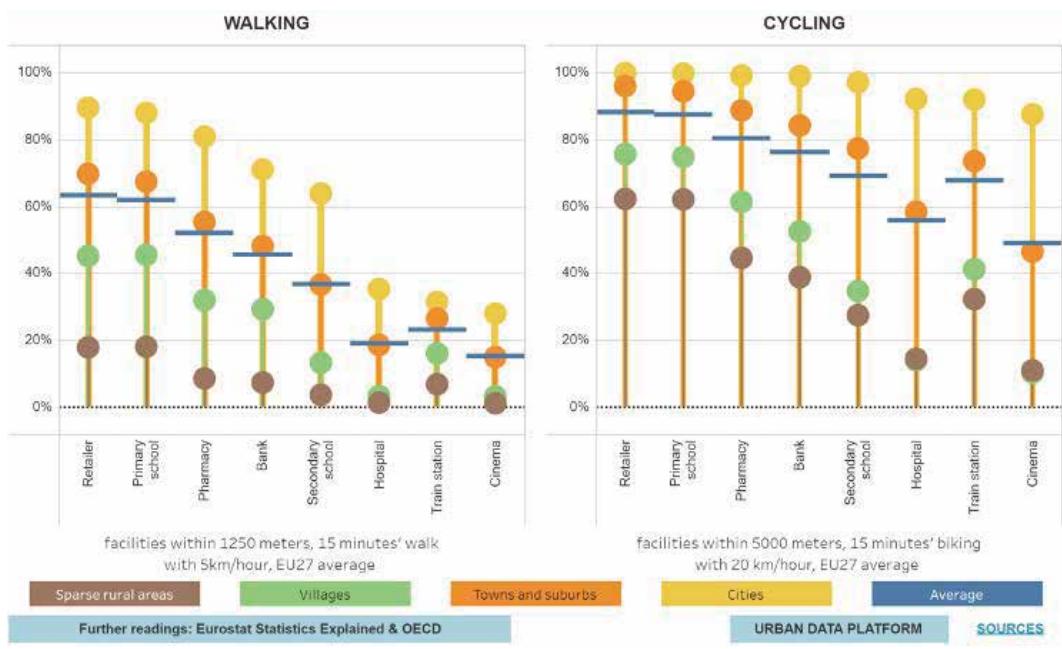


Fig 3 / Share of EU population within 15 min from service area

source/ KCMD Data Portal (2021)

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sector [16].

Tools and methodology

Rethinking Rural Mobility: MOD, TOD, DTR and MaaS

The past few centuries have seen significant trends in urbanization, with cities being the focus of social and economic development. However, we must not overlook the fact that Europe remains a predominantly rural territory. Approximately 75% of Europe's physical area comprises open countryside, rural and mountain villages, and smaller towns that exhibit low to moderate population density. Even in what is regarded as predominantly "urban" areas, the built-up areas are relatively small, surrounded by peri-urban and rural hinterlands of moderate population density. Rural areas are home to 28% of Europe's entire population, which amounts to 146.322.571 million people [23] [Figure 10]. Europe's rural areas, though individually small, collectively hold significant spatial and population sizes, impacting food production, ecology, culture, and social cohesion. Ensuring their health and effectiveness is crucial for Europe's overall well-being. Policies and objectives across Europe must acknowledge the diversity of rural areas and integrate them to achieve broader goals fully.

Resources for public transport in rural areas vary considerably by state. Although rural areas typically offer the most affordable housing, they provide the greatest accessibility challenges with few or no transportation services available to youth, seniors, and people with disabilities. Automobile ownership is an economic necessity, creating a serious strain on low-income household budgets. The combination of social capital and mobility presents a potent force in rural communities, fostering cohesion, connectivity, and prosperity. Ridesharing and neighbourly assistance already form the backbone of transportation in areas lacking public transit. Mobility-on-demand (MOD) enhances this grassroots system by offering diverse resources, improving communication, and providing technology training. MOD offers flexible, shared transport tailored to users' needs, expanding service coverage, and enhancing

convenience and cost-effectiveness through micro-transit options like shared rides in smaller vehicles. Integrating structured and on-demand transport creates a sustainable mobility ecosystem adaptable to local needs and constraints. Public transport authorities can partner with private firms to develop customized MOD models tailored to the unique needs of rural areas. Comprehensive research is crucial to understanding the feasibility and benefits of MOD solutions, particularly in enhancing access to job opportunities and essential services like healthcare. MOD services can also streamline goods delivery and agricultural product transport, fostering economic growth in rural communities. Traditional MOD methods, such as carpooling, can mitigate digital poverty and limited internet access in rural regions. Transportation solutions for rural areas should also consider Transportation-On-Demand (TOD) service, which includes semi-flexible demand-responsive transport as well as flexible door-to-door demand-responsive transport. TOD is a transportation service that is tailored to areas where the demand for mobility is scattered, such as business zones, suburban areas, rural communities, or even night services. Traditional public transportation, such as buses, light rail, and metros, works best in dense city centres and inner suburbs. On-demand transport provides a solution to these challenges by offering a flexible and efficient alternative to serve low-density areas or to complement regular routes in periods of lower traffic. On-demand transportation solutions are designed to promote social cohesion and expand territories, covering the first and last mile to/from regular routes, providing more mobility to people living in suburban areas, and addressing the unmet needs of specific groups of people, such as seniors or people with disabilities. Other emerging adaptive mobility solutions are Demand-Responsive Transport (DRT), as well as shared mobility solutions or shared transport. DRT services provide a flexible option between regular public transport and personalized taxi services. These services come with flexibility in route choice, trip scheduling, and on-demand stops. In contrast, shared mobility encompasses various models within the sharing economy, such as bike-sharing, car-sharing, car-pooling, or ridesharing, typically initiated by private

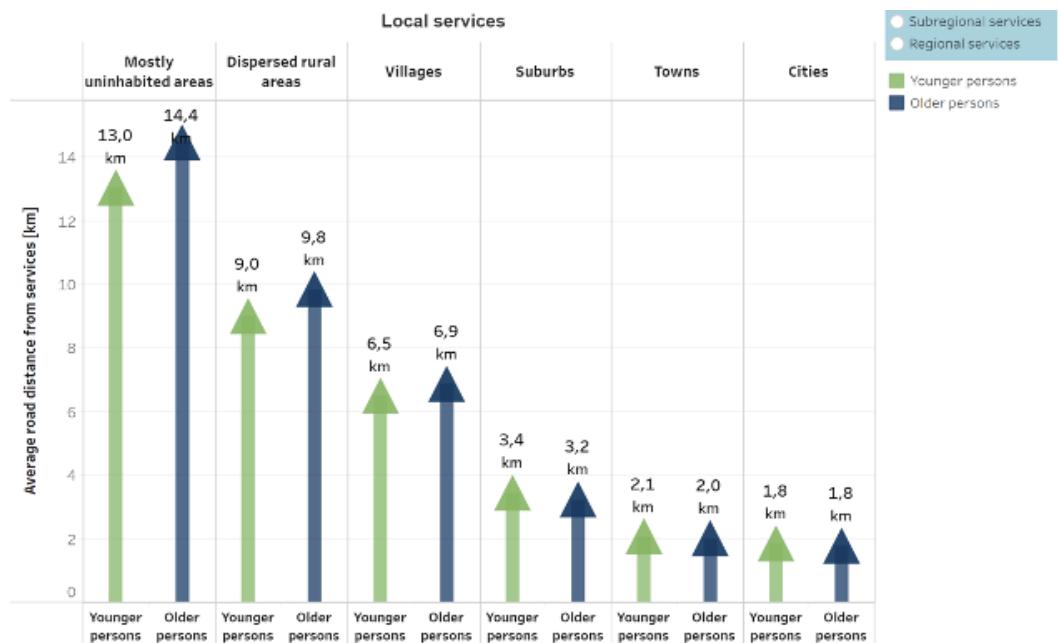


Fig 4/ Distance from services for elderly/non-elderly in EU areas with different degree of urbanisation

source/ KCMD Data Portal, JRC (2020)

entities. While DRT is considered a primary solution for contemporary rural mobility challenges, shared mobility is seen as complementary to conventional public transport [6]. The integration of technology to enhance the transportation system is becoming more prevalent. As the demand for passenger transportation rises, new and innovative solutions are being developed to integrate various transport services into a single, on-demand and accessible service model known as Mobility as a Service (MaaS). MaaS operators streamline costs, enhance safety, and ensure regulatory compliance. They offer diverse reservation channels like mobile apps, websites, or telephone services to meet customer needs. MaaS integrates various transport options into a single service accessible on demand, including public transport, ridesharing, car-sharing, taxi services, and more [24]. This approach simplifies payments and provides real-time information on available options. The rapid growth of MaaS suggests a potential revolution in mobility, evolving from previous unimodal and multimodal systems [25].

However, in rural areas, the success of new mobility solutions hinges on reliable internet access and digital literacy. Variations in mobile network availability and internet quality, compounded by sparse population density, pose challenges for digitally facilitated transport services. Additionally, accessing and utilizing these services necessitates internet-connected devices and proficiency in operating corresponding applications, presenting barriers for certain user groups and impeding progress toward sustainable mobility solutions [26]. Service solutions for passengers should be designed to be physically accessible but also technologically accessible, by offering booking choices that work for everyone without the necessity of a smartphone. Over the last decade, several EU-driven initiatives, such as SMARTA [27], have been undertaken. Despite a lack of extensive academic discourse, reports and insights from relevant transport operators provide valuable information on sustainable rural mobility solutions. The following paragraph presents case studies highlighting innovative mobility solutions and successful operational practices implemented in Albania and rural areas across Europe.

Good practices from Albania

Albania has undertaken several projects aimed at promoting accessibility and sustainable mobility [28]. Notably, three proposals have been put forth, with a focus on improving the urban fabric of Tirana, the capital city with a population of 475,577 inhabitants as of 2017 [12]. The Tirana Municipality is taking action to reduce private car usage and enhance cycling infrastructure to combat traffic congestion and air pollution caused by around 140,000 motor vehicles in the city. Through extensive stakeholder engagement, the initiative prioritizes bicycle lanes and parking facilities to encourage cycling and alleviate road traffic, leading to better public health outcomes. Ecovolis [29], a bike-sharing initiative in Albania, is promoting healthy living and improving air quality by making cycling accessible, enjoyable, and environmentally friendly for the community. Tirana has also taken a significant leap forward in its fight against pollution by introducing electric buses, marking a milestone in Albania's pursuit of sustainable transportation. This initiative follows the municipality's approval of Albania's first electric taxi company license, demonstrating a concerted effort to combat pollution in a city burdened by high population density and vehicular traffic. Additionally, the Tirana Ime mobile application represents a significant step towards enhancing citizen engagement and addressing urban issues in Tirana. This innovative app not only provides access to essential information on transportation and traffic but also empowers citizens to report neighbourhood issues in real time, facilitating prompt municipal responses. With its user-friendly interface and comprehensive categories covering traffic, pollution, and tourism, Tirana Ime fosters a sense of community participation in the city's improvement [28]. While successful transportation projects have been implemented, expanding such initiatives to remote rural areas is crucial. These regions hold transformative potential for economic, social, and tourist development. Securing funding for these areas should be a priority for policymakers and transportation stakeholders. To address this effectively, I have selected four European case studies resembling rural settlements. These studies encompass different transportation systems, including on-demand public transportation,

demand-responsive transport, and carpooling services, providing valuable insights for improving territorial accessibility in the Prespa Region.

Case studies for a new mobility system As previously mentioned, addressing accessibility challenges in the Prespa Region requires a multidimensional approach to rural life. Exploring case studies can inspire potential strategies for these remote communities. Drawing insights from SMARTA (Smart Rural Transport Areas) [27], an EU-funded project initiated by the European Parliament, can provide valuable perspectives on sustainable rural mobility solutions. SMARTA curated Good Practice Study Cases, highlighting innovative transportation methods like ride-sharing schemes tailored for rural residents and vulnerable social groups. These cases highlight various aspects of rural mobility, including solutions for the elderly and disabled, as well as the integration of ICT to enhance transport efficiency and user information [Figure 11].

Shotl (TOD), Spain

On-demand pooled transportation services were introduced in 2017 in municipalities surrounding the Barcelona conurbation, including Sant Cugat del Vallès and Vallirana (23-34 inhabitants/ km²). Shotl [30], an IT company, revolutionized suburban mobility by integrating a pooling technology platform that replaced inefficient regular services and extended them to low-demand peripheral areas. Their hybrid system combined fixed-route-and-schedule services during peak times with flexible on-demand services for the rest of the day, facilitated by passenger and driver apps for real-time booking and optimized routes. This approach fostered efficiency, accessibility, and healthier lifestyles for residents, leading to increased user numbers, reduced public spending, and healthier exercise habits. In Sant Cugat, the average vehicle occupancy increased significantly from six passengers per trip with the former conventional line to sixteen passengers per trip with the on-demand services. The weekly average number of passengers transported slightly increased from the service's launch, from 12-14 passengers per week to about twenty. In Vallirana, the daily ridership increased from twenty passengers before the on-demand service to 28 trips per day in Week 1 post-launch and by Week 6, the ridership exceeded the 50-trip per day mark. Most trips were observed from the town centre to the residential area, reflecting passengers' preference to walk downhill to the centre but less willingness to walk uphill on their return journey or while carrying heavy shopping bags. The service's success has led to its extension to larger areas, meeting the needs of a wider population while optimizing costs and minimizing empty trips.

Connecting Communities (DRT), England

Connecting Communities [31] is a demand-responsive transport service in Suffolk County's rural areas (5,237 inhabitants in 2011, 0.3-0.4 persons per hectare). The service, offered by Suffolk County Council, caters to individuals without regular bus access, serving seven geographical areas (Suffolk, Yoxford, Badingham, Earl Soham, Parham, Great Glemham and Rendham) and accommodating diverse activities such as accessing essential services and connecting to railway and bus stations. Users can book multiple journeys up to 14 days in advance or an hour before travel by contacting their local operator or using the online form. When local public transport is unavailable, users can be connected to nearby stations or bus routes for onward travel, ensuring convenient access to their destination. The service aims to enhance daily transport access for rural communities, reduce



Fig 5/ The Invisible Infrastructure, Rural Dimension

source/ Author. Pustec, Albania (November, 2023)



Fig 6/ The Invisible Infrastructure, Hiking Trails

source/ Author. Small Prespa, Greece (November 2023)



Fig 5/ The Invisible Infrastructure, Lake Prespa

source/ Author. Small Prespa, Greece (November 2023)



Fig 8/ The Invisible Infrastructure, Rural Dimension

source/ Photo by the Author. Pustec, Albania (November, 2023)

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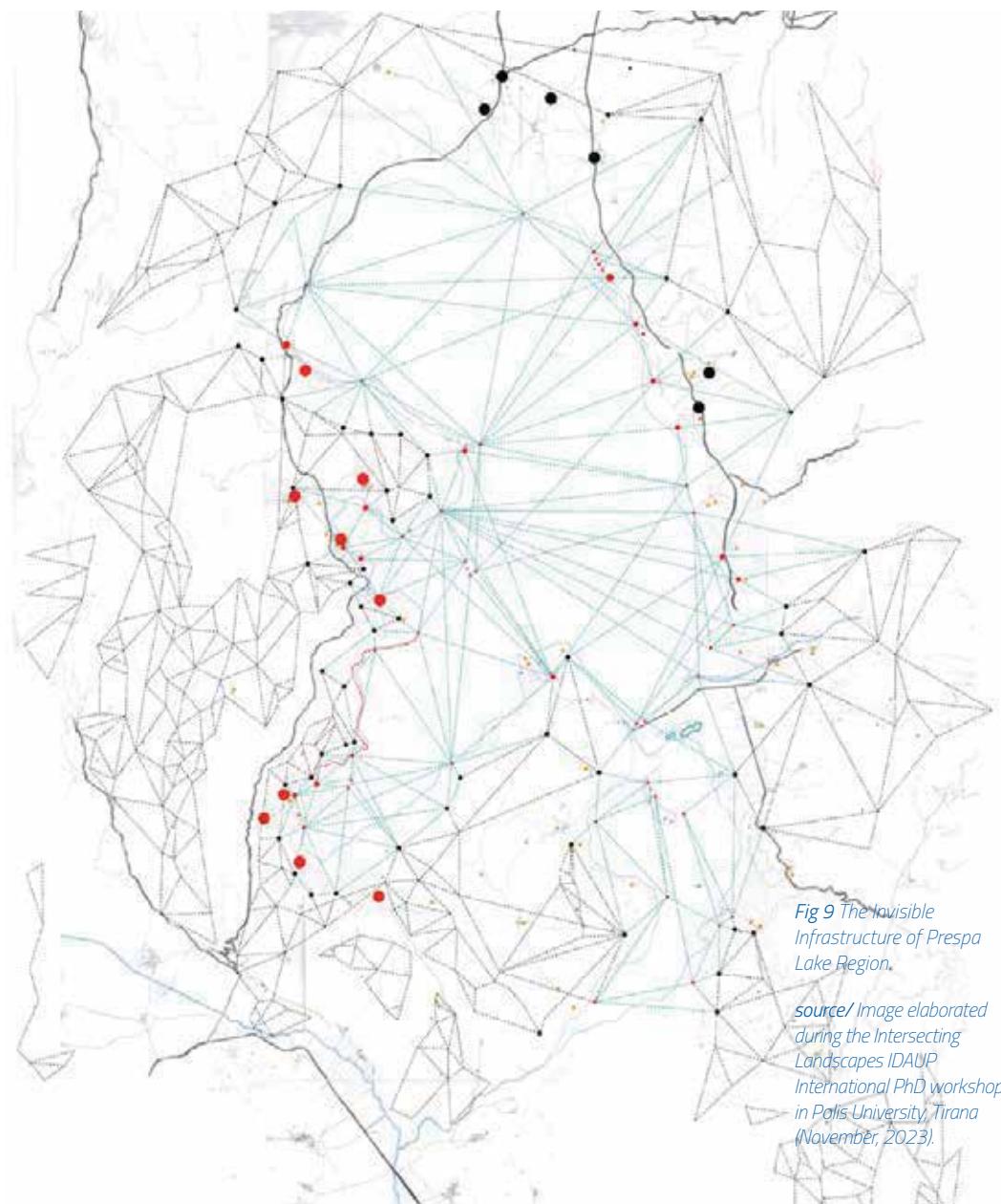


Fig 9 The Invisible Infrastructure of Prespa Lake Region.

source/ Image elaborated during the Intersecting Landscapes IDAUP International PhD workshop in Polis University, Tirana (November, 2023).

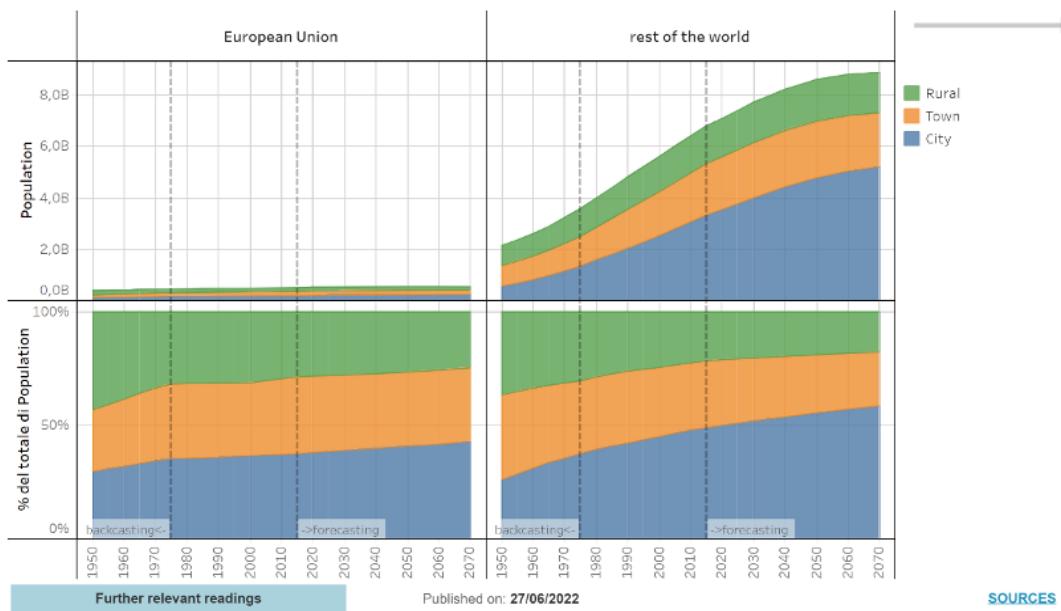


Fig 10/ : Trends in urban growth and urbanization

source/ KCMD Data Portal, Gesis repository (2022)

carbon emissions, and provide a mobility alternative to vehicle ownership.

RezoPouce (E-Hitchhiking), France

RezoPouce [32], a hitchhiking service launched in 2010, has transformed transportation with its fast, safe, and convenient approach. As a cooperative society (SCIC), it addresses rural public transport challenges and limited mobility by utilizing modern communication technology and municipal cooperation. RezoPouce simplifies transportation, enhances rural accessibility, reduces car underutilization, and fosters community connections. With a focus on trust, ease of use, efficiency, and ecological responsibility, it contributes to a greener future while ensuring peaceful journeys. Its success lies in providing a cost-effective service through efficient communication, behavioural coaching, and technology, fostering goodwill and community spirit among drivers and users. Despite its modest budget, RezoPouce offers excellent value for public investment, with over 3,000 stops established, covering 1,305 municipalities and 2 million people in 2016. It aims to expand to 2,500 municipalities by 2024, encompassing 20% of rural France.

Texelhopper (TOD), The Netherland

In the remote Isle of Texel, located in the North of The Netherlands, there is a successful public transport project known as Texelhopper [33]. The island is home to 14,000 local inhabitants, with a population density of 85 inhabitants/ km², and half of them are concentrated in the town of Den Burg. During the summer season, the number of tourists reaches 900,000 per year. Following public transport budget cuts in 2012, many rural buses were discontinued, prompting a radical overhaul of the public transport system. Now, there is only one traditional bus line and numerous on-demand services tailored to specific target groups. By offering public transport at an affordable cost, facilitating integration between ferry, train, and minibus (with a maximum capacity of eight people), and utilizing an ICT algorithm to create optimal timetables that combine an average of five trips, ridership increased by up to 45% during the first 2 years of operation. The service has been operational since 2014 and is utilized year-round, primarily by students and pupils, with tourists

being the main user group during the summer months. Additionally, the service is accessible for wheelchairs and strollers, and with 130 stops, every part of the island is easily accessible day and night for all people.

It is important to note that rural shared mobility solutions require minimal infrastructure and can be deployed rapidly, typically by local actors, using local resources. Once the framework is in place and there are obligations to act, a wide range of shared mobility services can be deployed. It is also important to appreciate that, in rural areas, social innovation may offer as much opportunity as technological innovation. The roadmap should recognize and accommodate such potential and low-/non-technology pathways, including the key role of voluntary citizen initiatives.

Conclusion and recommendations

Improving territorial accessibility in rural areas necessitates an inclusive and people-centric approach that prioritizes the diverse needs of users, particularly vulnerable categories. This involves ensuring the safety and responsiveness of mobility services while integrating various sustainable transportation modes, such as buses and shared vehicles, to promote efficiency and sustainability. Implementing a new vision and policy for rural mobility poses challenges that require addressing to meet evolving mobility needs and address existing deficits. Current frameworks and funding mechanisms are often inadequate for rural mobility outcomes, necessitating stakeholders to mobilize resources independently. Community-driven mobility solutions integrated with local activities are crucial for ensuring relevance and success. Transitioning from pilot phases to permanent operations demands long-term funding and scalability considerations. Shared mobility solutions, including flexible transport services and ridesharing, offer promising approaches, especially when coordinated with fixed-route services to improve coverage and service levels.

What emerges from these virtuous cases and good practices highlights possible mobility scenarios for the Prespa Lake Region, which integrate lightly into the physical and social system of the existing

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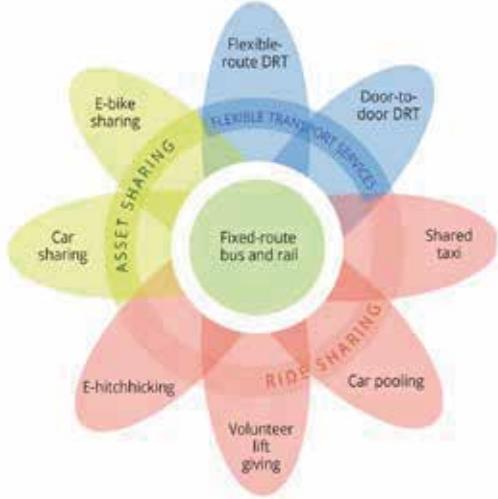


Fig 11/ : The array of rural shared mobility services.

source/ SMARTA PROJECT (2022)

landscape, safeguarding it and making it more accessible and usable for residents and tourists, but above all safe and inclusive for all vulnerable groups of people [Figure 12]. The proposals can be many, and for every budget and timeline, not all elements are yet available to evaluate which of these is the most appropriate to develop. However, given the premises, TOD could represent the most effective solution for this highly atomized territory, where flexible transport lines can comprehensively reach people who, out of necessity and leisure, move around a region where boundaries are no longer determined by politics but by the geography of the Prespa Lake basin territory.

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5.1

Fostering Spatial Justice in Cross-Border Areas: Exploring Tools and Instruments Beyond European Regions

Anila BEJKO

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5.2

Towards the “Playmaker region” model. Defining the emergent traits of a new epistemic model for the strategic understanding of regions

Alessandro Delli PONTI, Kejt DHRAMI

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Proposals for the protection and conservation of biodiversity and the Environment.

Spatial Justice and Equitable Development in the Prespa Lake Borderland: A Transboundary Analysis

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Abstract - This paper examines spatial justice in cross-border areas, specifically focusing on regions outside of Europe. Spatial justice refers to fair access to resources, services, and opportunities for diverse communities. While much of the current literature centers on European contexts, this study aims to fill the gap in understanding spatial justice in non-European cross-border settings. The research focuses on the Prespa Lake borderland, a tri-national area involving Albania, Greece, and North Macedonia. The study emphasizes that governance fragmentation in these regions can worsen socio-economic inequalities and environmental issues. The Prespa basin is known for its rich biodiversity but faces significant challenges, including declining water levels and pollution, which disproportionately impact local communities.

The paper explores the theoretical foundations of spatial justice and assesses existing cooperation mechanisms within the Prespa context. Key findings indicate ongoing distributional, procedural, and recognition injustices, resulting in unequal access to resources, inadequate infrastructure, and the marginalization of minority communities.

To promote equitable and sustainable development, the study recommends strengthening transboundary governance frameworks, enhancing stakeholder participation, and establishing fair resource management protocols. By encouraging collaboration among local communities, governments, and NGOs, the report seeks to tackle the underlying causes of spatial injustice in the region. Ultimately, this analysis highlights the necessity of incorporating spatial justice principles into policy and practice to create a fairer and more sustainable future for the Prespa Lake borderland.

Keywords - spatial justice, cross-border areas, transboundary governance, socio-economic disparities, Prespa Lake, environmental sustainability

Introduction

The pursuit of justice is increasingly recognized as having an inherent spatial dimension, a reality highlighted within cross-border regions. These territories, where distinct national sovereignties converge over shared landscapes, ecosystems, and socio-economic flows, present unique and complex challenges. Borderlands frequently experience peripherality within their respective national contexts, resulting in fragmented governance structures, significant socioeconomic disparities, and complex environmental management challenges. [1] Such complexities underscore the critical need for applying a spatial justice lens that intentionally focuses on the geographical distribution of resources and opportunities, the fairness of decision-making processes, and the recognition of diverse communities to understand and effectively address the inequalities prevalent in these territories. Ignoring the spatiality of justice in these contexts risks overlooking fundamental drivers of inequity and limits the potential for effective, collaborative solutions. [2]

Introducing the Prespa Lake Region: A Unique Tripoint

Nestled high in the Balkans, the Prespa Lake basin represents a compelling case for examining spatial justice in a transboundary setting. This unique region straddles the borders of Albania, Greece, and North Macedonia, encompassing the ancient tectonic Great and Small Prespa Lakes. Situated at an elevation of approximately 853 meters, these are the highest tectonic lakes in the Balkans. The region is internationally recognized as a biodiversity hotspot, boasting Ramsar sites, national parks within each country (Prespa National Park in Greece, Prespa National Park in Albania, and parts of Galičica and Pelister National Parks in North Macedonia), and inclusion in the Ohrid-Prespa Transboundary Biosphere Reserve designated by UNESCO. This ecological wealth and a rich cultural heritage spanning millennia coexist alongside

significant challenges. The Prespa basin faces severe environmental pressures, including dramatic water level decline and pollution, complex transboundary governance involving EU member and candidate states, and persistent socio-economic disparities. [3] This confluence of factors makes Prespa an ideal laboratory for analyzing the dynamics of spatial justice and the potential for achieving more equitable and sustainable development across borders.

Paper Aims and Structure

This paper aims to analyze spatial justice within the unique context of the Prespa Lake borderland. It investigates the theoretical underpinnings of spatial justice and applies these concepts to the specific challenges and opportunities present in the region. The analysis critically evaluates existing cross-border cooperation mechanisms and assesses the potential applicability of international best practices and tools for fostering more equitable outcomes. Ultimately, the report seeks to contribute to a deeper understanding of spatial justice in complex transboundary settings and offers evidence-based recommendations for promoting sustainable and just development in the Prespa region. The paper is structured as follows: Section II conceptualizes spatial justice, exploring its theoretical foundations and key dimensions relevant to planning. Section III examines the inherent challenges of cross-border regions, focusing on governance, socio-economic disparities, environmental management, and infrastructure. Section IV identifies and analyzes international tools, instruments, and governance models used to promote spatial justice in transboundary contexts. Section V presents a detailed case study of the Prespa Lake borderland, analyzing its specific context, spatial justice challenges, and existing cooperation frameworks. Section VI evaluates the applicability and potential

effectiveness of the international tools identified in Section IV within the Prespa context. Section VII synthesizes the findings, discussing the broader implications of the Prespa case for understanding spatial justice. Section VIII offers concrete recommendations for action, concludes the report, summarizes key findings, and emphasizes the path forward.

Conceptualizing Spatial Justice in Planning

Defining Spatial Justice: Theoretical Perspectives
 Spatial justice emerges from the fundamental recognition that social justice is inextricably linked to space and territory. It moves beyond viewing space as a mere backdrop for social processes; instead, it is understood as actively constituted by and constitutive of social relations—a concept often termed the socio-spatial dialectic. [4] In this view, space is not neutral; it embodies and reproduces power relations, inequalities, and opportunities. [5] Pioneering work by critical geographer Edward W. Soja significantly advanced the concept. Soja defined spatial justice primarily in distributional terms as "the fair and equitable distribution in space of socially valued resources and opportunities to use them." [2] However, he crucially emphasized that spatial (in)justice encompasses both the observable outcomes—the unjust geographies of advantage and disadvantage—and the underlying processes that produce these geographies. These processes can include deliberate or unintentional 'locational discrimination,' where specific populations are disadvantaged simply because of where they live, leading to enduring spatial structures of privilege. Complementing this perspective, Susan Fainstein, focusing on urban planning, developed the "Just City" concept. Fainstein argues for incorporating equity, democracy, and diversity as primary evaluative criteria in planning and policy-making. [6] Her work seeks pragmatic pathways for achieving greater



Fig 1/ : Landscape view of Pustec

source/ author Pustec (2023)

justice within existing political-economic systems, suggesting that meaningful reforms are possible at the local level despite structural constraints. She challenges planners to move beyond a narrow focus on economic growth and actively consider the distributional effects and democratic legitimacy of development projects. [6]

The concept of spatial justice is inherently interdisciplinary, drawing insights from geography, urban planning, sociology, political philosophy, and legal studies. While related to concepts like territorial justice (often focused on interregional equity) and environmental justice (focused on the distribution of environmental burdens and benefits), spatial justice offers a distinct critical spatial perspective. It provides a potentially broader framework for examining the geographical aspects of fairness across all societal domains, or at least sharpening the focus on how spatial arrangements contribute to or alleviate injustice. [2]

Core Dimensions: Distributional Equity, Procedural Justice, and Recognition

Contemporary understandings of spatial justice typically integrate three core, interdependent dimensions, drawing parallels with frameworks developed in environmental justice:

Distributional Justice: This dimension addresses the fairness of the spatial allocation of society's benefits and burdens. It scrutinizes the geography of access to essential resources (like clean water, land, and energy), public goods and amenities (parks, cultural facilities), services (healthcare, education, transport), and opportunities (employment, economic development). Conversely, it also examines the spatial distribution of burdens, such as exposure to pollution, environmental hazards, lack of infrastructure, or limited access. A key premise here is that the 'normal' functioning of market

economies and urban systems often inherently generates spatial inequalities, concentrating advantages in some areas while disadvantaging others. [7] Achieving distributional justice involves measuring disparities and actively working towards a more equitable spatial pattern of resource and opportunity allocation based on need and fairness. [8]

Procedural Justice: This dimension focuses on the fairness and inclusivity of the processes through which decisions about space are made. [9] It examines the governance of the built environment, including planning, policy-making, design, and management. Key elements include transparency, accountability, and meaningful public participation, ensuring that all stakeholders—including public bodies, private actors, and diverse civil society groups—have a voice in shaping their environment. Deliberative processes, which encourage reasoned discussion and the integration of diverse perspectives (including expert knowledge and citizen input), are crucial for achieving legitimate and just outcomes. The underlying principle is that fair procedures will likely lead to fair spatial distributions. [5]

Recognition Justice: Also referred to as recognition justice, this dimension emphasizes the importance of acknowledging, respecting, and valuing the diverse identities, experiences, needs, and cultural expressions of all individuals and groups within a society, particularly those who have been historically marginalized or misrepresented. It involves ensuring visibility and voice for these groups in political, social, and cultural institutions; promoting diversity and inclusion in decision-making; and treating all individuals with dignity. [10] Recognition justice also entails acknowledging and addressing historical injustices and their ongoing spatial impacts. It highlights the cultural, social, and



Fig 2/ : Landscape view of Pustec

source/ author Pustec (2023)

psychological dimensions of justice, recognizing that misrecognition or lack of respect can be as damaging as material inequality and underpin both distributional and procedural injustices. [11]

Implications for Equitable Access to Resources, Services, and Opportunities

These three dimensions of spatial justice are deeply interconnected and have profound implications for ensuring equitable access in urban and regional planning. Spatial patterns of unequal access—whether to good schools, reliable transport, affordable housing, clean environments, or economic opportunities—are rarely accidental. They often result from planning and governance processes that lack procedural fairness, failing to include or give adequate weight to the voices and needs of certain communities (procedural injustice). This, in turn, frequently stems from a failure to recognize the distinct circumstances, values, or rights of marginalized groups (recognition injustice). For instance, the siting of polluting industries or the lack of investment in public transport in low-income or minority neighborhoods (a distributional injustice) might be traced back to planning decisions made without meaningful consultation with residents (procedural injustice) and potentially influenced by a societal lack of recognition of their health concerns or mobility needs. [5] Similarly, inadequate provision of culturally appropriate services or the destruction of heritage sites significant to a particular group reflects failures in recognition that manifest as distributional and procedural shortcomings.

Therefore, achieving spatial justice requires a holistic approach in planning and policy-making. It demands that practitioners move beyond simply mapping inequalities (the outcomes) to critically examining the decision-making processes and underlying societal values that produce them. The goal is not

merely equitable distribution as an end state, but the creation of places and systems where equitable access to resources, services, and opportunities is achieved through fair, inclusive, and respectful processes that recognize the diversity and dignity of all inhabitants. [5] This involves actively challenging discriminatory practices, empowering marginalized communities, and designing planning frameworks that prioritize equity and inclusion across all three dimensions of spatial justice.

Cross-Border Regions: Shared Challenges, Fragmented Governance

Cross-border regions, defined as areas where functional socio-economic and ecological systems span national boundaries, present a unique and often intensified set of challenges for governance and development. [1] The very presence of an international border introduces inherent complexities that can impede cooperation, exacerbate inequalities, and hinder the sustainable management of shared resources. These challenges arise from fragmented governance, as multiple legal frameworks and administrative procedures coexist, often conflicting across borders. This fragmentation complicates cooperation and resource management, with diverging national standards and varying capacities among authorities impeding effective governance. [12]

Socio-economic asymmetries exacerbate these challenges. Border regions may experience underinvestment and weaker infrastructure compared to central areas, hindering economic performance and increasing costs for cross-border trade. [13] The disparities in income and employment across borders can lead to complex dynamics, including 'brain drain' and wage pressures, though they may also create opportunities for economic complementarity. [13]

Environmental management presents another critical area for cross-border cooperation, as ecosystems do not adhere to political boundaries. Effective governance of shared resources, such as transboundary water bodies, faces challenges from conflicting national interests and differing environmental standards. [13] Additionally, significant infrastructure deficits in border regions limit connectivity and access to services, necessitating coordinated investment efforts that often encounter political hurdles. [13]

The inherent fragmentation of governance, coupled with socio-economic disparities and environmental complexities, renders border regions particularly vulnerable to spatial injustices. Resource distribution and access to opportunities may be uneven. [13]

Achieving procedural justice remains a formidable challenge, as effective multi-level coordination is essential in bridging administrative divides.

Fostering Spatial Justice Across Borders: International Instruments and Models

Addressing the complex challenges and potential for injustice in cross-border regions requires specific tools, instruments, and governance models that facilitate cooperation and promote equitable outcomes. International practice offers various approaches, differing in formality, scope, and focus.

Typology of Tools: Agreements, Joint Planning, Resource Sharing, and Participation Models

A foundational element for cross-border cooperation often lies in transboundary agreements. These range from legally binding international treaties (bilateral or multilateral) to less formal Memoranda of Understanding. Key examples relevant to shared resources include the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) [14], the Ramsar Convention on Wetlands [15], and numerous basin-specific agreements governing rivers and lakes like the Prespa Park Agreement [16]. These agreements establish core principles (e.g., equitable and reasonable utilization, obligation not to cause significant harm), procedural rules (e.g., data exchange, notification, consultation), and institutional frameworks for ongoing cooperation. Building on or alongside agreements, various mechanisms facilitate joint planning and management. This can involve developing shared spatial strategies, such as those influenced by the European Spatial Development Perspective (ESDP) or pursued in specific cross-border regions like the Greater Region. [1]. More common are joint management plans for specific resources, such as River Basin Management Plans (RBMPs) often mandated by frameworks like the EU Water Framework Directive (WFD), shared fisheries management plans, or coordinated management plans for transboundary protected areas. Tools like Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) are increasingly applied in transboundary contexts to

evaluate the potential cross-border effects of plans and projects.

Specific resource-sharing mechanisms aim to distribute the benefits and costs associated with shared resources more equitably. These can include formal water allocation agreements defining shares for riparian states, [15] mechanisms for sharing hydropower benefits or trading energy across borders (e.g., the joint Norway-Sweden electricity certificate market), arrangements for joint financing, construction, and operation of cross-border infrastructure (like transport links or shared facilities such as the Cerdanya hospital), [17] and potentially frameworks for sharing the costs of environmental protection or the revenues from resource exploitation.

Enhancing participation models is crucial for procedural justice in transboundary settings. This involves creating structures and processes that allow diverse stakeholders, including local communities, NGOs, indigenous groups, and the private sector, to engage in governance. Examples include multi-stakeholder platforms or advisory councils associated with RBOs and joint committees with explicit NGO and local authority representation (as intended for the Prespa Park Management Committee). [18] Formal public consultation procedures for plans and projects [19], citizen science programs for monitoring, and specific mechanisms to ensure the participation of indigenous peoples in decisions affecting their lands and resources. Ensuring access to information is a prerequisite for meaningful participation. [20]

Governance Approaches: From Top-Down Coordination to Bottom-Up Collaboration

The governance models employed in cross-border cooperation vary significantly:

Top-Down Models: These are typically initiated and led by national governments through intergovernmental agreements. They often result in the creation of formal institutions like RBOs (e.g., International Commission for the Protection of the Danube River, International Sava River Basin Commission) or joint commissions (e.g., International Joint Commission for the US-Canada Great Lakes, International Commission for the Protection of Lake Constance). These bodies focus on high-level coordination, policy harmonization, and implementing treaty obligations. Their strengths lie in their formal authority, access to resources, and ability to address issues from a broader, strategic perspective. However, they can suffer from rigidity, bureaucratic inertia, and a potential disconnect from local realities and needs. [21]

Bottom-Up Models: These initiatives emerge from the local or regional level, driven by municipalities, NGOs, community groups, or business associations. Examples include NGO networks like PrespaNet or initiatives facilitated by organizations like the Association of European Border Regions (AEBR) through its b-solutions program. ((AEBR), 2018–2026) ((AEBR), 2018–2026) They often focus on tackling specific, tangible cross-border problems

or fostering people-to-people contacts. Their strengths include flexibility, responsiveness to local needs, and innovation potential. However, they often lack formal power, sustainable funding, and the capacity to address large-scale or systemic issues. [21]

Networked/Multi-Level Governance Models: Recognizing the limitations of purely top-down or bottom-up approaches, many contemporary models strive for a networked or multi-level structure. [22] These involve collaboration among actors across different scales (international, national, regional, local) and sectors (public, private, civil society). They aim to combine the strategic direction and resources of higher levels with the local knowledge and engagement of lower levels. This often involves intermediary organizations, such as specialized cross-border structures (e.g., Euroregions, European Groupings of Territorial Cooperation—EGTCs) [23] or NGOs acting as facilitators, conveners, or knowledge brokers, bridging gaps between different actors and levels. [24]

Lessons Learned from International Experiences

The lessons learned from international experience reveal several vital insights that can guide future initiatives. First, adaptability is crucial; successful strategies must be flexible enough to adjust to different local contexts' unique challenges and opportunities. Collaboration also plays a vital role, as engaging with diverse stakeholders fosters innovative solutions, builds trust, and strengthens the overall impact of projects. Continuous learning is essential; implementing regular assessments and feedback loops allows organizations to refine their approaches and remain relevant in a fast-changing environment. Additionally, understanding cultural nuances is key; being culturally sensitive can significantly enhance the effectiveness of initiatives by ensuring they resonate with local communities. Finally, sustainability must be a priority for long-term success, requiring practices that thoughtfully consider environmental, social, and economic impacts. Together, these lessons provide a solid foundation for navigating complex international landscapes.

The Prespa Lake Borderland: A Case Study in Spatial (In)Justice

The Prespa Lake borderland offers a rich and complex empirical setting for examining the manifestations and challenges of spatial justice within a transboundary context. Its unique combination of geopolitical divisions, socio-economic conditions, severe environmental pressures, and a long history of cooperation efforts provides valuable insights.

A. The Multifaceted Context of Prespa

Geopolitical Landscape: The region's defining feature is the tripoint border where Greece, an EU member state since 1981, meets North Macedonia and Albania, both EU candidate countries.

Throughout the years, this political configuration has created inherent asymmetries regarding access to EU funding mechanisms (like Interreg, IPA, and LIFE) [25], regulatory frameworks (e.g., alignment with the Water Framework Directive 43 or Natura 2000 network), and overall institutional capacity. Historically, the region experienced border closures, particularly during the communist era in Albania, which severely limited interaction and contributed to economic stagnation. The signing of the Prespa Agreement in 2018 between Greece and North Macedonia, resolving the long-standing name dispute, marked a significant positive development, potentially fostering greater stability and cooperation, although its full implementation remains crucial. 49 Plans for a new border crossing between Lemos (Greece) and Markova Noga (North Macedonia) aim to improve connectivity, which is currently limited, especially between Prespa's Greek and Albanian sides.

Socio-Economic Fabric: The Prespa region is predominantly rural, with agriculture as the mainstay of the local economy, though its nature varies significantly across the borders. North Macedonia's Resen municipality is known for intensive apple cultivation, which dominates the local economy and employment. Greek Prespa focuses heavily on bean monoculture, which has been supported historically by EU subsidies. [26] In contrast, agriculture in Albanian Prespa (Pustec Municipality) appears more subsistence-oriented, with mixed farming (cereals, vegetables, and livestock) for household consumption and limited market integration. Tourism, particularly ecotourism and rural tourism, is recognized as a key potential driver for development across all three countries, leveraging the region's natural beauty and cultural heritage, but remains largely underdeveloped, especially in Albania and North Macedonia. Fishing, once more significant, now provides mainly supplementary income, though it retains cultural importance.

Significant socio-economic disparities exist within the region. Greece, as an EU member, generally exhibits higher income levels and lower unemployment compared to North Macedonia and Albania. However, the Western Macedonian region of Greece faces its own challenges, including low scores in job opportunities, environmental quality, and life satisfaction compared to other Greek regions, though it performs better in education and health access. Both North Macedonia and Greece have experienced significant depopulation in the Prespa area, driven by a lack of economic opportunities and historical factors like the Greek Civil War. [26] Pustec municipality in Albania, while ethnically homogeneous (Macedonian minority), faces challenges of isolation, poor infrastructure, and limited economic diversification beyond subsistence agriculture and livestock.

Environmental Pressures: The Prespa basin faces severe and interconnected environmental challenges. The most alarming is the dramatic and accelerating water level decline of Great Prespa

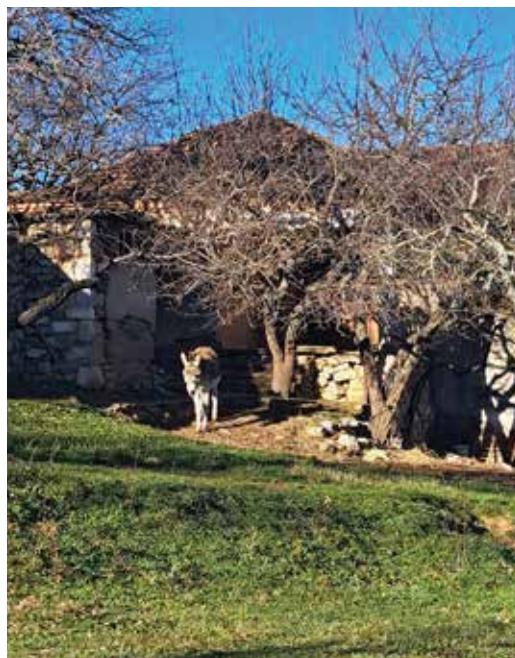
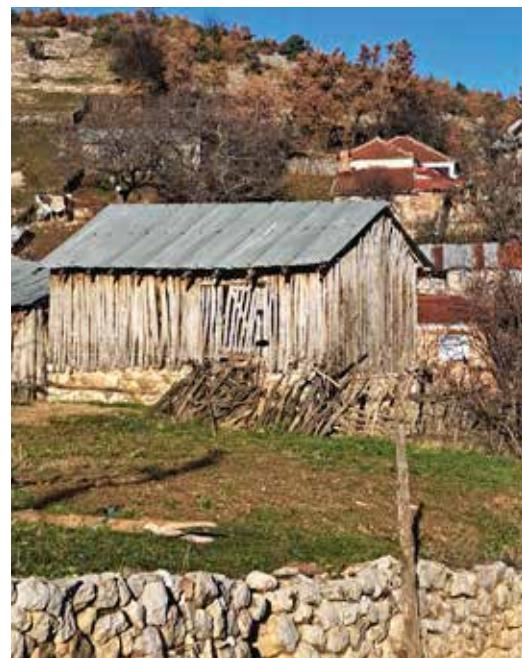


Fig 3/. Village context



source/ author Pustec (2023)

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Lake, dropping by 8-10 meters since the mid-20th century, with significant losses in surface area and volume. [27] This decline is driven by a combination of climate change (reduced precipitation, particularly snowfall, and increased evaporation) and anthropogenic pressures, primarily water abstraction for irrigation, though the precise balance between these drivers remains debated. Water quality is another major concern, with widespread eutrophication driven by nutrient inputs (nitrogen, phosphorus) from agricultural runoff (fertilizers, pesticides) and untreated wastewater from settlements. [18] This leads to algal blooms, oxygen depletion (anoxia) in deeper waters, and threats to aquatic life. [27] Biodiversity is under pressure from habitat degradation (loss of wetlands due to drainage and water level decline, forest degradation from logging/grazing) [26], direct threats to species (overfishing, poaching, impact of invasive species, wind farm development affecting bird corridors), and the overarching impacts of climate change, which exacerbate drought and fire risks. Land use changes, including agricultural intensification and expansion, historical deforestation, and infrastructure development, further contribute to these pressures. [26]

Cultural and Ethnic Dimensions: Prespa is not just an ecological area but also a region rich in cultural history, evidenced by numerous Byzantine monuments, traditional architecture, and archaeological sites dating back millennia. This heritage is an asset but also requires conservation efforts. The region's population is ethnically diverse, though specific compositions vary locally. A significant factor is the presence of an officially recognized Macedonian minority in Albania, primarily residing in the Pustec Municipality. This group's status, rights (e.g., language use in education and public signage), and political representation

are important considerations within the context of spatial justice, particularly given the region's historical complexities and potential external influences (e.g., Bulgarian citizenship offers).

Manifestations of Spatial Injustice in Prespa

The complex context described above manifests in several specific spatial justice challenges across the Prespa borderland:

Unequal Access: Water Resources, Infrastructure, and Services

Water: Great Prespa's declining water levels, exacerbated by climate change and abstraction, raise distributional justice concerns. [27] Intensive agriculture, such as apple orchards in North Macedonia and bean fields in Greece, relies heavily on irrigation from the lake system. [26] Upstream water usage for lucrative agriculture could adversely impact downstream ecological needs and availability for Albanian communities in a less developed sector. [28] The lack of coordinated management intensifies this injustice. [14] Pollution from agriculture and untreated sewage further compromises access to clean water, affecting those depending on surface or near-shore groundwater.

Infrastructure: Significant disparities exist. With EU support, Greece has better transport and environmental infrastructure than Albania and North Macedonia, where rural areas experience inadequate wastewater treatment, resulting in direct lake discharge. The absence of a border crossing between Pustec (Albania) and Greece limits movement and access, leading to unequal service access and economic development disparities. [29]

Social Services: Healthcare and education access vary across borders. Although reforms in North Macedonia and Albania aim to improve social protection, challenges persist, especially in remote



Fig 4/. Village context



source/ author Pustec (2023)

areas like Prespa. Cross-border mobile health units are proposed to address these access issues, acknowledging current inequities. [30]

Economic Opportunity Gaps: Sectoral and Geographic Imbalances

The differing economic structures and levels of development create significant spatial inequalities in opportunity. Farmers in Greece and North Macedonia engaged in more intensive, market-oriented agriculture (beans, apples) and likely have different economic prospects and access to support (e.g., EU CAP subsidies in Greece, though specific Prespa data is limited [31]) compared to subsistence farmers in Albania. [28] The lack of processing and marketing infrastructure within Pustec severely limits the ability of local producers to add value or access wider markets. Tourism development, identified as a key potential sector, is uneven, with infrastructure and services lagging significantly in Albania and North Macedonia compared to Greece or the nearby Ohrid region. This creates geographic imbalances that prevent the region from benefiting from its natural and cultural assets. Environmental degradation further threatens economic opportunities, particularly for those directly dependent on agriculture and fisheries, potentially exacerbating existing poverty. [18] The lack of diverse economic alternatives makes communities highly vulnerable to shocks in the agricultural sector or environmental changes.

Issues of Recognition and Marginalization (e.g., Pustec)

The situation of the Macedonian minority in Pustec, Albania, exemplifies the recognition dimension of spatial justice. While officially recognized within this municipality, questions remain about the effective implementation of minority rights, such

as adequate provision of Macedonian-language education, bilingual signage, and meaningful political participation at local and national levels. [32] Reports suggest limitations and potential pressures, including individuals seeking Bulgarian citizenship for EU access. Pustec's geographic isolation within Albania and strong socio-cultural and economic ties to North Macedonia create a unique situation where national borders significantly impact daily life and access. Legal and administrative obstacles at the border [33] and the lack of a direct crossing to Greece can spatially disadvantage this community, limiting access to services, markets, and opportunities in neighboring countries. Failure to adequately recognize and address these specific circumstances in national and transboundary planning constitutes a form of spatial injustice.

Environmental Burdens and Benefits Distribution
The distribution of environmental costs and benefits appears uneven. Intensive agricultural practices in Greece and North Macedonia, while generating economic benefits for those involved, contribute significantly to water pollution (pesticides, fertilizers) and water abstraction pressures, the negative consequences of which (eutrophication, lower lake levels) are shared across the basin, potentially impacting Albanian communities and the overall ecosystem health more severely. [18] Similarly, the benefits of conservation efforts, such as potential revenue from well-managed ecotourism in protected areas, may not be equitably distributed, particularly if infrastructure development and access remain concentrated on one side of the border or benefit external actors more than local communities. Addressing environmental burdens like waste management also shows disparities, with inadequate systems in Pustec leading to open dumping and burning, posing local health risks, and

contributing to lake pollution.

Evaluating Cross-Border Cooperation Mechanisms

Numerous mechanisms have been established over the past decades to foster cooperation in the Prespa basin. Evaluating their effectiveness, particularly through a spatial justice lens, reveals both progress and persistent challenges.

The Prespa Park Agreement (2010) and PPMC: The Prespa Park Agreement (2010) is the cornerstone of formal transboundary cooperation, signed by Albania, Greece, North Macedonia, and the EU. This legally binding agreement aims for integrated ecosystem protection and sustainable development, emphasizing sustainable water management, biodiversity conservation, and sustainable agriculture and waste management. It established the Prespa Park Management Committee (PPMC) to coordinate efforts, replacing the earlier Prespa Park Coordination Committee (PPCC). [3] The PPMC includes representatives from relevant ministries, local authorities, and environmental NGOs, striving for multi-stakeholder involvement, along with a dedicated Working Group on Water Management (WGWM). However, the implementation of the 2010 Agreement faced delays. Ratification processes, especially in Greece and Albania, were slow and affected by geopolitical issues, resulting in the PPMC and WGWM holding inaugural meetings in June 2022, twelve years post-signing. Early assessments of the PPCC highlighted challenges such as a lack of funding, reliance on ad hoc support, weak legal standing, and insufficient political commitment. Despite the PPMC/WGWM's recent operationalization, its long-term effectiveness in addressing deep-rooted issues of water allocation, pollution control, and socio-economic disparities remains uncertain. Current activities include developing roadmaps and prioritizing monitoring and updates to the Strategic Action Plan (SAP). Relying on NGOs like SPP for secretariat functions raises concerns about capacity within state structures. [32]

The Role of NGO Networks: PrespaNet has been vital in fostering transboundary cooperation since its 2013 establishment, building on the Society for the Protection of Prespa's earlier efforts in Greece. ((INWEB), 2004) Comprising SPP, the Macedonian Ecological Society (MES), and PPNEA, PrespaNet aims to enhance NGO-led conservation, collaborate with authorities, and engage civil society. Key donor-funded activities include transboundary monitoring and research, environmental education, promoting sustainable practices, and policy advocacy. PrespaNet has established a local NGO presence in Resen (NM) and Pustec (AL), generating valuable data and building capacity among NGOs and protected areas. From a spatial justice perspective, PrespaNet significantly contributes to procedural justice through stakeholder engagement and indirectly addresses distributional concerns.

Interreg and Other Donor-Funded Initiatives: External funding has been crucial in supporting

conservation and development in Prespa. Key initiatives include: (i) UNDP/GEF Integrated Ecosystem Management Project, which is focused on incorporating ecosystem management into sectoral practices and strengthening national capacities in Albania and North Macedonia. (ii) UNDP/SDC Lake Restoration Project aimed at reducing environmental pollution and improving management practices. (iii) Prespa Ohrid Nature Trust provides long-term funding for protected area authorities and NGOs in the wider Prespa-Ohrid region. (iv) EU funding supports cross-border infrastructure, environmental protection, and institutional cooperation under various action plans. Evaluation of these initiatives shows positive contributions, particularly in sustainable practices and dialogue. [18] However, their effectiveness is often limited by their project-based nature and reliance on external funding, raising concerns about the sustainability of outcomes once funding ends. [3]

Overall Assessment: Successes, Failures, and Obstacles in Addressing Spatial Justice

Synthesizing the evaluations, cooperation in Prespa has successfully established platforms for transboundary dialogue (PPCC/PPMC, PrespaNet), generated crucial environmental data, piloted sustainable agricultural and waste management practices (especially in NM), and fostered awareness and local participation to some extent.

However, significant failures and obstacles persist in terms of spatial justice. Distributional justice remains challenged by the unresolved (or poorly managed) transboundary water allocation issues amidst severe water level decline, persistent pollution impacting shared resources, significant infrastructure gaps limiting access to services (particularly in AL/NM), and vast economic disparities that hinder equitable development. [34] Procedural justice suffers from the historical weakness and slow operationalization of the formal PPMC structure, lack of enforcement power, potential capacity gaps within national and local institutions, and questions about the extent to which local communities, especially marginalized groups like the Pustec minority, can meaningfully influence key decisions on resource management and development priorities. [35] Recognitional justice issues are evident in the need for better integration of minority rights and needs (Pustec) into planning processes and ensuring that the diverse cultural values of the region are respected alongside environmental and economic goals. [36] The overall picture suggests that while cooperation exists, it often remains fragmented, project-dependent, and insufficient to address the scale and complexity of the spatial injustices present in the Prespa borderland. Despite decades of cooperation efforts and substantial donor investment, the persistence of significant environmental and socio-economic challenges in Prespa points towards a critical disconnect

between project-level interventions and achieving systemic change necessary for spatial justice. [18] While numerous initiatives have yielded localized successes, such as piloting sustainable agricultural practices or establishing dialogue platforms, they appear insufficient to overcome the deeply entrenched problems rooted in fragmented transboundary governance, conflicting resource demands (especially concerning water allocation between agriculture and ecosystem needs), and fundamental inequalities in infrastructure and economic opportunities, particularly those amplified by the EU/non-EU political divide. [37] The delayed operationalization of the formal PPMC structure further exemplifies the difficulty in translating high-level agreements into effective, on-the-ground action capable of comprehensively addressing these complex spatial justice issues. [16]

Synthesis: Lessons from Prespa for Spatial Justice

The Prespa Lake borderland case study offers significant insights into the theory and practice of spatial justice, particularly in complex transboundary settings. It yields lessons that resonate beyond the typical European regional context often dominated by studies within the EU's internal borders.

Prespa's Contribution to Understanding Spatial Justice Beyond Europe

Prespa's unique configuration—a tri-national borderland involving an EU member state (Greece) and two EU candidate countries (Albania, North Macedonia) with differing levels of economic development, institutional capacity, and integration with European frameworks—provides a valuable counterpoint to studies focused on more homogenous or economically integrated border regions within the EU. It illustrates how political boundaries superimposed on a shared ecosystem and historical landscape interact with differing national development trajectories and governance systems to produce profound spatial inequalities. The case highlights the critical importance of the transboundary dimension in spatial justice analysis. Issues like water resource management, pollution control, biodiversity conservation, and infrastructure development cannot be adequately understood or addressed solely within national frameworks. [38] The upstream-downstream dynamics in water use and pollution, the cross-border movement of species (and potentially people seeking opportunities), and the fragmented nature of infrastructure networks demonstrate how justice outcomes in one part of the basin are intrinsically linked to actions and conditions in others. Prespa underscores that achieving spatial justice in such contexts necessitates robust cross-border governance mechanisms capable of equitably mediating competing interests and coordinating action. Furthermore, Prespa highlights the challenges of achieving procedural justice in multi-level, multi-actor transboundary settings with significant power and capacity imbalances.

The long delay in operationalizing the formal Prespa Park Agreement and the reliance on NGOs and external donors highlight the difficulties in building sustained political will, institutional capacity, and effective participatory processes across borders, especially when dealing with sensitive issues like resource allocation or minority rights. [16] It suggests that formal agreements, while necessary, are insufficient without commensurate investment in institutional strengthening, trust-building, and mechanisms for genuine stakeholder engagement at all levels, including local communities, often most affected by decisions. [39]

The recognized Macedonian minority in Pustec, Albania, brings the dimension of recognition justice to the forefront. It demonstrates how concerns of spatial justice intersect with minority rights, cultural identity, and historical legacies in border regions. Ensuring that the specific needs, vulnerabilities, and aspirations of such groups are acknowledged and addressed within national policies and transboundary cooperation frameworks is essential for achieving truly equitable development. Pustec's situation highlights the necessity of looking beyond majority populations and considering how spatial arrangements and governance processes impact distinct minority groups located in border zones.

Implications for Spatial Justice Theory and Practice

The Prespa case reinforces the theoretical understanding of spatial justice as multi-dimensional, encompassing distributional, procedural, and recognition aspects. [40] It vividly demonstrates how these dimensions are intertwined in a real-world setting: distributional inequalities (e.g., water access, economic opportunity) are often rooted in procedural flaws (weak governance, lack of participation) and failures of recognition (ignoring downstream impacts or minority needs). Practically, Prespa underscores the limitations of purely project-based approaches to addressing deep-seated spatial injustices in complex regions. [18] While projects can pilot solutions and build capacity, they often fail to achieve systemic change without being embedded within effective, long-term governance structures and addressing underlying power imbalances and resource conflicts. It highlights the need to shift towards more integrated, adaptive, and place-based strategies that combine environmental protection with equitable socio-economic development, explicitly addressing distributional outcomes, procedural fairness, and recognition of all affected communities. The case also emphasizes the crucial role of non-state actors, particularly locally based NGOs like those in the PrespaNet network, in bridging governance gaps, fostering transboundary communication, generating knowledge, and engaging communities. However, it also points to the need for better integration and support for these actors within formal governance frameworks to ensure the sustainability and

scalability of their efforts. Finally, Prespa is a potent example of how environmental and spatial justice intersect. The severe environmental degradation, particularly concerning the shared water resources, disproportionately affects the livelihoods and well-being of local communities, especially those most dependent on agriculture and fisheries. Achieving environmental sustainability in Prespa is thus inseparable from achieving spatial justice, requiring solutions addressing ecological health and equitable access to resources and opportunities for all inhabitants across the three countries. The intricate interplay between severe environmental vulnerability (water crisis, climate change impacts), geopolitical fragmentation (EU/non-EU border), historical complexities, and persistent socio-economic disparities makes Prespa a critical case for understanding the profound challenges—and the absolute necessity—of pursuing spatial justice in shared, contested, and ecologically fragile borderlands globally.

Conclusion

The Prespa Lake borderland, a region of extraordinary ecological and cultural significance shared by Albania, Greece, and North Macedonia, stands as a critical juncture where the challenges of transboundary governance, environmental sustainability, and socio-economic development converge. This paper has applied the lens of spatial justice—encompassing distributional equity, procedural fairness, and recognition of diverse communities—to analyze the complex dynamics at play in this unique tripont.

The analysis reveals a landscape marked by significant spatial injustices. Profound environmental crises, most notably the alarming decline in lake water levels and persistent water pollution, intersect with considerable socio-economic disparities between the EU-member state (Greece) and the candidate countries (Albania, North Macedonia). Access to essential resources like clean water, adequate infrastructure (transport, sanitation, energy), social services, and equitable economic opportunities is unevenly distributed across the border, often reflecting historical legacies, differing national capacities, and the fragmented nature of governance. Procedural justice is hampered by the slow operationalization of formal transboundary institutions like the PPMC and the challenges of ensuring meaningful participation for all stakeholders, including local communities and minorities like the Macedonian population in Pustec. Issues of recognition, particularly concerning minority rights and the integration of local knowledge, further compound these challenges. While numerous cross-border cooperation initiatives—driven by international agreements, donor funding, and dedicated NGO networks like PrespaNet—have been undertaken over several decades, achieving notable successes in areas like piloting sustainable practices, generating data, and fostering dialogue, they have proven insufficient to address the systemic roots of spatial injustice in the

region. A persistent gap exists between project-based interventions and the transformative, long-term, integrated governance required to manage shared resources sustainably and ensure equitable development for all inhabitants.

Fostering spatial justice in Prespa demands a concerted and multifaceted approach. Strengthening the formal PPMC structure with adequate resources and political commitment is crucial but must be coupled with enhanced mechanisms for genuine multi-stakeholder participation, particularly empowering local communities and NGOs. Addressing the critical water crisis requires binding, equitable transboundary protocols for water allocation and pollution control, grounded in shared data and monitoring. Targeted investments are needed to bridge infrastructure gaps and promote sustainable livelihoods, particularly in disadvantaged areas, focusing on water efficiency, renewable energy, waste management, and inclusive ecotourism. Explicit attention must be paid to ensuring the rights and recognition of minority groups.

The Prespa case offers vital lessons for understanding and promoting spatial justice in other complex borderlands globally. It underscores the necessity of analyzing justice through an explicitly spatial lens, recognizing the profound impact of borders and geography on the distribution of opportunities and burdens. It highlights the limitations of fragmented or purely top-down governance and emphasizes the need for integrated, multi-level, participatory approaches that bridge national divides and empower local actors. Ultimately, achieving a sustainable and just future for Prespa requires moving beyond ad-hoc projects towards building resilient, equitable, and collaborative governance systems capable of navigating the inherent complexities of this shared natural and human landscape. The path is challenging, but the imperative—for the environment, for the people of Prespa, and the principles of regional cooperation and stability—is clear.

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Towards the “Playmaker region” model Defining the emergent traits of a new epistemic model for the strategic understanding of regions

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Abstract - The article examines current paradigms for regional development and transition in EU, analyzing their generative frameworks in search for hegemonic strategic representations and alternative, locally emergent models. In order to define a possible pathway for sustainable innovation, a critical analysis of the epistemic paradigms that interpret territorial phenomenologies and produce strategic visions is necessary. The relation between EU spatial policies and Albania's 2030 national plan is used to highlight how dominant frameworks are used and applied in integration processes. In this operative context, the notion of Transition is tackled as an ambiguous term that needs, in order to be understood, to be put in a concrete historical and spatial perspective. The article explores emerging alternative models, using Albania, and the cross-border regional of the Ohrid lakes area as an "acid test" to highlight the fragility of current strategic paradigms and the emergent alternatives. In particular the notion of "Playmaker region" is formulated, as both a specific spatial & environmental condition - an emergent phenomena - and a potential model to think territorial transitions in EU. This model articulates discursively the different epistemic frameworks and proposes a new role for cross-border regions dominated by natural assets. The article defines some invariants and features that identify the "Playmaking" action in regional strategies and geo-political positionment.

Keywords - playmaker region; epistemic model; emergent traits

Introduction

This article contributes to broader research on Lakes Ohrid and Prespa, examining the hypothesis that achieving sustainable cross-border integration in regions dominated by natural resources requires a reimagining of the prevailing epistemic and operational frameworks. Specifically, it advocates for an update to the hegemonic paradigms underpinning current EU policies for spatial integration and territorial transition.

The article is structured in four parts:

Part 1 offers a critical observation of the Inherited Paradigms through which we currently interpret spatial integration within the EU in cross-border regions.

Part 2, explores the multiple dimensions and problematic aspects of Transition policy.

Part 3, focuses on Albania as a test-terrain to evaluate operative consequences of current policies and frameworks of understanding in order to verify whether its cross-border territories can give hint to valuable epistemic alternatives.

Part 4, explores the notion of "Playmaker Region" and the guiding traits of this approach, as a counter-deduction inspired by the values and opportunities

brought by the analysis of the Ohrid lake case-study.

Inherited Paradigms

In order to prepare our strategic gaze to imagine the future evolution of cross-border territories dominated by natural assets we should first of all analyse what's in the toolbox of planning, and verify if the instruments we have are adapted to new emergent challenges. Observing the evolution of planning in the last fifty years in EU we recognize a dominant thread of political and societal ambitions, epistemic paradigms and spatial strategies, that have deeply influenced national and communitarian (EU) spatial policies and still do.

Linear growth & Competition

The big picture of territorial transformations illustrates the first feature of inherited paradigms, that is to say, the disciplinary primacy of economic sciences and more specifically of geographic economy, over other competencies and scientific domains of strategic thought such as Planning

or environmental studies. Over the years, this fundamental condition defined the filtering lenses through which to interpret existing spatial conditions and anticipate future orientations. The expectations of Linear, exponential growth dictated the line, bending territorial identities and vocations to the reductivism of economic models. The regional scale has progressively emerged as a space that would allow to manage and distribute growth in a uniform, coherent ensemble, allowing to shape each territory on the ideal model of perfect distribution and balance [2]. Within this framework, the diversification and specialization of the region's sub-areas aimed at controlling the distribution of specific attractor programs and to orient the fluxes of commuters and visitors along connective corridors of development [3]. Zooming out at the European scale, this model offered the illusion to insure inner balance and growth redistribution to each region, while enabling external competition among different regions. Unfortunately, the logic of economic competition for capital attractiveness, does not respect the ideal boundaries of geometric models and produces unbalance and fragilization in the very urban heart of central localisations.

Functional reductivism

The epistemic foundation of this strategic approach to regional organization is defined as the Functionalist model, which organizes programmatic offers in a space conceived as "rationally structured" – a neutral support for economic action (Conti). As Joel de Rosnay points it out, this was the latest result of a long tradition of positivistic analytical theories of spatial economic organization based on a cognitive strategy that reduced factual reality to simple, discrete elements that could be analyzed separately from one another and from the whole they belonged to. This resulted in the structuration of knowledge into distinct disciplinary domains and, as a corollary, in mono-thematic sectorial policies for spatial organization.

Polycentrism and the project of space

These ideal models are transformed into tangible spatial strategies through the adoption and dissemination of the Polycentric approach to regional organization. The raise of the Urban age,

with the collective focalization on metropolitan areas as growth machines that could produce a high percentage of GDP despite hosting a little minority of world population, resulted in wide spread diffusion of polycentric visions around EU. An archipelago of specialized centers would be connected by a dense grid of rail-transport systems, allowing for capitals and workers to fluently move from one attractor to the other. It is not astonishing, that in a strategic vision focused on the trajectory and localization choices of enterprises and capitals (financial, and human), key elements of regional spaces, such as environmental systems, living communities, landscape values, where reduced to reduced to the rank of background noise. Over the years, and starting with the ESPON inquiries on EU spatial condition of the 60s, Polycentrism has been at the core of very different spatial visions for EU and its trans-national dimension:

The **Megalopolis EU** was a first tentative, led by the CRONWE – an NGO of northern-Europe planners, that applied J. Gottman's ideas for an American megalopolis to the EU territory, essentially trying to cluster and connected the areas where urban density was higher, under a coordinated economic strategy.

The **Blue Banana scheme**, developed by the French Datar in '89, preparing for a vision of "united" Europe and in order to find a specific space for France and Paris. This vision represents an urban galaxy going from London to Milan, that binds together approximately 100 million people and serves as a symbol of connectivity and economic vitality across major European cities.

The **Polycentric N-O.** is a vision contained in the EUROPE 200+ report by the European Commission. The study identified EU's economic engine within the "Central and Capital Cities" (CCC) of the northeastern European region (Zonneveld). This report represents, of course, the triumph of a polycentric approach.

Over the years, alternative visions have emerged alongside the focus on economic locomotives, trying to decline polycentrism over natural economic resources. These visions are rooted in the identification of remarkable territories for touristic economy purposes (The Mediterranean, the Alps, the Danube, the Baltic sea), and have been the

object of interreg programs (2,3,4) led by networks of city.

A Plan for Europe?

The Visions we have mentioned, all influenced by the functionalist economic paradigm, where finally not implemented per-se as a Trans-national plan for EU. Though political and economic integration moved on through the years, spatial issues did not follow the same logic. The reasons for this is a prevailing logic in National systems, that reserves spatial design to the control of single states. The idea of a supranational plan—a spatializing vision—carries normative and restrictive implications, and delegating such power to supranational institutions raises concerns. Europe is also composed of very different urban cultures, legislative frameworks, and administrative tools for spatial design and governance. Harmonizing these diverse elements into a cohesive vision poses significant challenges. In other words, the quest for a trans-national European spatial project crossed complex political, cultural, and administrative settings.

Nevertheless, a strong system of ideas prevailed as the dominant frame of reference across boarders : the idea of Polycentric organization of regions, the strategies for economic specialization and the consequent mobility structuration did influence national and trans-national policies. Even though we do not have a spatial planning vision for EU's future territories, we can definitely recognize a plan "à l'œuvre" if we observe the strategies for Trans-European Transport Networks (TENs). These networks intertwine public and private investments, shaping spatial connectivity today, and (tomorrow) stronger political integration. TENs combine mobility and logistics systems across the entire EU territory, flattening, standardizing (and controlling) access conditions for the flows of goods and people. The TEN plan, extends beyond the continent in the network of Mediterranean and Atlantic sea-highways, delivering the utopian image of a fluid continent, where geographical and political boarders dissolve into liquid earth (AVALANCHE – TVK-KH STUDIO-AB). In this vision, physical space mimics the flattened and abstract features of the ideal functionalistic models for regional organization. The perfect image of a "Business plan Europe".

An Hegemonic consensus

The paradigm we have described, constituted a long-lasting reference for regional spatial policies around Europe, becoming a reassuring and automatic go-to, not only for designers and public authorities that managed space design processes, but also for those actors (policy makers, financial institutes, insurance companies, development companies) that relied on the "consensus hegemony" of such paradigms to orient themselves when operating in the realm of spatial transformation processes and regional development. The effectiveness of this referential of ideas and tools, relies on two aspects :

On one side the epistemic nature of the referential, which, being derived from the realm of Economy theories, has profited of a positive confirmation bias in all those operative domaines oriented towards capital accumulation and growth.

On the other side, the conceptual and visual aspect of the referential, built on easy-to-grasp geometric concepts of centrality, polarization, linear quantitative increase, gave to non-specialists, the candid sensation that urban phenomena could be easily understood and governed through a system of simple receipts. Complicated, and articulated steps, of course, but predictable, and mangable

after all... or a wishfull illusion.

Through the years this culture of development became a template for collective action, and brought us to touch the limits of growth (D. Medows), unleashing a plethora of unexpected negative counter-effects that justify the current urge to find alternative approaches to regional organization and transformation.

The challenges and opportunities of Transition-S

Today, the communicative effectiveness and the inertial energy of the inherited frameworks we have described confront with the pathways of Transition. What comes under the term Transition can be seen in two different ways : 1 -as a process dictated and governed by human societies towards a more sustainable tomorrow - a terrain for strategic confrontation of ideas on what future should look like; 2- as a environmental and societal revolution we are immersed in, with little hope to plan or anticipate our way through it. In both acceptions, the inherited protocols to plan and organize our relation with environment are challanged and proven fallacious. Both acceptions challange current approaches to planning; it is worth exploring them in order to elaborate alternative pathways.

Transition as an unplanned revolution

Transition, if seen as a process of disruptive change we simply happen to be immersed in, comes as an urgent "last call" for Humanity to save it-self. It arrives in a moment in time, in which our planning capacity is challanged, not by the lack of advanced forcasting methods, but by the lack of meaningfull, shared, long-term visions that could allow to orient the navigation of an era in which earth is shattered by interconnected, extreme revolutions. Spatial and environmental crisis are a Bio-political crisis. Climate change promises to alter the relation of men to its living environnements in radical ways – to such a point that insurance companies, in 2024, allready stopped covering sensitive geographical areas such as USA coast-lines. And all this while local human organizations are shattered by the incremental explosion of the global techno-financial domain boosted by artificial intelligence and its societal impact. Together, these forces herald a profound transformation in the fundamental dynamics of production, consumption, and distribution of goods on the planet, and question the attribution of meaning and social values of the old urban age. When it comes to Planning we can observe a series of consequences:

In terms of Time dimensions. These changes impose to think both in terms of urgency and of long-term impact, illustrating the failure of the long and slow process implied by policy making. Planning appears like an old-school, ineffective anticipatory instrument. It seems like by the act of Naming historical phase as "Transition" we hope to gain some control over its dynamic evolution. Transition will be about defining the tools to accompany transformations in real time, while setting control boundaries.

In terms of political governance. Authoritative institutions that in the past defined planning ambition horizons (nation-states, communities of states, regions) see their power to impact and govern the needed action decrease rapidly, if compared to Major cities (concentrating population and CO2 production), large multinational companies (shaping the world-wide flows of goods and information) or autonomous groups of citizens and bottom-up actors (free to incarnate a concrete political dimension that moves beyond the limits

of representatives democracy). Leaving these new emergent powers use the old toolbox of planning – shaped upon an economic functionalistic premise- risks to definitely alienate from the field of concrete planning issues such as : public/general interest, ecological balance, social justice, territorial instances.

Transition as battlefield for alternative future-S

On the other side, Transition, if meant as a multi-generation strategic project for the transformation of the Human impact on earth's nature, is a complex notion, hard to reduce to simple figures, and demanding of cross-disciplinary and inter-policy perspectives to be defended and implemented. Ecological Transition is often understood as a conceptual umbrella, covering the various fields of the battle against the climatic, social and environmental consequences of decades of unleashed industrial and urban development. But what might appear as a consensual revolution is, in practical terms, a battle-field of opposing ideas and perspectives, as the decreasing consensus in COP world meetings seems to confirm.

Within the distant Horizon of Transition an arena is revealed, where radically distant futures confront. The delta-gap among different ideal(l)s of future Transition spans from the Paradigm of de-growth and of a post economy society prepared for authonomization and secession from the urban (Marot, Faburel) to the hyper-liberism of company driven planning, preparing for a inter-planetary, digital transhuman age. Alternative narratives emerge and are championed by diverse interest groups within politics, civil society, and the cultural sphere. Curiously, each group seems fully empowered within its own echo chamber of consensus. However, this empowerment often transforms vision-making into a tool for promoting blind motivation rather than fostering inter-sectorial democratic consensus through open debate and constructive confrontation.

In the planning realm, we observe the emergence of new needs:

-The need of new approaches to Vision Making, capable to define societal meaning, and step-by step motivational strategies, in a post-planning perspective. Accompanying and expanding a missing democratic arena for confrontation upon spatial transformation topics.

-The need to define new paradigms for territorial transition in which alternative, emergent visions of the future can dialogue, going beyond the mould inherited from the 19th century economic theories models.

We have sketched a general panorama of alternative epistemic approaches to the term Transition and their implications for planning. It is also important to observe how this paradigm is mobilized by public institutions in official Policy making. This should allow us to understand the current evolution (and needs) of the strategic framework we are currently operating in as well as the role the project of space is playing. In order to conduct this observation we will move from the general EU context to the borders of neighbouring countries.

Transition in EU – a fragmented frame of reference

In recent years, the European Union has deployed various policies to stimulate and govern transition. We can mention the European Green Deal, which aims to make the EU climate-neutral by 2050; the "Ready for 55%" package, which aims to reduce greenhouse gas emissions by 55% by 2030; and

the Just Transition Mechanism (JTM)-economic fund and support and financing system-which is established to accompany the geographic areas and social spheres that will suffer most during the transition period. The main focus of EU's programs is the area of economic and productive policies, and despite references to founding texts such as the Burtland Report (1987) or the European Landscape Convention (2000), which assigned a key role to the project of space and of the environment in order to structure long lasting socio-cultural transformative visions, in current policies, the project of space appears to be relegated to an ancillary and supportive role to economic orientations. To get an approximative idea we can take as a reference ratio the budget of the "Investment for Jobs and Growth" (IJG) for 2021-2027, resulting in EUR 369 billion and that of "Next Generation EU" – 750 billions, and compare these with the financing of spatial planning related programs.

When examining European policies that reimagine the design of urban spaces and territories, we encounter a multifaceted and fragmented scenario. Without presumption of exhaustivity we can mention the framework and goals of some major programs :

URBACT processes focus on urban and territorial dynamics. Co-financed by the European Regional Development Fund (ERDF), they primarily serve as platforms for learning, experience exchange, and dissemination of best practices. Their overarching goal is to foster a common cross-cultural understanding among representations of cities and territories across different countries. While project proposals are not their primary aim, they contribute significantly to shaping urban discourse.

UIA (Urban Innovative Actions) active between 2014 and 2020, and EUI (European Urban Initiative) 2021-2027 support experimental transition-oriented projects and try and advance conceptual frameworks. Despite their limited budgets (UIA had a total of 372 million euros over 7 years), they prioritize specific actions and thematically themed policies, often with a techno-economic focus. These programs contribute to the evolution of urban practices and knowledge focusing on local experiments.

INTER-REG projects emphasize best practices, but their scope extends to supporting specific policies. Additionally, they operate at the EU frontier, fostering collaboration and integration with new partner countries.

A deeper analysis of these EU's initiatives, the size of their financial budgets and the geographic distribution of its territorial experimentations shows us some critical feature:

1. In EU the Financial Priority is given to technological and productive transformations, reserving a restricted budget for territorial related innovation.
2. The level of technicality and complexity of Transition oriented policy tools makes it hard for ordinary municipalities to enter EU programs or even learn lessons from their results. Bridging the gap between representation and real-world implementation is crucial.
3. EU tools operate within a spatially fragmented logic. They collect success-stories and disseminate them in the community of participants, though not transforming these in generalized policy proposals for fragilized territories. As such they produce widespread communication, and a shared culture among networks of experts, but find hard time translating into broad spatial transformations.
4. Transition, as it emerges from EU programs, is not oriented towards the definition of a cohesive spatial project for EU trans-national space

Transition in EU – regional experimentations for Vision making

If EU programs do not deliver a Vision of the trans-national European space of the future, and rather focus on the valorisation of local success initiatives, it is by looking at another set of international initiatives that we might find some interesting elements of reflection. It is the case of Regional ateliers for vision-making such as : Atelier International du Grand Paris, Luxembourg in Transition, Rheinishes Revier, Lausitz Raumblabor, Greater Geneva.

For the moment these processes remain rare experimentations, that have hard time impacting real planning processes, still based on the corpus of references from past decades. Nevertheless, these initiatives, allowed to test new institutional processes, using creativity to boost inter-actorial dialogues and augment the long time-spans of planning activity with more agile, short-term, tools for strategic thinking and design. In these initiatives new spatial paradigms and methods are developed, around the notion of circularity and environmental neutrality of territorial transformations. The scale of these reflections, vast and territorial, can inspire a new approach to spatial project of regions across Europe.

Albania, an "acid test" for planning

In order to better understand the impact of the paradigms that influenced EU's strategies for Spatial organization and integration in the last fifty ears, as well as current approaches to Transition, it appears useful to turn to current planning strategies in EU's candidate countries. Here the features of EU's Planning tradition, play the role of colonizing ideologies and appear clear on the map – in neat contrast with the organization of territories that in the past have evolved following different, endogenous, logics. At the same time, in distant territories, and under-considered areas, original ideas emerge, that allow to tackle Transition under unexpected perspectives. We will thus use the Albania case as an "acid test". We will refer to Albania's National plan, as an exemplary application of functionalistic strategic organization and polycentrism, and to its cross-boarder natural areas (Ohrid lakes area) as test terrain for a new approach to strategic thinking and vision making.

The paradox of the anvil and the hammer

EU candidate countries face a double challenge: on one side, they are asked to conform in political and economic terms to the levels of development of EU countries, which accelerates their growth processes while inevitably decreasing their control capacity in both economic and social terms; and on the other side they are also expected to invest in "Sustainability", though not having yet the capacity to structure the necessary economic, administrative and social models. The combination of these two conditions prepares the terrain for a risky situation, since as it has always been in the history of planning (especially in the mediterranean area), plans impact long before their physical enactment. The perspective of EU integration, pushes economic forces to take advantage of what becomes perceived as the last instants of old-fashioned urban laissez-faire before the arrival of a new regulatory monster. As a consequence, nations often struggle to simultaneously address the challenges of development and transition. They tend to tackle these two phases sequentially, compressing into a short period what took Europe 50 years: first develop, then cure.

If we observe the General National Spatial Plan

2030 - Shqipëria 2030 - we recognize EU's key-words and diagrams from the '90s (an explicit quote on Christaller's "Theory of central places" is even made in the method introduction chapter as a founding principle). The plan claims taking into account environmental goals but asses a localized and not systematized map of environmental and climate risks. What is called upon to build the national spatial vision is the armature of flows and infrastructural investments, associated with bubbles that represent a rather uniformized grid of interconnected urban polarizations.

The repertory of environmental values, of Natura 2000 or PON protected areas, of water valleys and river lines is of course rich and complete, but it does not constitute a leading system. The current Visions for the future of Albania relies on the same Doxa that informs the available spatial organization of future EU, and will likely face the same struggles : *The economic logic* defines Urban polarization areas, bassins of growth and distribution , and dictates the frame of reference to all the subsequent, ancillary domains. The focus on economic growth as goal per-se risks to boost the automatisms of "construction-industry based planning", consuming land and socio-cultural values at fast speed.

The rapid infrastructuration and connection of "strong urban polarities", produces, by contrast, the emergence of new "unthought territories": a diffused uncontrolled suburbia and, at distance, shrinking regions. Unbalanced development concentrates attention and resources where fluxes are concentrated and produces the progressive abandonment of new peripheral territories, where pollution and climatic effects strike harder, given the lack of control, maintenance and investments. The risk is that of reproducing, what happened in Italy in the '70s and '80s with the emergence of now called "aree interne", i.e. areas with low access to basic educational and health services, in high risk of depopulation, making it hard to confront incipient climate challenges.

The blueprint of tomorrow – in the form of a grid of infrastructures connecting homologated development centres – thinks space as a perfect and simple machine to be completed in all its parts, which will then proceed autonomously granting the expected results. This conception does not take into consideration the variable of time : areas will mutate progressively, activating unpredictable reactions on the overall plan. With current tools we get an image of the future, but not a Kompass to move into action one step at a time.

Learning from cross-boarder natural areas

Within the strategic map of polycentric Albania what might be more relevant for the scope of future Transition are the "inbetween blank spaces". What in economic models is seen as "distances between key economic polarities" (quote). These are huge natural areas, that constitute the linear boundaries of the nation, towards the sea – on the west and towards neighbouring countries on the east, interconnected by linear ecosystemic chains, and assessing the fringes of a potential "Portal nation", between the east and the west of the European continent.

In these white spaces, and more specifically, in cross-boarder territories dominated by natural assets, the usual economy-based receipts have hard time proving their effectiveness. The territories that historically challenged urban expansion expose the opportunities that lay beyond the "limits of/to growth" and expose the "limits of economic models" who defined these areas as "geometric distances" between meaningfull

centers. The peripheral localization - cut aside from central urban poles, the lack of population critical mass, the absence of urban services and of infrastructures, the deconnection from major urban areas of neighbouring countries have prepared the ground for a territorial situation in which values and capitals are essentially nature based, where local communities have organized through cooperation rather than competition, "co-evolving with" rather than conquering local ecosystems. Areas such as the Ohrid lakes, offer the opportunity to imagine Transition not as form of post-development repair, but as a new way to inhabit, care and prepare valuable natural reserves to evolve towards a higher environmental complexity and robustness.

Towards the "Playmaker" Region

How can new regional models help leap-frog the toolkits inherited from the "old continent"? First we need to change our gaze. Current strategies for regional spaces usually envision and sell territories as "Champions" of economic performance, as "strikers" (in sports jargon) - specialized in a specific branch of urban programming (production, tertiary, residential, tourism, etc). The culture of comparative benchmarks has long reflected this philosophy, colonizing distant territories with Central European keywords, hoping to locally implant "success-stories" built on quite different political, social and economic preconditions.

Cross-boarder, peripheral territories, dominated by natural assets force us to change our gaze on territorial development, suggesting new strategic approaches – new regional models. These are territories of diversity, of extreme specificity, not reducible to imported exogenous categories. They offer the opportunity for a game-changing approach to Transition - think the regional territory as a "Playmaker". In basketball, the "playmaker" is the person in charge of distributing playing opportunities to the different members of the team, of maintaining and coordinating a wide and long lasting strategic vision while also supporting to face unpredicted emergencies. The Playmaker uses lateral thinking and peripheral view to keep an eye on the complex dynamic of the game. Imagine the Regional space as a Playmaker implies a transition in values, strategic posture and spatial organizations. The "Playmaker region" is a region in which, starting from an inter-connected and unified systems of "cross-boundary environmental and urban protagonists," a common strategy for multiple nations is envisioned around the same geographical values. Developing this strategic vision means not only thinking about programming from the perspective

Transitions of the "playmaker model"

Epistème : From the functionalistic paradigm to the logic of complex systems

The Playmaker region is a strategic concept that does not try to force the existing reality in the mould of a pre-defined geo-economic models, but originates from the specificity of local living systems, socio-cultural organizations and of co-evolution patterns among human communities and ecosystems. The Playmaker Region model detaches from the recipes inherited from the positivistic culture of mechanical functioning and automatic policy design. It rather expands the reflections of Territorial studies (Magnaghi, Corboz) and of System Theories applied to planning strategies. Using Acoff's terms, the Playmaker perspective should enable the passage from the age of Machines to the age of Systems. In epistemic terms, as Sergio Conti synthesizes it - the Systemic approach identifies reality as

a whole in which the various phenomena are in mutual relationship. It proposes a combinatorial methodology, to organize knowledge and the object of knowledge itself, integrating the critical retroactive investigation of how phenomenon are observed. The systems approach may involve the notion of "bounded rationality", and thus the recognition that certain levels of complexity can only be partially grasped by human intelligence - it is the case of living systems and complex ecosystemic relations.

Under this new paradigm, the regional system emerges from the articulation of internal constituent relations and from the retroactive internal elaboration of external inputs. To the geometric immobility of traditional models, Playmaking opposes a time-sensitive Regional organization, holistically articulating key relations at multiple scales, among different sectorial domains. The visions for Bio-Regions proposed by the territorialist school of thought (A. Magnaghi) are integrated in the Playmaker concept. The Bio-regional features of local territories, are not seen as the foundation of a paradigm for an autonomous, "secessionist" alternative to existing urban sectors, but as broader connectors of existing urban regions within nature-based areas open to strategic experimentations. In a space-time perspective, we can imagine that when the scalar focus of territorial reading is widened, the bio-regions currently set on the outskirts of leading national systems, acquire a new connective position. They can thus take on new roles and contribute to reshaping the overall system. Bio-regions can structure a system of systems in which peripheries re-invent centres.

Development: From competition and growth – to adaptivity and cooperation

In the recent European history, territorial transformations have seen regions compete to attract capitals, enterprises and specialized populations (creatives, tourists, etc). This process resulted in the standardization of urban spaces and territorial identities. Similar recipes for success produced similar spaces around EU, resulting in fast-burning successes. When "city clients" move away from their specialized district: "commercial areas", the "creative districts", the "business quartier", the "touristic destinations" the fragile condition of urban values and spaces - reduced to market products- is exposed.

In the Playmaker region model, development, is no longer meant as expansive and quantitative growth, but rather, as in biological systems, as the progressive augmentation of systemic complexity and robustness, achieved through adaptation and cooperation. The aim is that of increasing the robustness of the region's internal and external definitory relations, and more specifically : - Local and territorial constitutive relations that define the Regional System's cohesion. - Supra-local and trans-territorial relations, defining the potential interaction of the regional system with other systems or external forces. This kind of development conceives the augmented autonomy and capacity of the Playmaker region as a potential asset for the performances of neighbouring territories.

Economy : From financial capital to "capital earth"

If ordinary metropolitan regions struggled during the 20th century to conquer and attract financial capitals in the playmaker region, the presence of ancestral ecosystems and embedded natural resources allows to move towards another kind of capital accounting - "earth's capital" (Stanziani). This Capital, like gold, is not meant to be consumed or

spent, but represents a safety reservoir, that allows human communities to pursue their experience on earth. It is constituted by a rich palette of components ranging from soil components, geological ingredients, natural habitats, living communities, water ecosystems and reserves. It also integrates the ecosystem services the local systems provide to wider territories.

The size of this capital can be assessed by evaluating which financial resources (on which time-spans) would be needed to reproduce on site the same ecosystemic complexity, and to deliver the same "ecosystemic services". What if we damaged local natural systems to promote business as usual growth ? Which price shall we pay ?

The financial price would be incommensurable – which explains clearly why natural values should be assessed as "non negotiable". This value/price will grow increasingly with climate change and environmental crisis since ecosystemic richness rarifies. Just as in the '90s -2000's "Global cities" became the heros of the planetary urban age, similarly in the future, Global reservoirs of naturality, such as the Ohrid Lake, can become the protagonists of a new chapter in the history of human relation to the world. Playmaker regions are built around the concept of preserving and enhancing these reservoirs of "capital earth".

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Boundaries : From inclosed regional structures to open, cross-border coherence operators

The playmaker region is no longer thought as a bounded territory within which to find specialized areas, in concurrential juxtaposition with neighbouring territories. It is rather a system that connects and weaves distant territories across borders in a new whole, reaching far to establish new relation between a shared natural domain and the urban polarities that inhabit it. It is thus a tool for territories laying in different countries to grow "stronger together", rather than competing. A natural region connecting urban regions in a trans-national perspective.

The Playmaker Region articulates a local system with other territorial scales through the intermediation of actors or entities belonging simultaneously to the local network and a supra-local network, the region can thus be seen as an open system that connects elements strengthening overall coherence. This dynamic process, takes into consideration the dimension of time.

In the Ohrid Lake region each territory lives in a distinct historical time, a distinct age of socio-economic development, with the Macedonian sequence, dominated by semi-industrial agriculture, and an aggressive relationship to the lake plain that has led to pollution of the reservoir; the Greek sequence, now integrated to Europe and in the midst of developing an economy of protection and knowledge; the Albanian sequence, stuck in a condition of interrupted modernity. Coordinating the becoming of these three units in a reunited anthropogenic-environmental system means thinking each sequence in relation to its urban and naturalistic '*arrière pays*' and at the same time, in coordination with its neighbours, distributing opportunities for investment and protection initiatives.

Structure : From networks of urban centers - to inhabited connective ecosystems

In the Playmaker region, Natural spaces constitute the founding structure. This allows to avoid thinking separately the space of humans and the space of natural ecosystems, but to rather weave them together as inhabited realms. The bi-dimensional

traditional schemes of interconnected urban polarities gain supplementary dimensions, by taking into account the environmental and the landscape infrastructure. In cross-border areas, environmental values and trans-national natural systems make it possible to recognize new territorial commons, and legible spatial relations on which to establish territorial strategies. In these models, Urban areas are not exclusively conceived in their mutual transport-related relation, but rather as parts of meaningful landscapes. As such, urban sequences can be recomposed and adapted in accordance with their landscape sequence they belong to. This results in an opened and adaptable regional perimeter, capable to integrate and recompose with other vast natural areas.

In the case of the Ohrid Lakes we can imagine the aquatic core area, connecting to the "third lake" of neighbouring agricultural valleys in Albania or the mountain-chains of the Pelister National park on the Greek side. An open system and an interconnecting organization in which urban hubs of different size (such as Bitola or Corizza - among others) can find their place of exchange, contact and service sharing.

Program : From parachuted economic specializations to social empowerment and meaning building

In the Playmaker region, the systemic understanding of constituent elements suggests to think programming and economic specialization, not as the resultant of short-term capital extraction, but as a multi-dimensional choice, that should contribute to the strengthening of social, and environmental contextual durability. For instance, taking the Ohrid example, rather than imagining a reductive "touristic specialization", which would essentially focus on the services to be provided in function of an ideal "client-visitor", resulting in the banalization of program offer and of spaces, in the Playmaker region the focus will be on local populations, social groups and environmental protection. Rather than applying ready-made formulas, this will imply to formulate strategic questions to identify the multiple virtues and conditions future economic activities should grant : Which kind of activity can be beneficial for both visitors and locals? With which perspectives for Knowledge economy ? How can environmental considerations define, limit and precise the kind of service offer to be installed? Can new services be used in different ways, by different publics, during different seasons? How can the arrival of new population contribute to the care of local ecosystems ? These are some of the premises to imagine a socially driven economic model, that might attract environmental-cultural sensitive publics, and institutional investment.

Conclusions – Towards next steps

Our exploration of the paradigms for regional strategies in EU in the age of Transition has shown that Cross-border regions dominated by natural assets hold the potential to become a new reference for alternative territorial models. In particular the "Playmaker Region" proposal articulates strategic thinking moving from the oppositional dualism of - Polycentrism vs. Territorialism - towards a Systemic integration of the two. This strategic perspective opens the domain of spatial regional strategies to new paradigmatic influences of the Transition age, integrating ordinary multipolar urban regions with more autonomous ones, growth oriented territories, with bio-reserve territories and post-growth experimental areas. This model, that is here presented in its initial definitory phase, can help, tomorrow, structure a new approach to the spatial project of a Playmaker EU.

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6.1

What development for the Prespa region? Cultural issues and heritage conservation for the enhancement of local identity and as a catalyst for sustainable development

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Proposals for landscapes and heritage

What development for the Prespa region?

Cultural issues and heritage conservation for the enhancement of local identity and as a catalyst for sustainable development

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Abstract - *Assessing the development of an area requires a thorough understanding of its identity, in order to prevent the economic growth from distorting the peculiarities of the site. In this sense, a strategic project for the Prespa region, and particularly the municipality of Pustec, must adopt a holistic approach, seeking to manage as many aspects of the development process as possible.*

Economic development must be assessed, and consequently guided, with consideration of its impact (cost-benefit) also on the region heritage. Firstly, the impact that an infrastructural, touristic and social development may have on the natural heritage must be evaluated, assessing how the territory will be altered by new roads and urbanization, taking into account both the preservation of natural beauty and the environmental effects on the lake ecosystem. Secondly, the effects on cultural heritage, including the numerous archaeological sites and Byzantine cave churches, should be assessed to ensure their sustainable preservation and fruition.

*Additionally, it should also be examined the impact of the development on the material and immaterial culture of the places. The spread of alternative lifestyles and of increasingly easier connections with the outside world may lead to the decline of traditional customs, affecting not only social dynamics but also architectural and cultural practices. In many cases, rapid development in previously isolated areas results in the abandonment of vernacular architecture in favor of standardized models. Therefore, evaluating sustainable development in the region involves considering the distinctive architectural aspects of the Prespa region and exploring ways to preserve and enhance them to establish a unique identity for the area, including for tourism, while respecting its *genius loci*.*

Keywords - Pustec, vernacular architecture, *genius loci*, local identity, historic centres, basic buildings

Introduction

The recognition and preservation of cultural heritage have long been acknowledged as essential endeavours. However, the criteria for identifying heritage and determining strategies for its conservation have evolved over time. In recent decades, there has been a broadening of the definition of heritage, which was once confined to architectural monuments and natural wonders considered for their aesthetic value. Today, aesthetic and historic significance alone are no longer a sufficient basis for heritage identification. Instead, there is a growing recognition of other forms of value, such as testimonial and identity value, which extend beyond traditional monumental and landscape heritage to incorporate broader cultural domains. Today, the concept of heritage can involve intangible aspects, including anthropological and ethnographic elements like local traditions. Moreover, there is an expanded consideration of material culture previously overlooked due to

its lack of monumental status. This disciplinary evolution leads to discussions on preserving historic town centres and vernacular architecture, including basic buildings, which fall under this broadening of the idea of heritage. The widening of the concept of heritage necessitates the identification of suitable preservation approaches, which may not always be easy to acknowledge. Indeed, as the concept of heritage becomes more and more pervasive, conservation cannot lead to the crystallisation of every aspect of a society's life. Against this backdrop, this contribution aims to explore the heritage of the Prespa region, focusing on the municipality of Pustec. It aims to highlight the region's unique characteristics and challenges, particularly regarding heritage elements that may be rather difficult to identify. Additionally, efforts will be made to propose protection strategies for the area's non-monumental built heritage, which is particularly vulnerable due to its fragmentation,

diffusion, and exposure, especially in the event of rapid and uncontrolled economic development.

Literature review

The dialogue on heritage conservation and enhancement raises recurring questions regarding both the definition of heritage itself and the practical methods to ensure its preservation and utilization. In this regard, the Charters for Conservation and Restoration crafted since the early 20th century serve as valuable documents aimed at establishing a universally recognized set of principles. These charters not only offer practical guidance but also delineate the scope and effectiveness of the discipline. Serving as a fundamental point of convergence among scholars, authorities, and practitioners, they provide crucial guidelines for objectively assessing approaches to heritage.

Italy's unique landscape, characterized by an exceptional density of architectural and archaeological monuments shaped by historic events since antiquity, has facilitated the rapid advancement, compared to other regions, of the discipline concerning restoration and conservation practices. Thus, it's not surprising that Italian scholars have made significant contributions to these charters. Their involvement underscores the vitality of the discipline, which has been cultivated in both academic and practical spheres since the 19th century and further solidified in the 20th century through figures like Gustavo Giovannoni.

Giovannoni's influence on the 1931 Athens Restoration Charter is noteworthy, as his ideas helped shape the principles articulated in that document. The Charter [18] emphasized the importance for nations to care for their heritage and uniform legislation giving priority to public interest over private concerns. Furthermore, it advocated for broadening the study of art to instil in people the love and respect for their cultural legacy. The Charter also introduced the concept of monuments not as isolated entities, but as elements embedded in a context given by the historic city.

The Italian Restoration Charter of 1932 [18]

confirmed the purposes of the Athens document at the national level, expanding the concept of scientific restoration, i.e. based on objective principles. The subsequent Venice Charter of 1964 [18] reflected on lessons learned from restoration efforts post-World War II, emphasizing the principle that «restoration ends where the hypothesis begins». It stressed the importance of avoiding stylistic falsification, introducing the need to operate «with the sign of one's age» in the reconstruction of irreparably damaged portions. Moreover, the Venice Charter broadens the concept of preservation to the urban environment, partly overcoming the idea of a picturesque context, which still permeated the previous charters.

Further charters, including the Italian Restoration Charter of 1972 [18] and international declarations like the Amsterdam Declaration of 1975 [18], the

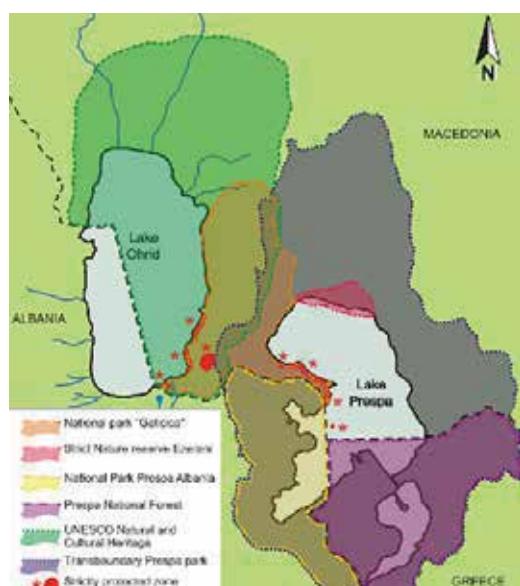


Fig 1/ The division between Albania, Macendonia and Greece of the Prespa Lake. It is possible to see the presence of nationally divided parks.

source/ Kostoski Albrecht Trajanovski (2010)



Fig 2/ The church of St. Mary of Maligrad, interior and exterior, one of the 11 cave churches on the Prespa Lake.

source/ Prophora (2019)

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Washington International Charter of 1987 [18], and the Krakow Charter of 2000 [6], and many others, continued to underscore the significance of preservation, conservation, and restoration. They increasingly broadened the concept of heritage, emphasizing the need to protect not only architectural monuments but also landscapes and historic centres in a widespread manner.

In this context, it is important to consider the Council of Europe Framework Convention on the Value of Cultural Heritage for Society, signed in Faro in 2005. The Faro Convention definitively sanctions the broadening of the concept of cultural heritage, defining it as «a group of resources inherited from the past which people identify [...] as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time» [14]. Furthermore, it is defined how the value of heritage is not intrinsic to an asset, but derives from the recognition of the community, which attaches value to specific aspects of cultural heritage, and consequently wishes to sustain and transmit them to future generations.

On the other hand, the recognition of the structural value of all historic settlements and basic buildings, no longer viewed solely as picturesque background for monuments, undoubtedly owes much to the studies initiated by the school of thought established by Saverio Muratori since the 1960s. This paper specifically acknowledges the contributions of this school, focusing on its typological and morphological analysis of building fabrics, which were further developed and refined by Gianfranco Caniggia. Caniggia's work emphasises the reading of built environment and deepens the comprehension of the historic processes that have shaped it. For Caniggia, comprehending the dynamics underlying the evolution of historic urban fabric is, on the one hand, the tool for identifying the value of the basic buildings and, on the other hand, the instrument that can guide new interventions on the consolidated fabric [4]. His approach seeks to align new interventions with historic logics

preserving the integrity of historic centres and avoiding any distortion of their character.

The Ferrara school, which the present paper intends to be part of, is grafted onto the critical conception of the conservative intervention, as identified by the figures of Cesare Brandi, Guglielmo De Angelis D'Ossat, Renato Bonelli, Roberto Pane, and many others, whose thought strongly influenced the disciplinary dissertations of the second half of the 20th century, conditioning the 1964 and 1972 restoration charters in various ways. Accordingly, Professor Dalla Negra's interpretation of Restoration is aimed at re-establishing the architectural text's legibility, whenever it is mutilated or tampered with or degraded, through an intervention that may be contemporary but is in harmony with the pre-existence [13]. This principle coexists with the conviction of the need for a value judgement on the architectures to assess if they are susceptible only to conservative restoration interventions or can allow for transformation and restructuring interventions. Depending on the value of an asset, it is possible to intervene either in a more conservative or transformative manner. Especially in the case of basic building, it is often possible to recognise a value of basic building types, which enables non purely conservative interventions, but which should be developed in an assonant manner without renouncing design, along the natural evolution of historic basic building types over time [8].

Tangible and intangible heritage of the Prespa region

Heritage protection as an aspect of identity and a driver of development.

As highlighted in the Amsterdam Declaration «historical continuity must be preserved in the environment if we are to maintain or create surroundings which enable individuals to find their identity and feel secure despite abrupt social changes» [18]. Such a belief is the topic of numerous reflections that have been developed over the years, involving both scholars and the Council of Europe's production at regulatory and policy level on culture. While the precise definition of cultural heritage remains a topic of ongoing debate,



Fig 3/ The church of St. Mary of Maligrad, interior and exterior, one of the 11 cave churches on the Prespa Lake.

source/ Prophora (2019)

it is generally identified as the product of significant human endeavours, connecting the importance attributed to the object with the collective memory it represents. Thus, Heritage can be considered a «cultural scaffolding» [5], manifesting the identity values of a community and its evolution within a specific territorial context. This expanded notion of cultural heritage encompasses not only architectural monuments but also a multiplicity of forms, including landscape and natural heritage, as well as intangible heritage linked to the ethnographic values that define human identity.

The Prespa Lake region shows a transversal identity heritage across its different shores, encompassing Albanian, Greek, and Macedonian territories. Historically, the lake has served as the primary communication route connecting the settlements along its shores. The surrounding mountains have fostered the development and preservation of distinctive identity traits shared among these settlements. However, the introduction of national borders in the early 20th century, dividing territories that were once united under the Ottoman Empire (Figure 1), has added complexity to the region's heritage dynamics. Given this historic context, heritage preservation in the Prespa region holds particular significance.

On one hand, it can help strengthening the bonds between the lake's shores, advocating for strategic policies aimed at facilitating cross-border interactions. Additionally, the region's preserved customs, settlement patterns, and natural landscapes offer a unique and compelling touristic attraction, contrasting with the industrialized and densely populated areas elsewhere.

On the other hand, the preservation of heritage also presents challenges. While constituting a potential vector of economic and social development from a tourism perspective, there is a delicate balance to maintain. Development initiatives aimed at harvest tourism have the potential to alter the very heritage they seek to promote. Thus, it is crucial to carefully assess both the potential and challenges inherent in the region's heritage.

To gain a comprehensive understanding of the Prespa region's heritage, it is essential to identify its key aspects, considering both its potential and

vulnerabilities. This holistic approach will enable stakeholders to develop sustainable strategies that can take advantage of the region's heritage for positive economic and social outcomes while safeguarding its integrity for future generations.

Monumental heritage: landscape and architectural monuments

The very first heritage aspects that can be identified in the Prespa region are those connected with a conventional conception of heritage, notably focusing on architectural monuments. These monuments hold significant aesthetic and historic value and are typically identified and protected by regulatory bodies which identifies assets of cultural interest and ensures their preservation. This identification may be subject to refinement following accurate in situ assessments, but it is basically already present in the region. Notably, the region shows numerous archaeological sites, including prehistoric hut settlements and ancient and medieval fortifications. Among the architectural monuments, the most notable are the Byzantine churches built on cliffs and other challenging terrains, serving as hermitages during the Middle Ages (Figure 2). Preserving these buildings present unique challenges, not only in ensuring physical conservation, which cannot be taken for granted in any case, but also in facilitating their meaningful utilization. Overcoming the natural obstacles to access these hermitages requires the establishment of routes and installations that should harmonize with the surrounding context while respecting the integrity of these assets. Maintaining their authenticity and cultural significance requires careful planning and implementation to avoid any distortion.

However, in addition to architectural heritage, another major heritage asset in the Prespa region pertains to the landscape (Figure 3), which was once identified as natural beauty. Nowadays, this term is considered outdated as it is linked to an exclusively aesthetic conception, whereas the idea of landscape encompasses the territory in a holistic manner. This broader understanding recognizes the inherent environmental, cultural, and ecological values embedded within the landscape. The Prespa



Fig 4/ The pristine landscape of Prespa region, from the street to Pustec.

source/ author, Pustec (2023)

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Lake ecosystem, along with the surrounding mountain complexes, is embedded with remarkable biodiversity and environmental significance. While the presence of several national parks across the bordering nations is a positive indicator (Figure 1), there is still space for improvement in coordinating and linking these entities to enhance their effectiveness in conservation efforts.

A significant challenge lies in addressing the impact of intensive agricultural practices, particularly in Greece and Macedonia, on the lake ecosystem. Pollution from pesticides and fertilizers, as well as excessive water consumption, have contributed to a decrease in the lake's water level, posing a significant concern in recent years [15]. Addressing these challenges requires concerted efforts to mitigate pollution, promote sustainable agricultural practices, and ensure the conservation of water resources. Safeguarding the integrity of the landscape and its associated ecological values, is an essential clue for the region to uphold its heritage while fostering long-term environmental sustainability.

Widespread heritage: ethnographic issues and evidence from material culture

In a contemporary perspective on heritage, it becomes imperative to recognize additional elements of the cultural fabric that define the identity of people of the Prespa region. This encompasses both tangible and intangible aspects of culture, reflecting the social traditions and way of life unique to the area. These cultural elements are evidence of the enduring survival of certain practices, often fostered by the region's geographical and geopolitical isolation as a border area.

The demo-ethnographic aspects of the region are evident in the enduring social structures, traditions, dialects, and customs that have persisted over time. Traditional occupations, particularly those related to agriculture aimed at subsistence, continue to rely on pack animals such as mules and horses, as well as manual tools. This permanence is particularly pronounced in the Albanian area, where agricultural mechanization has been slower to penetrate compared to the Macedonian area, which benefits from more extensive flat terrain. Even

the tourist-driven development which has already begun to alter the social compositions of local populations of the Greek region, has not yet made an impact in the Pustec area. Indeed, involving local populations in a participative conservation process is crucial to ensuring that conservation efforts align with the needs and values of the communities deeply connected to the territory. The 2005 Faro Convention underscores the significance of engaging local communities in the conservation of cultural heritage, advocating for collaborative and inclusive approaches. Strategies should be devised to actively involve residents in various aspects of conservation, including the collection and transmission of traditional knowledge, as well as participation in guided processes of urban regeneration and restoration. Additionally, efforts should be made to promote sustainable tourism practices that prioritize environmental preservation and respect for local culture. By fostering greater awareness and appreciation of regional heritage among both visitors and residents, these initiatives can contribute to the long-term preservation and vitality of cultural heritage in the Prespa region.

However, the dynamic relationship between society and material culture means that social changes also impact on tangible aspects of heritage. This often leads to the loss or modification of certain material aspects, such as the replacement of wooden boats with plastic ones, the alteration of traditional lot fences, and the demolition of historic houses in favour of modern concrete buildings. Inadequate regulation of such replacements is a significant factor contributing to the changes in the urban landscape, resulting in the loss of both formal and structural values (Figure 4). While it's essential to empower the preservation of intangible traditions by establishing cultural centres to sustain traditions, festivals, dances, traditional fishing and farming methods, and local idioms, it's equally crucial to conserve certain physical aspects to uphold the region's identity. Preserving these physical elements, particularly architectural structures comprising the basic buildings fabric of the region, is fundamental as they serve as tangible manifestations of the area's building culture. Although these buildings may not be



formally protected like architectural monumental heritage, they are nonetheless vital testimonies of the region's architectural identity. Therefore, it's necessary to critically assess their value and identify acceptable transformation possibilities to safeguard their intelligibility. This approach ensures the preservation of valuable elements inherent in these basic building types while allowing for necessary adaptations.

Therefore, since protecting the historic urban fabric is essential for maintaining the identity of places, it's crucial to comprehensively understand the values embedded within them, so that correct actions can be adequately addressed. Only this understanding will help prevent their loss due to replacement by modern buildings while also avoiding their transformation into static tourist sceneries devoid of any authenticity. By striking a balance between preservation and adaptation, the region can retain its unique identity while fostering sustainable development.

Tools and methodology

Understanding morpho-typological aspects of the basic buildings fabrics as an instrument for preservation

Recognizing the need to preserve diffuse heritage beyond architectural or landscape monuments requires a deep understanding of the underlying reasons and construction methods of basic buildings. Unlike architecture meticulously planned by the critical conscience of a discernible designer, basic constructions often exhibit an apparently chaotic layout. However, these organic buildings fabrics are not products of chance; rather, they originate from a logic of adaptation to the territory and the needs of inhabitants, driven by the builders' «spontaneous conscience» [4]. Such spontaneous buildings involve a non-mediated response to various factors such as local topography, construction techniques, and society structure, aiming to create efficient settlements through a dialectic between human action and environmental reaction. Consequently, a critical analysis of the historic and environmental context, combined with a detailed survey of historic urban design, allows for a deeper understanding of

urban settlement formation, unravelling apparently chaotic fabrics and revealing the underlying logic behind their structure. Through the lens of Muratori and Caniggia's school of thought, the analysis begins with understanding the concept of building type as an «a priori synthesis» of the archetypal house for a specific space and time. Identifying building types involves both a theoretical a priori understanding and an analysis of reality a posteriori, tracing the evolution of the building type over time through synchronic and diachronic variants [4]. In this evolutive approach, building types develop through the settlement of simpler structures on a building parcel, gradually growing and diversifying through successive additions. Building type influences the creation of the urban fabric according to its aggregation capacity. This implies that analysing urban development necessitates a continuous transition from considerations of urban planning to architectural design, and from morphological to typological investigation. This shift in focus is crucial for recognizing the intricate details present in historic buildings and comprehending their evolution over time. For instance, while row houses tend to cluster together forming continuous street fronts, courtyard basic building types do not exhibit this characteristic. To this second typology can be ascribed most of the historic buildings in Pustec and in the settlements around the Prespa lakes (Figure 5). Moreover, conducting a morpho-typological survey serves not only an historic purpose but also provides valuable insights for identifying intervention strategies at various scales (urban, territorial, or architectural). This approach is especially pertinent for municipalities like Pustec, given the ongoing of informal urban practices, in continuity with the spontaneous historic settlements. The objective is to comprehend the evolutive patterns of historic basic building types, allowing for interventions that preserve their essence while accepting a certain degree of transformation which should be compatible with historic buildings while accommodating contemporary lifestyles. This ensures that these buildings retain their authenticity without irreparably altering their characteristics or transforming them into mere scenography for tourists. On a broader urban scale, understanding

the fabric and typologies of historic areas can impact on the planning of new developments, ensuring coherence and harmony without resorting to mere stylistic imitation.

While a comprehensive analysis of all settlement in Pustec may not be possible in this paper due to time constraints and limited data, preliminary observations based on cartographic imagery can provide valuable insights. Not only these observations reveal the peculiar features of the settlements in the Prespa region, but they also underline the importance of employing morpho-typological studies in urban planning and historic centre revitalisation efforts in order to preserve the intrinsic value of existing basic buildings.

Identification of the main basic building types and constructive techniques

The settlements in the Prespa region typically occupy slightly elevated positions above the lake and the adjacent flat agricultural areas, forming a low-promontory settlement type. Examples include Tuminec, Gorice and Madhe, Diellas, and Pustec. These settlements are often structured along secondary ridge-top routes (following the

definitions of Caniggia Maffei 1979) descending from surrounding hills, with the initial courtyard houses clustered near a small church, although this may not always be visible due to urban changes over time. As settlements evolved, new fabric has been often constructed downstream, featuring new flat or pseudo-flat paths, some of which were situated close to the lake before the decline in water levels in recent decades. On the opposite side, toward the heights, stables and sheds are typically located, while flat lands closer to the lake are utilized for agriculture (As visible on Figure 5).

Planting building routes generally follows curved paths along contour lines, maintaining horizontality, whereas connecting routes tend to be considerably sloping. Between two planting building routes, fabrics of courtyard houses are arranged in a loose manner, resulting in historic centres characterized by low settlement density and a significant presence of orchards and gardens, often bordered by masonry fences or wooden palisades. Even with a preliminary observation, some basic building types can be identified, stemming from the base type of 1 or 2 rooms and an open area (Figure 6). The derived buildings are generally more complex, with two floors and more or less extensive wooden



Fig 5/ A glimpse of Gollomboc and Tuminec (Pustec).



source/ author, Pustec (2023)



Fig 6/ Orthophoto of Tuminec (Pustec).

source/ Google Maps

porches (Figure 7).

During the communist era, the marginalization of the Prespa region led to new buildings retaining a similar morphology, although maybe with little more plot regularity. The building boom of the 1990s had a marginal impact on the Pustec area, where, however, courtyard buildings of distinctly modern construction can be found, characterized by the use of concrete and hollow bricks, often featuring classically inspired decorative motifs totally unrelated to the regional context.

The construction techniques employed in historic buildings of the Prespa region are relatively simple and rely heavily on locally sourced materials such as stone and wood, which are abundant due to the mountainous terrain. In some cases, particularly in non-residential structures, unfired clay bricks (adobe) are used. This kind of masonry, often combined with wooden inserts, is probably the evidence of the most archaic construction technique that can be found in the area, which has only survived in some of the more elementary buildings (Figure 8).

In both adobe and stone buildings, wood plays a significant role, serving as anti-seismic reinforcement, inserted in strips every 5/6 courses.

Additionally, wood is widely utilized for floors, roofs, architraves, and intricate overhanging features designed to create terraces and loggias. While the specific function of these architectural elements may vary, their presence must be read in relation to the region's mild climate, influenced by the presence of the lake despite the high altitude, which allows outdoor spaces to be liveable for a good part of the year. In historic buildings, the use of terracotta is generally limited to under-eaves cornices and roofing tiles, while modern buildings feature a much more extensive use of bricks. Consequently, modern buildings appear entirely out of place in the context due to their morphological, typological, and material characteristics. The decay of historic buildings, coupled with the loss of traditional building skills and inadequate urban planning control, often results in the frequent replacement of stone buildings with new constructions that are completely different in terms of techniques and types. This practice irreversibly distorts the identity of the places, erasing the historic urban fabric and disrupting the visual cohesion and identity of the region.

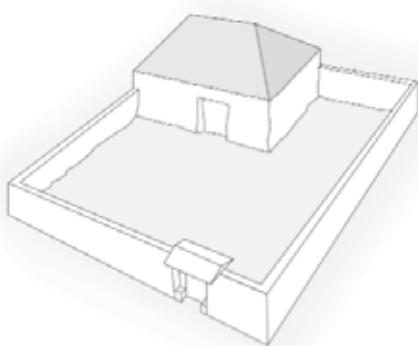


Fig 7/ Base Types that can be seen in Pustec Villages.
source/ Elaboration by the Author



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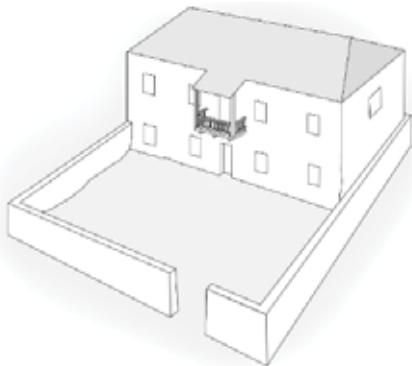


Fig 8/ Advanced courtyard type that can be seen in Pustec Villages. Porches often have a wide variety of configurations.
source/ Elaboration by the Author



Fig 9/ Typical construction techniques: on the left stone masonry with wood strips; in the center adobe masonry; in the right plastered stone masonry with brick mouldings and terracotta roof tiles.

source/ author (Pustec 2023)

Vulnerability and possible interventions

An in-depth analysis integrating history and cartography could serve as an excellent basis for identifying a comprehensive planning and intervention strategy. Understanding the historic routes around Lake Prespa, even those now abandoned and used as mule tracks, can provide valuable insights on how effectively promote the area to attract tourism. This strategic plan, if politically supported, could be implemented across Pustec and surrounding villages, connecting the entire region and leveraging its cultural and natural heritage. On an urban scale, the logics governing the development of the historic built environment, identifiable through a morpho-typological reading, can serve as guidelines for interventions on both existing and new buildings. A thorough understanding of settlement typologies would facilitate the identification of solutions that employ compatible materials, respecting the alignment of buildings and distribution systems. However, it's crucial that this knowledge doesn't lead to attempts to mimic old constructions with new ones. Instead, it should foster a dialogue between modern architecture and historic heritage, respecting the natural evolution of building types while allowing for the technical and intellectual expression of modern design principles. This approach should aim to build bridges between contemporary buildings and the region's rich historic legacy, ensuring the preservation of its cultural heritage.

The in-depth study of historic forms of building aggregation shouldn't be limited in proposals for urban restoration, which often focus solely on street furniture or conservative-chromatic indications on wall envelopes. Instead, it should delve into the analysis of building types within their processuality to establish the «physiological limits of transformability» [7]. By doing so, we can equip ourselves with the necessary tools for conducting interventions that preserve historic fabrics without reducing them to mere scenery.

This comprehensive knowledge is essential for guiding contemporary interventions toward a genuine respect for the *genius loci*, enhancing the conservation of local identity and the promotion of the region's cultural heritage. By understanding the evolutive processes that have shaped building types over time, we can ensure that interventions honour the authenticity and character of the built environment while accommodating the needs of modern society.

Conclusions and recommendations

In conclusion, the local identity of the Prespa region presents characteristics that hold great potential for economic and tourism development. The natural isolation of the area has not only preserved untouched landscapes but also safeguarded local traditions, particularly in settlement and construction practices. However, this valuable heritage faces significant threats from the very economic development it could foster. Consequently, Heritage, in this context, represents both a strength and a vulnerability. While it possesses intriguing and unique qualities, it is also fragile and easily susceptible to damage. Among the most endangered aspects of heritage are the basic buildings that show intact pre-modern typological characteristics. Without careful intervention, there is a risk of irreversible damage caused by unchecked development. To mitigate this risk, it is imperative to conduct thorough studies of these settlement fabrics to elaborate conservation strategies and respectful intervention approaches. This proactive attitude is crucial in order to safeguard the fragile

ecosystem of the region from being overtaken by rapid and uncontrolled development. The ultimate danger lies in the potential replacement of historic fabrics or their transformation into mere tourist attractions, thereby eroding the intrinsic identity of the places. Only by prioritizing the preservation of local heritage, we can ensure the long-term sustainability and authenticity of the Prespa region for generations to come.

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7.1

THE HERMIT - In search of new utopias

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Towards an "Open City" prospective for cross-border landscapes: From confined settlements to Ambiguous Edges - the case of Prespa Region

Julian BEQIRI

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Proposals for settlements,
public spaces and dwelling

The hermit

The architectural trip between objective visualizations and imaginary.

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Abstract - *The architect is a sailor on a drifting boat, searching for the missing architectural form, a fragmentary manifesto that is placed before him at the beginning of his research. Sailing alone like a hermit, he continually searches for a white whale, drawing fictitious shapes on long white sheets, as if to imitate the object of desire, trying to imagine and recreate his shapes sometimes in an obsessed way. On the bow of the boat, the scholar refines his vision day after day. He leans out over an empty ocean, every silence and ever denser color, in search of a new horizon, a limit to overcome. The Omeric journey that the architect undertakes, along the lines of that conducted by Ulysses in the Odyssey, in search of the perfect form, is described through blocks of notes and hidden images of mental maps to navigate the north of the tables. In both stories, we search for a home or a version of it that we keep in our memory, moving from a physical to an imaginary conception of it. Thresholds, borders, and states are crossed to recreate or imagine the possible transformations that occurred in the place of origin. Ulysses finds Ithaca different; the architect imagines the changes that can happen in a place. The mental image and theories that we can find in our drawings during a journey are an undisputed source for the imagination, creating possibilities through the hybridization of what we observe and what we know. The Pustec region gives us the challenge of imagining a utopian reality and the possibility of a new way of colonizing new territories.*

Keywords - Memory, Palimpsest, Architecture, Landscape.

A retroactive narrative

During the international workshop of the double PhD program between Polis University in Tirana, Albania, and the University of Ferrara in Italy, a three-day trip took place in the southeastern Albania region of Pustec.

The focus of this tour was, as per the title of the workshop, "Intersecting Landscapes: Finding New Spatial Visions for the Cross-Border Region of Prespa Lakes and the Case of Pustec Municipality - Albania" to question the possibilities and potentiality that cross-border regions have in terms of developing and future attractive projects and visions (fig.01). To reflect on these questions, it becomes imperative and of fundamental importance to resume the tradition of the Grand Tour expeditions through Italy and the Mediterranean regions of classical antiquity as a final step in the education of European architects. For Charles-Edouard Jenneaeret, later known as Le Corbusier, the voyage across Italy and the Mediterranean region was fundamental to his understanding of architecture. Later on, he completed the tour by a second route 'journey to the east' of 1911, an auto didacticism period exploring

more natural and wild lands to find new spatial exploration missing at the time in the western region of the world. Le Corbusier relates his journey through a variety of sketchbooks, photographs, and letters (Figs. 02, 03). A selection of these works, along with two essays composed in 1914 about Mount Athos in Greece and the Parthenon, were later published posthumously as *Voyage d'Orient* in 1966. In our case the same concept, even if in a different scale, becomes a point of reflection to investigate the contemporaneity defined as "a singolar relation with your time" [01] and the possibilities of the architecture of the near future by searching for the new lands available exploring new possibilities. A journey, in which learning and theorizing are no longer sought in antiquities but rather in those places that have not yet been seen and undergone radical transformations, but which at the same time are searching for new sustainable spatial solutions. Explorers who experiment with theoretical research for the first time and who travel through diversified worlds and landscapes, physically and culturally intertwined places united

by geography defined by the natural element of the lake. This is seen as a body of water generating reflections and potential projects capable of developing and involving the triptych of states that share this natural element.

In this article, we will investigate pieces of literature that deeply reflect on the act of traveling, exploring, and searching for a point. It is important in this specific case to assert that the narrative and descriptive approach of this writing is retroactive, which means, it is produced 'at posteriori' of the trip to the region investigated and is therefore based on memories and mental images and maps that reconnect the architectural tour approach to the of the expedition in search of a distant treasure.

This way of thinking gives us the power to generate more versions to use the new lands the region offers and to improve the scenario for new architecture or livable machines.

Which imaginary?

Herman Melville begins his journey from the crazy Mhanattan, a rapidly changing peninsula around which all the city's commerce develops, from the dizzying trend of verticalism which is increasingly a dominant figure in the composition of the metropolis, defined in the famous *Delirious New York* by Rem Kohoolas with the term 'Manhattanism'.

With this term, the author describes the tendency to obscure the delirious architectural approach in the peninsula during the 1920s, which aims to create a consciousness around the architectural object in question by treating it as the only means capable of defining a new identity in the territory.

Within it, the quadratic organization of the peninsula defines a scheme, or ecosystem, where necessary and inevitably leads to the sea, later understood as a potential water infrastructure.

In the same way, we escaped from the growing Tirana and its vertical matrices of skyscrapers, seeking new tangents that could link "landscape" and "architecture", new ways to make matter and context dialogue, reading the region in which

Lake Prespa resides through devices capable of reactivating its architectural organism.

The journey to the land of Prespa, once called Ligenas, starts from Tirana, the Albanian Manhattan. After we cross the mountainous horseshoe that protects Tirana, travelling eastwards, finding on our road the city of Elbasan and then Pogradec, which overlooks its lake, that of Ohri, three hundred and forty-nine square kilometers of fresh water, where the citizens improvise as fishermen and an architectural walk on its banks becomes a physical threshold where a transition of state takes place: from urbanised to natural, from possession to "Empty oceans (locked up inside millions of windows)" [02].

Once arrived in the Prespa Region, the cadets were amazed by the landscape, a succession of rolling hills illuminated by the sun, lost in an almost infinite body of water. This lake, which looks like a sea, hides every secret, protects stories, myths, and legends. Considered almost like a divinity, Lake Prespa protected its inhabitants by giving food and work, but then, suddenly, an earthquake happened. The lake retreated ten meters, leaving only an ephemeral trace of its ancient limit, while a new land emerged from the underground, ready to be occupied. A new relationship deserves to be built, and new avenues to explore with different architectures.

Thus, we open the discussion dedicated to the trip to the Pustec region, a small municipality in the south-east of Albania, made up of nine urban settlements: Cerje, Goricë e madhe, Goricë e Vogel, Glloboçen, Leskë, Pustec, Tuminec, Shulin, and Zërnovskë. The villages are located in a network made up of three main elements: water, immature infrastructure, uncultivated fields, and above all, a ring of new lands that separates the urban settlement from the lake. The access to the region in question is via a single state road, this one with two lanes, one in each direction, and the region presents itself to travelers after a curve on a hill, opening up the view to the mountains, where the large mirror of water, an abandoned infrastructure, appears. Although there are substantial economic differences between

NORTH
MACEDONIA

ALBANIA

PRESPA LAKE

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Fig 1 / Prespa reagion drawing

source/ author (2023)

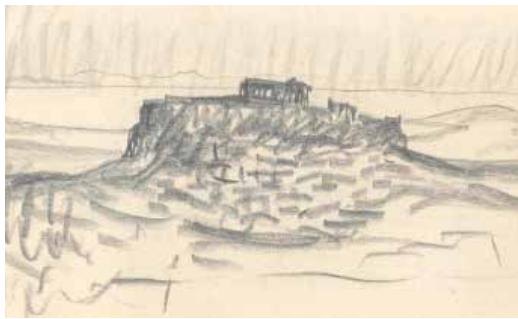


Fig.02 - 03 Drawings by Le Corbusier, taken from his third sketchbook in the Voyage d'Orient collection (1911)

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the three states, the potential is the same; on paper, the territorial qualities do not change, the only difference is how these are exercised and pushed towards their potential.

The territory, part of a buffer zone generated spontaneously around Lake Prespa, becomes a lodestar for all three states that circumnavigate it: Albania, Greece, and North Macedonia. This aquatic system which is the main source of sustenance breaks the political rules and generates various parallel worlds in which the three states are no longer separated, they visually communicate with each other like dispersed brother and the nine villages that overlooked the lake in the Albanian region are now inland, and even if they still see it, they are no longer able to touch it. The relationship between urban settlement and natural elements, as the inhabitants knew it, is now missing, requiring a total reorganization by seeking new projects for the new landscapes available. (Figs. 05-06)

The retreat of the lake changes the rules of the game and generates at the same time crises, new needs and opportunities: defining new thresholds, expanding the lands to be welcomed into the urbanized landscape and outlining new possibilities by re-adapting to coexistence, re-establishing the limit and balance between man and nature, home and landscape.

According to Sara Marini in *Nuove Terre, Architettura e paesaggi dello scarto*, there are three points of tangency between architecture and landscape capable of redefining this relationship. A first point of tangency is defined by the interpretation of the place through the device of the human eye which records nature, a second emerges as a result of the interest in the geometries of places and finally the third point of tangency resides in the temporal scansion where the modification of the object over time becomes the material of the project [03].

Melville embarks on a journey to discover a world made entirely of water, where every space expands, the convention of the north becomes just a star in

the sky, and the hope that it indicates the correct path towards a place that in our imagination becomes home is the only encouraging thought. Shelters that we find in their primordial form, as in Chris Rainier's 1996 images in New Guinea, or as we find explained by Simone Gobbo in *Fuori Registro*:

*"The Greek word *domus*, from which the Latin *domus* derives, has the meaning of the most basic human habitation, an enclosure, that which protects. Making architecture, in this sense, means identifying an area, a place, carrying out a tracing action [...]" [04].*

In the case of the improvised sailor, it will be a shared cot in the hold, defining a new limit to the minimum architectural space-trace or outline of a safe place, where the sense of architectural ownership is maximized.

Or like the iconography on the cover of *Essai Sur l'architecture* by A. Laugier, where in the first pages it explains that the beginning of architecture, as we know it today, is a derivation of the initial archetype or the hut, born out of necessity more than by intention.

Minimal architecture, the reference to Aldo Rossi's Cabine d'Elba project automatically comes back to us, who states in his famous *Scientific Autobiography*:

"With The Cabins of Elba, I wanted to reduce the house to the values it has in the seasons. The small house is not merely a reduction of the villa in scale; it is the antithesis of the villa. The villa presupposes both infinite interiors like labyrinths and gardens, however small they may be, and a locus. The small house, on the other hand, seems to be without place, because the locus is inside, or is identified with whoever lives in the house for a time—a stay which we know may be brief but which we cannot calculate" [05].

The settlements in the Pustec region, although at first glance they may appear simple, rural, and lacking a defined urban tradition, reveal—through careful graphic analysis—distinct characteristics closely tied to their relationship with local infrastructure. This includes not only the road network but also the lake system, which acts as a generative and organizing force for settlement morphology.

In the case of the village of Pustec (fig. 07), for example, we observe an organic fan-shaped development, where the dwellings follow the main road and then open toward the lakefront.

It is also essential to identify internal or secondary rules—often implicit—that subdivide and self-regulate public and private spaces. As a result, three primary settlement matrices emerge, shaped by two fundamental elements: the lake and the road infrastructure. These elements act as spatial devices that structure and regulate the organization of the settlement.

As shown in the diagrams (figs.08), the settlements emerge in a seemingly spontaneous—or spontaneously guided—manner along the road, which represents the only access route to the region.

Nevertheless, the orientation of the houses appears to be directly influenced by the pull of the water, a second crucial infrastructure that supports the

community through fishing and other functions. In summary, the settlements take shape along two main vectors—both infrastructural—that correspond to two essential needs: connectivity and sustenance. The infrastructural device, therefore, not only connects but also regulates how the village grows, profoundly influencing the form and spatial organization of its built environment.

When one of the two infrastructures is absent, it becomes difficult to define a clear rule. However, we can hypothesize that by following the two vectors, it is possible to envision a potential layout for newly emerged or available lands.

In a context like this, the practice of densifying available areas cannot follow a top-down or entirely imposed approach. Instead, it must consider the objective tendencies inherent in the context and align itself with the existing logic and modes of action already present on the territory.

This naturally raises a key question: what is the most appropriate approach to implementing a new settlement? *What actions should be taken to ensure its growth respects the internal rules already in place, while simultaneously attracting culture and tourism?*

Which devices must be activated to make this process both organic and productive? And ultimately, what is *or can be a device in architecture?*

When we consider devices capable of managing and organizing new land, we can imagine them as machines that bring together two worlds: the material one of built architecture and the geometric one of the natural context. The device must act as a hinge between landscape and site, between geometry and architecture.

To engage with the built palimpsest means to interpret it as the interaction of different elements that come together to define an image—that of the city itself [06].

Architectural systems and machinery are described like the white cathedrals by Le Corbusier who in the book dated 1937 argues the European territory and in particular its cities as a *'New world. White, limpid, joyful, clean, clear and without returns, the new world blossomed like a flower among the ruins'* [07].

The white cathedrals that Le Corbusier researched can be associated in our case with the definition of what a device is, as a mechanism capable of connecting. Giorgio Agamben tries to interpret this concept starting from Foucault's reflections, deducing the device as a technique described by three characteristics: 1-A network that holds together a heterogeneous system composed of different elements, linguistic and non-linguistic 2-It must have a strategic function 3-It can describe relationships and/or balance between situations of knowledge and power [08].

Methodology and New Lands

New lands, waste architecture and landscapes.

Sara Marini writes an essay dedicated to reflections on the themes of the palimpsest, of the variations that this word contains within it, and of the architectural gestures that try to coexist with the landscape that welcomes them.

A series of chapters that dig into and subsequently fill in the material gaps that emerge through this gesture, it strongly defines the three-dimensionality

of the landscape, which must not be limited to a two-dimensional vision but be considered as an object with depth, which preserves different energies and layers.

Almost an archaeological parallel is that of Sara Marini, who defines palimpsest, stating: *"If you place a cloth over a surface, it adapts to it in form, but there is no other channel of communication between the two elements. Furthermore, the term 'palimpsest' evokes an action not foreseen in the term stratification, indeed it represents the opposite, which is precisely scratching the surface, erasing the found text and then introducing a new story that has no mediations, no relationships with the present"* [09].

New lands for new layers, devices for new layers, exactly like during the third International Architecture Exhibition in Venice, where in 1985 Daniel Libeskind staged three *'Memory machines'* defining the possibility of architecture becoming a machine, a gear with the power to bring man and nature back into balance by re-establishing a finite result to the initial equation.

The new lands require new projects even sometimes those are already *"spaces whose fate is already sealed"* [10], an imagination capable of deciphering the needs of the contemporary, and an architecture that does not limit itself to existing but that responds to increasingly labile and changing needs as well as the time they go through.

In The City and the Territory, Giancarlo de Carlo has this aspect very clear; already in the first pages, he questions *"What is the city? What is the territory?"*.

Then he continues by arguing that there is a lot of confusion about these two terms, which are often interchanged, in attempting to generate an answer he proceeds with an excursus of systems and trends referring to settlements with classic systems, referring to the case of Thermi, the island of Lesbos he states: *"the city is no longer conceived in terms of buildings, houses, and streets, but the city is conceived in terms of contexts which are relationships between street spaces or square spaces and the spaces built on their edges"* [11].

When continuing with the narrative he comes to define the most interesting characteristics of medieval settlements, in the second lesson, he manages to identify when the city actually becomes architecture: *"The city thus becomes architecture, and the territory amazes, and descriptions of incredible places begin to circulate, at the limits of the known world"* [12].

In the contemporary imagination, it is therefore imperative to take wonder into account, as well as mere function. For reactivating the lands in the Prespa Lake region is not enough to make the project eternal, but rather, we must generate wonder to see the territory in a new way.

But when can we say that the project truly lives an eternal life? When does it not just represent an ephemeral response but become an integral part of the territory on which to found cities?

And again: *"Which works, which books, which objects, which tools, which strategies, which spaces, which places, which stories, which architectures deserve eternal life, and which ones truly correspond to the memory that defines them within us, the opposable thumb of the first monkey who used it to use a tool deserved eternal life and is still ours as we write the memories that are only minimally ours"* [13].

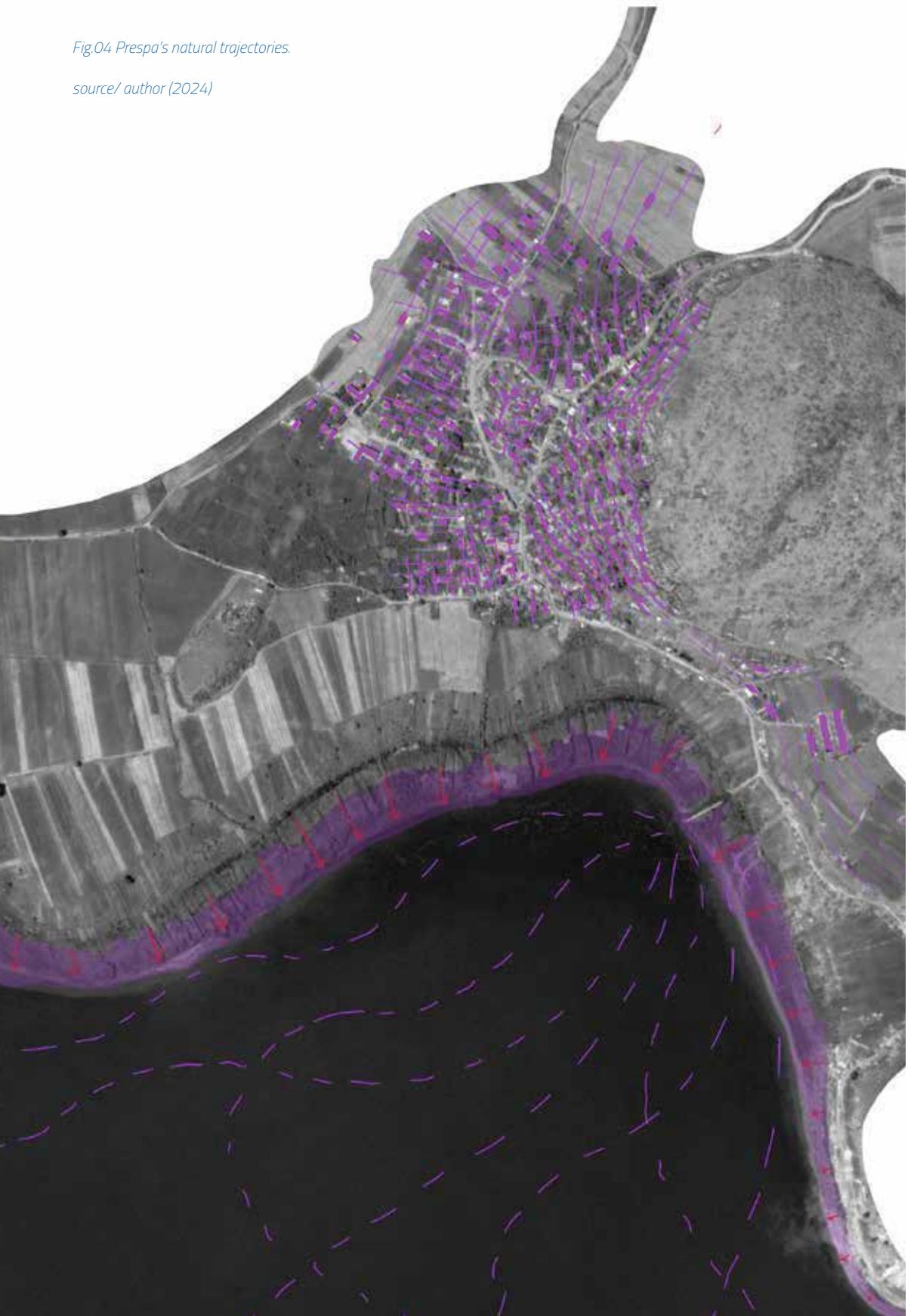
The Pustec region generates different questions, in our specific case, we need to give strength to the eternal life of the already active settlements, not necessarily expanding, unifying, or making them a continuous façade or a new urban area to build in but at the same time don't assume all this shouldn't happen. To activate those settlements, we need to unify their relationship with the aquatic

infrastructure and, at the same time, guarantee some degree of liability, with the hidden world full of possibilities that it offers. The rehabilitation of the buffer zone that the receding lake has generated is the answer to making the project eternal, because the landscape that is generated within the territory becomes eternal.

In 1982, the French government organized a competition for one of the last free spots in Paris,

Fig.04 Prespa's natural trajectories.

source/ author (2024)



Parc de la Villette. Bernard Tschumi was selected by over 470 international architects to develop his proposal made by several dispositives able to rehabilitate and establish on the site a different program compared to the classic one. The "urban park for the 21st century" developed a complex program of cultural and entertainment facilities, what Tschumi did in la Villette was to deconstruct all the functions that we used to have inside a cultural

center in several small architectures and put them in a rigid grid that could cover the site, creating a complex system of multifunctional architecture-machines able to push up the economy and generating a new attractive poles

Bernard Tschumi's Folies project, located in the Parc de la Villette in Paris (1982–1998) [14], stands as a quintessential representation of deconstructivist architecture and serves as a critical examination of

Fig.05 Prespa's natural trajectories.

source/ author (2024)

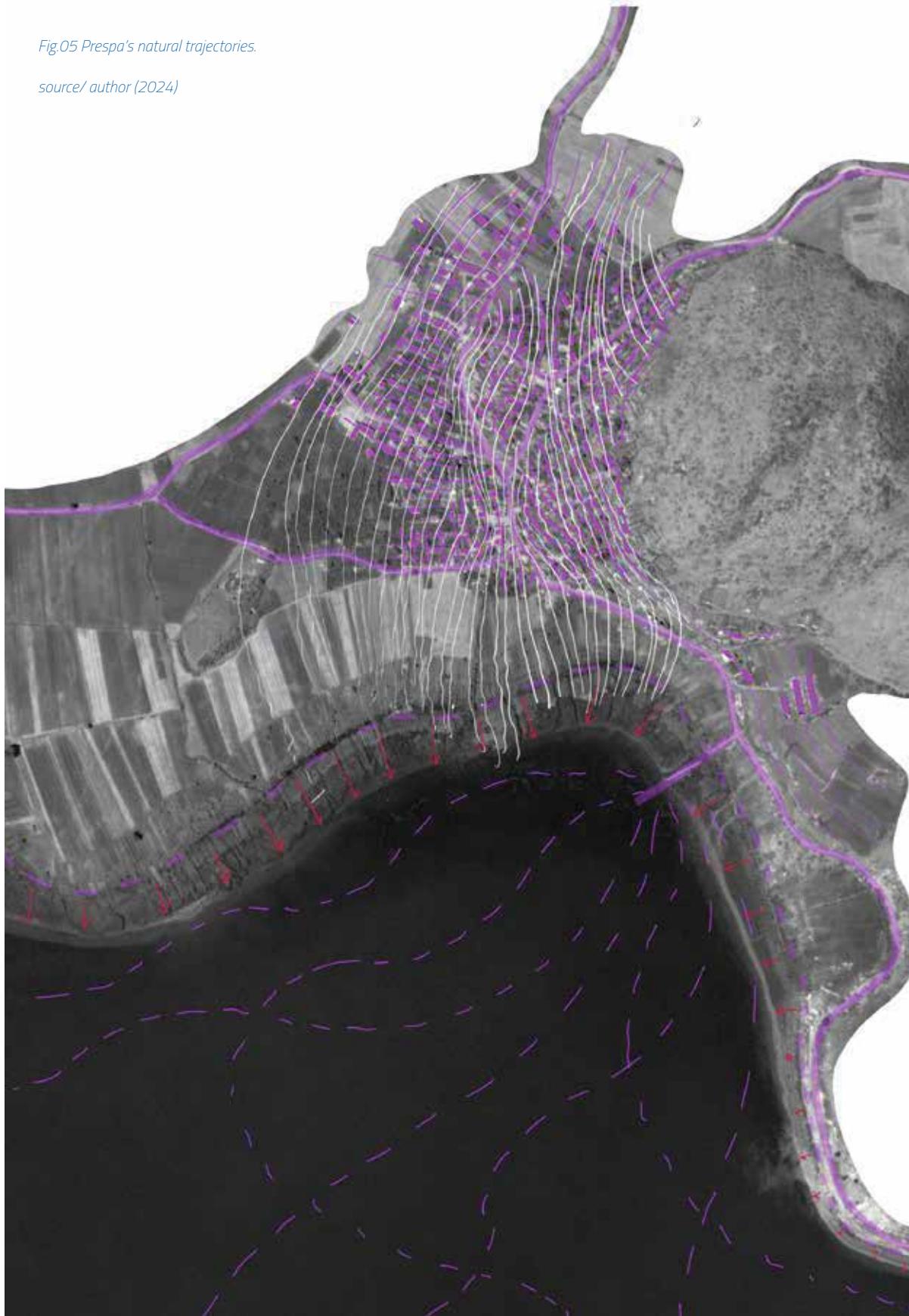




Fig. 7/ Pustec village tendencies

source/ author (2024)

urban spatial organization. The Folies consist of architectural elements distributed in a systematic grid throughout the park, designed to question conventional norms of form and function.

The strategy is founded on the layering of three independent systems: Points, red dispositives juxtaposed in the net interactions. Lines as pedestrian promenades and Surfaces transformed in open spaces for cultural and recreational activities. The Folies project represents Tschumi's interpretation of 'disjunction' between form and function, contesting the established link between space and its application. Influenced by deconstructivism and Jacques Derrida's philosophy, Tschumi suggests an architectural approach that refrains from imposing meanings, instead facilitating them through the arrangement of self-sufficient systems. In this regard, the Folies act as 'conceptual machines' that inspire fresh perspectives on the perception and use of urban spaces. A more contemporary project to expose in this paper is the vision of James Corner with his project of the South Bay Sponge in California. Shows how an innovative model to improve, adapt, and develop urban coast areas shapes an imaginary where nature, buildings, and technology work together for a more sustainable development, improving resilience and soil consumption due to climate change. 'The San Francisco Bay' is considered a very vulnerable community, which is growing rapidly and showing the need for a proper housing strategy. To answer this need, the 'sponge' model adapts ecological infrastructures able to connect nature and new urban areas, creating a healthy synergy between the models. This is able to filter water and allocate the rise of water due to storms into the urban settlements' layout (Fig. 09-10).

The sponge metaphor represents a strategy of accommodating water through processes of absorption, filtration, and gradual management, as opposed to traditional approaches that seek to resist or divert it. This method prioritizes

ecological systems—such as restored creeks, wetlands, and vegetated corridors—over rigid infrastructure, fostering adaptability and long-term resilience. In this way, we can envision a return of Pustec's settlements to a more direct and dynamic relationship with water, where the natural landscape once again becomes an active part of the urban and cultural fabric.

To achieve this, it is essential to implement wetlands, parks, and green spaces that are capable of storing, slowing, and filtering stormwater and rising lake levels. This would be supported by a decentralized network of "sponges"—including retrofitted infrastructure, shared public areas, and water-sensitive private developments—that collectively manage water across multiple scales, integrating natural processes into the everyday life of the settlement.

So, even in Pustec, architects and sailors need to imagine new solutions that can be used for more than just a single function. But the devices must be able to be moved, deconstructed, and reimagined continuously, without end, changing and mobile, they can be repositioned and reinterpreted every season, from work machines to culture machines, punctual connections, like landmarks that every person can refer to in everyday life, but it. It can't be just about new architectures; managing the soil and providing a general scheme are also needed to avoid speculation and soil consumption, while taking care of the lake's resilience.

Epilogue

The contemporary world demands contemporary architecture, grounded in innovative approaches, not merely in monumental gestures or invasive building models. Lake Prespa is for Albania a rare opportunity to rethink territorial rules, prompting new ways of inhabiting the edge, or the limit. By integrating the projects of Bernard Tschumi and James Corner within the Pustec region and the rules we investigated through the diagrams, we can imagine strategies for the expansion of

settlements based on their respective spatial and conceptual frameworks. Extending public spaces and establishing a direct connection to the lake are essential steps toward reactivating the territorial system and rebalancing land use. These interventions not only enhance ecological integration and accessibility but also aim to create a more dynamic, inclusive public realm.

As architects, we must respond to this challenge by adapting our imagination to something as fluid and transformative as the lake itself.

If the emerged land from Lake Prespa can serve as a connecting system between three nations, it may also represent a new architectural and territorial model capable of overcoming borders through design.

By viewing the palimpsest as an opportunity—and combining it with innovative visions—we begin to understand the potential of designing a new floating landscape. Within this context, architecture becomes a total interaction between stratification and spatial organization.

Here, the sites of intervention are no longer seen

as static or purely functional containers; rather, they become conceptual deformations—not of form, but of meaning—capable of accommodating human needs while connecting the territory to symbolic, manifest, or landmark narratives.

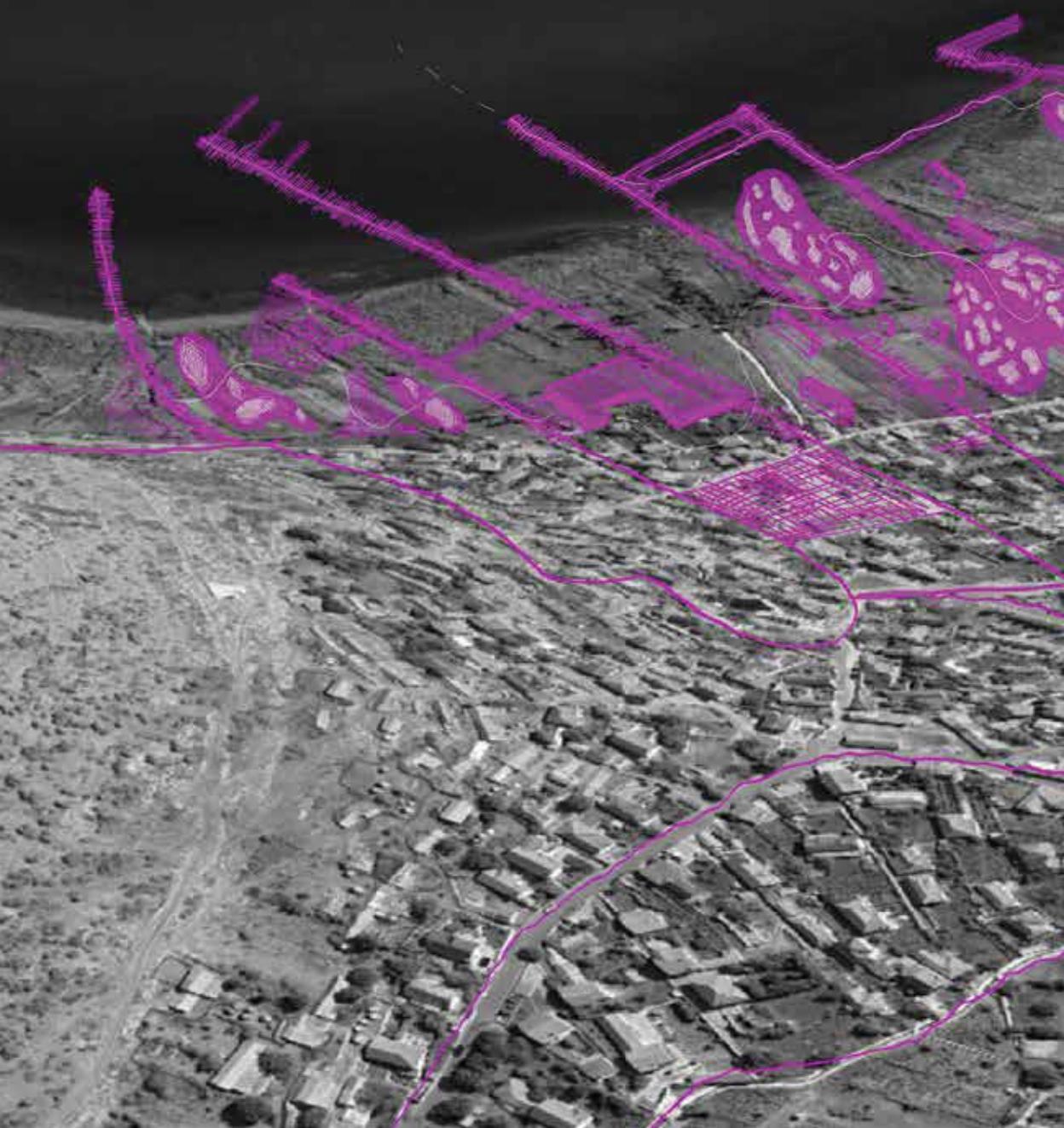


Fig 8/ settlement spontaneous lake guided

source/ author (2024)

Fig.9/ *Sponge model adapted in Pustec*

source/ author (2024)



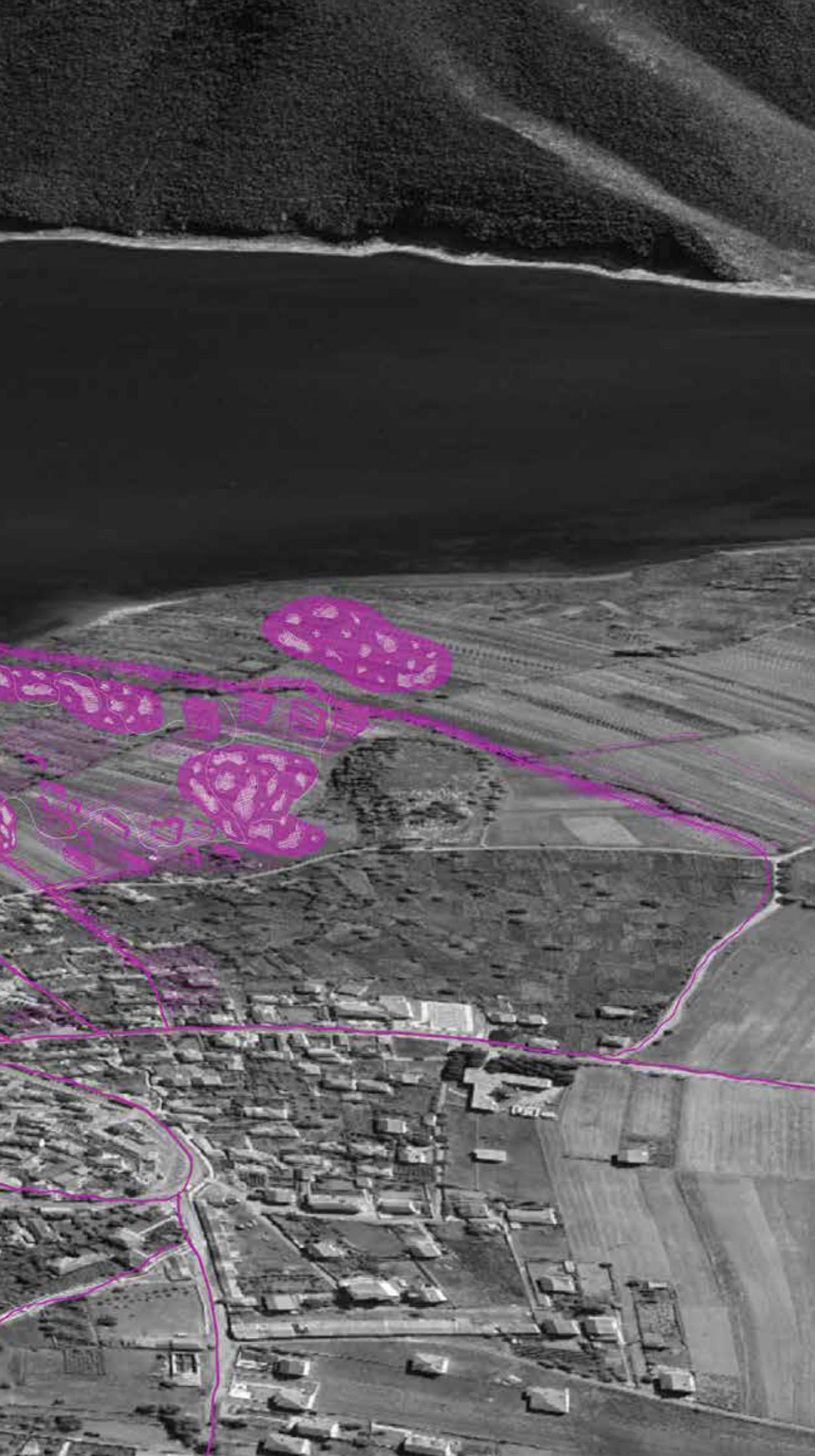


Fig.10/ Pustec development

source/ author (2024)



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Towards an "Open City" prospective for cross-border landscapes: From confined settlements to ambiguous edges - the case of Prespa Region.

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Abstract - While government policies intended for cross-border landscapes across the Balkan countries aim at maintaining a national equilibrium, their individualistic over-determination has broadly nourished a self-centred model of development. In the case of Prespa Lakes Region, state-commissioned strategic plans regularly elaborate on the basis of promoting the countries' own interests but perpetually fail to comprehend the collective regional concerns. Collages of multinational design inventory unceasingly overlay the natural landscape producing innumerable solutions frequently incoherent and ephemeral. This article discusses the historical trajectory of the architectural presence in the region, its non-linear form of development and its ability to combine elements of chance mutation. As confined settlements separated by political decisions, Pustec and other Albanian villages have been enjoying the attributes of a closed system, but, however, the contemporary challenges put forward by the rapid globalization and the accession of Albania and North Macedonia to the EU are questioning these settlements' ability to adapt and economically sustain themselves. In order to reevaluate the region's possibility for international accessibility and exchange while acknowledging its dichotomy as a cultural archipelago spanning three different countries, the Richard Sennett thesis on ambiguous edges will be tested. Rather than entirely refusing the political borders in favour of creating a borderless society a speculative answer for the region as a whole will develop on the Niklas Luhmann hypothesis of autopoiesis, suggesting an open-ended form of coexistence which maintains itself by promoting its own parts.

Keywords - Richard Sennett, Ambiguous Edges, cross-border landscapes, Open City

Introduction

Albania, Greece and North Macedonia share the diverse transboundary landscape of the Prespa Region which is distinguished by the two interconnected lakes, Great Prespa (259,4 km²) and Small Prespa (47,4km²) and the three National Parks of Galicia, Pelister and Prespa. As a restricted geographical area, the Prespa National Park hosts an ecosystem of global significance and one of Europe's major transboundary ecological sites. In 2000, a Joint Prime Ministerial Declaration between Greece, Northern Macedonia and Albania, declared the area a Transnational Park, and in 2013, the Lake Prespa was eventually listed as a Ramsar site. The Transboundary Prespa Park is the first transboundary protected area in the Balkans and its cultural values are recognized and documented by several archaeological sites that span from the Neolithic Age to the Byzantine and Post-Byzantine period. Also, a significant presence of domestic

vernacular architecture enriches the cultural heritage of the whole region. Following the fall of the Iron Curtain, the political events of the 90s completely transformed the distribution of power in the Balkans. While in 1992 communism in Albania was eventually routed, Yugoslavia dissolved into six successor states which in their first decade went through different paths of regime change. Nowadays, the European Union (EU) accession is the foremost aspiration in the region pushing all the constituent countries towards consecutive reformation. However, since only Greece is a full member of the EU, its borders with non-EU states adjacent to the union constitute the actual EU political borders with these states. Under these circumstances, the obligations deriving from this membership to a large degree impede the free movement of people and exchange of capital. According to EU's border crossing policies, "the

abolition of border controls cannot come at the expense of security" (Migration and Home Affairs, 2022) , and until all the countries comprising the Transboundary Prespa Park become full members of the union this territory is compelled to remain a restricted cross- border landscape. While the notion of the neighbourhood as a peculiar urban condition gets to be preserved, there is a plea for an implicit act of socio-geographic unification that would support economic development and at the same time allow the region's population to continue living in its own dispersed way. While peripherality and isolation remain the prime reason behind its closed-system model of development, there are precisely the solitude and remoteness the foundations behind its monastic character. A large number of hermitages and clear evidences of anchorites such as the Hermitage of the Metamorphosis (dated to the 13 th c.) on the eastern shore of The Great Prespa Lake and the Hermitage of Panagia Eleousa (date to the 15 th c.) on its south shore reinforce this identity. As a cross-border landscape the diverse nature of Prespa National Park has been under a constant pressure for order and control, especially during the second half of the 20 th century. On the Albanian side, the over-determination imposed during the communism period has made far-reaching marks on the region's visual form. As George Soros notes on his foreword to Karl Popper's "The Open Society and Its Enemies" (Soros, 2020) , universal ideas can also lead to a closed society if they are adopted by a one-party state, and that was the case of Albania during the second half of the 20 th century. Not only did communism apply a strong hand of authority over the local planning but Albanian cities also suffered the long-lasting consequences of the isolation even after the changing of the regime. A rapid rate and exceptional intensity of growth of the existing administrative centres followed, which in response challenged the normative planning methods, and as Eve Blau (Project Zagreb, 2007) stresses it, "even a literature of transitology emerged sensationalizing the post-communist phenomena". The internal

migration which was harshly prevented during that time later became the main reason for the region's population shrinking. During the 90s, an unprecedented scale of construction marked the post-socialist transition, and even though Albanian authorities continued the drafting of local and national strategic plans, very few of these plans did actively consider the Prespa Region as a transboundary natural landscape. Physically distant from the administrative centres, the urbanity of the region has grown spontaneously creating fragmented communities but extensively diverse. As Jane Jacobs (Jacobs, 1961) observes, it is precisely the unplanned spontaneous growth that is the main ingredient towards having liveable communities. Today, the region appears as an urban habitat cut up into segregated parts underlying the necessity to develop an immediate interface with the landscape.

Methodology

Given the scope and complexity of this research, the methodology applied includes superimposition and speculation, and consider the Prespa Region as a unified territory also freed from administrative restrictions. By acknowledging the boundaries of region's cultural diversity, the theory of Open City is overlaid to its political landscape aiming at inflicting a debate if an open city prospective for cross-borders landscapes is with relevance to Balkan's transboundary territories. This superimposition of contemporary Western theories of town-planning and politically divided territories of South Eastern Europe constitutes the paper's main thesis. According to Jane Jacobs (Jacobs, 1961) , the community is spontaneous and only happen when you are at the local scale. However, beyond the debate between locals and design, one must look at the notion if the applied urbanism can also maintain spontaneity by allowing the emergence of new and undefined forms of development. By recognizing the genetic ability of cities to complete themselves by intentionally leaving sufficient

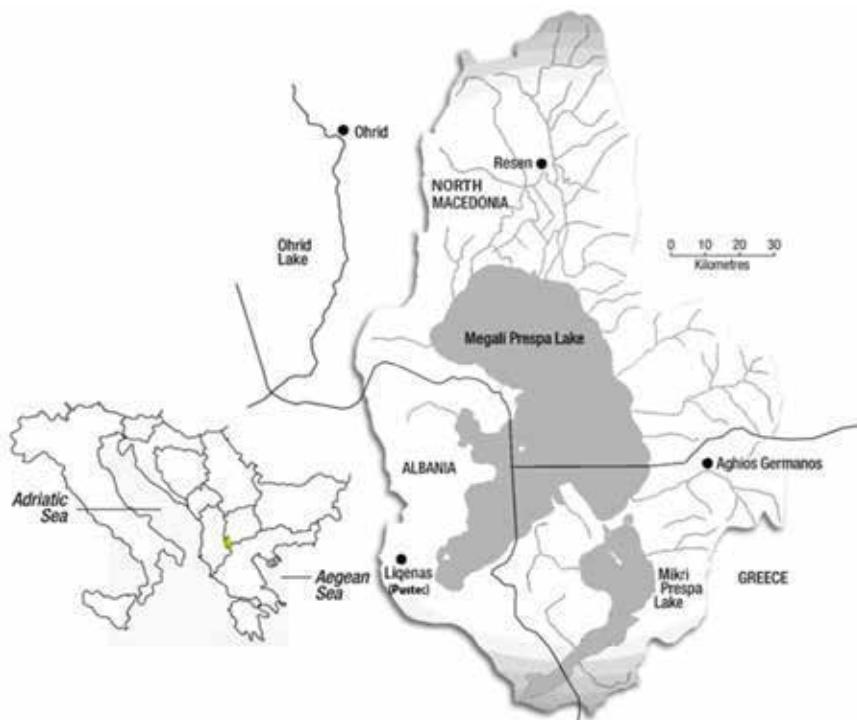


Fig 1/ Prespa Lakes Basin.

source/ Aleksandar Ristevski, (2017)

room within them in order that other forms of coexistence can emerge, a transformation of borders into edges of physical exchange can also happen. Speculating that a closed system of development denies complexity and consequently cause a denial of diversity, too, the application of Open City planning and design principles would change and overturn the status quo of peripheral systems as fixed, organised, hegemonic and internally closed. This research develops around the hypothesis of Prespa Region as a group of three closed systems (Albania, Greece and North Macedonia) characterized by similar linear paths of growth. According to Richard Sennett (GSD, 2013), "mathematically a closed system possess additivity which means that the parts always add up to a clear sum, and homogeneity which means that the parts are directly interchangeable". Therefore, aiming for a common and non-linear pattern of resolution, and by considering the natural landscape as a strong catalyst the Open City theory is argued that can overlay the staticity of these comprising systems. This superimposition of the current situation with elements of Open City theory like incompleteness, dynamism and complexity is expected to highlight the region's unbalanced trajectory of development. As an alternative to traditional regional planning the Open City approach is argued that can facilitate the transnational cooperation, ease the process of ecology restoration and inflict adjustments onto an agriculture landscape already divided on three countries.

Literature Review

The politics of the neighbour

During the 19th century, the dissolution of the Ottoman Empire prepared the grounds for a rise of nationalism in the region which served as the main ideology for the formation of an independent Greece in 1830, Bulgaria in 1908 and Serbia in 1878. However, even after World War I, the wars and political upheavals in the Balkan Peninsula continued leaving the Prespa Region extensively

fragmented. The end of World War II introduced a different kind of division and the establishment of socialist regimes abruptly interrupted the flow of people and capital. While in 1974 democracy in Greece was restored, in countries like Yugoslavia and Albania these changes did not happen until the early 90s. The harsh political situation did affect the relationship between countries adding pressure on the idea of the neighbour and its etymological significance. The re-institutionalized cooperation between politically opposing regimes was not to be seen until after 1991, and as part of a closed-systems that provides security and equilibrium, the region's cultural landscape continued to remain intact and extensively unpromoted. While communist Albania applied the five-years plans model of development borrowed from the Soviet Union, according to James Simmie (Simmie, 1989), "Yugoslavia was the first socialist country to change the system of governance from a typical centralized to a decentralized one". On the other side of the Iron Curtain, the Greek part of the Prespa Lakes Region continued to remain underpopulated until the 1970s when it began to emerge as a tourist destination. In cross-borders landscapes stretched on culturally different countries, the fragility in neighbourly relations comes also due to the pressing need to favour the natural resources over natural cooperation. As a consequence, the urgency to worship the benefits coming from an ever-growing global economy leaves no room for the Biblical injunction to "love thy neighbour". The understanding of this metaphorical rendition by Martin Buber (Buber, 2012) of the commandment to love one's neighbour requires one's involvement in political theology, however, the idea here is to shed light on the understanding of this relationship as aligned with the idea of transnationality and access to shared natural resources. The ethical and political obligation behind the region's fragmented identity calls for a re-evaluation of the concept of the neighbour as a resource. As Dana Hollander (Hollander, 2009) stresses it, both Hermann

Cohen and Emmanuel Levinas look at the Biblical concept of it and reject the love of the neighbour as an ethically productive concept. However, in the case of Prespa Region one must look beyond the intergovernmental relations and seek for substantial forms that would drive people to work for the common good. Considering the region as an amalgam of diverse cultural landscapes, the polity of the form would have to be constituted from the same towns and villages which do not necessarily oblige to each other.

On the necessity of borders

While most European countries have already removed their border controls in favour of a free movement of people, culture and capital, "the Western Balkan region lags behind other central and eastern European countries" (Dabrowski & Myachenkova, 2018). Even though citizens of Albania and North Macedonia can travel visa free to the Schengen area which includes Greece as a full member of the EU, the general thought of borders as obstacles remains. However, to what degree are state borders counter-productive and to what extent do these political territories determine the communities to which people feel attached remains still questionable. In the case of the Prespa Lakes Region, borders as mechanisms of control still remain preeminent thus making little room for other spatial logics to emerge. As the EU enlargement programme is expected to maintain its admission criteria, an alternative approach of cooperation between neighbouring countries is needed. Parallel to the facilitation of the free movement of people and capital this approach must also address the important issues of unknowability and dialogicality in the region.

According to Joel S. Migdal, in the period from the end of the Cold War to the present, "academics and laymen alike have moved away from a view of borders as fixed and hard features of international life" (Migdal, 2004). However, there have been extraordinarily limited periods of state-border stability, and the short history of human civilization shows that seeing states in the Cold War era as givens and the particular division of boundaries on map as a depiction of the permanent configuration of the social and political landscape speaks for naivety and short-seeing. Accordingly, for most of the European territory the creation of European Unions as a unified political assemblage has already eclipsed the permanence of countries' dividing lines. The successful flow of capital and communications across the borders has proved that borders are impermanent features strictly dependent on particular circumstances.

In order to prove the viability of borders one must envision a region cleared of any division lines other than lakes and mountains. Genuinely, people can remain apart and yet mutually aware of the ongoing interaction and even though the territory of Prespa Region consists of three sovereign states the development of its transboundary landscape should inevitably involve the establishment of an ongoing dialogicality on the level of international community. According to Irvin Goh (Goh, 2006), "the term 'international community' after all has been invoked most often times only as an alibi for the justification of the violent decimation of a state-entity by

another of global politico-economic-military leverage", but, however, in this case a form of international collaboration is required precisely to address the plurality of the intertwined political and economic interests of the acting countries.

Integration Revised

While for most of the Balkan's countries, the European integration is primarily seen as equivalent to the embracing of European Union policies, it seems that the term has already surpassed its original meaning and is defining the common understanding of cultural progress in the region. Rather than setting up an environment where various cultures incorporate into a larger structure while maintaining their identity, integration in the Balkans has become a synonym of the universality of recognized, shared and enacted set of values. The society as a whole is quickly embracing the benefits of this imminence adding pressure on the possibility for a long-term dialogicality. On the other hand, the linear tradition of territorial planning and the urge to control any possible radical ambivalence has led to the unbothered continuation of the old and unrelated means of strategic planning, which even after all this time continues to be the main obstacle towards a comprehensive consideration of the region's ecological heritage. Under these circumstances, the ambiguous edges of Prespa's transboundary landscapes should by no means push for the creation of a "living center" which prioritizes certain aspects of the cultural landscape. According to Dan Avnon (Avnon, 1993), "Buber maintained that true community consists of men who have a common, immediate relation to a living center [die lebendige Mitte] and just by virtue of this common center have an immediate relation to one another". As this return to religion addresses the tension between the ethical and the legal-political response it also unveils the biblical I-Thou relationship. Looking at Lewis Mumford (Mumford, 1962) interpretation of Martin Buber I-Thou relations "between visible people who are aware of their personal identity and their common interests even though they may not exchange a word", we see that people are able to gradually manage their differences and strangers to remain strangers without implying that the local community is ultimately the ethical foundation of a city. By doing so, instead of thinking about integration, we could think about locating physical resources that oblige people to be in the same space with those that are different. This kind of amalgamation would prevent the creation of an inclusive local community as the first step towards preventing the solidification of the internally closed systems.

From Transboundary to Synchronicity

The social aspect on transboundary landscapes is conceived as it already exists, assuming it works as an entity established by the joining of each country's separate social construct. But, taking into consideration the cultural diversity characterizing the Prespa Lakes Region it seems that the sociality

comprising it still remains as something that needs to be forged. According to Bruno Latour (Latour, 2005) , "the social happens via networks or how people and objects come together to create the social, which consists of things like culture and knowledge", and as we aim at creating a single entity which will see the region as one, a synchronizing of a wide unrelated activities is required. In Politics, Aristotle (Ellis, 1895) claims that the city cannot come into being by people who are the same, but precisely by people who are different. Therefore, the promotion of diversity remains the main ethical framework involved and an essential ingredient towards forging a transnational cultural landscape. As such spaces of productive coexistence require synchronization, the confrontation with the rigidity of states appears unavoidable. So, rather than a critique of nationalism or globalism alike, the necessity for a re-evaluation of the conditions set by political borders appears also decisive. The transboundary landscape involves an area beyond one's boundary and the set of laws on one side of a

state borders traditionally enforce this separation. According to Migdal (Migdal, 2004) , "boundaries signify the point at which 'we' and 'they' begin and certain rules for behaviour no longer obtain and others take hold". And as the site where different ways of doing things meet, they are likely to be filled with tension and conflict. As Richard Sennett stresses it (Sennett, 2020) , "the one spatial distinction which helps us engage actively with the changing context of time lies in the difference between borders and boundaries", therefore the more open and borderless the city becomes, the more it tends to escape the nation states desire to create order. Due to the prevailing national interests, the formal coherence in the Prespa Lakes Region has given shape to villages whose structures are hegemonic and internally-closed. The perpetual wish for equilibrium and the engagement to maintain a balance and staticity between the national strategic plans and nature itself has fostered the status quo of the culturally divided landscape. However, among other measures

Fig.2/ The idea of a controlled harmony between landscape and city.

source/ Netherlands, paradise of "the Modern Project" - Masterplan IJsselmeerpolders, (1961)



intended to support synchronization in the region, a decisive act toward an open city prospective for cross-border landscape would be the documentation of what Richard Sennett (GSD, 2013) calls "the unresolved narratives of development". This would be the first step towards mapping the incompleteness, non-linearity and the morphological conflicts that give shape to the region's urban form. As planning is quite often seen as an attempt to fuse adaptivity, one of the pioneering projects is the 1961's Masterplan IJsselmeerpolders in the Netherlands where ambition to work with an 'open plan' acknowledged the fact that the world had changed too quickly to plan rigidly. A comprehensive analysis of Prespa Region's underlying motives behind its distinctive character of a closed system shows that the urge of the former communist regime for order and control has been the main influence behind the region's clinical closure and segregation. On the Greek side, as a cause and effect relationship, a state of equilibrium surfaced during that time. This gave shape to urbanized areas which are balanced and static, adding effort to constructing new buildings with an historical look as an attempt to reinforce internal security. There is very little evidence of modernist architecture in the region, and even less of postmodern one. With the exception of Bitola, where the Yugoslavia modernist approach spanned equally across the federation, the rest of the Prespa Region territory relied on additivity and repetition in architecture as typical features of controlled, linear and internally-closed systems.

Conclusions

The presence of the EU as a binding political entity prevents a three-sided opening of borders in the Prespa Region and unavoidably links its permeability with the EU accession of the remaining countries. This adds to the fragility of the area comprised by a mixture of local cultures which under the influence of political upheavals quite often have chosen to favour the natural resources over natural cooperation. Regions like Prespa Lakes appear as closed in time, consequently providing security and a sense of local identity, therefore when addressing fundamental issues of regional planning synchronicity between local cultures must be addressed and promoted. In an ever-globalizing world, enclosed regions showcase significant problems of values as well as of political economy. Under the influence of an ongoing domestic introspection they fail to embrace the benefits coming from the cross-border flow of people and capital. On the other hand, a fully globalized economy shows little empathy towards the cultural heritage and a permanent state of openness can easily dismantle the fragile sociality characterizing isolated regions. As a consequence, any borrowed ideology or applicable theory as a planning instrument constructed through a series of

propositions can exacerbate the problem, rather than making it better.

In order to avoid the denouement of the Open City theory to a conglomeration of informality regardless of peoples' particular recognisability a hybrid version of Open City should prevail. In this respect, the Ambiguous Edges could avoid an explicit implementation of the Open City doctrine while manufacturing

a coherent involvement of unresolved narratives of development. As a hybrid version of Open City, the Ambiguous Edges would maintain the habitat already confined by borders, natural and political alike, but

porous enough so the exchange and communication between countries happen naturally. A region neither totally sealed nor totally exposed would contribute to the re-evaluation of the meaning of borders and boundaries alike on a whole international level.

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8.1

Conclusions

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Conclusions

Conclusions of Policy-Based Issue

Cultural issues and heritage conservation for the enhancement of local identity and as a catalyst for sustainable development

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In this issue, the articles and contributions focus mainly in 'Policy-Based' aspects.

The first part here is concentrated on infrastructure and facilities.

Caterina RONDINA – from Ferrara University deals with "Invisible Infrastructure" rethinking transboundary development by using as an example the case of Prespa Lake Region. According her, the cross border Prespa Lake, stands as an untouched oasis of nature and traditional livelihoods at the margin of the so-called infrastructure between the dividing borders of Albania, Greece and Northern Macedonia. She emphasizes the fact that critical demographic shifts, with an aging population and youth abandonment, contribute to social problems in the few remaining villages surrounding the lake. The Pan-European Corridor VIII investments are crucial, but yet a comprehensive strategy is essential, integrating both transport and social justice to safeguard the well-being of the region's inhabitants and unlock the potential of transboundary water landscapes. Transport is essential for economic activities, mobility, and social cohesion: the purpose of this paper is to explore the "invisible infrastructure," diverging from conventional narratives on traditional transportation systems. According her the cross-border landscape's strategic approach considers area sensitivity and practical interventions by identifying gaps in traditional infrastructure, emphasizing even more the need for a comprehensive strategy. The article further integrates mobility concepts including hiking trails and water-based exploration, redefining the narrative around infrastructure. Focused on Prespa Lake, the vision transcends Corridor VIII limitations, envisioning it as a hub for sustainable exploration and connectivity. Some examples of successful international governance regarding lakes initiatives must be taken in consideration from other European cross-border lakes/regions. Albania and Montenegro also are similarly cooperating such theme successfully, establishing a joint working group and information exchange protocol under the UNECE Water Convention in 2021. However

the "Transboundary Waters Assessment Program" offers also a comprehensive global assessment reference, increasing awareness and fostering cooperation. This means a starting point for the strategy of development and protection is to practically suspend the political borders in such sensitive areas, in order to reflect and maximize the real nature and landscape of such region. Her proposal practically envisions Prespa Lake beyond a geographic entity, instead as a canvas for exploration: the integration of hiking paths and water-based mobility serves as a catalyst for unlocking the region's potential.

A second part is concentrated on environmental systems.

Alessandro dellI PONTI – from University of Ferrara deals with the ecosystem of Ohrid and Pustec Lakes as a playmaker region during the transition towards EU integration of the region between two non-member countries and Greece. He does that by looking into the elements for an ecological approach towards cross-border regional vision-making. Ponti points out that regional vision making and cross-border territorial strategies for European territories rely on a rich list of design explorations conducted in the experiences of the last 40 years in central and northern Europe. These efforts resulted in major infrastructural transformations, grounded in specific geopolitical orientations and supra-national agendas, using heavy infrastructure as a systematic tool to bring access and continuity among urban and productive areas. The architecture of globalization reconfigured the position of boarders and portal territories, defining a new mechanics of international fluxes. In parallel with the weaving of this vast global architecture, the finer grain of local/ regional territorial reconfigurations was the object of planning research, conducted in academia, as well as in actor-relational planning workshops where an intense confrontation of ideas and conflicting transformational models took place, allowing to compare alternative scenarios and destinies. He recalls the efforts to define the image of the Netherlands as an integrated mega-region (the Randstaadt), the process-oriented transformation

of the Rhur, the plethora of "Grander" city Ateliers (Paris, Geneva, Luxembourg), the more recent workshops for German post-coal future regions (Lausitz, Rheinishes), etc. These experiences in these cases produced different models to understand regional territories, and define the potential projects for their transformation. Ponti observes a progressive shift in focus, with the emergence of a dominating interest for the topics related to environmental transition. Nevertheless, this apparently consensual word – transition – is currently tackled from radically different perspectives from different actors, resulting in a potential conflict of strategic orientations. Transition agendas often are also copy-pasted a-critically on territories with a very different story, and which are not in the same phase of socio-economic development, resulting in latent controversies and missed opportunities, which are mistakes not necessary to be repeated in Prespa region. The author explores and confronts the ideas, and paradigms of "transition" as a concept that influence the efforts to define the future of the cross-border regions, including that of Pustec and Ohrid lakes. The investigation is oriented by key question: How to make regions visible? Do they constitute an archetypal regional territory? Do we have ready-made recipes, or shall we induct local models for contextual transformations? Etc. Thus the paper explores the trans-scalar and inter-disciplinary relation between: EU agendas for transition; the national/local strategic vision for the area; and puts them in a critical perspective with the findings of a foot on the ground research-by-design experience. The paper also explores the controversial relation between the inherited agendas for territorial development and the emergent notions of "playmaker territory" and "bio-region" illustrating which methods and strategic operations can help define a model for local sustainable metamorphosis.

Anila BEJKO – from Polis University deals with "Fostering Spatial Justice in Cross-Border Areas" by exploring tools and instruments beyond European regions, using as an illustration the case of Prespa Lake borderland. This author explores spatial justice, as an evolving paradigm in urban studies and regional planning, which encompasses equitable access to resources, services, and opportunities for diverse communities. While this concept has gained considerable attention within European regions and urban areas, this author addresses the research gap concerning its relevance and applicability in non-European cross-border settings. She investigates a range of tools and instruments designed to promote spatial justice in territories across borders and, through a comparative approach, reflecting on whether these tools can work in a specific context, which is that of the Prespa Lake borderland, spanning across three European and yet non-European countries: Greece, Albania, and North Macedonia. The author focuses on the challenges and opportunities associated with environmental resources and development potentials of the Prespa Lake borderland, aiming to contribute to a nuanced understanding of the complexities involved in fostering spatial justice in similar contexts, and especially in the Albanian part of the region which suffers most of consequences related in addition to historic discrimination and self-isolation.

A third part is concentrated on landscapes and heritage.

Daniele ROMAGNOLI – from University of Ferrara deals with the question on "What kind

of development could be proposed for the Prespa region?". He considers cultural issues and heritage conservation as a starting asset for the enhancement of local identity and as a catalyst for further sustainable development. Author tries to assess how to develop an area which involves a clear sense of the identity of a place, in order to prevent the economic growth from distorting the peculiarities of the site. In this sense, he recommends that a strategic project for the Prespa region, and in particular the municipality of Pustec, must be configured holistically, trying to "control" as many aspects of the development process as possible. In this sense, economic development must be assessed, and consequently guided, in relation to the impact (cost-benefit) also on the heritage of the region. To him the first critical aspect is the impact on infrastructural, touristic and social development aspects; they may have on the natural heritage. And this must be evaluated, assessing how the territory will change when a new road and urbanization works will be required, especially in relation both to the perception of natural beauty and to the environmental impact on the lake ecosystem. Secondly, the effects that may be in relation to the cultural heritage, comprising the numerous archaeological sites and Byzantine rock churches, should be assessed to ensure their preservation and fruition in sustainable terms, given also the fact that minority population live in the three bordering countries. The author suggests that what should also be examined in relation to the development of the area is the impact this could have on the material and immaterial culture of the places. The spread of alternative ways of life, of increasingly easier connections with the outside world, could lead to traditional customs being lost or forgotten. This would not only affect social aspects, but also the way of living and constructing. What is often observed in similar cases, when development suddenly accelerates in previously isolated areas, is a rapid abandonment of vernacular architecture, and its replacement by standardized/"modern" building models. So author concludes: by evaluating the sustainable development of the area, therefore, it must involve reasoning on the characteristic aspects of architecture and other heritage of Prespa region, in relation to the actual possibility of preserving and enhancing them, in order to create an identity, also for touristic purposes, of the places, respecting their 'genius loci'.

A third part is concentrated on settlements, public spaces, and dwelling.

Dejvi DAUTI – from Polis University deals with a unique historic almost romantic aspect of "the Hermit", while in search for a new local utopias. The author underlines that the architect is a kind of "sailor on a drifting boat", searching for the missing architectural form in an incomplete manifesto that is placed in front of him at the beginning of his research. Sailing, alone like a hermit (an ancient tradition of the local priests), makes architect continually searching for a "white whale", drawing fictitious shapes on long white sheets, as if to imitate the object of desire, trying to imagine and recreate his shapes sometimes in an obsessed way. On the bow of the boat the scholar refines his vision day after day, he leans out over an empty 'ocean', every silenced and in denser colors, in search of a new horizon, a limit to overcome. The "Homeric journey" that the architect undertakes, along the lines of that undertaken by "Ulysses in the Odyssey", in search of

the perfect form is described by blocks of notes, and hidden images of "mental maps" to search for the north of the tables. In both stories author sees the search for a home or a version of it that profusions keep in their memory, moving from a physical to an imaginary conception of it. Thresholds, borders and states are crossed to recreate or imagine the possible transformations that occurred in the place of origin. Author says; while "Ulysses finds Ithaca" in its own way, the architect imagines the changes that can occur in a place. The "mental image" and theories that architects can find in their drawings during a journey are an undisputed source for the imagination, creating possibilities through the hybridisation of what we observe and what we have in memory. The Pustec region gives us the challenge of imagining an "utopian reality", of narrating a dreamlike journey through three states and a body of water that unites them, but it all must be translated pragmatically in guidelines and projects to local authorities and communities in need.

Julian BEQIRI – from Polis University deals with the "open city" prospective for cross-border landscapes, looking into it from confined settlements to ambiguous edges in the case of Prespa Region. Author underlines the fact that while government policies are also intended for cross-border landscapes, across the Balkan countries they in contrary aim at maintaining a national equilibrium. So, their individualistic over-determination has broadly nourished a self-centered model of development. Where cooperation and coordination is often very limited. In the case of Prespa Region, also state-commissioned strategic plans in three countries, regularly elaborate on the basis of promoting the countries' own interests but perpetually fail to comprehend the collective regional concerns. Collages of multinational design inventory unceasingly overlay the natural landscape producing innumerable solutions frequently incoherent and ephemeral. The author discusses the historical trajectory of the architectural presence in the region, its non-linear form of development and its ability to combine elements of chance mutation. As confined settlements separated by political decisions, Pustec and other Albanian villages have been enjoying the attributes of a closed system, but, however, the contemporary challenges put forward by the rapid globalization are questioning these settlements' ability to adapt and economically sustain themselves. In order to reevaluate the region's possibility for international accessibility and exchange, while acknowledging its dichotomy as a cultural archipelago spanning on three different countries. Author tests in the conditions of Prespa the Richard Sennett thesis on ambiguous edges. Rather than entirely refusing the political borders in favor of creating a borderless society, a speculative answer for the region as a whole develops by him on the basis of Niklas Luhmann hypothesis of autopoiesis, suggesting an open-ended form of coexistence which maintains itself by promoting its own parts.

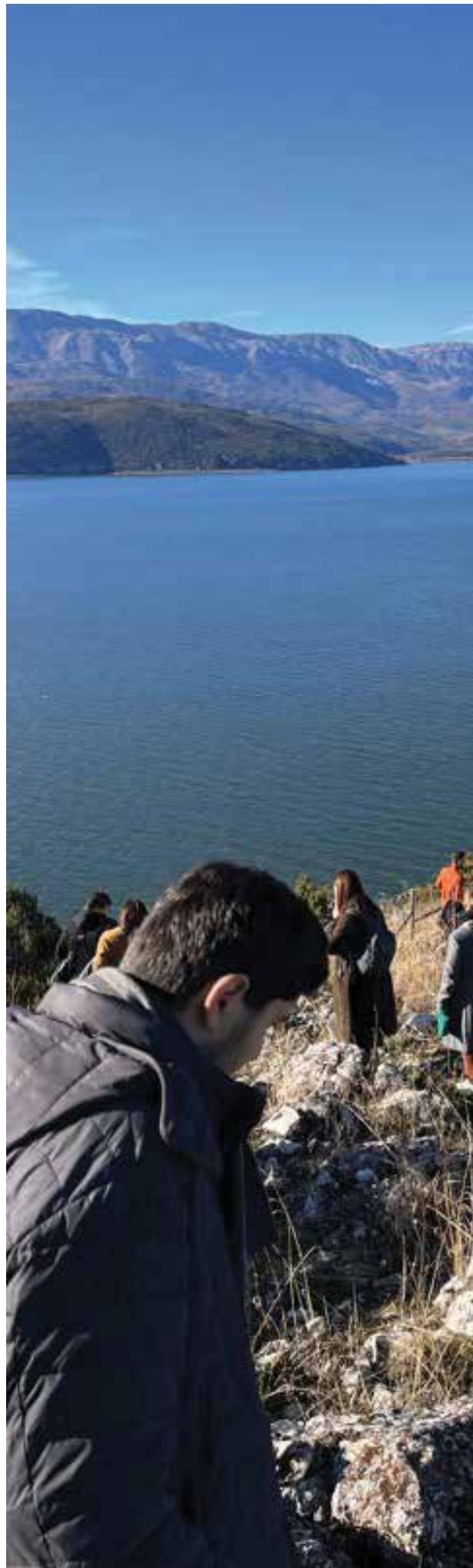


Fig. 1 / Photo taken from the site visit during the PhD workshop

source/ author (2023)







#1

WORKSHOP DAY



TEAM



BRAINSTORM



#2

SITE VISIT



CONTEXT



Observation



#2

SITE VISIT



CONTEXT



Observation

FINAL PRESENTATION

#1





Stakeholders







Intersecting Landscapes

Finding New Spatial Visions for the Cross-Border Region of Prespa Lakes and the case of Pustec Municipality - Albania.

Issue 2

A project developed in the framework of the
International Doctorate in Architecture and Urban Planning IDAUP
POLIS University, Albania / University of Ferrara, Italy

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Reframing the Landscape of the Prespa Lake An Interpretative Apparatus for the Regional Development of Pustec Municipality

DOI: 10.37199/o41010110

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Abstract - This paper examines the Prespa Lake landscape as a complex cultural, ecological, and territorial system, proposing an interpretative framework for the regional development of Pustec Municipality in Albania. Positioned at the borders with North Macedonia and Greece, Pustec represents a unique intersection of landscapes, cultures, and ecosystems. The study investigates the interplay between territory, landscape, and environment, highlighting how qualitative perceptions of landscape can inform planning and development, complementing quantitative territorial analysis. Drawing on the works of Turri, Jakob, Cosgrove, and Magnaghi, the research situates landscape as both a perceptual and operative tool, capable of integrating infrastructure, natural systems, cultural heritage, and dwelling patterns into a coherent vision when the protagonist is the Prespa Lake. Comparative analysis with transboundary developments around Prespa Lake illustrates differing approaches to sustainable tourism, rural livelihoods, and environmental stewardship across Albania, North Macedonia, and Greece. The methodology combines field observation, mapping, and qualitative analysis, producing a framework that identifies potentials, constraints, and opportunities for Pustec. The paper concludes by proposing an integrated, landscape-based approach for regional development, emphasizing environmental conservation, cultural valorisation, and socio-economic resilience. By framing Pustec within the broader Prespa Lake landscape, this study offers a model for interpreting and guiding development in border regions, where ecological, cultural, and spatial dynamics converge.

Keywords - Landscape, Territory, Nature, Culture, Environment

Introduction

The municipality of Pustec is part of the district of Korça and is located at the northeastern end of the district. The municipality shares borders to the west with the municipalities of Pogradec and Maliq, while on the northwest and east with the Republic of North Macedonia and on the south and southeast by Greece. The capital of the municipality is the town of Pustec, which is located 25 km from the city of Korça. The municipal administration is organized with 9 villages, which are: Pustec itself, Shulin, Leska, Zarashka, Cerje, Goricë e Madhe, Goricë e Vogël, Diellas, Gollomboc, which extend over a length of 45 km. The territory of the municipality covers an area of 1363.8 ha. The population density is 94 inhabitants/km². The largest village in terms of area is the centre of the municipality, Pustec; as well as the village of Gorica e Madhe. These villages together, represent 35% of the inhabited territory of the municipality. Pustec Municipality, is one of the newest municipalities of Albania dominated by the Northern Macedonian minority in Albania, and established in the 2015-th by the latest territorial-administrative reform. It has a strong rural and natural character and is not a much-known region, due to its geographic location. However, in the last

years there has been an ever-growing interest in the region, thanks to the growing tourism from within and outside the national borders. Tourism is slowly but surely becoming the main local economy in addition to that of agriculture. Pustec has very distinct characteristics and a high potential of development, due to the rich natural and cultural resources, the mix of ethnical population; and its strategic geographic location. Despite these potentials, there also exist several territorial, social, and environmental problems, related to isolation, shrinking, migration and emigration, and natural erosion. Pustec is positioned at the edge of Albania's border with Northern Macedonia and Greece (EU). We would like to imagine Pustec municipality not as a confined territory, but as a point where different landscapes intersect, and which, in turn, potentially re-connect Pustec with the territorial tissue of Albania, Northern Macedonia and Greece. This issue will become more critical after the EU joining of the first two countries. We see Pustec as a point of convergence and territorial reference, capable of valorising the potentials and mitigating the problematics. Starting from the issues of accessibility, infrastructure and fragmentation

and the potentials of Pustec's nature, culture and dwelling, the aim is to propose a vision for the future development of the area: a contemporary and all-encompassing vision of development capable of putting Pustec on the map. In relation to the transformations, potentials, and problematics, outlined above, this research aims to develop a methodology that will allow settlements to respond to these specific problematics and valorise the potentials for the envisioning of future sustainable development in the Albanian context. The aim therefore, is to propose solutions and conceptual frameworks for the problems listed above. Given the lack of perspective for an area with great potentials like Pustec, and the general direction of the global and local trends of developments towards sustainability, heritage and tourism, the purpose of this research is to provide an all-encompassing frame of analysis that can bring to a vision for the future sustainable development, at the strategic and spatial level. If we take in consideration the development around the Prespa lake we can notice very different conditions regarding Grece, North Macedonia and Albania. From the Greek side we can see an attention towards the valorisation of natural, cultural and rural landscape (Fig. 1). It appears clear that from the Greek side, considering also the encounters with local authorities, is important to promote for the economic development of the area a certain experiential tourism without alternating the autochthonous characteristics of the place. From the Macedonian side we can notice how generally the settlements are more urban and the tendency is to utilize the natural resources at their disposal, but always without overloading the territory. From the extensive cultivation of apples, to the beaches around the lake (Fig. 2). Pustec in the productive sense remains a bit passive in development but with great potentials. It relies mainly on small agriculture plots in rural settings. The natural landscape is not particularly curated, but there is a great variety of cultural aspects, from the building modalities, to the monuments, to the various crafts, that need to be valorised. Analysing Prespa Lake is particularly insightful when applied to transboundary regions, which form one of the most significant and culturally rich landscapes in Southeast Europe. Situated at the borders of Albania,

North Macedonia, and Greece, these protected areas show how rural territories can function as evidences for sustainable land management, biodiversity conservation, and landscape planning. The mosaic of traditional agricultural practices, wetlands, forests, and small villages around the lake demonstrates a dynamic interaction between nature and human adaptation. Such cultural landscapes are critical to understanding how socio-ecological systems evolve over time and how they can inspire more integrated urban planning models. In the context of urban sustainability, studying the Prespa landscape enables a deeper appreciation of nature's role not only in ecological resilience but also in regional cooperation. The border context intensifies the value of this landscape, as it requires coordinated governance, shared conservation strategies, and multicultural understanding to preserve its ecological integrity.

In the conventional planning formula employed by the authorities there are two main issues regarding the analysis and planning processes: the rigid territorial boundary of the region; the non-overlapping systems (nature, agriculture, water, infrastructure, urban). The administrative division of the territory and the compartmentalisation of the systems fall short on the capturing of the complexity and the wholeness of the region's characteristics and potentials. For this reason, the research proposes a place-based, and landscape-based approach, founded on a transversal frame that works on the superimposition of different overlapping systems, in order to capture the essence of the Prespa Lake region in its multifaceted, cultural, spatial and relational dimension.

Literature review – The complex nature of landscape

Landscape vs. Paysage: an etymological enquiry

If we take a look at the Anglo-Saxon and Latin derivations of the words landscape and paysage we start to recognise two different approaches in the comprehension and worldview that orient the meaning of the word. Landscape as a term, originally emerged in the 1600s as a pictorial term representing an extensive view of a natural

scenery. It has its origins in the Middle Dutch (landscap) meaning region, from land 'land' and -scap '-ship, condition'. Similar formation in Old English (landscape), Old High German (lantscaf), German (Landschaft), Old Norse (landskapr), Danish (landskab), a region, district, province (*Online Etymology Dictionary*, n.d.). The term usually referred to a system of humanmade spaces on the land. Other than the condition of the land, we can derive in the contemporary aesthetic dimension the root Land which is something that people belong to has the suffix Scape that sets back to the root shape. In the Latin version we see the appearance of the term Paysage in similar circumstances but much earlier. Once again, we have the introduction used to denote a stretch of land in the distance. The first documented use is registered by the French poet Jean Molinet (c. 1486, as cited in *Online Etymology Dictionary*, n.d.). This neologism is composed from the root Pays that means also land, and the suffix age which refers to an ensemble, overall view, totality (e.g. vernissage, foliage, etc.). This implies a comprehensive and self-sufficiency dimension. It is clear that we have two different conceptions displayed. Etymologically landscape refers to an action on land apt to shape it, meanwhile paysage suggests a view over the landscape, and ads a

perspective on the land.

Landscape and Nature

The first consideration to make is that landscape is different from nature alone. There is a tendency to think of them as the same but in fact the latter includes the former. Nature itself is a concept of the citizens not the villagers. In ancient and medieval times nature takes the connotation of a sacred or productive space. It was only starting from the renaissance that it became the mental and visual construct that we all share today (Vitta, 2005). Landscape is the artificial not natural, result of a culture that redefines its relationship with nature (Jakob, 2009). The cultural aspect is crucial to understand the potential of landscape as a recognition and transforming tool. According to Cosgrove (1998) landscape is a way of seeing, a cultural tool that orders and signifies lived space. Starting from the industrial revolution there has been a fracture between nature and the city. Today the landscape represents a terrain of conflict and negotiation between transformation and conservation, between local identity and globalisation (Vitta, 2005). Vitta invites to not see landscape as a background, but as a structural component of the project and symbolic space

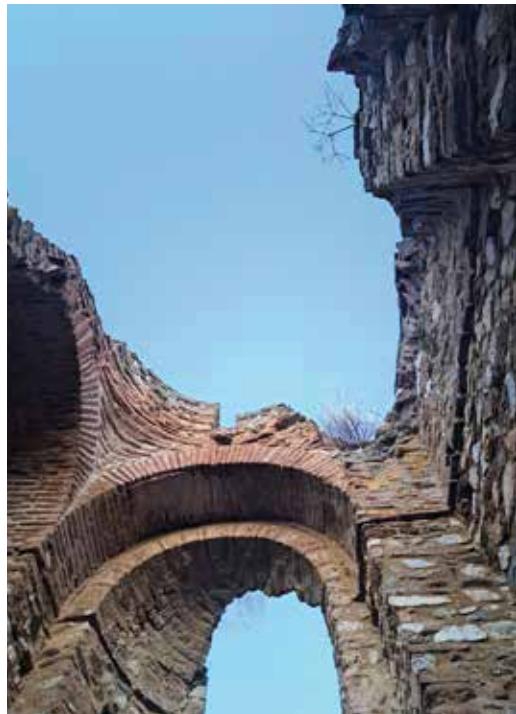
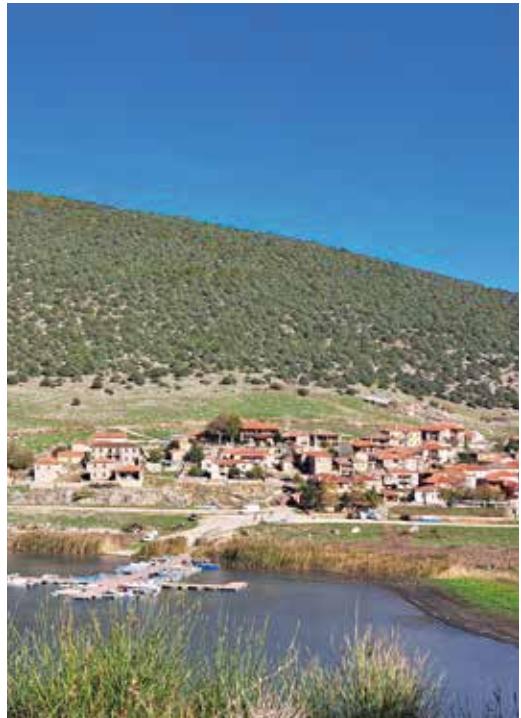


Fig. 1. Images from the Greece (Psarades on the left, Agios Achilios on the right).

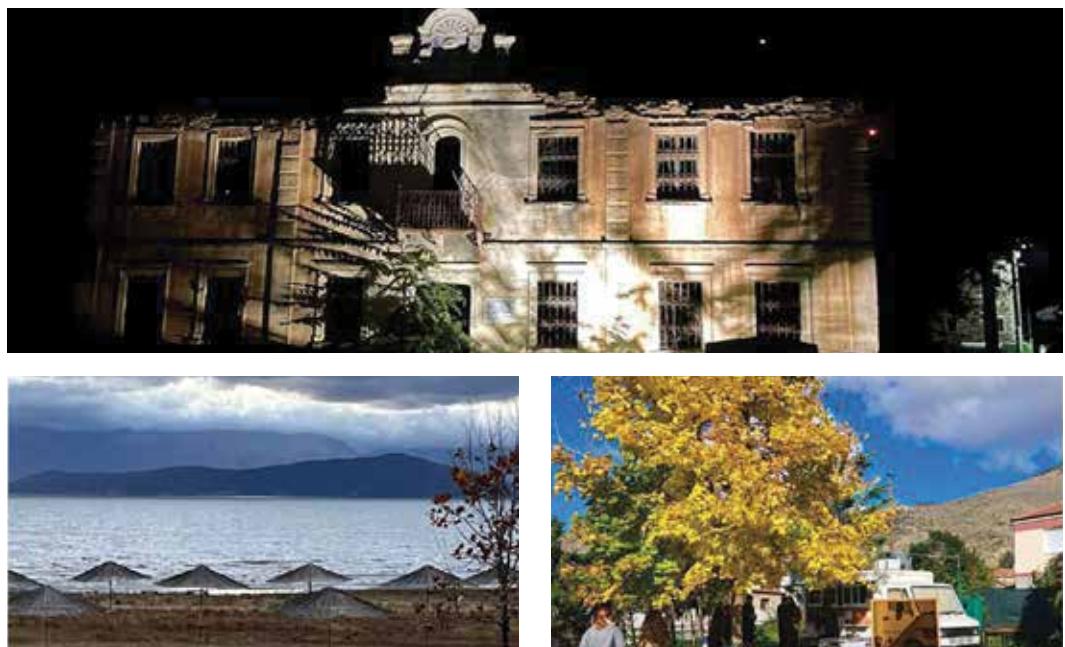


Fig. 2. Images from North Macedonia (Ljubochno and beach near Dolno Dupeni).

source/ author (2023)

where culture is reflected. The landscape is to be intended as a critical category, in order to become a criterion of analysis, and a design category, as a general horizon of designing the ambient around the buildings.

Landscape and Territory

Territory is a spatial and social ensemble, made of things that are subject to transformations and modifications. A territory tends to be defined quantitatively, as a measurable portion of space governed, used, and transformed through human practices. In this sense, territory is not only a geographical category but also a political and economic construct that expresses power, control, and appropriation (Elden, 2013). The territorial dimension connects human communities to their resources, infrastructures, and governance systems, situating them within processes of continuous change.

By contrast, landscape represents a qualitative dimension of space. As Jakob (2009) argues, landscape does not encompass all the territory, but it is the portion of territory "covered by the gaze of the subject." Landscape emerges through perception and cultural interpretation, it is the territory as seen, felt, and valued. While territory refers to the material and organizational aspects of space, landscape translates these into aesthetic and symbolic forms. The act of seeing transforms the territorial ensemble into a meaningful image, mediated by experience, history, and emotion (Cosgrove, 1984; Wylie, 2007).

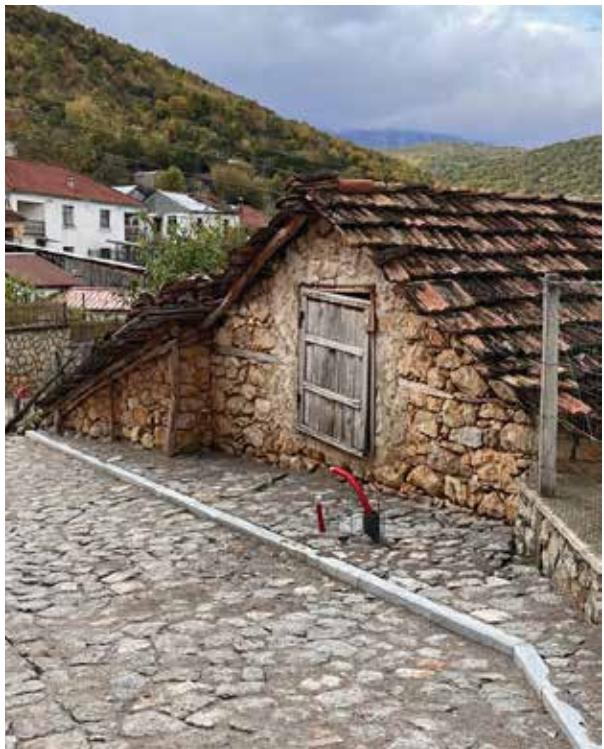
Magnaghi (2010) in his work, uses what he calls a territorialist approach that considers landscape as inseparable with the territory. He aims for a place – based approach to urban and regional design, through a combination of top – down and bottom – up practices. Through an evaluation of cultural, natural and historic factors he proposes reterritorialization sustainable practices. In his frame there are many sustainabilities to be taken into account. Social, political, economic, environmental and territorial sustainabilities are indispensable for the reterritorialization of places. In order to institute places Identities Magnaghi (2010) methodologically in a non-deterministic way proposes: the historical reconstruction of the process of formation of the

territories in order to discover virtuous relations and previous local knowhow; an analysis of the cycles of territorialisation in order to discover the foundational values of the dwellings and the territories (myth, religion, identity, economy, etc.); an anti-evolutionary perspective of the development of the territories.

Landscape and Environment

Environment concerns our living in it, our health and wellbeing and the wellbeing of plants and animals. We can indeed live inside a Landscape but in the very moment we start perceiving it as a landscape we are thinking about it as something external, something visible, located inside a specific space and time frame. Environment refers to the totality of conditions that sustain life, human, animal, and vegetal. It implies an immersive condition: we live within environments, dependent on their health and balance for our wellbeing (Berleant, 1992). From an ecological perspective, the environment is an active and dynamic system of exchanges, composed of biological, physical, and chemical relations (Odum & Barrett, 2005). The most ambitious project of the environmentalist movement is to reconstruct an economy of nature (Daly & Cobb, 1994; Odum, 1989; Hirsch, 1981), introducing the natural capital for the constitution of an ecological economy.

By contrast, landscape refers to the environment as it appears to perception, as a visible and meaningful configuration. It emerges when human consciousness frames a portion of the environment through cultural or aesthetic lenses (Cosgrove, 1984). The very act of perceiving a setting as landscape externalizes it: it becomes an object of contemplation or design, situated within specific spatial and temporal boundaries (Ingold, 2000). In this sense, landscape belongs to geography and the humanities as much as to ecology but it is not only a physical entity but also a qualitative construct shaped by cultural interpretation and sensory experience (Wylie, 2007). Landscape includes both a portion of a territory and the perception of the latter, and encompasses environment and relationships (Turri, 2008).



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Fig 3/. Images from Pustec (Pustec and Gollomboc).



source/ author (2023)

Methodology

From a methodological standpoint, this research proposes landscape as an instrument of urban and territorial reading and transformation. Rather than treating the components of planning (nature, agriculture, water, infrastructure, and urban systems) as separate and rigid, the study advocates a transversal reading that integrates these dimensions. We focus on four interrelated categories that are infrastructure, nature, culture, and dwelling, as lenses to reframe the classical paradigm of regional planning, in order to explore new ways of reading the territory of Pustec Municipality.

The research combines field observations, mappings and photographic documentations on the Prespa Lake in the Albanian, Greek, and North Macedonian parts, with a critical review of different theoretical positions in landscape theory of authors such as Turri, Jakob, Cosgrove, Magnaghi, Vitta. All of these authors share a notion of landscape that goes beyond the residual or decorative dimension. They also emphasise the cultural and operational potential of landscape as an all-inclusive qualitative dimension, which better expresses itself in the peculiar characteristics of specific places.

Through this framework, landscape functions both as a tool of observation and as a medium for intervention: it allows us to perceive the interactions between human activity and natural systems, identify potentials and vulnerabilities, and eventually propose strategies for sustainable development. This approach is inherently qualitative, emphasizing perception, interpretation, and relational understanding, but it also accommodates spatial representation through mapping and visual documentation.

By intersecting these categories, the methodology aims to produce an integrated reading of the region of Pustec that transcends conventional sectorial planning, focusing on the Prespa Lake basin as a collector of the transboundary condition, and individuating characteristic aspects for the Albanian, Greek and Northern Macedonian parts.

Discussion and Results

The first and most important assumption in the analysis phases is to consider the Prespa Lake as the centre and the starting point of the analysis and eventual strategies and projects. The lake as a strong element holds together these three nations and goes beyond the territorial divisions and the cultural diversities. If the territorial divisions need to be broken down, the cultural diversities need to be valorised. The challenge of understanding in a prepositive way this territory is precisely to provide a new multidimensional frame of interpretation, that might allow to see the territory with new eyes. Through the transversality and multidimensionality, the study grounds a possibility of methodologically passing from a sectorial and quantitative practice, to an interpretative and qualitative one.

Infrastructure

In practical terms when we talk about infrastructure the area is connected by a main road that goes around the lake, which branches to serve the various settlements, agricultural fields and connections with the lake. It is important to expand the understanding beyond the physical and practical meaning of the term. In the case of infrastructure it is the lake, in fact, that infrastructures the territory. The considerations are expanded further when we consider nature which is the predominant element of the territory, or even culture as infrastructure. Starting with these assumptions we can reframe the study of the infrastructure of Pustec in a series of other infrastructures. We start to discover that there is a visual infrastructure that connects and is connected by the natural elements. If we consider the lake as disappearing there is an infrastructure that connects the ring road of the lake. There is also an infrastructure that connects the fields of forces of the entire region with the cultural elements (Fig. 4). We can see that by liberating infrastructure from the functional dimension of an artificial layer that connects and organizes flows and services, it assumes a new qualitative dimension. The lake in fact is the main infrastructure. It has sustained and characterized the whole region in centuries. When we talk about sustainability, the improvement of the relation with the lake is a primary aspect. The lake has the potential to infrastructure the region not only physically, but also perceptually and culturally.

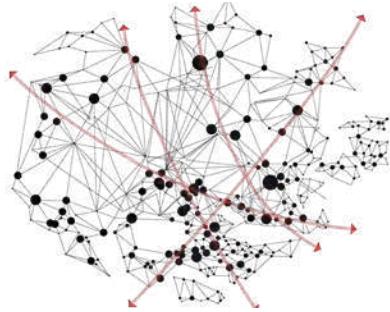
Dwelling

When we consider the dwellings in the region, just by mapping them we can start to understand the different characteristics in the three nations (Fig. 5). From the Albanian side we notice how the settlements are closer to the lake. Paradoxically, due also to the receding of the lake, through the site visit it is noticeable in the Pustec area a disconnection with the lake. In the North Macedonian side, the settlements are collocated further emphasising

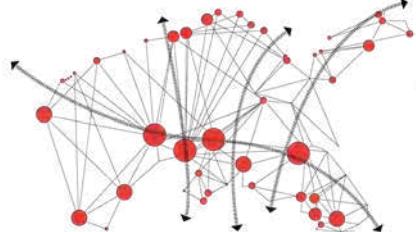


Fig. 5. Dwelling analysis.

Visual communication of the territorial context with the lake



Communication of lake with the existing roads



Understanding context

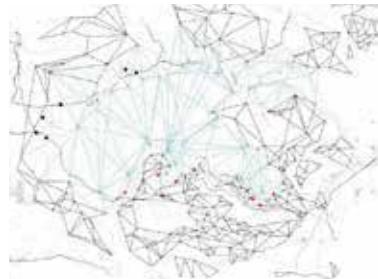
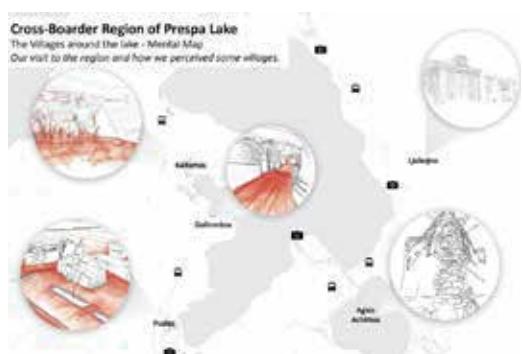


Fig. 4. Infrastructural analysis.

Elaborations: Sadmira Malaj, Gregor Andoni, Caterina Rondina, Lisa Mensi (2023)



Elaborations: Julian Begiri, Dejvi Dauti, Andrea Sterpin, Christin Erdmann-Goldoni (2023)

the particular connection when the lake is not immediately part of the settlements but the lake conserves its natural character and the proximity allows the pleasure of a completely natural scenario carefully curated (see Fig. 2). As for the Greek part, there are two strategically placed settlements that characterise the approach towards the lake. Psarades, which is a small rural settlement with a little harbour connected to several foot tracks that lead to many favourable views of the lake and cultural spots. Agios Achilios is a small agropastoral community in an island with notable cultural and paesistic characteristics (see Fig. 1). The next analysis proposed is a mental map proposed as a

subjective analysis in order to capture dynamically the perception of the several settlements (Fig. 5). The dwelling analysis comes to be a crucial one, as it reveals the cultural diversities in the built environments, be it in the techniques of construction, characteristics of the settlements, their different cultural characteristics, or the relations with the lake. In this sense the perceptual analysis, that considers Jakob's notion of landscape as a gaze, is fundamental to capture qualitatively the differences. In a prepositive sense the strengthening of the characteristics of Pustec might be a strategy that values the identitarian characteristics in order to produce variety around the lake.

Culture

When we talk about culture, the region has a very ancient history. There is the need for a change of scale in order to include in a system the Ohrid Lake, the Great Prespa and the small Prespa Lake which are home to historical settlements and fortifications. Furthermore, in this case, due to the presence of a particular kind of historical monument such are the cave churches, geology itself is considered as a cultural monument itself (Fig. 6). The peculiarity of the cave churches, found on the Albanian and Greek coasts of the Prespa Lake, is that they are accessible mainly only by the lake. This peculiar character allows for the infrastructuring of the lake in a set of connections that put together the geological and cultural aspects in the Pustec and Psarades area, which goes beyond the national boundaries. It is important no mention that the Prespa Lakes are annumerated as protected areas by UNESCO due to the cultural heritage and natural values. Culture constitutes a fundamental layer of the region that blurs man made and natural elements studied through a geological, archeological and infrastructural lens in our case. According to Magnaghi, in order to discover the foundational values of a territory, the mythical and historical dimension is indispensable. For Maurizio Vitta landscape in a sense is the continuous reevaluation of the relationship between nature and culture. In this sense, the geological and historical investigation, reveals the identitarian settlements and the characteristic cave churches, that reunite again the lake in an anthropological palimpsest that goes beyond the administrative divisions. The notion of heritage expands from isolated artifacts to systemic overlappings.

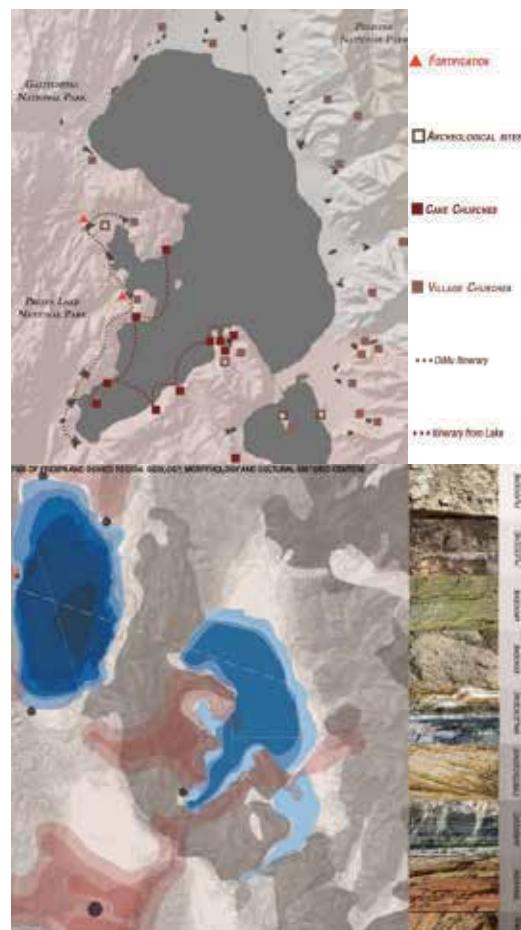


Fig. 6. Culture analysis

Elaborations: Kejsi Veselagu, Daniele Romagnoli, Maristella De Fabrizio

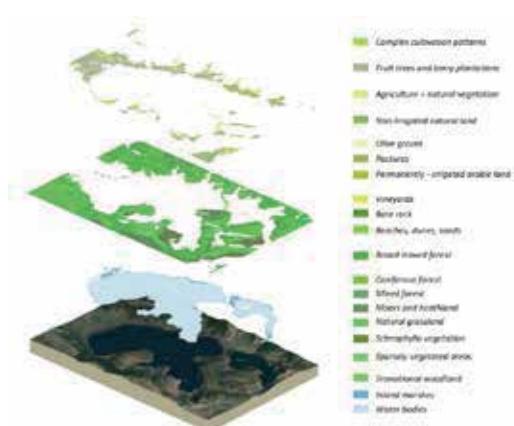
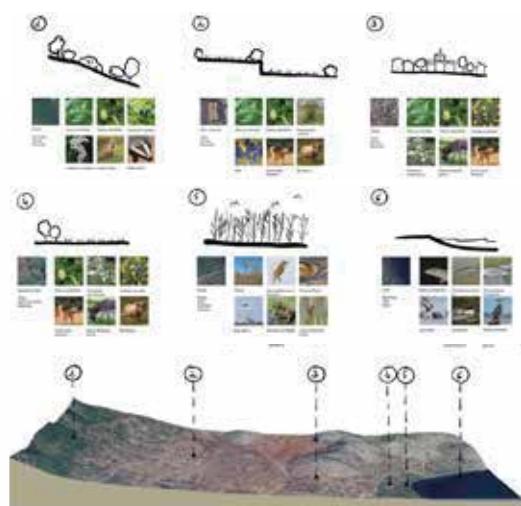


Fig. 7. .Nature analysis

Nature

From the natural standpoint the region is home to a high geographic and biologic diversity. The geographic variety of the region is expressed in its high mountains, narrow islands, vast freshwater wetlands, salt marshes, meadows, reed beds and dense forests. The Great Prespa Lake and the Small Prespa Lake are also connected through underground water channels. The complexity of the natural system (Fig. 7) is further accentuated by the centenary relationship of man and nature. As a multilayered method of analysis there is the proposition of a section that puts together: the mountainous terrain; the agricultural fields; the urban environment; the lake hinterland; the



Elabotations: Anila Giika, Alessandro delli Ponti, Francesco Axel Pio Romio

wetlands; the lake (Fig. 7). Putting in relation these different Ambiental characteristics, including the human habitat allows to imagine a connection and continuity between these different systems. In this case we note how the five elements of traditional planning (in order, nature, agriculture, infrastructure, urban, water) are, and should be a continuous unitary ecosystem. Magnahti's call for reterritorialization proposes exactly the instauration of a closer relationship with the local productive systems and values. The lake as the center of this complex ecosystem embodies the synthesis of what Cosgrove define as the symbolic and functional elements that constitute the landscape.

Conclusions

Across all four analytical dimensions, the PrespaLake landscape emerges as a continuous and relational system, contradicting the compartmentalized and nationalized logic of conventional planning. Infrastructure, nature, culture, and dwelling function as interconnected multilayered categories, that actualise methodologically a new reading of the territory. By reframing theoretically the planning paradigm through the concept of landscape, we have a kaleidoscopic fresh view of the territory. This is expressed in a practical apparatus that identifies relations and overlappings. These new landscape-based frames constitute a mosaic of possibilities that better represent the complexity of cultural, social and ecological relations. In the study the lake emerges as the core cultural, infrastructural, and natural element that holds together the whole area, around which these different frames revolve.

Though the methodological apparatus might be used as such, it is important to note that the reframing is based on another important characteristic of landscape that reside on the place-based dimension. After all, landscape is not a language, it is a dialect so to speak. These four new categories are chosen specifically to valorise

the characteristics of the region. The takeaway, methodologically resides in the approach that is simultaneously synthetic and fragmented.

Practically speaking, Pustec on one side should reinforce its identity valorising the intrinsic characteristics in relation with Grece and North Macedonia, and on the other the three regions should relay on the lake as the common ground. In the continuous battle between global and local it is a prerogative for Pustec to relay on the autochthonous cultural, natural, and productive systems to instaurate a true sustainable practice connected with the territory. The infrastructuring of the lake, the valorisation of the local culture, and the ecological continuity is a priceless resource and opportunity for the future development, be it for local sustenance or regarding the experiential tourism, in a world more and more globalised.

Ultimately, the landscape-based approach proposed allows for a more comprehensive view and understanding of the territory, where the overlapping systems allow the envisioning of future sustainable practices, that transcend the territorial boundaries and rigid planning instruments for the governing of the territory.

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Changing face of Prespa

Local and inter/national initiatives in the context of revival of trilateral Prespa region

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Abstract - *The history of the Prespa Region has been long and rich, filled with various cultural, social, and above all political changes, that largely influenced the life of the local population, which is divided between three neighboring countries: North Macedonia, Albania and Greece.*

Based on the above, Prespa region can be considered a highly sensitive area that evokes various common links between the population in the trilateral region causing significant "political" disparities in many aspects.

However, the initiatives and changes undertaken in the past few decades enabled various re/shaping of each integral part of Prespa. Yet they are based on the national policies of every distinctive country.

Through this paper, I will try to give a short overview of Prespa's "changing face" through some of the historical and contemporary events and also present some of the national, or bilateral initiatives undertaken within the framework of EU cross border cooperation and other programs.

Archival researches have been conducted to provide necessary information, and comparative analysis of some materials have been done. Much of the data presented is a result of in-depth qualitative ethnographic researches conducted especially about the Macedonian-Albania border, which provided essential and relevant data not only for the past decades and personal experiences, but also for the changes that occurred by the end of the 20th century till nowadays.

The paper also considers a few cross-border projects as case studies to elaborate on the importance of joint actions.

Keywords - Prespa, cross-border cooperation, political changes

Burden of the past

Regarding cultural and natural elements Prespa region as a whole can be considered as a critical area, that interlaces and embraces centuries of cultural heritage monuments. It has witnessed many victories and falls, each of which has left a significant mark on Prespa's face.

The existence of numerous archaeological findings¹ can confirm that the Macedonian part of the Prespa region was inhabited from prehistoric times² through antiquity, the Middle Ages till the present. Nevertheless, the other parts of Prespa belonging to the neighboring countries of Albania³ and Greece⁴ are also rich in archaeological findings proving the same. Concerning this we can conclude that Prespa region has been inhabited since the remote past, continuing to the present days. When we consider the archaeological findings, we can note that besides the socio-economic importance, the area also possessed religious significance. This can be confirmed by the preserved historical data, archaeological remains of various Christian religious objects and a vast range of centuries-old preserved

churches.

Even though the medieval period was quite turbulent the Prespa region, large-scale changes occurred at the end of the 19th and the beginning of the 20th century.

During Ottoman rule, Prespa was considered a remote part of the Ottoman Empire, not any different from the other similar regions within it.

With the decline of the Empire, gradual changes took place in the region, making it a battlefield of various political and military influences.

By the end of the 19th century weakening off the Empire had already become notable. The signing of the Treaty of San Stefano in 1878⁵, followed by the Berlin Congress also in 1878, were merely the start of events that gradually changed the Balkan, and along with them, Prespa's history.

The Balkan wars in 1912 and 1913, fiercely divided the Macedonian territories. As the Carnegie Commission Report states, Macedonia, is no longer a tomb; it has become a hell⁶.

The Bucharest Agreement in 1913 defined the

division of the Macedonian territories among the winning countries. As per the London Agreement in 1913 the division, of the territory of Prespa region was finalized by the designation of nine villages⁷, a part of Great Prespa Lake, as well as the island of Mali Grad⁸ to the newly founded Albanian state⁹, while the rest of Prespa's territories remained divided between Greece and Serbia.

This situation remained pretty much the same during the First and Second World Wars, even though periodically the region became part of one or the other military administration¹⁰.

With the end of the Second World War the situation remained calm only for a few years, or more precisely until the beginning of the Greek Civil War. During this period the trilateral Prespa region became the fugitive's main route from Greece to Albania and Yugoslavia. These groups of refugees, mainly women and children, were then transferred to refugee reception centers. Then they were transferred to other countries mainly within the socialist/communist bloc¹¹.

For example, one of the closest refugee centres was the one in the village of Ljubojno, where the refugees, found food and shelter before continuing their route. Because of these reasons, Prespa remained the most emotional spot in the region for many of these refugees since many of them never managed to go back to their homes.

Decades later, some of these people, who never went back to their homes due to the various political reasons imposed by Greece, even bought properties in the villages near the border like Dolno Dupeni, Ljubojno, Shtrbovo etc. and build houses there to be as "close as possible to their homes"¹².

However, the borders within the Prespa Region that divided three countries for most of the second half of the 20th century became completely closed. Namely, the borders after the Second World War remained open until 1948. The border between, Yugoslavia and Albania, was completely closed due to the political and ideological dispute between Yugoslavia and the Soviet Union block including other socialist/communist countries, known as the period of Informbiro. Although the dispute was eased by 1953, the border in Prespa firmly divided the two countries.

The border remained almost hermetically closed

until the regime of Enver Hodja fell in Albania, and Macedonian independence in 1991. Since then, the border has been completely open for any communication and people from two neighboring countries can freely move, nowadays, even with only an ID card.

Conversely the border with Greece, was temporarily closed after the Civil War. It was then reopened and it remained open until 1967.

At that time, people from Yugoslavia and Greece, could easily cross the border with a simple ID card or border card. People from Macedonian villages could freely go to the markets in the Greek part of Prespa, buying mostly metal plates or various household items. Still, they also maintained close ties with their relatives who lived in the surrounding villages in Greece.

Then, the border was completely closed for any type of communication. This political decision divided the families on both sides of the border which is the case with this border.

Some bilateral initiatives to reopen the border crossing in Prespa Region between Macedonia¹³ and Greece started decades ago, but they were unsuccessful due to the "Macedonian name dispute".

With the signing of the so-called Prespa Agreement¹⁴ and change of the name from the Republic of Macedonia to the Republic of North Macedonia these initiatives have sped up, and the reopening of the border crossing has been announced for 2027/2028.

The burden of all this historical, or much more political issues, has had a great impact on the local population from all three constitutive parts of Prespa region, who belong to and develop in the frameworks of all three neighboring countries.

In addition, due to countries' different political orientations, these three parts underwent distinctive processes and changes.

Ethnographic characteristics

In an ethnographic sense, and considering the verbal and nonverbal symbols of the population such as dialect, clothing, ritual practices etc., the region of Prespa can be divided in two distinctive parts: Lower and Upper Prespa. Further on the region of Lower Prespa can be divided to two subregions i.e.



Fig. 1. Prespa Lake

Big and Small Prespa¹⁵.

The people of two distinctive parts of Prespa mainly interacted within their group, which means that the people from Lower Prespa will conclude marriages only within this part of Prespa, while the people from Upper Prespa will conclude marriages only within the "borders" of Upper Prespa. There are rare cases of intermarriage between two groups, only in specific cases, but we will not elaborate further due to the limited space.

To be more precise and clearer, we can say that the region of Upper Prespa which encompasses the northern part of Prespa, starting from the village of Slivnica to the Macedonian – Albanian border fully falls in the Macedonian political borders.

Lower Prespa also includes the part of Prespa that is in Albania's political border, also known as Small Prespa. This area covers the territory of 9 villages. The rest of Lower Prespa, also known as a subregion of Big Prespa, is located between North Macedonia and Greece's political borders.

Considering the ethnic origin of the population we can conclude that based on the political circumstances within the countries, ethnic or minority rights have been fully, partially or not respected at all.

The majority of the population is Macedonian within the part of Prespa belonging to the political borders of North Macedonia. The most inhabited part of Prespa is the Macedonian part or the Municipality of Resen. According to the last Census from 2021 there are total of 14.373 inhabitants from different ethnic origin. The largest number falls on the Macedonian population 10.130, 1.381 Albanians, 1.457 Turks and 314 Roma people¹⁶.

As a constituent population of Yugoslavia, the Macedonian population living in the Republic of Macedonia, nowadays, according to the Prespa Agreement in North Macedonia, was a constituent and subsequently thoroughly enjoyed the ethnic rights.

The population living in nine villages located in the Albanian part of Prespa is also Macedonian. The Macedonian minority in Small Prespa, Albania, has been recognized as such since 1934 with the acceptance of the resolution of the Comintern. This population living in Small Prespa has fully enjoyed minority rights regarding the ethnic proclamation,

religious orientation, education, traditional practices, etc. They had the right to proclaim themselves as Macedonians freely, and to speak Macedonian language but only within the Prespa Region. Leaving the region meant that they will lose any minority rights over the above stated markers. This also referred to the Macedonian population in other parts of Albania, which did not have the right to proclaim or refer to it ethnic origin.

However, in the last decades just as it was a century ago¹⁷, Bulgarian propaganda started to use the same measures over the Macedonian population, trying to prove its Bulgarian origin. In this process, they do not choose the means to achieve their goals. Many articles have been written on these topics in the past¹⁸. Still, the latest event, especially related to the Census in Albania brought to light that this propaganda is even fiercer than before¹⁹. The so called "Macedonian question"²⁰ that tackled the feelings of millions of people worldwide, for specific category of people obviously has not been answered yet.

Whatever we have to say that due to various pressures, there is a certain number of people that have proclaimed themselves as Bulgarian but mainly for "economic reasons"²¹ and by declaring themselves as Bulgarians, they can be issued a Bulgarian passport, thus being able to move, work and live within the European Union²² freely.

The situation of the Macedonian population in Greece was completely different. The exonym that the Greek population used referring to the Macedonian population was a Slavophone Greeks²³. The ethnic question of these populations is multilayered and impossible to elaborate in this paper, thus enabling only the listing of the main facts.

As previously stated, the Civil War in Greece, 1946-1949, caused significant suffering to Greece's entire population and especially to the Macedonian population. By the end of the War in 1948, this population was forced to leave the native territories and fled to the neighboring countries, thus Greece deprived them of the right to claim their properties later unless they changed their names into the Greek ones²⁴. Northern territories that were previously settled by this population remained empty so in 1953, with the Decree No. 2536 Greece enacted a



source/ author (2024)

law to colonise the northern territories "with new colonists with healthy national consciousness", considering that the previous "Slavic" population was "declared" as a state enemy to the Greek state²⁵.

Based on the above the resettlement or colonisation of the northern territories, including Prespa region, was enacted mainly with the population from other parts of Greece, such as Epirus and Thessaly²⁶.

The remaining Macedonian population that settled the Greek part of the Prespa Region was prohibited or suppressed from proclaiming itself as Macedonian. They were also forbidden to use Macedonian language in any public space, and at home.

This situation started to change only recently. However, a large portion of the area's population still speaks Macedonian language, and nowadays even more, probably freed by the heavy burden that, to a certain extent, was felt with the signing of Prespa Agreement.

No matter how scarce the political situation between the neighboring countries was, with the political changes that took place in the last three decades, the people started to communicate once more. Old relations were renewed, old relatives rediscovered and new ties began to develop.

Nowadays, communication between North Macedonia and Albania is fully open through the cross-border check point set in Prespa region. People can freely move over the border even with ID cards. On a daily basis, many people from the Albanian part of Prespa come and work various jobs in the Macedonian part of Prespa or elsewhere.

Communication between Albania and Greece is also enabled through the border crossing near the village of Bilshtë on the Albanian side.

However, the communication between North Macedonia and Greece in the Prespa Region is still impossible. As for the local population that lives only a few kilometres from each other, they have to pass about 100km to reach the border near Bitola, and through Florina go to the Prespa Region in Greece, or vice versa to go to the Prespa region in North Macedonia.

The latest news related to this matter is that the border checkpoint Markova Noga - Lemnos will open in 2027/2028.

Changing face of Prespa

It seems that in the last couple of decades Prespa has started to change gradually.

The bordering countries in Prespa have developed many new national and bilateral initiatives, in order to help develop and revive this magnificent region.

Macedonian part of Prespa

The Macedonian part of Prespa peaked after World War II sometime between the 1980s and 1990s, becoming an excellent tourist area, mainly for domestic tourists.

Many facilities, summer camps, and hotels were built and operated, providing excellent visitor's services. Many companies have their own "workers" camps, thus enabling employees to spend their summer vacation in Prespa. However, Yugoslavia's collapse worsened some companies' economic situation and caused the closure of others, which took its toll, leaving the summer camps empty and neglected.

In addition to these, the lakeshore started to change gradually. The decrease in the water level in Prespa Lake became increasingly visible, turning the once great sandy beaches into a dry swamp.

At this point, the cultural heritage and abundantly beautiful nature were not completely considered attractive tourist points leading to a significant decay of many important monuments. Various factors influenced that situation which will be considered on another occasion. Even though multiple steps for the protection of cultural heritage were undertaken they were insufficient to contribute to the preservation of all the important monuments and sites.

Albanian part of Prespa

At the same time the Albanian part of Prespa lakeshore, was completely underdeveloped. Even though nature was abundant with beauty, there were no facilities for tourist. The country's complete closure and its general external and internal politics, disabled any development in this sense.

The cultural heritage as well as the natural potentials, were not used at all. On the contrary, due to the poor conditions in the country, as well as the communist regime that was in force, especially religious cultural heritage, was left to be destroyed. In this sense, a large number of churches were



Fig. 2. Prespa Lake

converted into warehouses, and the icons were left behind. With the individual efforts of certain people, some of whom were professionals in their field, some of these monuments, as icons, in the 80s, were allocated in the premises of the newly established Museum of Medieval Art in Korche, which enabled their preservation.

The fall of Enver Hodja's regime, and the country's opening at the beginning of the 90s, allowed the local population to personally witness "what is on the other side of the border". The picture that they saw was much different from what they expected. Even though in this period the tourist capacities and socio-economic situation of the people in the Macedonian part of Prespa started to decline, the situation was much better than in Albania.

The poor socio-economic condition of the population in the Albanian part of Prespa Region led many families to seek their fortune in Macedonia once the border was opened. Many of these families settled in the Macedonian part of Prespa. As hardworking people, they sought jobs as masters/builders, or they worked various jobs in the fields, creating conditions for a better life for them and their families. Many of these families managed to buy properties and build their own houses.

Greek part of Prespa

After the end of the Civil War in Greece, the Prespa area became empty. Many of the people fled from this region either across the border or elsewhere within Greece.

By the end of the 50s and the beginning of the 60s the region started to stabilize. The economy although poor enabled the local people to sustain their existence.

With the previously undertaken land redistribution²⁷ and agricultural reforms, the Greek part of Prespa, once an isolated, remote area, begun to change and develop step by step sometime after the mid-80s. Livestock breeding as well as fishery played a great role in the region's socio-economic development.

Joining the European Union enabled Greece to increase the available funds for various project activities, contributing step by step to the development of the Prespa region.

Cross-border cooperation programs

One of the largest-scale cooperation programs between three neighboring countries has been developed within the framework of Prespa Park, the first protected trilateral park in the Balkans. The Park comprises four entities. The National Park "Galicica", established in 1958²⁸, and the "Ezerani" Nature Park, established in 1996 as a strict reserve – IUCN category I, reproclaimed in 2012, under the IUCN category (IV)²⁹, comprise the Macedonian Part of Prespa Park. This part of the region has also been included within the Ohrid-Prespa transboundary reserve³⁰ at the UNESCO's Man and the Biosphere (MAB) programme³¹.

National Prespa Park in Albania was established in 2013. It encompasses parts of Big and Small Prespa Lake as well as the island of Mali Grad that lies in the waters of Big Prespa Lake. The National Park is managed by the National Agency for Protected Areas³².

Prespa National Park was established in 2009³³. Two bodies have governed it: the Management Body for Prespa National Park which is the Management Unit of Prespes National Park and Protected Areas of Western Macedonia, Greece. Prespa National Park incorporates two Natura 2000 sites i.e. the Prespa National Forest and the Varnous Mountains. Even though natural habitats have been greatly endangered due to the decrease in water level among the other factors, Greece took a step further by inscribing this region to UNESCO's tentative list as a mixed natural and cultural site³⁴.

Regarding other cross-border programs and initiatives we have to point out that all three countries have established long-term partnership in the past period, regardless of any political issues that have concerned the implementation of various projects.

However, further on, the accent will be set on the cross-border cooperation projects of North Macedonia with Albania and Greece.

Cross-border cooperation programs³⁵ are one of the main elements that foster the neighboring countries in the process of EU accession and they support sustainable development in the bordering regions. Both North Macedonia and Albania are eligible for the IPA II program which has been known



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as an instrument for pre-accession assistance to the candidate countries to promote sustainable socio-economic development and to address joint challenges that the neighboring countries share. On the other side Greece as a member state, mainly uses INTERREG funds to support regional cooperation and economic growth.

Many projects have been implemented within the above-mentioned programs, each giving an added value to the region.

The developed idea especially when it comes to the long-term partnerships among the project partners, show an increase of the quality of the actions and enables better sustainability of the result.

For example, the conservation of the church of St. Elijah in Grncari village, North Macedonia enabled complete protection of the architecture and subsequently to the wall painting, while the 3D photorealistic augmented reality models developed for the St. Achilleus Basilica and Rebels' Hospital in Greek part of Prespa enabled insight of the "original" appearance of the monuments. These activities and many more were part of the HOLY WATER³⁶ project that was successfully implemented among five project partners from both countries, i.e. Municipality of Prespes, Municipality of Resen, The Society for the Protection of Prespa, The Ephorate of Antiquities of Florina and the NI Institute and Museum Bitola.

On the other hand, the IPA cross-border programs between North Macedonia and Albania have made a notable impact in the wider region, especially through the implementation of SMART-CULT-TOUR³⁷ and SMART4YOU²⁸ projects. These projects were developed and implemented in the same partnership i.e. Municipality of Bitola, Municipality of Pustec, NI "Institute and museum" – Bitola, Directorate for protection of cultural heritage – Korce, and Youth cultural center-Bitola.

Some of the most notable activities were conservation of the old school building in Globochani village and establishment of the Sterjo Spase museum. Sterjo Spase is a prominent Albanian writer of Macedonian ethnic origin, who had a significant impact on Albanian literature in the second half of the 20th century. This museum became a must-see tourist spot in the region and many domestic and

foreign visitors had the opportunity to enjoy the remarkable life story of this author. Besides these activities, the infrastructural improvements of the archaeological site of Heraclea in Bitola and the interventions that enabled accessibility for disabled people to the site have made a significant impact.

The second project enabled the continuation of improvements that had already started within the cultural heritage protection sector. Its main activities are the conservation of the church of Mother Mary on the island of Mali Grad, and interventions within the permanent hall of the museum exhibition space. In this case we have to point out that certain delays occurred due to the political situation in each of the partner countries, and each of the institutions.

This is a great example that the people are the only relevant factor that can influence the final project result and define the success of a certain project.

In addition to these major programs enabling all three countries to implement projects aligned with the projected goals, a new EU for Prespa program³⁹ was launched last year. This program includes projects mainly implemented in the Macedonian part of the Prespa region by local institutions and organisations in order to develop their capacities. Still, it is also recommended that partners from the other two countries, Albania and Greece, be included.

Based on the previous experience, needs, and long-term cooperation among various stakeholders and partners, the ACT4PRESPA⁴⁰ project has been developed. The project aims to protect and promote the cultural heritage in various aspects, and it will involve professionals, young researchers, and students in different activities that will enable them to gain professional skills through diverse actions. One more important aspect of this project is the constant communication of the local population, which will influence a positive increase in consciousness regarding the preservation and transmission of knowledge and skills for the protection and promotion of cultural heritage.

Even though the project is still in its first year of implementation, the results arising from the research are quite positive and rewarding.

The upcoming period and the upcoming activities

shall bring more information about the development of the activities, but more importantly, about the development of further relations among the partners and, above all among the students that are being involved in the activities.

By empowering younger generations and professionals in the field, we are contributing towards better socio-economic growth that will enable further sustainability of the resources and development of the region itself.

Conclusion

Based on the above presented I tried to give a short overview of Prespa Region as a whole, spin of historical and political events that contributed towards constant changes of the region, and contributed to the separation and disparities of this trilateral region.

The historical events presented are only elaborated to better understand the region itself and to understand and the burden that the local population bears at every point of their life.

Contemporary initiatives have been used to serve as an example that this trilateral region can function and exist as one only if the border does not exist in the sense of physical but also as mental barrier, and if the people are not burdened by the weight of the past.

The cross-border cooperation programs provided, gives us a short insight into the type of activities implemented in the past couple of years, mainly tackling cultural heritage and its protection.

The question of the long-term success of these and other projects will remain open, giving us the possibility of further researches and conclusion on the matter concerned.

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Development Vision

Integrated Urban Design

Concept

Integrated Regional

Development

Programme

DOI: 10.37199/o41010112

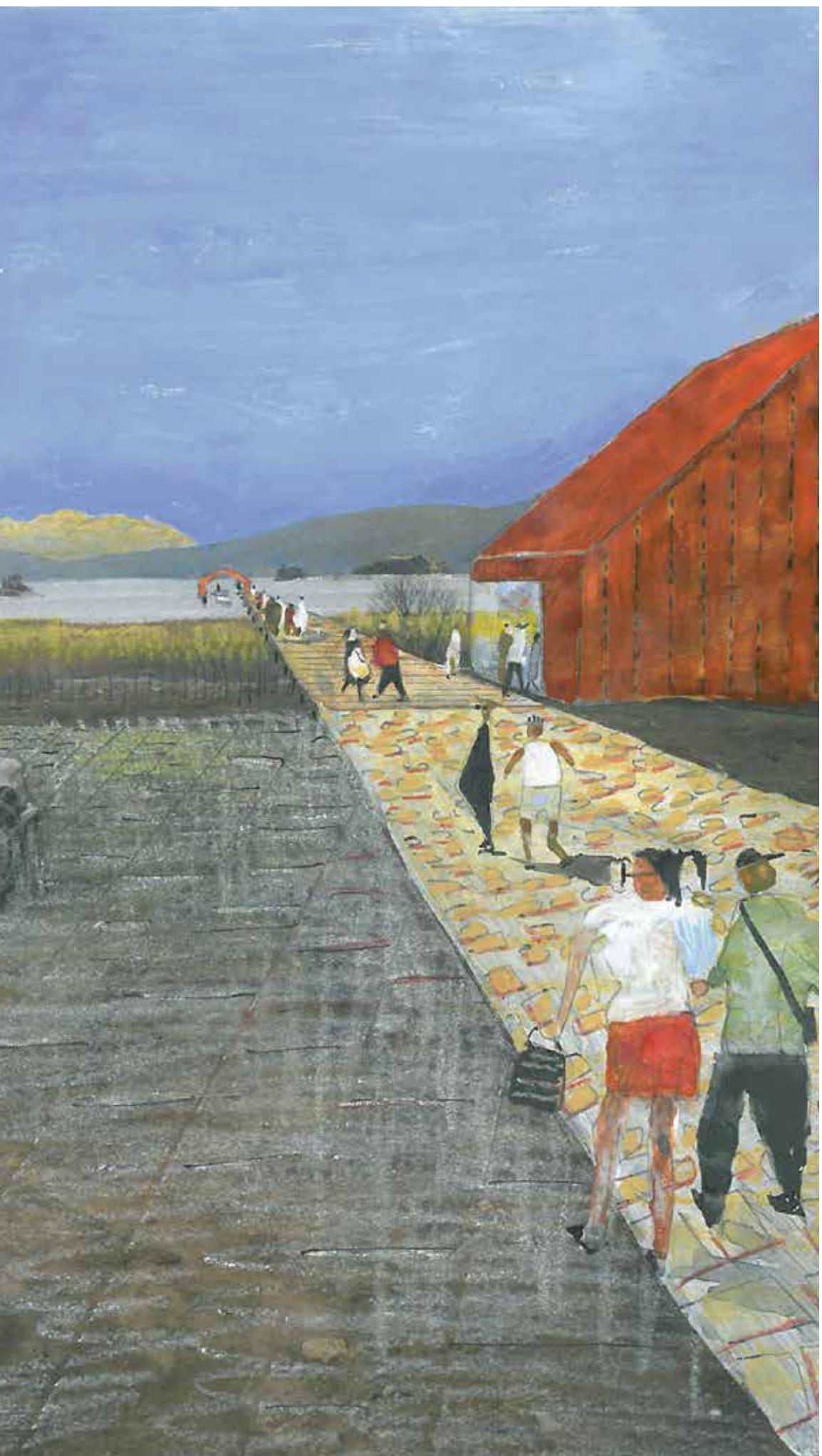
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Bolles + Wilson

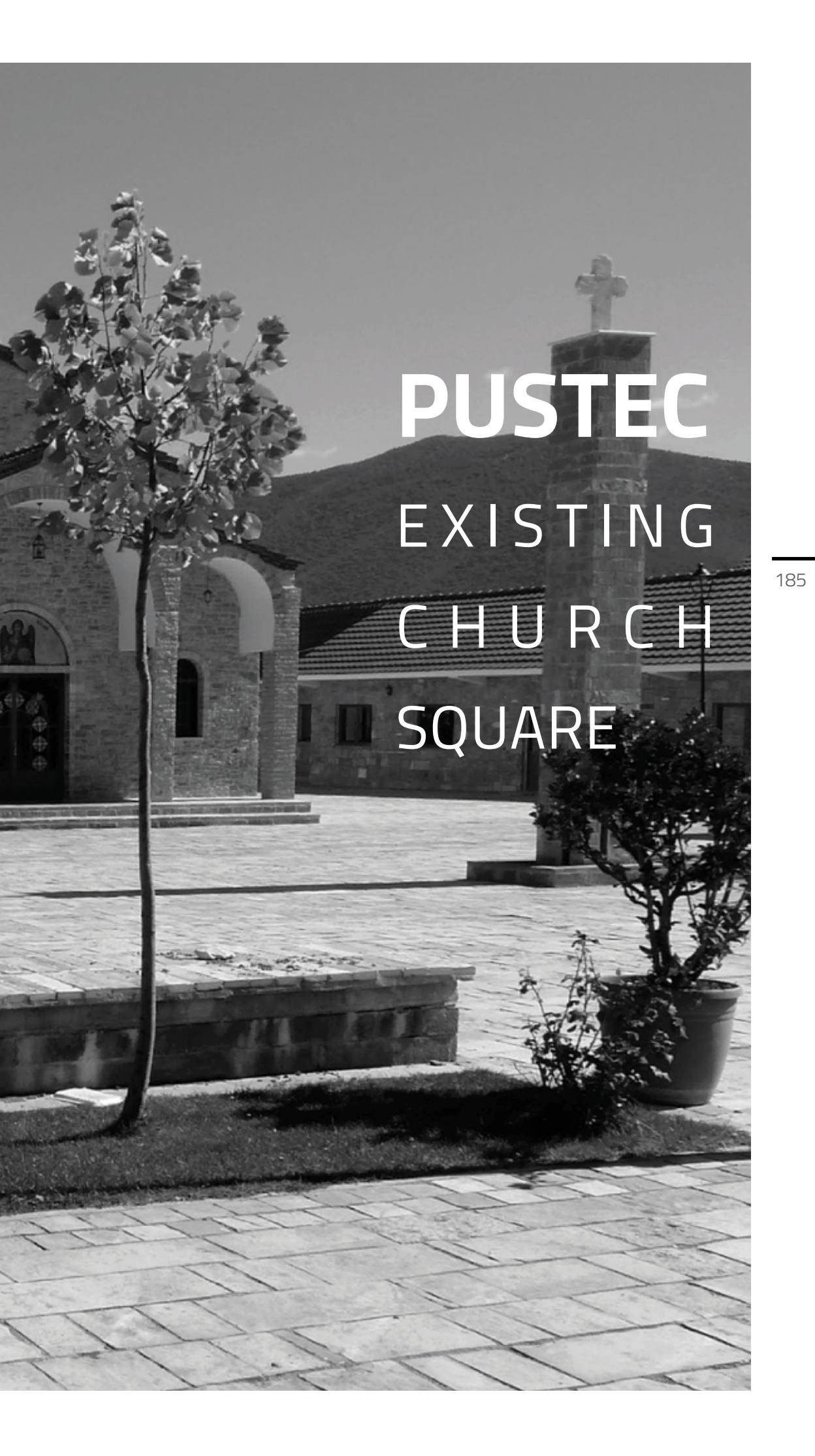
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Introduction - The Municipality of Pustec occupies a singular position within the Prespa Lake region, defined by its lacustrine setting, dispersed village structure, and strong cultural and agricultural identity. As a tertiary urban center within the Korça regional system, Pustec is not conceived as a pole of metropolitan growth, but as a landscape-based settlement network whose value lies in environmental integrity, rural character, and cross-border continuity with North Macedonia and Greece. The development vision for Pustec builds upon its role as a municipality of small villages embedded in a sensitive natural system. Villages such as Pustec, Zaroshka, and surrounding settlements retain a clear rural morphology characterized by cobblestone streets, compact centers, religious and communal squares, and a close relationship between built fabric, agricultural land, and the lake edge. This spatial structure constitutes a key asset, supporting a lifestyle rooted in seasonal rhythms, agriculture, and community life. The project approach recognizes that Pustec's future development must be grounded in the preservation and enhancement of this rural and landscape identity rather than in extensive urbanization or infrastructure-led growth. Interventions are therefore oriented toward qualitative improvement: upgrading public spaces, restoring façades, improving accessibility and services, and reinforcing the legibility of village centers, while maintaining their scale and character. Cobblestone streets, church squares, and central axes are treated not merely as circulation spaces, but as civic elements that structure everyday encounters and collective life. Agriculture plays a central role in the territorial vision for Pustec. Fields of sage and other local crops, together with small-scale farming

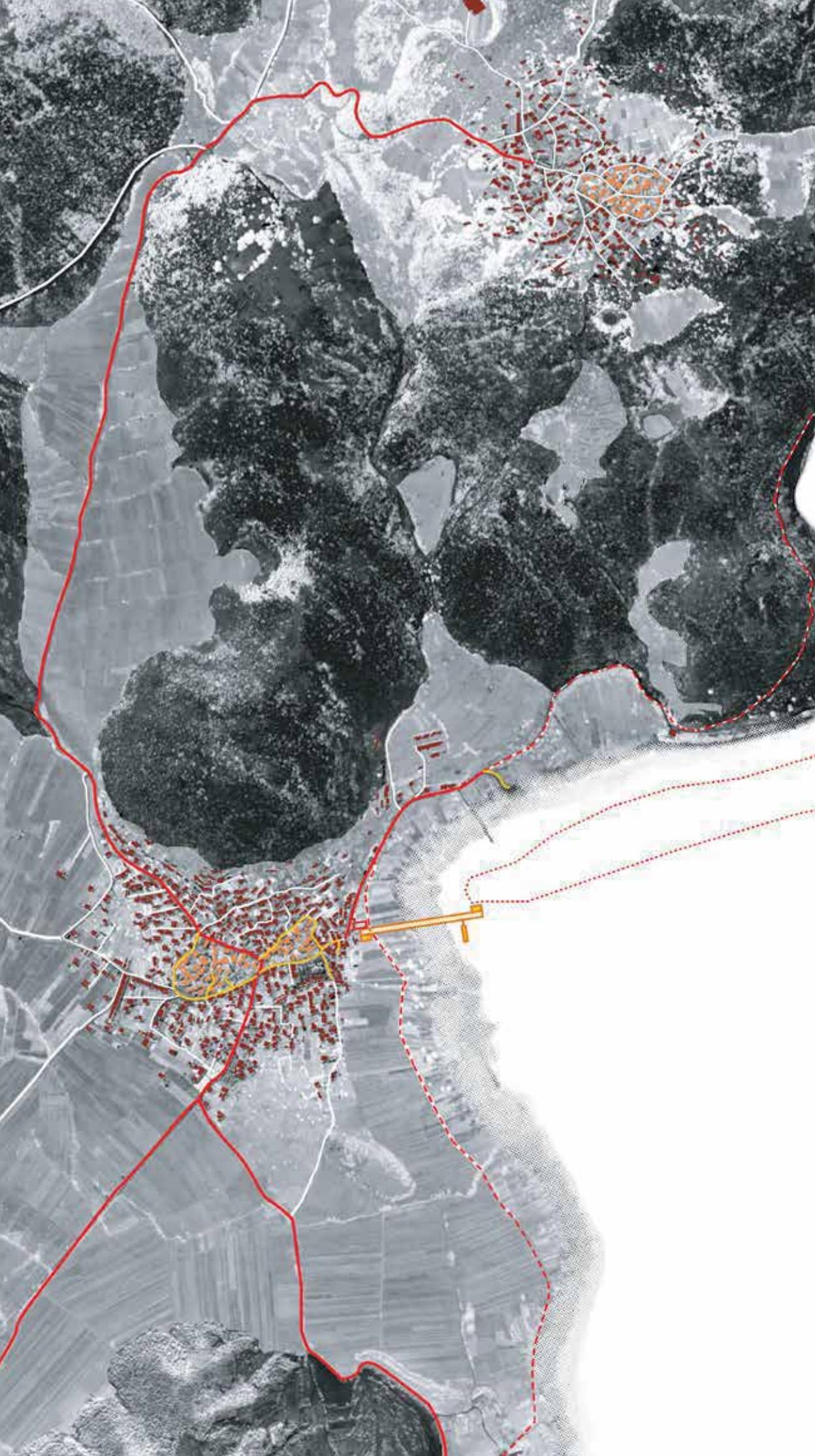
practices, form both the economic base and the landscape framework of the municipality. The project emphasizes the coexistence of productive land and settlement, promoting rural tourism, agro-based activities, and landscape stewardship as complementary strategies. Rather than separating villages from their agricultural surroundings, the vision reinforces their interdependence, framing the agro-field as an extension of public life and local identity. Tourism development in Pustec is approached selectively and with caution, privileging low-impact, nature- and culture-based activities. Proposals such as small-scale hospitality facilities, camping areas, and a sailing club are conceived as integrated elements within the landscape, supporting local economies without compromising ecological balance or village character. The lake is treated as a shared asset whose accessibility must be carefully managed, emphasizing experiential quality over intensity of use. Overall, the project for Pustec and its villages articulates a development model based on continuity rather than transformation. By enhancing existing spatial structures, reinforcing rural character, and aligning economic opportunities with environmental values, the vision positions Pustec as a municipality where landscape, culture, and everyday life remain inseparable. In doing so, it contributes to a broader understanding of Prespa as a cross-border region in which small settlements play a strategic role in maintaining ecological integrity and cultural continuity.







PUSTEC EXISTING CHURCH SQUARE





1 COMMUNITY HALL, BUS+CARPARK + LAKE JETTY FOR TOURIST BOAT + SWIMMING PONTOONS

2 FRESH WATER + SEWAGE

3 ROADS ASPHALT ROAD
 COBBLED STREET
 BICYCLE / FOOTPATH

4 STREET LIGHTING

5 BEACH

6 PONTOONS FOR LAKE TOUR

THE VILLAGE OF PUSTEC - PROJECT **PROJECT SUMMARY**



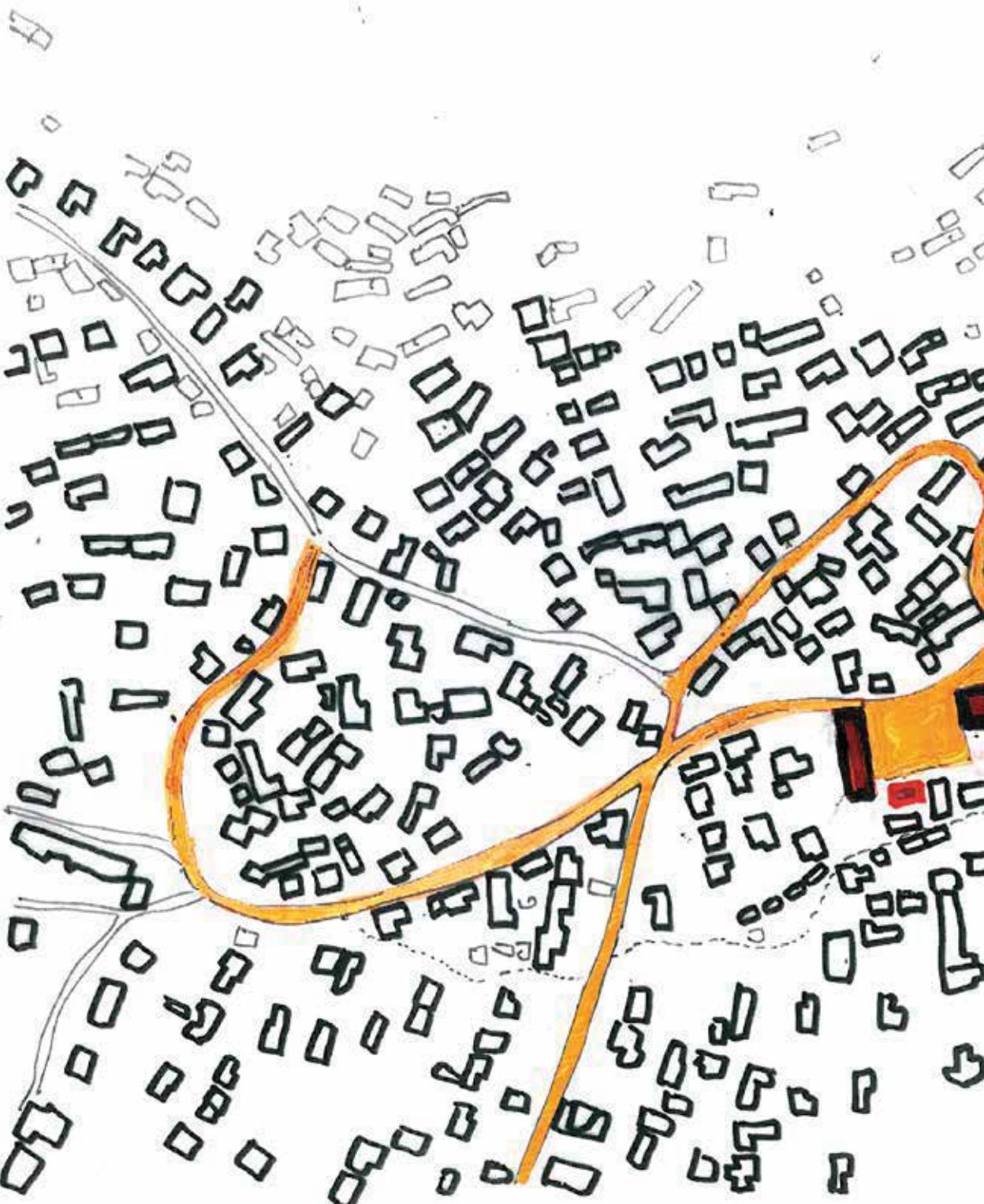
PUSTEC STREETS IN COBBLESTONE

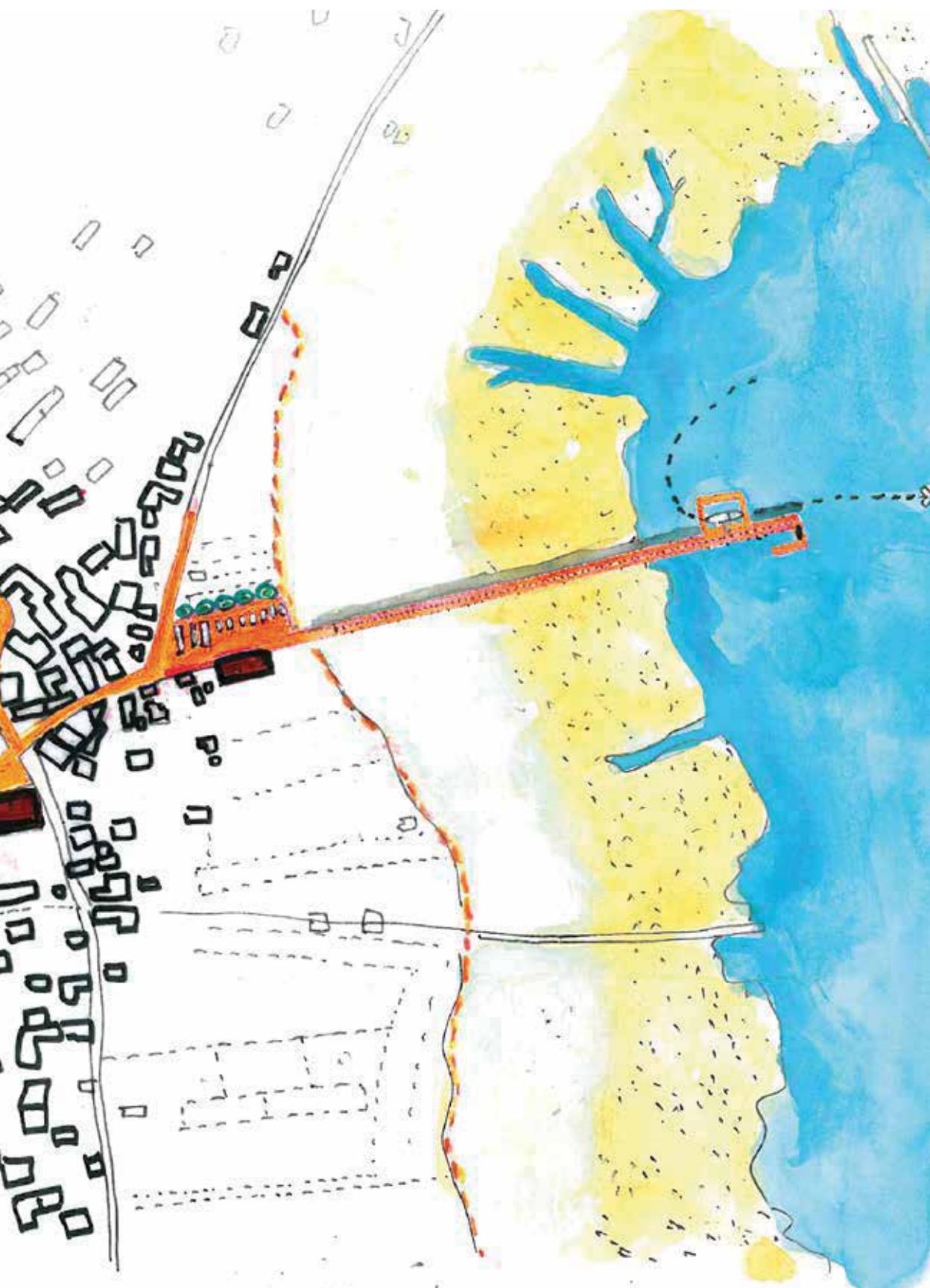
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The project presents the existing spatial character of Pustec's village center, emphasizing the role of the church square and the network of cobblestone streets as key elements of local identity. These spaces define a compact rural morphology where public life, religious landmarks, and everyday movement are closely interwoven. The human-scale streets support slow mobility and social interaction,

while the use of traditional materials reflects cultural continuity and long-standing construction practices. Overall, the project highlights Pustec as a cohesive village structure in which modest public spaces and the built fabric reinforce a strong sense of community and place.





BOLLES+WILSON

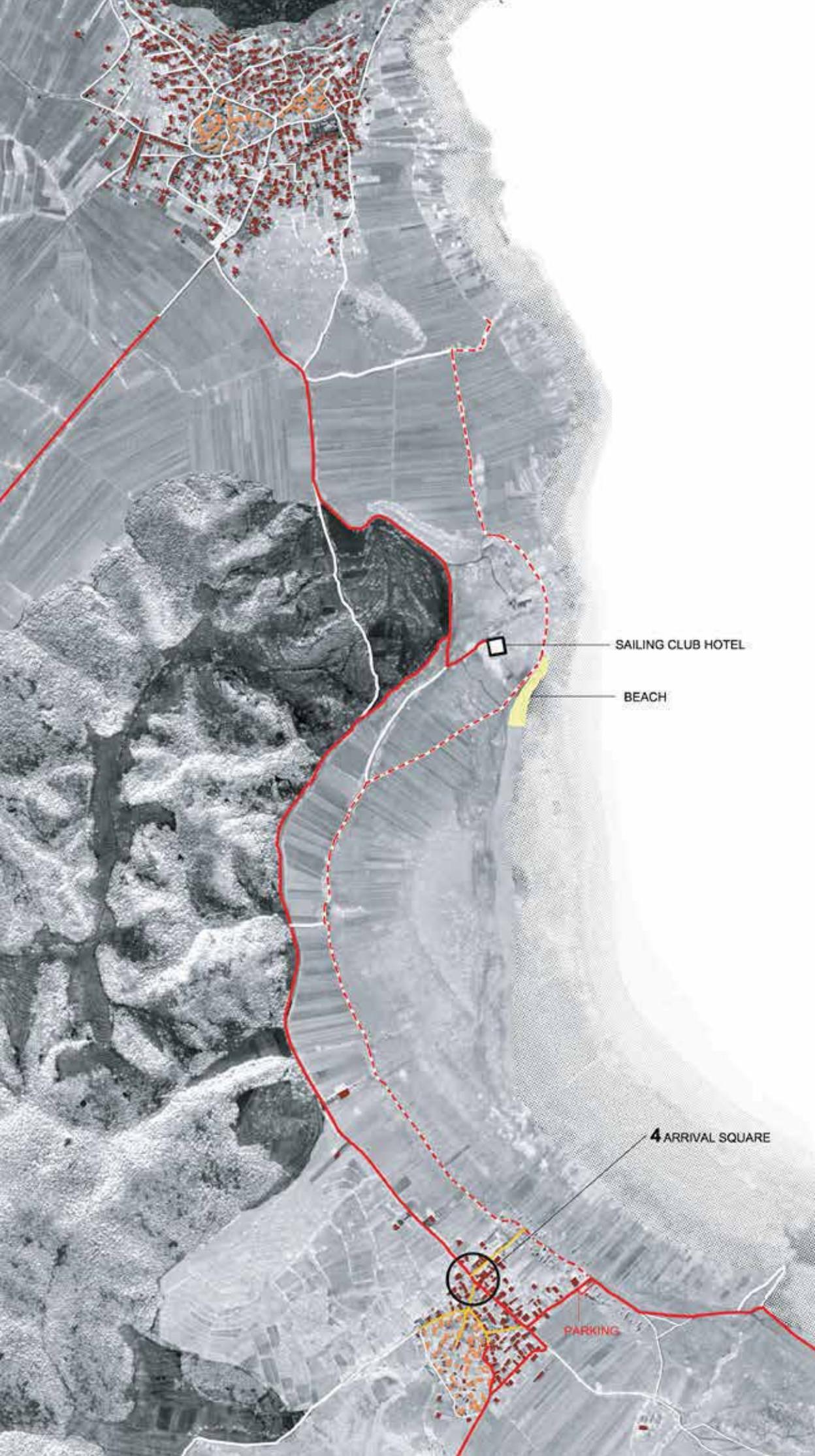
ZAROSHKA

192



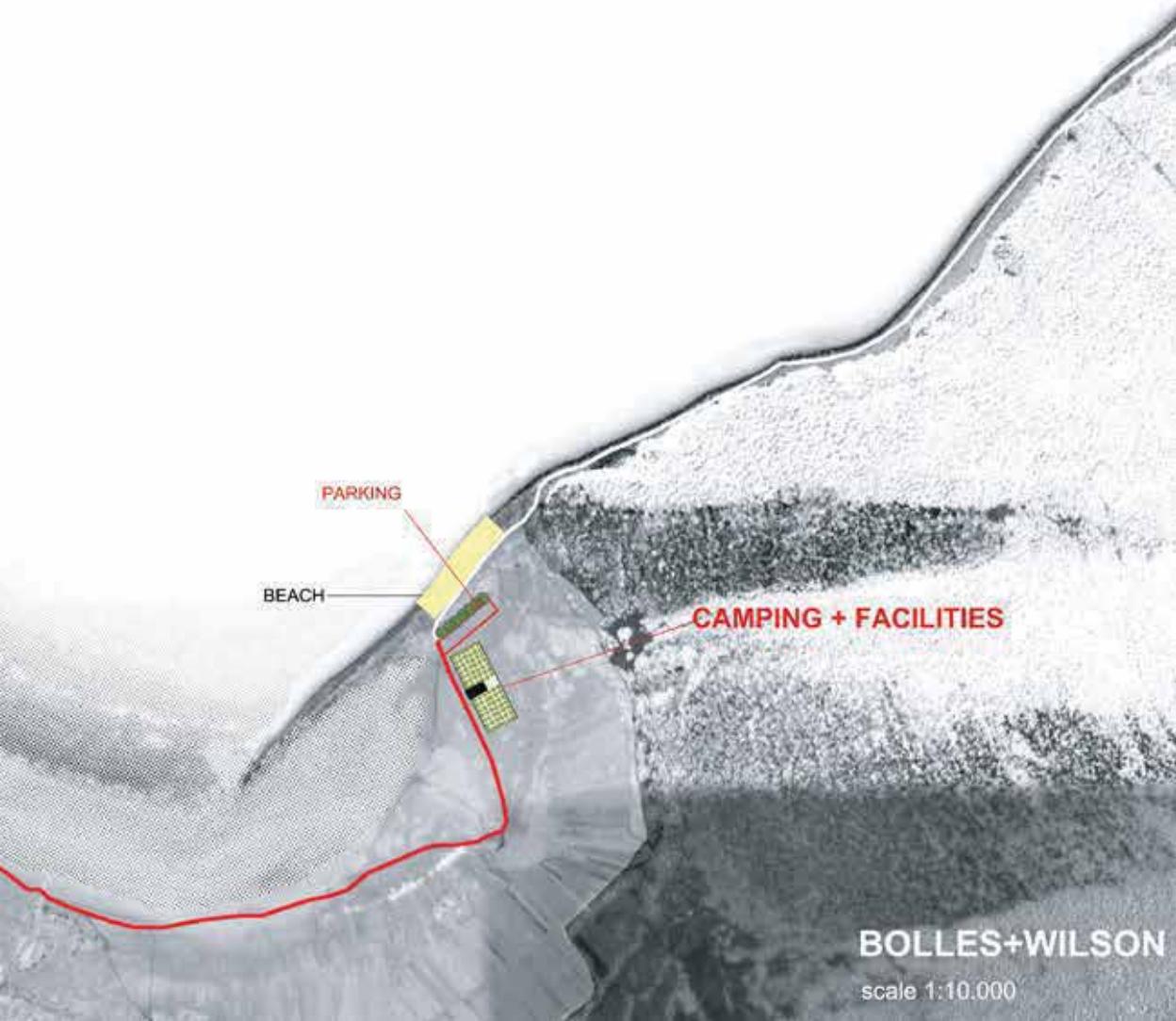
CAMPING VIEW







- 2 FRESH WATER + SEWAGE FOR THE VILLAGE OF ZAROSHKA
- 3 CAMPING PLACE + FACILITIES
- 4 ARRIVAL SQUARE + CONVENIENCE STORE - PUBLIC MEETING PLACE
- 5 STREET LIGHTING
- 6 2 BEACHES
- 7 SAILING CLUB HOTEL



ZAROSHKA



SAGE FIELDS

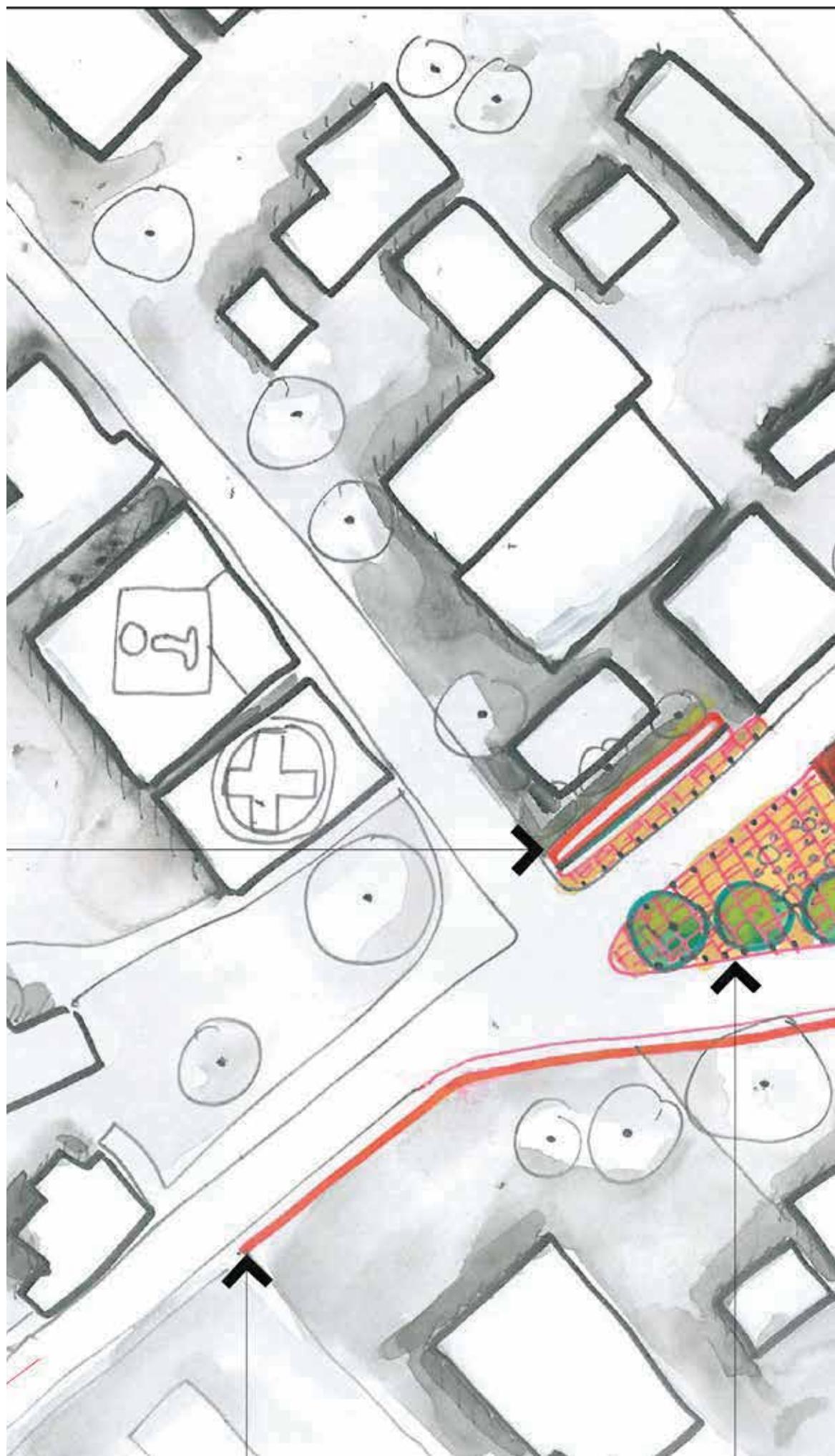




ZAROSHKA RURAL CHARACTER



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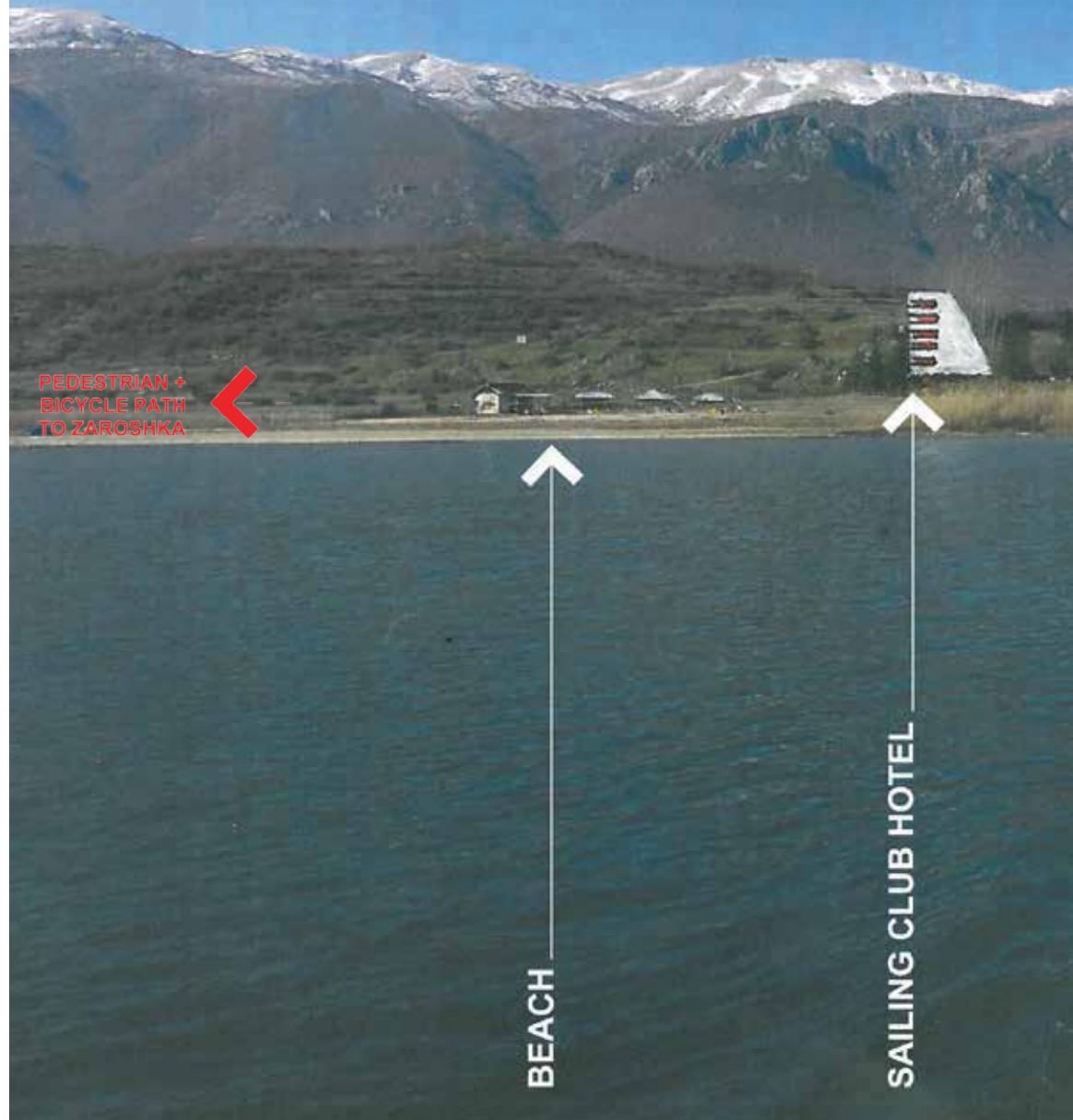


Zaroshka

The project presents a strategic opportunity for small-scale tourism development at the edge of Pustec/Zaroshka, focusing on the suggested location for a sailing club and hotel. The proposal emphasizes a low-impact relationship with the lake, where leisure, sport, and hospitality are integrated into the natural and rural landscape. Rather than introducing a dominant landmark, the intervention is conceived as a complementary function that

supports local economic activity, reinforces the lake-based identity of the area, and remains compatible with the village scale and environmental sensitivity of the Prespa context.

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PROPOSAL

A sailing club hotel on the property of the existing restaurant - the owner is interested in such a development, but requires an investment partner. Such hotel requires minimum of 30 beds it also requires approval on a national level

BENEFIT

HOTEL = employment for both residents of Zaroshka + pustec (it is located at a midpoint between the two)

SAILING CLUB (for local + visitors) requires a boat house and a sailing instructor. beach sailing club hotel

BEACH

Between Pustec and Zaroshka, the beach is understood by locals as a public beach.



2.1

Settlements / Report

*Malvina ISTREFAJ, Julian BEQIRI, Dejvi DAUTI,
Andrea STERPIN, Christin ERDMANN-GOLDONI*

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2.2

Culture / Report

*Mersela DEMAJ, Kejsi VESALAGU, Daniele
ROMAGNOLI, Maristella DE FABRIZIO*

p. 218

2

Workshop Reports

Reimagining the Future of the Lake Prespa Region

A Cross-Border Perspective

DOI: 10.37199/o41010113

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Abstract - When in 2000 "United in diversity" was introduced as the European Union (EU) motto, it envisioned a united Europe in the form of the EU to fight for peace and prosperity while also being enriched by the continent's many diverse cultures, customs, and languages when "United in diversity" was adopted as the EU's motto in 2000. The majority of European nations have already eliminated border restrictions throughout time to allow for the free flow of wealth, people, and culture. The western Balkan nations, on the other hand, have been more susceptible to the impact of a borderless society and have been slower to reform.

The fractionary model that dominates the Prespa region's morphology is acknowledged in this study, which also illuminates the development potential that lies beyond national boundaries.

The Prespa region has been recognized as a well-preserved natural ecosystem that demands unification, but these intersecting landscapes that span three separate countries present significant obstacles to accessibility and collaboration between cities and villages.

'Prespa Renaissance' embraces the concept of a borderless society and examines the significant effects it may have on how the communities and public areas grow in the future. A collection of principles is extracted and applied to various areas through regional case studies. It is anticipated that these important measures would improve the current urban tissue and lay the foundation for resilient expansion that remains uninfluenced by boundaries and encouraged by neighbors.

Keywords - Cross-Border Cooperation, Regional Revitalization, Borderless Settlements, Vernacular Urbanism

Introduction

Prespa Lake's surrounding area, which includes Albania, Greece, and North Macedonia, is home to more than 40 villages and towns, each with its own distinct settlement layout and features. These differences have been shaped by natural and political borders, which have affected growth and, more significantly, the fall of the population over the last thirty years. The presence of stable minority communities and cross-border labour movement have made it possible for the villages in many states to share cultural characteristics despite these disparities. There are two kinds of borders in this region: manmade, which includes traditions, commercial interests, and ethno-cultural barriers, and natural, which include the lake, mountains, and forests.

In anticipation for Albania's possible EU membership, in this study, the idea of removing the transnational borders around the lake has been

explored. There would be serious repercussions from such a removal, especially for the Albanian side, which faces a concerning demographic loss toward larger urban areas or other nations, much like many other peripheral Albanian communities.

Over the past few decades, the lake's water level has fluctuated constantly, gradually declining. There are no trustworthy claims to support the numerous ideas and myths that have been put up to explain this phenomenon. This has caused communities like Pustec, which in 1990 had a direct border with Lake Prespa, to be farther away from the lake's edge. Therefore, the so-called "buffer zone," which each lakeside village has approached in a more or less planned way, has been exposed by the retreating water.

As a result of the lake's waters draining, the "buffer zone" was exposed, and each lakefront city has dealt with it in a more or less organized or

unplanned way. Since Albanian people have a less controlled and more unplanned approach to this area, it has been considered crucial to acknowledge it as a key resource for the development of future settlements.

Opening borders and permitting the unrestricted flow of individuals and goods is thought to provide new momentum for regional revitalization, along with ways to assist local towns' demographic and economic growth. Undoubtedly, tourism has the potential to be a substantial resource, particularly considering the magnificent lakeside scenery and the existence of genuine, traditional local communities. But careful planning in terms of the environment, infrastructure, urban landscape, and culture is necessary to protect and improve the region's natural and human capital. Therefore, the objective is to present plans and strategies for supplying settlement and economic resources that will help to revitalize the region and its inhabitants. The settlements, public areas, and residential areas will be the subject of in-depth analysis and recommendations at the urban scale in this investigation in relation to a number of settlements visited in Greece and Macedonia during the workshop, special attention will be paid to the municipality of Pustec in Albania.

Process and Methodology

In order to achieve a better understanding of the area towards the goals of this workshop, the methodological steps at first, an Ethnographic Investigation was taken in consideration, while relying on the analytical data and application on the case study.

It was necessary to carry out a comprehensive ethnographical inquiry in order to better comprehend the cultural diversity of the region and its spatial distribution as the project morphologically examined one region that spread over three distinct countries. In order to capture patterns of growth, social interaction, and local perspectives for future development, this research largely depended on participant observation, at least in a minor role, by examining the cultural phenomena from the perspective of the study's subject.

Relevant data from both the national and local

governments were presented in order to address the growing problems of depopulation. Gaining a better grasp of the region's demographic concerns was greatly aided by this comprehensive quantitative study that was rationally based and mainly depended on numerical analysis of actual data. The project's hypotheses were examined using a method that made it possible to interpret the provided statistical analysis. Alongside this, a thorough on-site survey was conducted in an effort to contextualize the data by country and read it territorially. A comprehensive analysis of regional case studies was also used in order to conduct in-depth study on a specific topic and gain a better understanding of its functionality and achievements.

Unfolding the Landscape Exploration Dialogue

Investigating the Lakeside Tapestry: An Exploration of Albania (Kallamas, Gollomboc & Pustec), North Macedonia (Ljubojno), and Greece (Agios Achillios). The settlements surrounding the Prespa Lake, tucked away at the intersection of Albania, North Macedonia, and Greece, invited us on an adventure that transcends national borders.

Mental maps played a crucial role in guiding views and experiences of the various communities scattered along the lakeshore as the journey proceeded. Mental mapping became a dynamic tool that influenced the perspective and connection with each location, guiding the investigation through the complex tapestry of cultural nuances, architectural variations, and the distinct pulse of life in each community. This journey was more than just a physical exploration; it was a sensory and emotional immersion into the essence of these villages. The mental map that was created by reflecting on the location functioned as a narrative thread that connected further interactions with Diellas, Pustec, Ljubojno, and Psarades.

On this mental map process, each settlement is a unique point that adds to the complex narrative of lakeside life. Mental mapping enhances comprehension and appreciation of the connecting settlements surrounding the lake through a trip of the mind between reality and perception. As you go

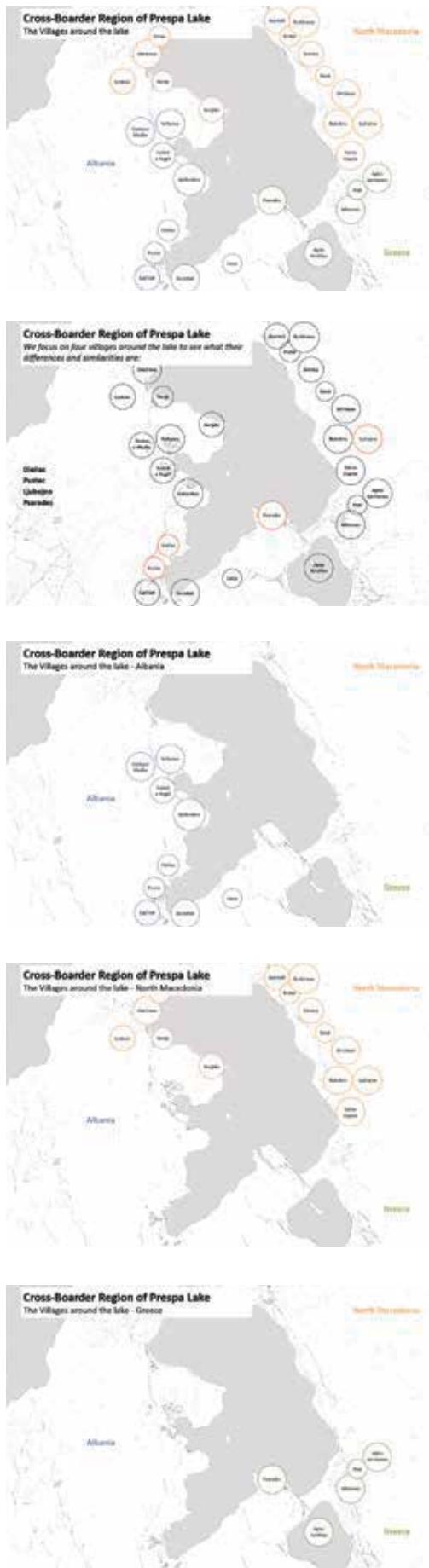


Fig. 1. Mapping the settlements around Prespa River. Source: PhD Candidates

Elaborations: Christin Erdmann-Goldoni, Julian Begiri, Dejvi Dauti, Andrea Sterpin, (2023)

over this terrain, it becomes a dynamic painting that captures the spirit of each community and the unity that unites them.

During the workshop and working on site, the collective thoughts transformed into a cohesive plan and future vision for the Prespa Region through the discussion of observations, opinions, and hypotheses. Distinctive difficulties were acknowledged and found to be important elements affecting the development of the area. Housing problems, underdeveloped public areas, inherent spatial constraints, inadequate service accessibility, long commutes for necessities and education, and a general trend of depopulation are some of these difficulties.

Envisioning a Borderless Future for Lakeside Villages

The research's primary investigation revolves around the possible future of borderless settlements. This investigation focused on four different communities around the lake: Diellas, Pustec (Albania), Ljubochno (North Macedonia), and Psarades (Greece). Analyzing the range of patterns that define their organic growth, as well as the variations and shared traits.

Guy Debord's 1957 map, "The Naked City," which depicts the city as a dynamic mechanism with fluctuating patterns of mobility, occupation, and density, served as inspiration, guided by theoretical frameworks that aligned with the vision of the working group. As stated in "Cities for People" (2010), Jan Gehl's worldview reaffirmed the aim to create environments that are conducive to human activity and put people before vehicles or structures. The ageless wisdom of Jane Jacobs highlights the critical function of sidewalks and streets as a city's most important organs. From this perspective, the investigation of particular villages takes place:

Diellas Village represents a distinctive pattern of organic growth influenced by the prevalent idea of land and house as a single entity, within Puster Municipality

Pustec's unique character is shaped by the buildings' repetition as a unit, demonstrating an alternative method of organic development, in Korçë County

In Ljubochno, the Village in Resen, North Macedonia, how shared spaces promote community interactions by highlighting the extent of public space in the village is examined.

Psarades Village, in Greece demonstrates a dedication to protecting the environment by emphasizing buffer zones as protected areas and streets as lively public areas.

The process of exploration unfolded the following variables that are emerged from the layers of Built Environment, Natural Landscape, and Human Sources. These constituted the main pillars of the generated vision, which gave rise to a number of concepts meant to improve and revitalize the Prespa Region's future. A unified approach that integrates several smaller projects, able to create a vibrant dynamic and interconnected future to surface in the cooperative investigation of the Prespa Region. The vision included a thorough strategy to deal with obstacles and take advantage of opportunities, by enhancing the impact of the existing resources.

Vision for the Prespa Lake Region

The framework Vision for the Prespa Region represents a dynamic network that skillfully connects settlements through easily accessible amenities and well-placed highlights. The goal of this careful integration is to produce a seamless tapestry that strengthens the region's overall fabric while also connecting local communities. Developing

a feeling of shared identity and cooperation among the various villages is aimed to be achieved by promoting accessibility and connectivity, which will ultimately strengthen the communities unity and vitality.

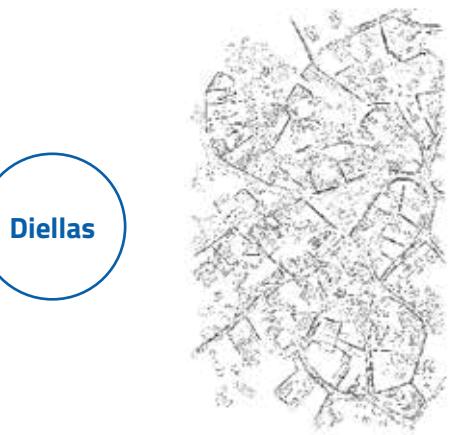
The strategic initiative of Establishing Strong Tourist Spots is another integral part of the vision. This entails creating alluring tourist attractions that highlight the unique appeal of the area and attract tourists from both nearby and distant locations. These thoughtfully chosen locations are intended to not only highlight the region's natural and cultural diversity but also make a substantial economic contribution. By developing captivating attractions, the possibility enhances for the establishment of the Prespa Region as a must-see location and promote tourism as a vital engine of prosperity and sustainable development. Public spaces must be integrated with vital economic infrastructure and cultural institutions in order for them to be connected to them.

The goal of this integration is to promote a vibrant and rich community experience. Simultaneously, Enriching Public Spaces with Cultural Activities entails bringing these areas to life through a variety of cultural events, such as festivals, markets, exhibitions, and more. When taken as a whole, these programs produce active areas for social interaction, making public areas not only useful but also dynamic hubs that support the Prespa Region's cultural and economic life. The Preservation of the Natural State of Buffer Zones initiative is part of the dedication to preserve the Prespa Region. This entails maintaining buffer zones' inherent integrity as crucial ecological protections. At the same time, carefully chosen social activities to activate these areas are suggested to take place.

The vision established during this work, seeks to achieve a balance that not only safeguards the ecological significance of buffer zones but also encourages communities to actively engage with and value these priceless natural areas by balancing preservation with mindful involvement. Identifying and protecting natural highlights that emphasize the area's natural beauty and provide spaces for reflection and interaction with the natural world. An encompassing plan for the Prespa Region smoothly combines two essential projects.

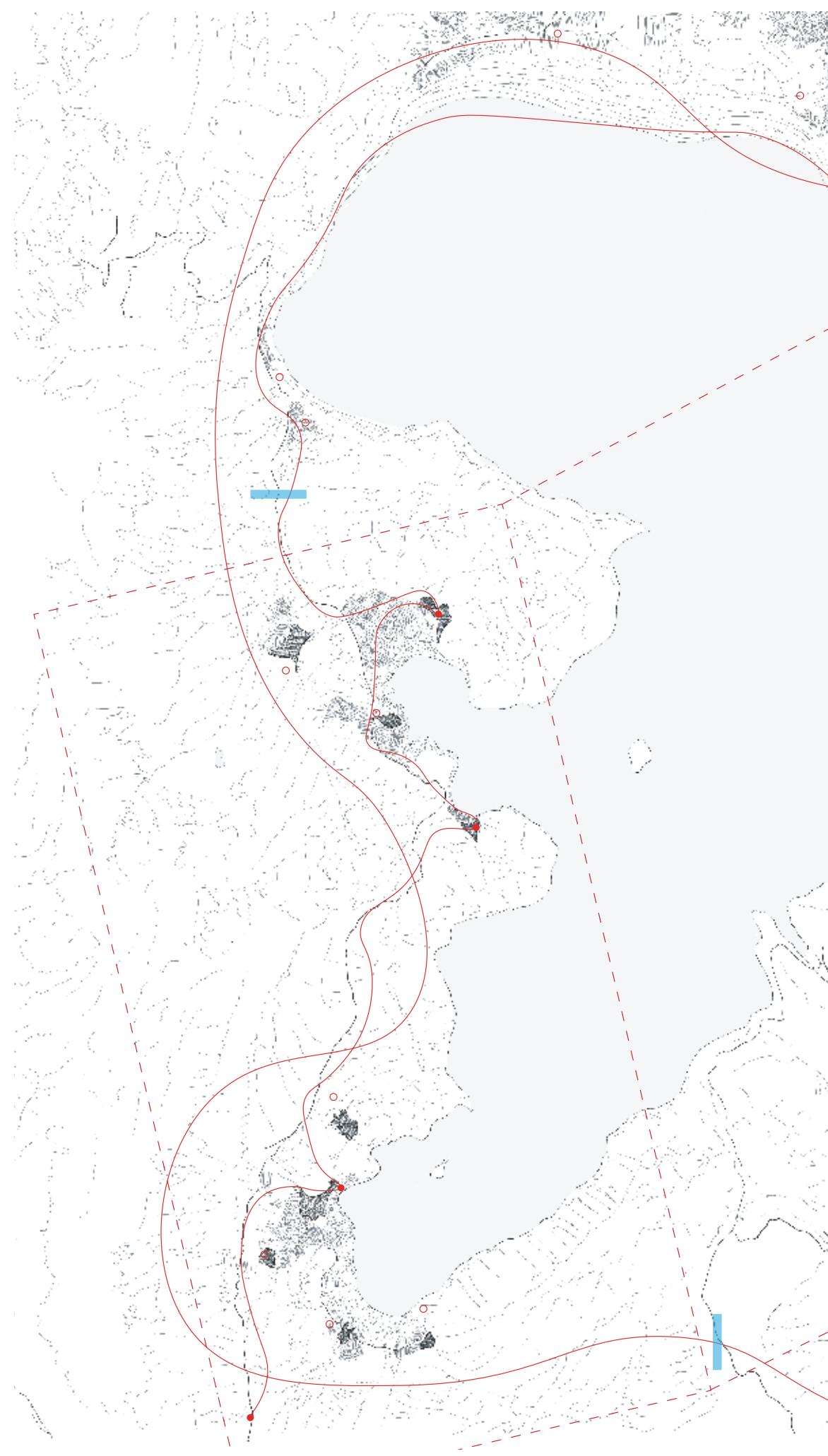
First and foremost, the Reconnection of Villages to the Lake is a strategic step that aims to revitalize the relationship between villages and the lake by creating a mutually beneficial partnership that enhances the recreational, cultural, and economic aspects of lakeside living. Concurrently, the endeavor to Establish Hubs as Connecting Points to the Lake concentrates on developing strategic spots that function as essential points of connection to the lake. In addition to fostering a feeling of community, these focal points offer necessary services and facilities, guaranteeing a connected and prosperous lakeside environment for the locals. The unique patterns seen in the communities of Diellas, Pustec, Ljubochno, and Psarades serve as inspiration the concept of the future settlement and way of life surrounding Lake Prespa.

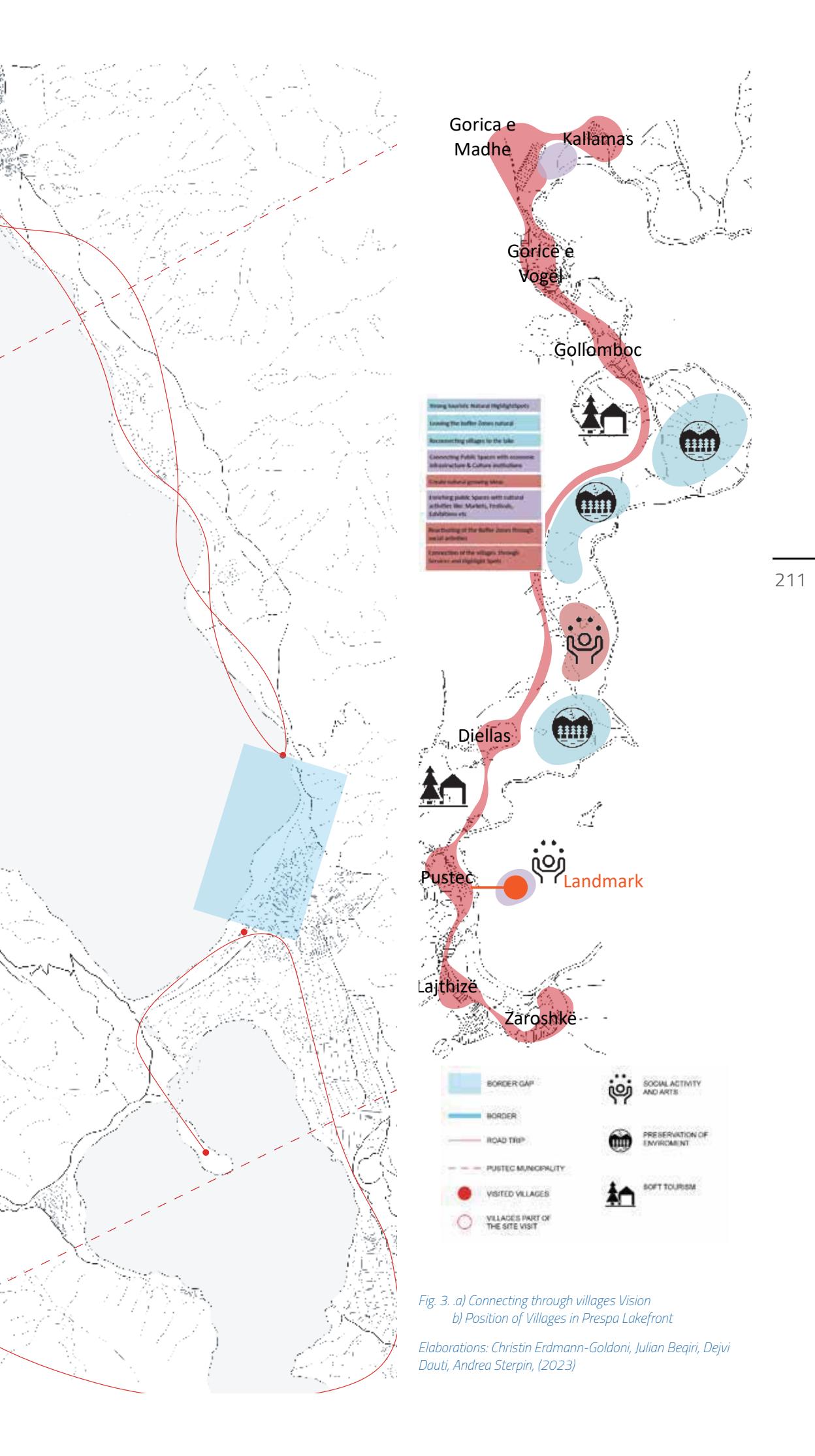
In this ideal environment, the notion of land and house are combined to create a single, cohesive whole. This creative method reflects a strong bond between the built environment and the surrounding land and helps create a distinctive and harmonious pattern of organic growth. The dedication to a comprehensive and sustainable future for the Prespa Region is reflected in this integrated vision. By combining these efforts, we hope to build a strong and cohesive network that honors the area's natural beauty, cultural diversity,

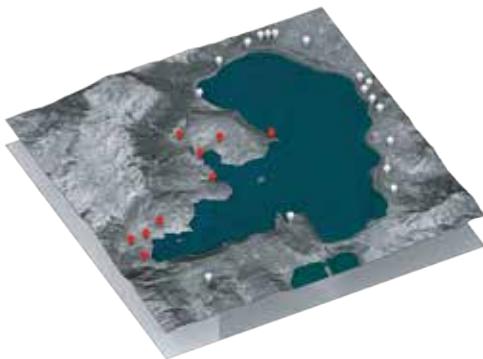


*Fig 2 .Patterns of organic growth of the 4 villages selected.
Source: PhD Candidates*

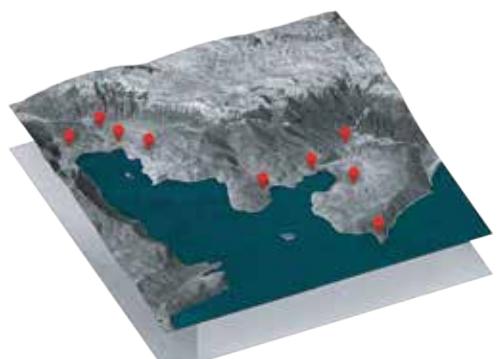
Elaborations: Christin Erdmann-Goldoni, Julian Begiri, Dejvi Dauti, Andrea Sterpin, (2023)







PRESPA LAKE : CROSS-BORDER RELATIONS VIEW

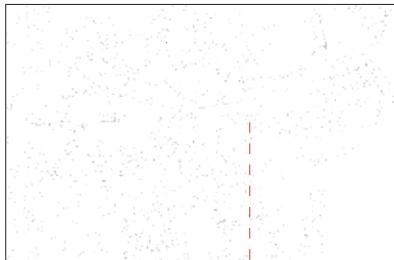


PRESPA LAKE: PUSTEC MUNICIPALITY

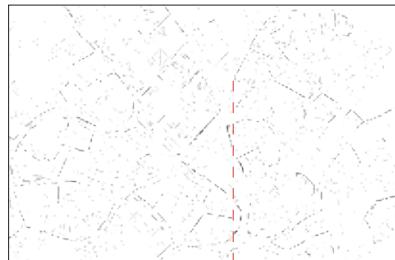
Fig. 4. .a) Connecting through villages Vision
b) Position of Villages in Prespa Lakefront

Elaborations: Andrea Sterpin, Christin Erdmann-Goldoni, Julian Beqiri, Dejvi Dauti (2023)

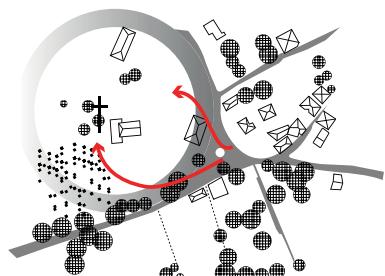
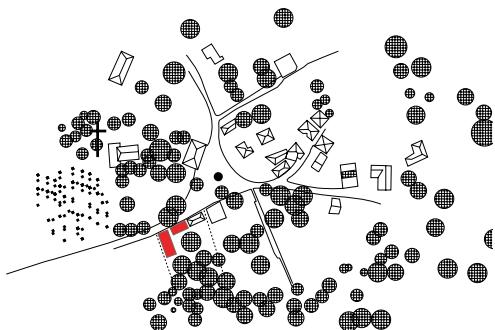
Ljuboyno



Diellas



CENTRAL GRAVITY



OPTIMIZING PRIVATE PROPERTY

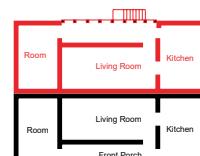
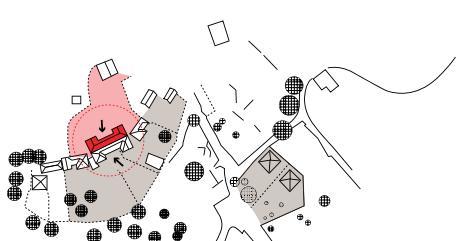
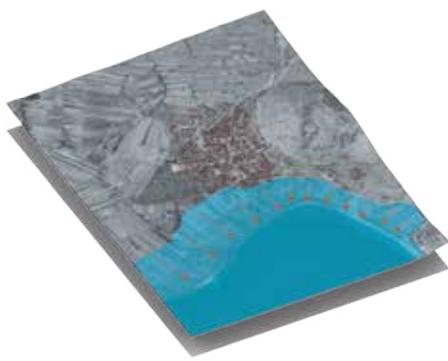
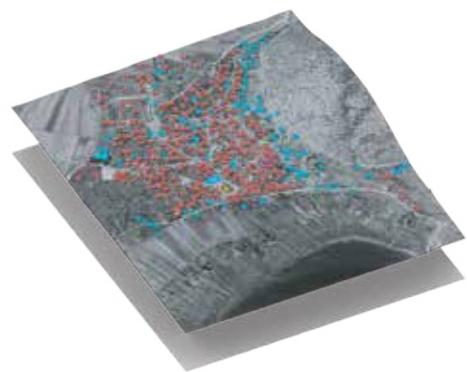


Fig. 6. .Connecting through villages Vision

Elaborations: Julian Beqiri, Andrea Sterpin, Christin Erdmann-Goldoni, Dejvi Dauti (2023)



PRESPA LAKE: 1990 - 2023 SHRINKING

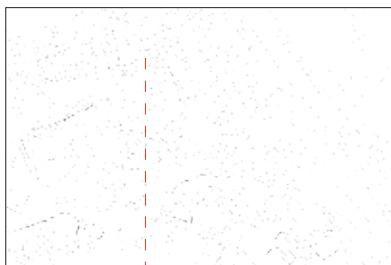


PUSTEC VILLAGE: CURRENT STATE OF AFFAIRS

Fig. 5. a) Connecting through villages Vision
b) Position of Villages in Prespa Lakefront

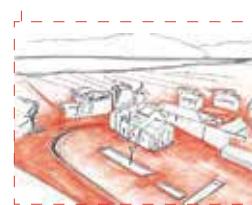
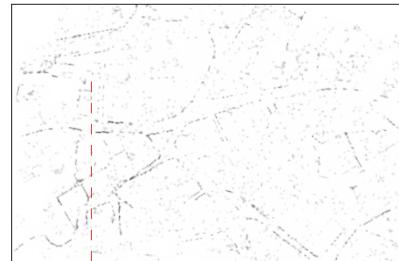
Elaborations: Andrea Sterpin, Christin Erdmann-Goldoni, Julian Begiri, Dejvi Dauti (2023)

Psarades



PRESERVING NATURAL AREA

Pustec



STREETS AS REAL PUBLIC SPACE

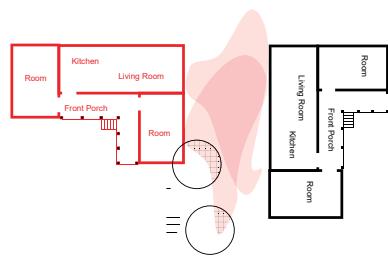
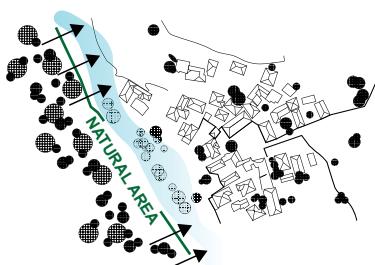
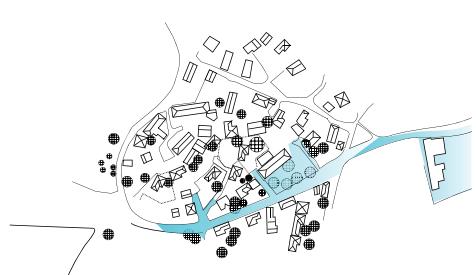
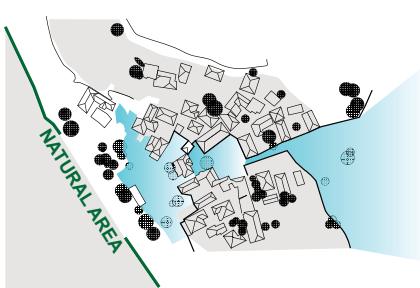


Fig. 7. .a) Connecting through villages Vision
b) Position of Villages in Prespa Lakefront

Elaborations: Julian Begiri, Andrea Sterpin, Christin Erdmann-Goldoni, Dejvi Dauti (2023)

and sense of community. Together, these concepts provide a thorough strategy for resolving the issues raised by emphasizing community involvement, interconnectedness, and the peaceful merge of natural and cultural aspects to revitalize the Prespa Region.

This investigation aims to rethink these lakeside settlements using concepts from the creation of organic dwellings and studies on vernacular architecture. In order to promote a linked and borderless future, it seeks to incorporate many patterns while valuing the individuality of every community. The aim is based on the conviction that recognizing and appreciating these patterns can help build thriving, livable, and sustainable lakeside communities.

Conclusions

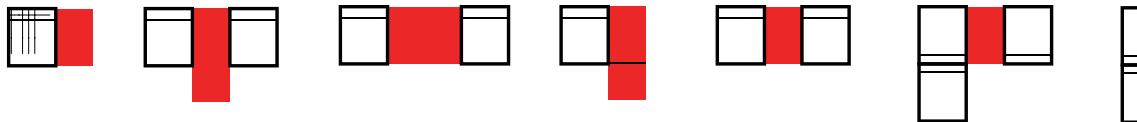
The product of this workshop, under the project name "Prespa Renaissance," was developed as a dynamic investigation within the imagination of a borderless future inside the Prespa Region's changing story. The study, which is based on the European Union's motto, "United in diversity," embraces the notion of a borderless society and acknowledges the potential for revitalization concealed behind

the borders of the nations surrounding Lake Prespa. The research highlights the possibility of transformative interventions that could go beyond the Prespa region's artificial and natural bounds, while also acknowledging the particular difficulties these boundaries present. Revealing the complex fabric of lakeside life, influenced by both natural and political factors by analyzing the morphology and dynamics of more than 40 communities in Albania, Greece, and Macedonia.

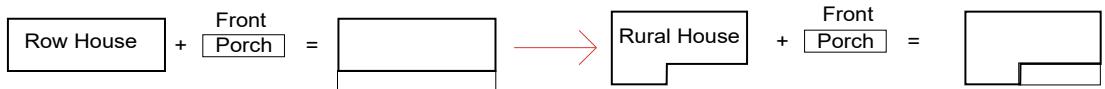
In light of Albania's prospective membership in the Schengen Area and the European Union, the idea of eliminating transnational barriers around the lake becomes a focus point. The study examines the population decrease, spatial limitations, and developmental difficulties that Albanian settlements like Pustec, emphasizing the importance of well-thought-out remedies. A "buffer zone," a region mostly used for farming and agriculture, has been revealed by Lake Prespa's water level oscillations over the past few decades, providing a rare chance to reinvent lakeside areas.

Under the speculation that opening up borders and permitting unrestricted travel could boost population and economic expansion, it is expected that with the immaculate lakeside scenery and

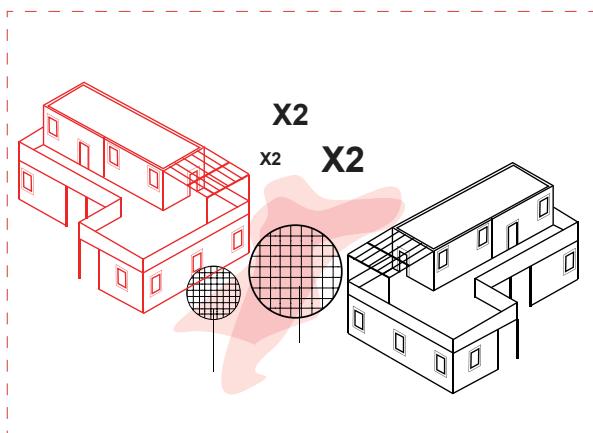
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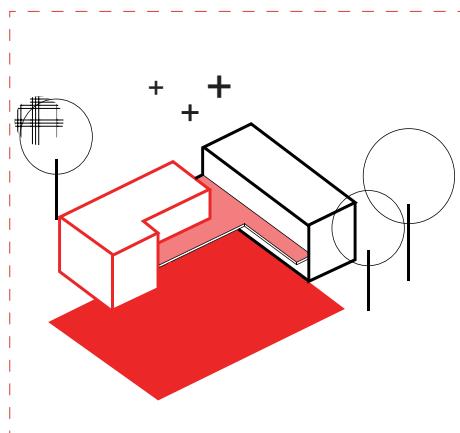
PRINCIPLE OF GROWTH



ADDITION IN VERNACULAR ARCHITECTURE



MIRRORING AND MULTIPLYING



CONNECTING AND ADDING

Fig. 8. Connecting through villages Vision

Elaborations: Julian Begiri, Andrea Sterpin, Christin Erdmann-Goldoni, Dejvi Dauti (2023)

genuine local communities enormous potential is offered based on the tourism emerging as a crucial resource. This project work integrates case studies, quantitative analysis, and ethnographic research to provide a thorough picture of the region's growth trends, demographic challenges, and cultural diversity. The theoretical framework-driven investigation of certain villages highlights the natural evolution of each community.

The Prespa Region's unified vision focuses on establishing strong tourist destinations, integrating public spaces with economic infrastructure and cultural institutions, enhancing public spaces with cultural activities, maintaining buffer zones in their natural state, reconnecting villages to the lake through strategic hubs, and connecting villages through services and highlight spots.

This integrated vision celebrates the area's natural beauty, cultural diversity, and sense of community while working toward a robust and connected network. It imagines a world without borders in which the Prespa Region's lakeside settlements are thriving, habitable, and sustainable thanks to an awareness of and acceptance of the diversity of patterns. A fascinating story of possibility is revealed as one travels through the complex

tapestry of settlements surrounding Lake Prespa, which have been fashioned by many cultures, natural boundaries, and historical influences. The idea that population and economic growth could be accelerated by border removal offers a novel viewpoint. It becomes an important catalyst for sustainable development because of its capacity to highlight the region's allure.

This investigation presents essentially an affirmation of the transforming potential of teamwork, creative thinking, and a common dedication to creating a future that honors diversity, promotes connectivity, and revitalizes the spirit of lakeside towns. It inspires a sense of purpose and optimism for a Prespa Region that is borderless, vibrant, and prosperous.

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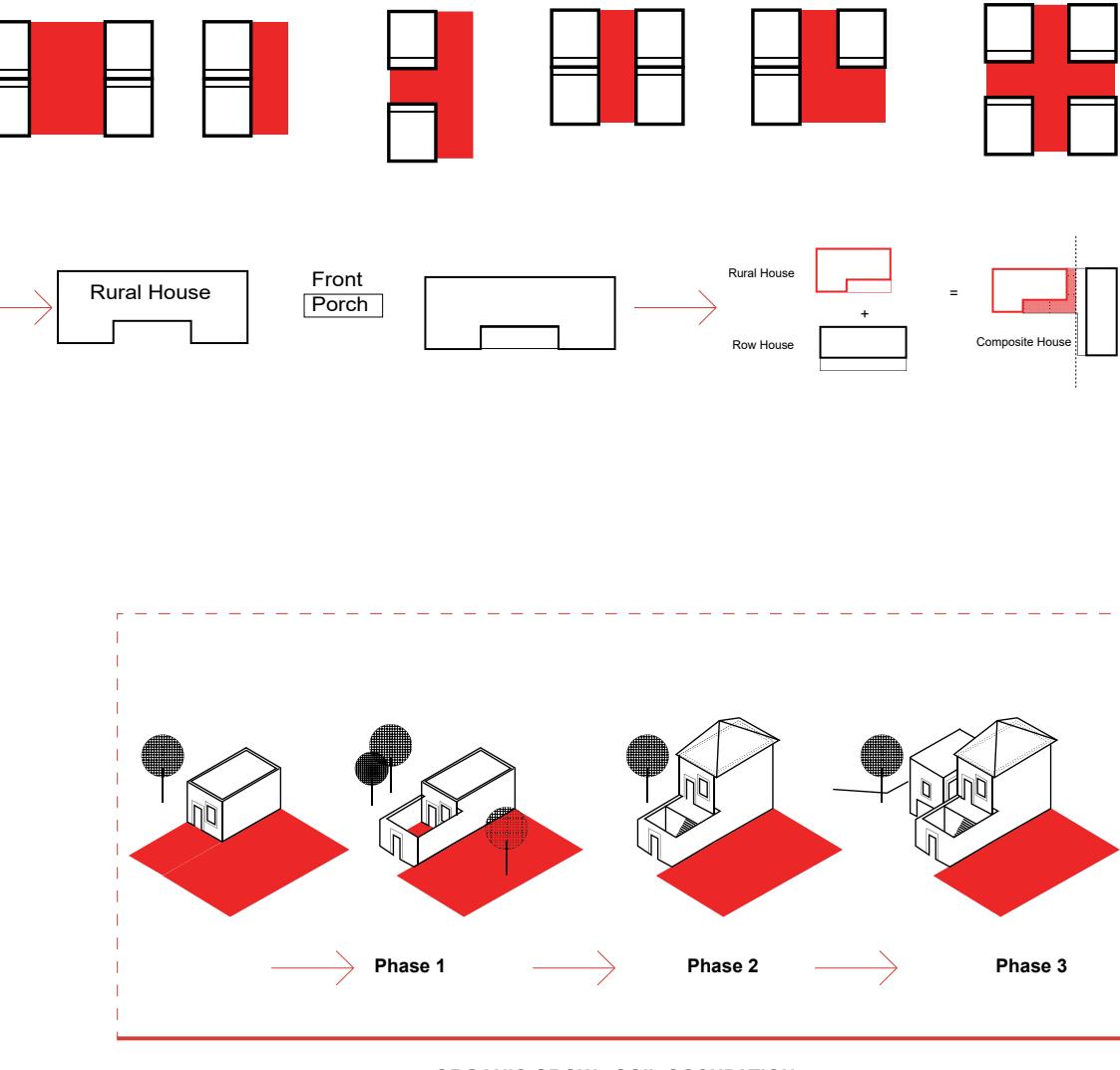


Fig. 9. Connecting through villages Vision

Elaborations: Julian Beqiri, Andrea Sterpin, Christin Erdmann-Goldoni, Dejvi Dauti (2023)



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Fig. 10 .Envisioned Spatial Vision Map. Source: Authors



Fig. 11 .Envisioned Spatial Vision Map. Source: Authors



Fig. 12 .Envisioned Spatial Vision Map. Source: Authors



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Historic Cultural Landscapes Across Political Borders Connecting Communities and Cultures - case of Prespa Lake

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Abstract - This report shows the research undertaken by the 39th PhD cycle Cultural Heritage Landscape Group, in the framework of the Joint International PhD Program IDAUP between POLIS University and University of Ferrara. The Cross-Border Region of the Prespa Lakes and Pustec Municipality, the case study of this research, was framed as the intersection of infrastructural, environmental, cultural and habitation landscapes. Located in the southeast of Albania, Pustec Municipality borders with Greece and North Macedonia, all of three countries sharing the Prespa Lakes. The environmental richness and the wider multidimensional ecological importance of the zone led jointly the three countries to establish the Prespa Transboundary Park in 2000. Very rich also in terms of cultural heritage, this site testimonies the continuous presence of human settlements starting from the Neolithic Age and continuing today. Byzantine hermitages and examples of stone masonry vernacular architecture, are identifying cultural heritage elements of the region. Despite the richness, multiple territorial, social, and environmental problems have been identified in the site. They have led to isolation, shrinking, migration, and emigration of the local population. In response to these problems, cultural heritage was proposed as one of the four fields of inquiry of the PhD Workshop and was followed by this PhD research group. Under a shared vision of Pustec as capable of valorising the potentials and mitigating the problems, the cultural heritage landscape PhD group envisioned to enhance the cultural heritage in its broadest sense. It explored the interrelation of historic built environment with the geomorphology of the site, as potential drivers for sustainable development. Adopting a holistic multi-scale approach, the PhD research group proposed reintegration of the dispersed cultural heritage assets into a coherent landscape system as key to limit depopulation, restore continuity and enhance territorial identity of the region and particularly of Pustec Municipality.

Keywords - Historic Landscape, Cultural Heritage, Heritage-Led planning, Geomorphology, Sustainable Development

Introduction

Pustec Municipality is in southeast Albania, bordering with Greece (southeast) and North Macedonia (north and east). All three countries share the two-freshwater tectonic Prespa Lakes. A third lake being Lake Ohrid, is located just thirty kilometers away and is inscribed in the UNESCO World Heritage List. The Great Prespa lake is shared between Albania, Greece and North Macedonia; while the Lesser Prespa Lake between Albania and Greece. The two Prespa lakes, and the mountains surrounding them create a natural paradise rarely encountered elsewhere. The region is an example of the harmonic coexistence of human and nature and it was the first National Park to be designated in 1992 in Albania after the communist regime fall. Aware of the wider and multidimensional ecological

importance of the zone, the three countries jointly established the Prespas Transboundary Park in 2000, the first transboundary protected area in the Balkans. The National Park in Albania comprises both terrestrial and aquatic components (including Maligrad Island) and its boundaries correspond with the watershed of both Prespa lakes. The terrestrial ecosystem is dominated by the mountain massif of Mali i Thatë (Dry Mountain) which extends in North Macedonia with the Galicica Mountain range. The entire Prespa region hosts unique habitats and species that are important from both a European and a global conservation perspective.

The historic and cultural richness of the region is described in many sources (see section 2.1). According to Bunguri et al [1], the earliest

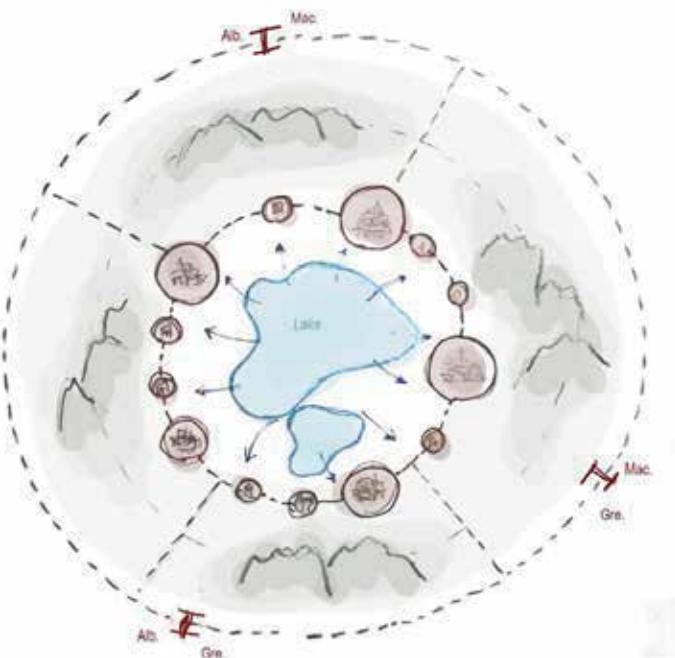


Fig. 1. Strategy. Source/ Authors

archaeological evidence of the presence of human settlements in this region dates back to the Neolithic Age. Subsequently the region hosts significant heritage assets from the Roman, Byzantine and Ottoman periods up to the early 20th century. Sources show that documented human presence emerges around 2nd century BC when Prespa region became part of the Roman Provinces. After a short period as the first seat of Czar Samuel of Bulgaria, the territory was reconquered by the Byzantine in 1018, period when the seat of the Archbishop of Ohrid was established. After the 12th century, the region passed under subsequent rules of the Despot of Epirus, Michael II Angelus and of the Emperor of Nicaea, Michael VIII Palaeologus. New political and social changes happened in 1334, when the Bishopric of Ohrid was included under the Serbian state of Stefan Dushan interrupting its traditional ties with Constantinople. It was conquered by the Ottomans in circa 1386 and the region remained under their rule for 526 years. Current national borders were redrawn in the aftermath of World War I by the Great Powers. This together with the militarization of borders during the communist regime in Albania, significantly diminished the historical cultural interactions between settlements around the lake. Even though this region is today divided between Albania, Greece and North Macedonia, it presents common points in terms of tangible and intangible heritage, which is coherent since, as mentioned in [2], the establishment of national borders dates back only to the 1926. The local populations in each of the three countries naturally include also minority communities from bordering countries.

Many sources refer to the Byzantine hermitages (cave churches) as the most outstanding cultural heritage elements of the region. Caved in steep and hardly accessible rocky shores, they are inseparable from the landscape. Together with archaeological sites, post byzantine churches and several examples of vernacular architecture from 18th – 19th and early 20th century, they compose the built heritage panorama of this region. Even in a reduced form due to shrinking population, traditional practices present since prehistory [3], such as fishing, agriculture, gardening and cattle, still survive in the area.

The natural and cultural richness of the region coexists with multiple territorial, social, and environmental problems. Isolation of the settlements, shrinking, migration and emigration of the population are some of the negative phenomena that Pustec Municipality and the region needs to cope. Cultural heritage assets seem to be dispersed across the territory as isolated points, reflecting the impact of the fragmentation of settlements.

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Literature review

Presence of human settlements in the region through history

Many sources such as [3], Bunguri et al [1] etc. attest to the richness of the Prespa region in terms of archaeological evidence that confirm the presence of human settlements since prehistory. The Lake has always been the dominant element to which human life and activity was dependent. The highest number of archaeological sites date back to the Roman times. The settlement choice remains constant throughout the historic periods from prehistory up to Roman times, experiencing a drop in the transition between Roman times to late antiquity. While in prehistoric periods hill tops were preferred for location of walled settlements while using the lowlands for agricultural exploitation, during the antiquity (Hellenistic and Roman times) the interest for settling was transferred extensively to the shores of the lake. These sources refer to the prosperity of the region in terms of settlements, which maintained direct and indirect links with neighboring or even more distant cultural horizons through a variety of productive activities. Even though palafitta settlements have been registered in eastern and northern shores of the Prespas, no palafitta-type-settlements have been registered in the Albanian side which Bunguri et al [1], explains by the presence of elevated relief where people can settle protected from the water.

Cave Churches (Hermitages)

Cave churches are one of the most interesting architectural developments in the history of Christian culture. Part rock, part built, part murals, they display outstanding skills of local master builders and artists. Numerous cave churches have

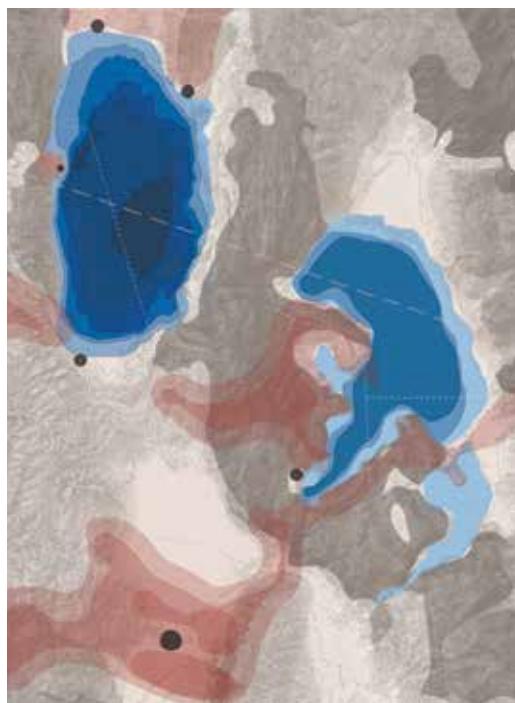


Fig. 2. Comparison of cultural heritage and geological formations in the Regional Level. Source/ Authors

220 appeared across the Mediterranean, from Southern Italy to France and Egypt. Six churches caved in steep rock formations have been registered on the shores around Prespa Lake. Based on diverse sources (Dhamo [4], Popa [5], Thomo [6], Xhaferaj et al [7], Bushi et al [8], these hermit foundations were built by local nobles. They are in fact a combination of a chapel and a very basic housing opportunity and were built to house hermit monks who retreated from society to be more in communion with God. Most of them have been built in the Middle Ages, although there are few that date originally back to the 9th century. During the 14th century, under the Bishopric of Ohrid, numerous nobles and monks helped in their painting, confirming the presence of byzantine art in this region. Often, these caves were unreachable, on steep rocky cliffs. When the Balkans came in the late Middle Ages under Ottoman rule and stayed so for five centuries, the cave churches continued to be used by hermits and played an important role for the continuity of the Christian religion in the region.

Being of mostly karstic formations, the region has an abundance of caves and rock shelters, however only one cave prehistoric settlement site and 6 cave churches have been registered, fact which is seen by Bunguri et al [1] as an outcome of the lack of research in this region. The monuments of Prespa are numerous but this research focuses mainly on those situated within Albanian territory, which have been included in the national list of monuments since 1971, but for many reasons, are the least well-known. Management Plan of Prespa National Park in Albania 2014-2024 as well as other studies and projects – have aimed at valorizing and integrating cultural heritage in the management concept and tourist development strategy.

Natural landscape as substratum of the built environment - Geoheritage Concept

[9] state that, in terms of Semperian Criticism, the built environment can be framed as *topos*, *typos* and *tekton*. "Topos refers to the place as the specific geographic, geomorphologic, and cultural context in which architecture is situated. *Typos*, means the type, as the recurring patterns, forms, or building archetypes that emerge over time

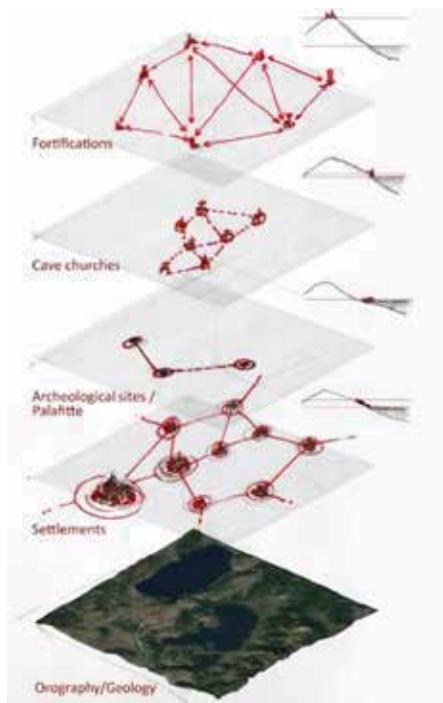


Fig. 3. Diagram showing different typologies of monuments in relation to the orography of the terrain. Source/ Authors

within architectural practice. *Tekton* denotes the builder or craft, referring to the technical and artistic processes of construction. [9, p. 11].

Considering the above, Frampton proposed that the future development of architecture should result from the continuity of the tectonic form, concept which he builds up largely focusing more on the technique, even though he considers all Semperian elements as contributors to it. In terms of this research, it is the *topos*, in terms of the physical and historical environment that emerges as a powerful and sustainable element influencing the built environment through history.

The PhD research group considered that the interrelation between geomorphology and human presence is very powerful in this area. It might be, by itself, an identifying and permanent element throughout history. Built heritage was investigated in its relationship with the natural landscape and with the geomorphology of the area, which, emerged not only as a substratum that conditioned human settlement and the resulting cultural heritage, but as a natural heritage itself. This consideration of the relation between geomorphology and built environment as a heritage in itself led to the exploration of literature sources on the concepts of Geoheritage concerned with the preservation of Earth Science features. [10] explain that the term "geological heritage" first appeared during the 1st International Symposium of the Conservation of Geological Heritage in Digne, France (1991). It led to the emergence of the concept of "Geoheritage" in the Malvern International Conference (1993). "Geoheritage encompasses features of geology, at all scales that are intrinsically important sites or culturally important sites offering information into the evolution of the Earth; or into the history of science, or that can be used for research, teaching, or reference".

Learning from vernacular architecture

The interest of architects in studying pre-modern cultural expressions and techniques started in the first decade after WWII. Within the broad name "learn from vernacular architecture", it included various views and denominations such as spontaneous architecture, or the most widely



Fig. 4. Typical relationship between geomorphology, lithology and heritage. Source/ Authors

known architecture without architects. These research paths, highlighting the study of the pre-modern architecture, were vividly promoted through powerful exhibitions, which are regarded by [11] as signs of the crisis of modernist authorship approach.

Here it is important to mention also [12] who launches a third typology in addition to two typologies of architecture, the one that promoted a natural basis for design and launched by Laugier, as well as the other that promoted the productive process and the machine as basis for design (Le Corbusier). In the Vidler's 3rd typology, the city is considered as a whole, its past and present revealed in its physical structure. It is in itself and on itself a new typology that need to be analysed and studied as basis for design.

Tools and methodology

"The way a manmade environment has been structured is linked until it is identified with the historical-construction process, which can be perceived in the formation of typology: this is the physical trace of human experience left behind in each cultural context and therefore living cultural material". [9, p. 11]

Considering the millennial interlinkage of natural and cultural heritage in the site, as well as acknowledging interdependence and interplay between different scales, the PhD research group used a holistic and multi-scale approach for the analysis. Such a holistic approach is also seen in the research work of Bunguri et al [1] where they propose an archaeology of the Prespas. Adding to that, the present research focuses on the spatial dimensions of the built heritage and interrelations between nature and culture while proposing a Historic Cultural Landscape of the Prespas. The research aims to analyze elements of different layers of heritage in different scales such as regional scale, settlement scale and architectural scale.

Objectives

Integration and coherence of the whole landscape of the lake, regardless of the national borders,

was the Leading Objective of the research. So our strategy as shown in Figure 1, is to reunify the heritage through the lake.

The secondary objectives inherent in cultural heritage are:

- i. Identification and enhancement of cultural monuments.
- ii. Revival of historic links and routes to improve accessibility of isolated monuments, and in particular cave churches.
- iii. Preservation of the vernacular architecture, preventing uncontrolled tourism development that may lead to its excessive transformations or even its demolition.
- iv. Stimulate the preservation and recovery of tradition and folklore.
- v. Keeping alive traditional practices such as agriculture, livestock and fishing, avoiding their transformation in an industrial sense by enhancing handicraft products.
- vi. Reverse the trend of depopulation.
- vii. Develop functional services for slow experiential tourism.

These secondary objectives align with the leading objective and aim at the sustainable development of the area aimed to encouraging residents to remain, support local activities and enhance them through potential contributions from the tourism sector.

Methodology

The research methodology involves a comprehensive analysis of the Prespa Lake region. As stated above, it seems essential, to adopt a holistic approach, taking into consideration the orographic, geomorphological, geological, climatic, settlement and cultural systems, in order to be able to understand its potentials and limitations [13]. This holistic approach comprises a multi-scale analysis of (1) identification of various typologies of cultural heritage as well as (2) analysis of interrelations between natural and cultural heritage and practices.

1. The identification of cultural heritage assets in the region aimed at grouping them in terms of genre (fortifications, rock cave churches, Neolithic settlements etc...).

2. Special attention was given to the interrelation of historic values of the landscape and its natural beauty, thus defining geological outcrops, caves, submarine karst cavities, hydrology and natural landscape as geoheritage [14]. The relationship between cultural heritage with the geoheritage and the cultural practices guided a closer reading of monuments. Identified groups of monuments were typologically classified according to their geometry, geomorphological location and building materials.

Analysis

The multi-analysis includes three different scales, namely the Regional Scale, the Settlement Scale and the Architectural Scale each leading to specific proposals.

Regional Scale

The Regional scale takes into consideration the area of the three lakes, namely Ohrid lake, Great Prespa and Lesser Prespa lakes, (see Figure 2). Our decision to analyse this region as a whole, comes from the fact that cultural heritage is strongly influenced by the natural landscape and the three lakes constitute one strong natural system in this respect.

A comparison of the geology and the cultural heritage, developed in this level, resulted in a series of patches rather than point elements. The basin is divided geologically in two distinct parts: the Southwestern is characterized by limestones and dolomites, and the northeastern is dominated by granites and gneiss. This division determines the distinctive types of vegetation on each side. (Figure 2).

The diagram in Figure 3, shows how cultural heritage differ according to the orography of the terrain. In fact, starting from the lower level, that is the lake, different layers of cultural heritage can be identified in different elevations, namely the pile dwellings, the cave churches, the settlements, the village churches, and finally the fortifications. The geological and morphological conformation has strongly influenced the development of the Ohrid and Prespa region. On one hand, the presence of mountains around the lake naturally limited contact with the outside world, making obvious the isolation and seclusion of the region. This led to the development of its own distinct socio-cultural character and was an attraction for hermit religious practices in medieval times. On the other hand, the development of the settlements was conditioned not only by orography but also by geological conformation, which in the framework of this research is referred to as geoheritage. The materials found in the region also conditioned building techniques, related to stone wall textures, where readily available, or to earthen (adobe) construction in the flat clay areas [15]. Figure 4 shows the mutual



Fig. 5. Geology and sections. Source/ Authors

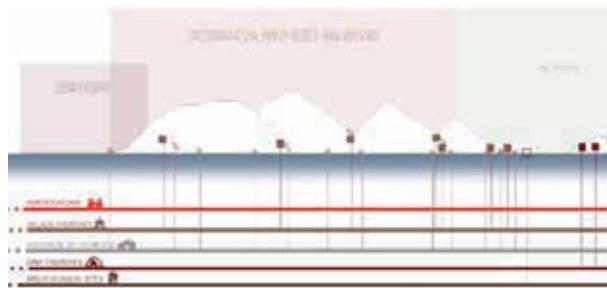


Fig. 7. Prespa Lake panorama. Source/ Authors

relationship between these aspects.

Settlement Scale

region also conditioned building techniques, related to stone wall textures, where readily available, or to Settlement scale analysis focused on the area of Great Prespa Lake alone, overlooked by the Municipality of Pustec. The geology layer analysed at this scale, as seen in Figure 5, is complemented with environmental sections that interrelate the main villages and monuments, thus to offer a reading of typical cultural heritage locations.

In Figure 6, we wanted to represent the lakeside in its entirety enabling a quick vision of the reciprocal relationship between monuments and the geography of the territory. This panorama led us to the strategy explained in Section 3.1. It also inspired us to see the lake as key element connecting the land and the monuments. Figure 7 shows the distribution in plan of main typologies of monuments, namely cave churches, village churches, archaeological sites, fortifications and natural parks.

Architectural Scale

The analysis undertaken in the architectural scale, focuses in two macro divisions of cultural heritage: single and diffuse heritage monuments. The first case includes single monuments of declared

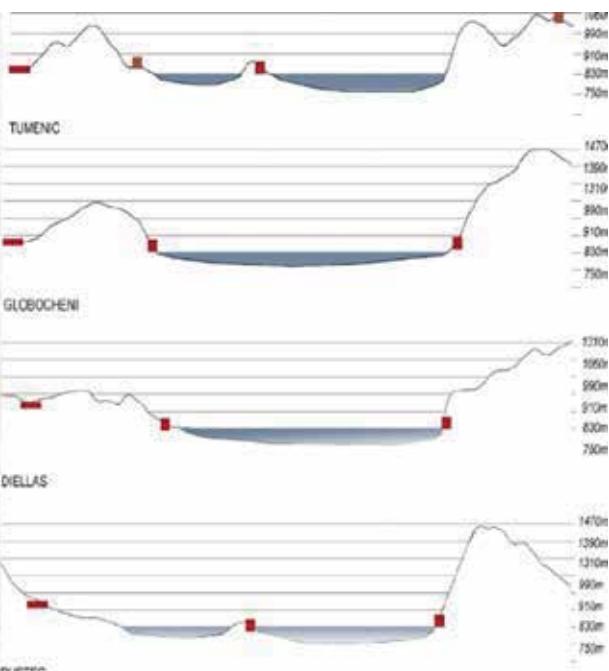
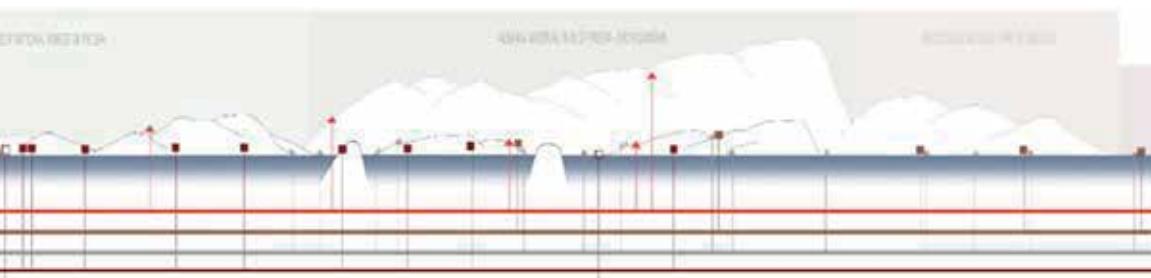


Fig. 6. Distribution of cultural monuments in plan - Settlement scale. Source/ Authors



national interest, (such as cave churches etc.) administered by regional or local authorities. It also includes specific areas of declared interest such as natural/geological monuments, managed by national or transnational authorities.

More challenging was the classification and conservation of diffuse heritage, which was divided into tangible and intangible culture. The tangible culture includes local vernacular houses which reflect Balkan 18th- 19th-century architecture. In most cases they feature (local granite or limestone) stone masonry with visible horizontal timber ties. The walls of the upper storeys with lighter internal partitions, with a timber-frame structure covered by lath or reed and plaster or filled with adobe bricks. In early 20th century buildings, stone walls contain a hidden timber frame, revealed by characteristic metal ties at the corners of the building. For buildings of the same period in the plains, the basic construction material are adobe bricks. The 19th-century houses display an extroverted rural character, while the houses of the early 20th century exhibit a more introverted, urban character. The classification of the vernacular heritage based on building materials used is shown in Figure 9.

Intangible cultural practices are seen to exist in close relation to geoheritage and the conformation of the area. Figure 9 shows also a reading of the presence of traditional practices linked (1) to the

lake (fishing), (2) to the land (agriculture, livestock farming, timber harvesting), (3) to the caves (artistic presence in relation to the churches quarries), and (4) the seclusion of the region conditioned by the mountainous reliefs (permanence of traditional customs and traditions).

Conclusions and recommendations

It is essential to note that despite the ancient history of the entire Prespa Lake region, its timeline remains uninterrupted. The lake itself is not merely a monument but a thriving settlement that continues to evolve, therefore, its culture is not just an artifact but an active entity that must be nurtured. The tangible and intangible heritage of the region is deeply intertwined with the natural environment and geoheritage. Despite its historical richness and diversity, cultural heritage remains fragmented, isolated from the local community, and at times lacks maintenance and valorization. Based on the Regional Scale analysis, the area around Prespa Lake being geologically oldest, corresponds to the area that hosts some of the oldest cultural heritage, including prehistoric settlements such as fortifications in the Prespas and the palafitta-settlements including the inner land (Maliq area) and in and around lake Ohrid.

According to our strategy, each of architectural and built heritage key elements should not be viewed in

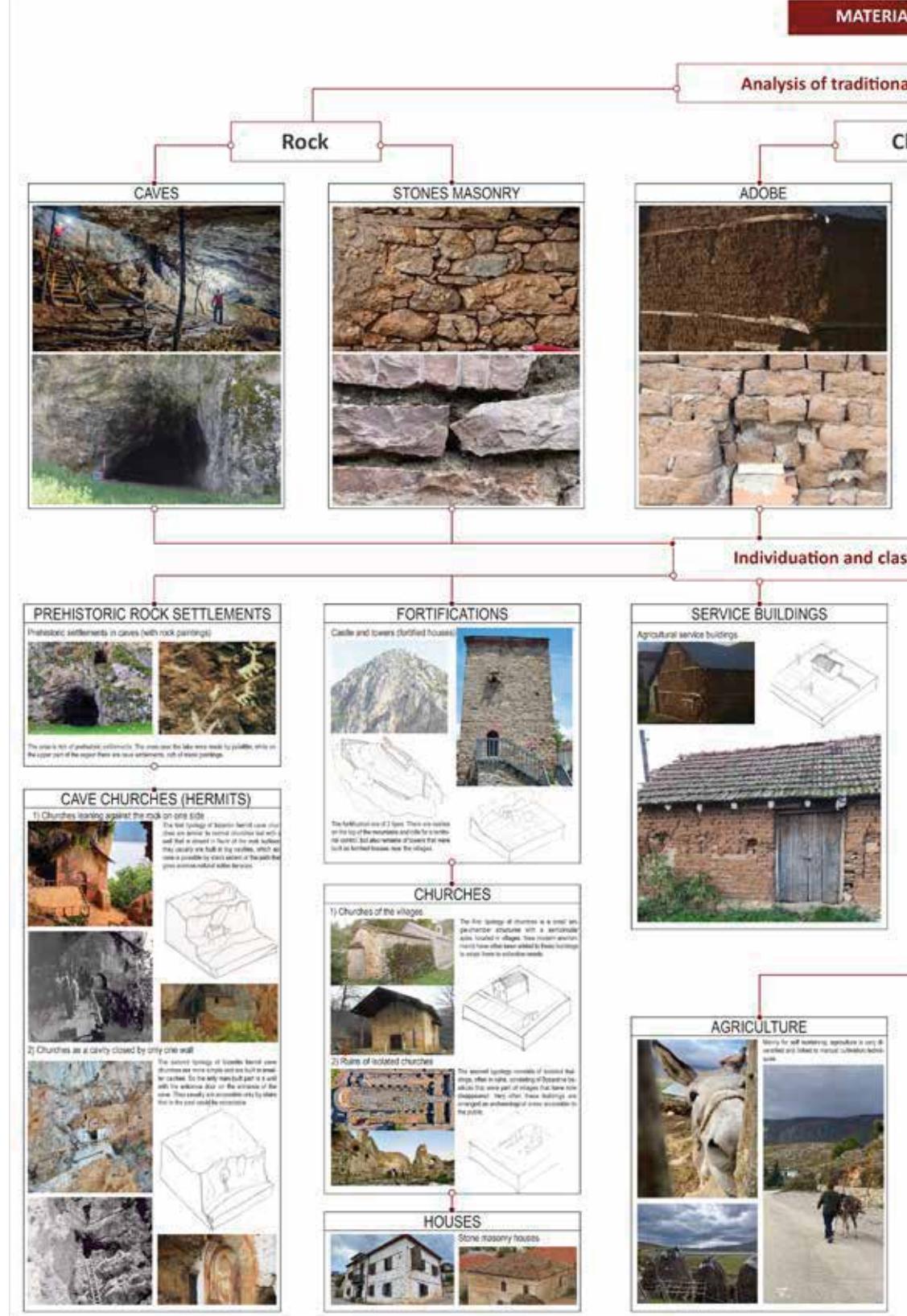


Fig. 8. Material and typological analysis. Source/ Authors

CULTURE

Material constructive materials

Clay

BRICKS



TIMBER STRUCTURE



Wood

MIX STRUCTURE



Classification of typologies

CHURCHES

Bricks used in special part of the walls (arches, capitals, plinths).



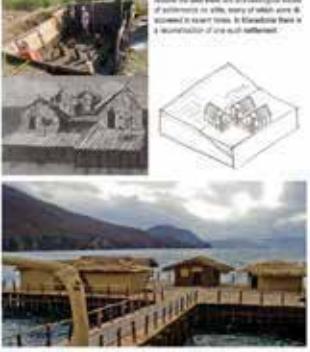
HOUSES

Brick masonry houses (and mixed masonry stones-bricks).



PALAFITTE

Pontedile Lake settlements (galatine)



HOUSES

Buildings with wooden parts for functional and structural purposes



IMMATERIAL CULTURE

FISHING

The idea is that of fish, especially cod, trout and other lake fishes. The activity is performed with small boats individually.



FARMING

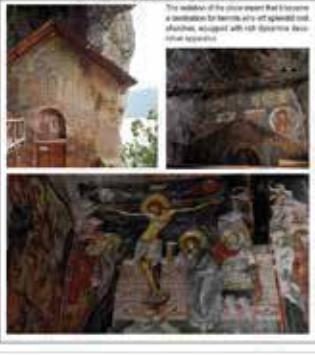
Farming for domestic use is very common, especially for feeding animals, gold and lace.



TRADITIONS



ART AND RELIGION



Cultural

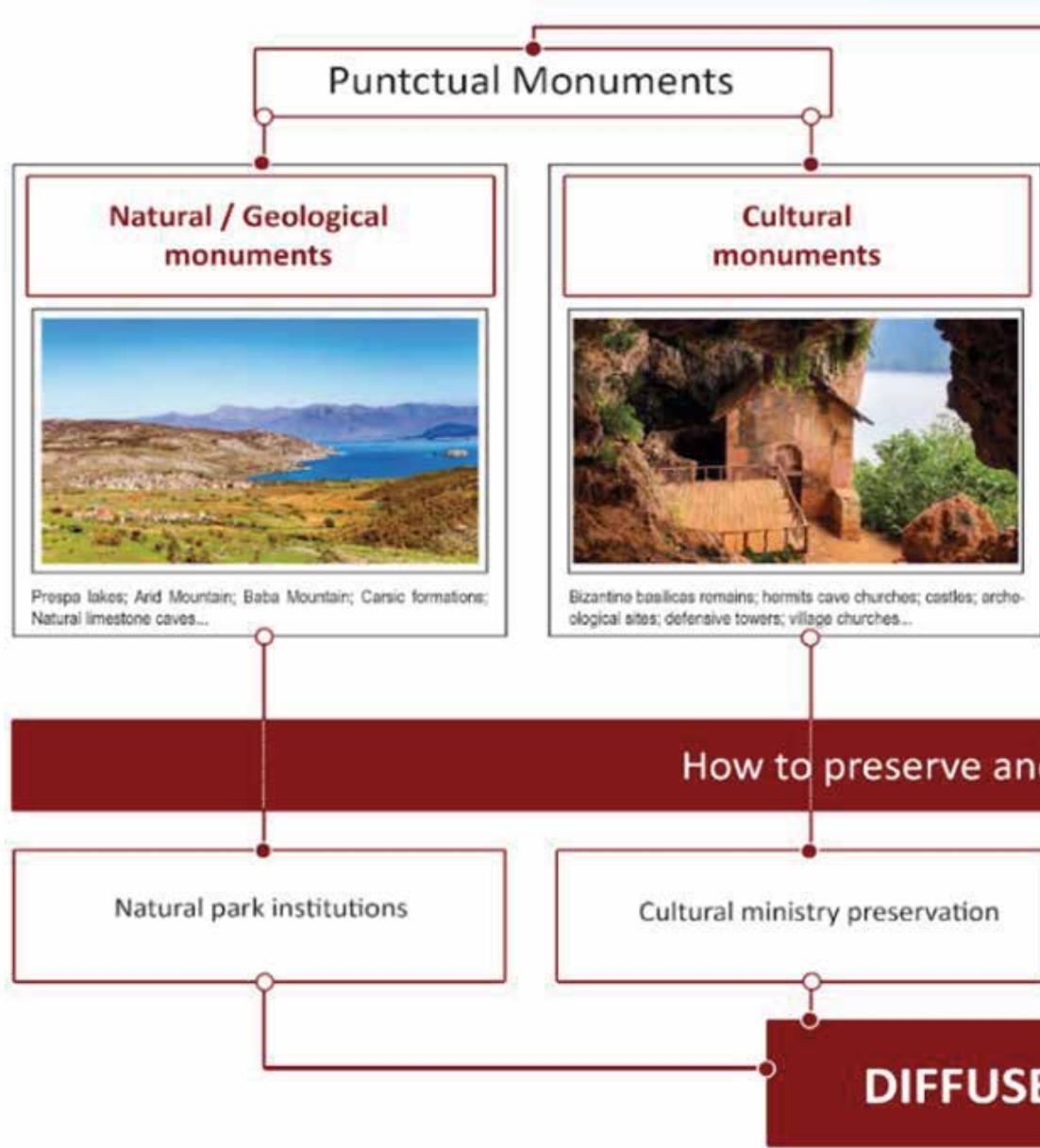


Fig. 9. Diffuse Museum Idea. Source/ Authors

Heritage

Diffuse Heritage

Material culture



Historic built buildings, vernacular buildings, typical typologies and constructive techniques...

Immaterial culture



Traditional activities; local traditions, dances, habits; ethnographic and anthropological heritage...

valorize the heritage?

Tipological catalogation of the town centers buildings and indications for the recovery

Local demo-ethno-anthropological museums / traditional festival support / cultural centers

MUSEUM

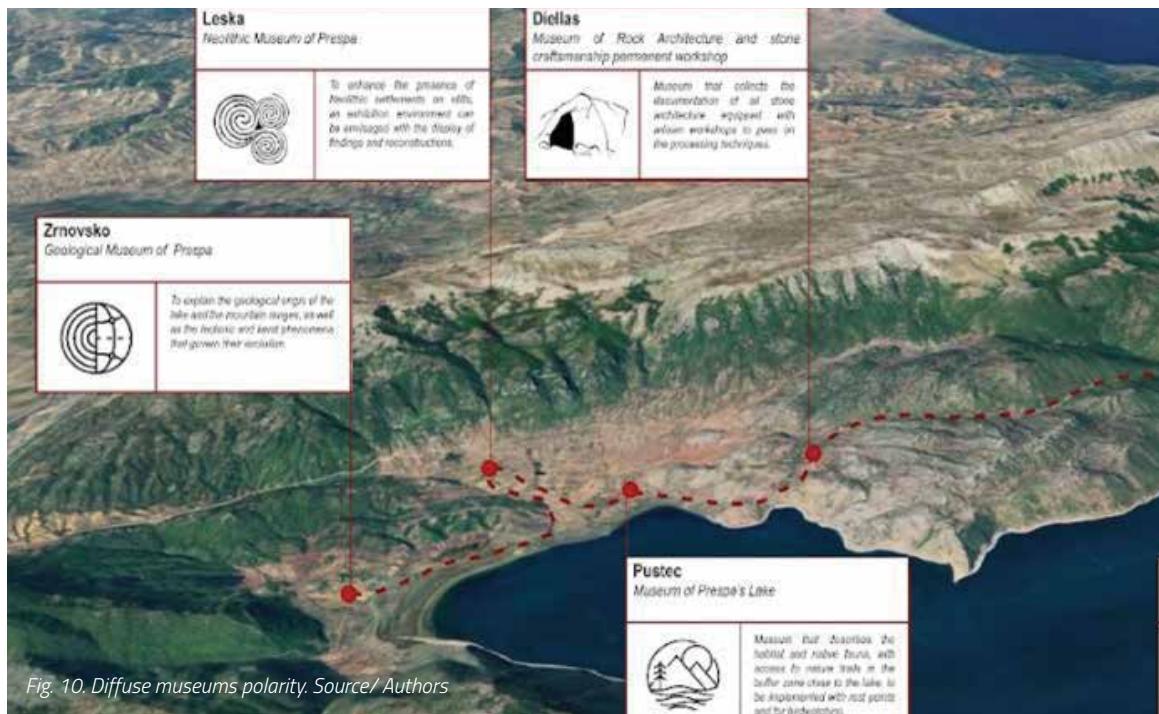


Fig. 10. Diffuse museums polarity. Source/ Authors

isolation but as interconnected parts of a system. The proposed interventions aim to achieve two primary objectives: firstly, to promote experiential tourism by linking emerging cultural sites through small-scale networks and establishing new museum systems to reinforce local identity; secondly, to safeguard tangible and intangible heritage by preserving the typological features of historic vernacular buildings and promoting cultural centers that sustain local traditions and festivals. As concluded in the Settlement Scale Analysis, local settlements can easily create interconnections with each other, yet their individual identities are not easily perceived. Our proposal at this scale is to connect these towns not only with each other but also with the monuments that are part of the landscape, often isolated. This can be achieved through the concept of a diffuse museum, serving as an acupuncture strategy to extract and emphasize the unique identity and culture of each village while enhancing accessibility to heritage monuments. The concept of a diffuse museum encompasses all aspects of heritage. Cultural heritage should be part of an itinerary that starts from the lake, passes through cave churches, and extends into the surrounding land, connecting villages where the diffuse museum concept will operate, as illustrated in Figure 9.

In the architectural scale, there exists a parallelism between the lake and its monuments. The natural caves are not cultural monuments in themselves, but cultural sites created by human activities such as building and mural painting. Persistent human activity serves as a link between geology and archaeology. To sustain this dynamic landscape, continuous activity is crucial. Thus, we propose first that these monuments and museums could serve as points where artists from various countries can

meet and engage in creative processes amidst the natural landscape. It would serve as connection to the spirit of Byzantine painters and hermits who once used these spaces for meditation and creation, ensuring the continuity of this cultural heritage. This second type of the proposed interventions, concern the enhancement of the local characteristics of each settlement and monument, and involves, the creation of museums and cultural centers, in the local villages (See Figure 10). It further involves creating clusters that unite the various emergencies with each other.

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3.1

Micro Mobility Solutions in Underdeveloped Areas: Bridging Transportation Gaps for Inclusive Development

Gregor ANDONI

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3.2

Intervening in Pustec: development of a matrix for the evaluation of intervention models promoting sustainable tourism in the Prespa Lake area.

Lisa MENSI

p. 240

3

**Proposals for Proposals
for Infrastructure and
facilities.**

Micromobility Solutions for Sustainable Transportation in Underdeveloped Areas

DOI: 10.37199/o41010115

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Abstract - *Adopting micro mobility solutions offers a possible way to address mobility issues and promote inclusive development in developing regions where traditional transportation infrastructure is frequently insufficient. This study examines the particular dynamics involved in putting micro mobility initiatives into practice in developing countries, looking at the socioeconomic effects, cultural factors, and technology adjustments necessary for a smooth integration. The study looks into how micro mobility can help provide accessible and reasonably priced transportation options, especially for underserved communities that have little access to traditional transit systems. This Paper is especially pertinent to the Prespa Region, which is a transboundary area shared by Greece, Albania, and North Macedonia. There, local mobility and growth have long been hampered by transportation constraints. Accessibility and economic growth are hampered by the area's scattered rural villages, elderly population, and reliance on private automobiles. However, Prespa's thriving ecotourism industry and abundant natural surroundings present significant opportunities for sustainable mobility projects. In addition to lessening environmental effects, using micromobility solutions here could improve community cohesion, boost tourism, and foster a more environmentally conscious sense of place.*

The study examines how shared bicycles, electric scooters, and other micro-transport options help people in developing countries feel more connected, have better livelihoods, and travel less distance by using case studies and empirical data.

Furthermore, the study explores the difficulties in designing and implementing micro mobility solutions in locations with limited resources. It goes over how crucial it is to support these cutting-edge transportation systems with sustainable economic models, local empowerment, and community engagement to ensure their long-term viability and acceptance.

In addition, the study looks at how micro mobility might help local economic development by promoting ventures like last-mile delivery services and micro entrepreneurship. Through an analysis of the relationship between micro mobility and social fairness, the study clarifies the ways in which these solutions might enhance community empowerment and general well-being.

In conclusion, by demonstrating the revolutionary potential of micro mobility, this research adds to the conversation on sustainable development in developing nations. Policymakers and stakeholders may design interventions that harness micro mobility to establish resilient, inclusive, and people-centric transportation networks in undeveloped countries by having a thorough grasp of the context-specific obstacles and opportunities.

Keywords - Micro mobility, inclusive development, sustainable, transportations, micro-transport

Introduction

The potential and difficulties of using micromobility solutions as a sustainable form of transportation in developing nations are examined in this scientific study. These areas are rapidly becoming more

urbanized, and as a result, there is a growing need for environmentally friendly, economical, and easily accessible transportation options. Micromobility, which includes electric scooters, bicycles, and other

small-scale vehicles, offers a novel way to meet the particular mobility requirements of developing regions. In order to evaluate the viability, significance, and difficulties of putting such solutions into practice, this paper examines recent research, case studies, and active micromobility initiatives. It talks about the possible socio-economic advantages, such as increased environmental sustainability, less traffic jams, and better accessibility.

The paper also explores the technological and infrastructure requirements for the effective implementation of micromobility solutions in developing nations. This research intends to provide insightful analysis and helpful suggestions for stakeholders, policymakers, and urban planners involved in promoting sustainable transportation in developing areas by closely analyzing the opportunities and challenges.

Given the problems caused by poor transportation infrastructure in developing nations and the accelerating rate of urbanization, there is a greater need than ever for innovative and sustainable mobility solutions. In order to satisfy the unique transportation needs of emerging countries, this study investigates the area of micromobility. Compact, frequently electric-powered vehicles like scooters and bicycles are known as micromobility, and they present a viable option for improving accessibility, lessening the impact on the environment, and promoting socioeconomic development. Given the challenges posed by traffic, inadequate public transportation, and deteriorating environmental conditions in these urban centers, incorporating micromobility solutions seems like a sensible and environmentally responsible course of action.

This paper explores the complexities of micromobility's role in promoting sustainable transportation in developing regions through an examination of the literature, case studies, and

project analyses. In order to help stakeholders, urban planners, and policymakers find resilient and equitable mobility solutions, this research intends to provide insightful information on the possible advantages, difficulties, and important factors. Micromobility is being highlighted as a ray of hope for developing sustainable and inclusive transportation systems in impoverished areas of the world, where urbanization is still accelerating.

Examine the possible advantages of micromobility solutions in developing Regions. (Pustec Area)

Extensive public transportation networks are built into most modern cities in developed nations to facilitate people's mobility even in the absence of their own cars. Making every journey's first and last mile more convenient is a problem that even the most sophisticated public transportation systems have failed to address. For example, expanding train networks with more and more stations would make them a much slower mode of transportation, so this is not feasible. Micromobility is one solution that is currently garnering a lot of interest. *But what is micromobility?*

Large cities' challenges with short-distance travel are the focus of micromobility solutions. One example of a solution that has been implemented recently is the bicycle sharing program, which is available in many cities across the world, including Sydney, London, Washington, D.C., and many others. Since the bikes are available for anyone to use, these schemes are better described as shared micromobility. You just drop off your used bicycle at the closest collection point so that another commuter can pick it up after you've arrived at your destination. The goal of all micromobility solutions is the same, regardless of whether they are free or have a service charge: to give people an easy and affordable way to finish the first or last their final

leg of travel in a city. What happens in Pustec in the area we are studying if we were to implement this micromobility?

Pustec is a picturesque village located near the lake and as such is visited by many tourists. If we were to implement micromobility in this still undeveloped country by creating some points as below:

Reduced traffic – Initiatives that make scooters, e-bikes, and other small vehicles accessible in big cities can aid in reducing traffic. Without extending roads or implementing other costly modifications, it ought to be feasible to enhance traffic flow in the world's most populous city districts if brief trips can be accomplished on two wheels as opposed to four.

More environmentally friendly: In cities struggling with pollution, bicycles are an excellent option for micromobility systems. If small scooters are preferred over taxis or ride-sharing cars, they can even contribute to lowering the air's carbon monoxide content. Governments throughout the world continue to have serious concerns about

the environment, so micromobility solutions' environmentally friendly features will undoubtedly make them a desirable option in all major cities and towns in the future.

Cost-effective transportation: Taxis and other alternatives are significantly more expensive than micromobility systems, which are operated by service providers at a fee. Using an e-bike or scooter for the final portion of trips is a great way for people to reduce the cost of their city travels.

Flexibility: The flexibility that micromobility solutions provide is one of their most appealing aspects. If you take a taxi, you have to tell the driver where you want to go, and once you're moving, it's difficult to change your mind. However, since you are in control when riding an e-bike, bicycle, or scooter, you don't have to decide exactly where you are going. A micromobility service is a great option if you want to explore a part of a big city at your own pace and don't feel like you have to schedule every minute of your day in advance.

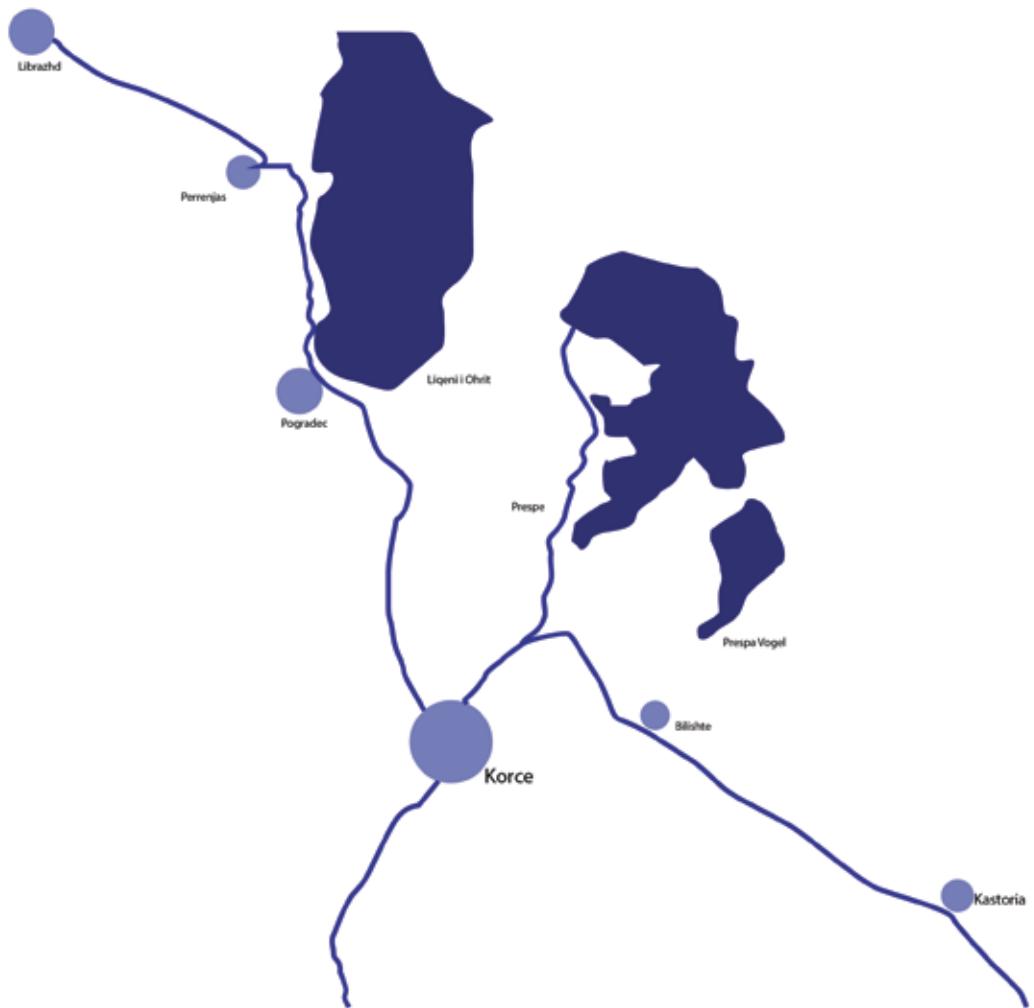


Fig 1. .Diagram map of Pustec Village.

source/ author (2023)

Bringing attention to public transportation concerns

Micromobility schemes serve a crucial additional function beyond offering a quick fix for the first- and last-mile travel challenges that individuals in crowded cities encounter. These programs, when run on a cutting-edge software platform capable of gathering and analyzing travel data and vehicle usage, can identify flaws in public transportation networks and assist local governments in allocating funding to the most critical areas.

These advantages are supporting the growth of micromobility trends in numerous nations worldwide. Companies should think about providing micromobility services to draw in new clients if they're searching for innovative methods to boost the income from their fleets of vehicles. In the diagram below (Figure 1), the main points that can be connected to each other with the help of this micromobility are studied from our field visits. These points are like itineraries for different visitors, each offering a specific service.

Micromobility and Sustainable Transportation

Green Mobility: Managing the Transition to Micromobility and Sustainable Transportation

The rise of micromobility offers a promising path toward sustainable transportation solutions as the world faces the environmental effects of traditional transportation methods and rapid urbanization. Micromobility includes shared, lightweight, and frequently electric forms of transportation like e-bikes, electric scooters, and bicycles. The interaction between micromobility and sustainable transportation is examined in this talk, along with its possible advantages, difficulties, and revolutionary potential for urban mobility ecosystems. (Shaheen, Cohen, & Martin, 2019; Zhang, Lu, & Abou-Zeid, 2020).

Advantages of Micromobility for Ecological Transportation: The Effect on the Environment

Because micromobility options emit fewer greenhouse gases and leave a smaller overall carbon footprint than traditional modes of transportation, they are by nature more environmentally friendly. (Hugosson & Westin, 2019).

Decreased Congestion in Traffic: Through encouraging personal mobility and decreasing dependence on personal vehicles, micromobility helps to ease traffic congestion, resulting in quicker and more effective urban transportation. (Andreev & Blagoev, 2020).

Last-Mile Network Access: The critical last-mile gap in transportation networks is filled by micromobility solutions, which give commuters practical and adaptable ways to get to their final destinations.

Well-being and Health: By encouraging physical activity and lowering sedentary lifestyles, active modes of transportation like walking and cycling improve public health. (Martin, Shaheen, & Cohen, 2010)

Accessibility and Affordability: A wider range of people

can use micromobility options because they are frequently less expensive than more conventional forms of transportation. (Fishman, Washington, Haworth, & Watson, 2015).

Difficulties in Putting Micromobility into Practice for Sustainability:

Infrastructure and Safety Issues: The broad implementation of micromobility may be impeded by inadequate bike lanes and safety issues, underscoring the necessity of strong infrastructure development. (Zolfaghari, Yildirimoglu, & Haugen, 2020).

Regulatory Frameworks: To address safety, liability, and operational issues, precise regulatory frameworks are necessary for the integration of micromobility into the current urban transport systems.

Technological Solutions: The successful deployment of micromobility services, such as app-based platforms and vehicle maintenance, depends on guaranteeing their technological security and dependability.

Equitable Access: In order to achieve sustainability and prevent future inequalities, it is imperative that micromobility services be available to all socioeconomic groups and communities. (Knapp, Mennicken, Reichelt, & Kirchner, 2018).

All urban residents must have access to mobility in a safe, environmentally responsible manner through a sustainable transportation system. When the needs and demands of people from different income groups are not only different but frequently at odds with one another, this becomes a complex and challenging task. For instance, many people must walk or ride bicycles to work if they cannot afford to use motorized transportation, such as private automobiles or public buses. It may be necessary to separate bike and pedestrian lanes from motorized traffic or lower vehicle speeds in order to provide a safe infrastructure for these users. The mobility of drivers may be restricted as a result of both measures.

In a similar vein, actions taken to curb pollution may occasionally clash with those required to lower the number of traffic accidents. For instance, while higher average car speeds may lower emissions, they may also raise the risk of accidents. (Zolfaghari et al., 2020)

However, the majority of public debates and official government policy documents pertaining to health and transportation exclusively address air pollution as the primary issue. This is due to the fact that air pollution is typically visible and has noticeable negative effects. Most people find it simple to draw the connections between increased morbidity from pollution, exhaust fumes from motor vehicles, and vehicle quality. (Martin et al., 2010) However, the majority of people are unable to comprehend the intricate interplay of variables linked to traffic accidents. (Fishman et al., 2015) All modes of transportation function less than optimally if the infrastructure design does not adhere to these criteria. Nonetheless, it is feasible to redesign the



Fig.2. *Itineraries of micromobility.*

source/ author (2023)

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current roads to give non-motorized modes a safer and more convenient environment.

When expressed in terms of the number of passengers carried per hour per lane in the corridor, this also leads to increased capacity and improved efficiency of public transportation vehicles. Individuals base their decisions about their mode of transportation on a variety of factors, including cost, the length of the trip, comfort, convenience, and safety. (Zhang et al., 2020) Out of all these worries, the person finds the safety concern to be the most challenging. The fact that a road user believes they will save more time by driving faster than they actually do is a significant factor in the perception of the advantages of mobility versus the perception of accident risk.1. Many users of the road benefit from the increased mobility, which is typically realized in very brief bursts of a few seconds. A comparatively smaller number of people who prevent many years of premature death from occurring sustain the safety benefit. The promotion of public transportation and non-motorized modes is crucial for sustainable transportation options. However, some of the recommended measures' inherent conflicts are not acknowledged in the actual policies that are being promoted. (Shaheen et al., 2019; Knapp et al., 2018).

The concept of sustainability transportation

The concept of sustainable transport is closely related to the development of sustainable modes, infrastructures, and operations of transportation. Three primary dimensions are taken into account: surroundings. One likely sustainable strategy is to lessen the effects of transportation on the environment. Climate change, noise pollution, and harmful emissions are all influenced by transportation. Transportation is responsible for about 15% of all greenhouse gas emissions and 22% of CO₂ emissions. On the other hand, as cars become more ecologically friendly, the number of vehicles in the world is growing. Another strategic objective is

to improve transportation's footprint, particularly the effects of infrastructure development and upkeep. Vehicles, parts, packaging, and other waste generators found in transportation systems need to be reduced, reused, and recycled. Finance, Employment, development, and economic growth are all influenced by transportation. It needs energy for operations, modes, and infrastructure, all of which can be used more effectively. Fair pricing for transportation would entail charging users the full cost of using the system, both directly and indirectly. It is likely that modal choice and efficiency will be enhanced in a transportation system with fair and open competition. Price distortions and capital misallocations may arise in a system where transportation is a public or private monopoly. Over time, these factors are likely to make the system unsustainable. Community, Sustainable transportation should minimize disruption to the community, be safe, improve human health, and benefit society. Car use has been stimulated by various societal developments. For example, reliable motor vehicles and the corresponding infrastructure of roads, petrol stations, traffic regulation and the like became widely available. Increases in spending capacity have led more and more people to own and use cars. Urban sprawl has increased the need to travel. In many countries around the world, infrastructural and societal organisation is tuned towards the widespread availability and the regular use of cars but in the Pustec city this is not an element of the urban environment. These (and other) developments have made the use of private cars attractive and in some cases even necessary. Indeed, many people claim they need a car in order to undertake their daily activities but if you choose another way. But people also presume the availability of a car when making choices on where to live, work, shop, or how to spend their leisure time. As a consequence, many people became dependent of their car use turned into a socio-economic necessity, but if you choose a bicycle or something else in the Pustec you can develop this city, so the tourist can go to do sports. If there is a mobile app, you can choose how you will describe the road to the desert or choose the type of infrastructure, land or water. (Figure 2)



Fig.3. Mobile App Design for Pustec.

source/ author (2023)

Reducing the need for travel is perhaps the single most significant factor in sustainable urban transportation, and mixed development and land use planning are the best ways to achieve this. It is necessary to create additional tactics that promote the adoption of energy- and environmentally-friendly modes. Parking and traffic control techniques should be used to discourage the use of solo driving. The planning and administration of road transportation in our cities can be done in a number of economical and efficient ways.

Our cities are becoming less and less sustainable. The widespread use of roads for the movement of people and goods is one of the main causes of unsustainability; it is the source of air, water, and noise pollution, traffic jams, delays, accidents, stress, and annoyance. Cities will become far more sustainable and livable if efforts are made to steer urban transportation in a sustainable direction. If human survival is to be ensured, a transportation system that permits a high degree of accessibility and mobility without adverse effects is not only desirable but also necessary. Thankfully, it is technically possible, but if the goal of sustainability is to be realized, substantial adjustments to societal norms and governmental regulations will be necessary.

Feasibility and Impact

Urbanization and transportation issues are constantly changing, and developing regions are facing new challenges in finding sustainable solutions that take into account their distinct socio-economic and environmental characteristics. Micromobility, which includes shared, compact, and frequently electric forms of transportation, appears to be a ray of hope for the paradigm shift in transportation. This talk explores the viability of deploying micromobility solutions in developing nations and looks at how it might affect affordability, accessibility, and environmental sustainability. A significant challenge is the limited infrastructure that currently exists. Micromobility, however, calls for a redesign of the infrastructure, involving the establishment of designated lanes and safe parking zones. A supportive environment for micromobility can be established by concentrating on fundamental

improvements, even though an initial investment is necessary. The way that urban transportation functions is changing significantly, and the idea of micromobility is leading this change. Micromobility, which includes small, shared, and frequently electric vehicles like e-scooters, bicycles, and electric bikes, is a paradigm shift toward effective and sustainable urban mobility solutions. This investigation explores the viability of micromobility and looks at how it might affect urban settings. It covers a range of topics, including regulatory frameworks, infrastructure adaptation, economic viability, and the revolutionary effects on affordability, accessibility, and environmental sustainability.

It is necessary to reevaluate urban infrastructure in light of micromobility. Although many cities were originally planned with traditional forms of transportation in mind, micromobility necessitates the installation of designated lanes, safe parking areas, and electric vehicle charging stations. The viability of this adaptation is contingent upon the infrastructure currently in place in the city as well as its willingness to make the necessary investments. The viability of micromobility solutions heavily depends on economic factors.

The financial feasibility of these systems is influenced by the expenses related to setting up and managing the required infrastructure, purchasing and maintaining fleets of micromobility cars, and taking care of regulatory compliance. In order to overcome financial limitations, public-private partnerships, creative business models, and community involvement are essential.

The regulatory environment has a big impact on whether micromobility is feasible. It is critical to set precise rules for the use, security requirements, and incorporation of micromobility into the current transportation systems. The effectiveness of these solutions depends on how easily regulatory frameworks can be modified to support micromobility and create an atmosphere that is favorable to its expansion.

Technological advancements are intrinsically linked to micromobility. The viability of these solutions is contingent upon a city's technological infrastructure, which includes elements like payment systems, fleet management integration with smart technologies,

and integration of mobile apps. Strong technological capacities put cities in a better position to embrace and adjust to micromobility.

Micromobility's acceptance and uptake by the community are key to its success. Important components of community acceptance include recognizing local preferences, addressing safety and accessibility issues, and making sure micromobility fits within the socio-cultural context. Initiatives for community engagement and successful pilot programs can open doors to wider acceptance.

Potential Impact:

Micromobility has the potential to completely transform urban accessibility. Micromobility solutions fill in the holes in the current transportation networks by offering first- and last-mile connectivity. Underprivileged communities and places with restricted access to conventional modes of transportation will be especially affected by this. One of the main factors influencing micromobility's widespread adoption is affordability. By providing affordable substitutes for conventional means of transportation, these solutions increase accessibility to mobility for a wider range of people. Concurrently, the rise of micromobility generates economic prospects by means of employment generation, maintenance services, and regional car production.

Micromobility is consistent with international efforts to maintain a sustainable environment. Micromobility is a means of promoting human- or electric-powered modes of transportation that help create more environmentally friendly urban environments by lowering carbon footprints and emissions.

In urban areas, micromobility may help reduce traffic congestion. Micromobility lessens the need for wider roadways and traffic jams by promoting individual mobility through the use of smaller, more maneuverable automobiles.

Public health is improved when active transportation options like walking and cycling are promoted. Micromobility addresses health issues linked to inactivity by encouraging physical activity, lowering sedentary behavior, and enhancing general wellbeing.

For micromobility to be successful in the long run, safety issues like bicycle or e-scooter accidents must be addressed. Enforcing safety laws, launching public education initiatives, and funding infrastructure that prioritizes safety are crucial first steps.

It takes careful planning to incorporate micromobility into the current public transportation systems. Efficient transitions between various modes of transportation require the development of cohesive payment systems, schedule coordination, and connectivity assurance.

Given how much data micromobility depends on for operations, it is critical to address privacy and data security issues. Gaining the trust of users requires putting in place strong data protection measures and making sure that data usage policies are clear.

Conclusion

The adaptability of cities, stakeholder commitment, and regulatory framework resilience all play a role in the viability and effects of micromobility solutions on urban transportation. Micromobility is a dynamic and transformative force that offers a vision of efficient, accessible, and sustainable urban mobility as urban areas change. Cities can fully utilize micromobility to influence the direction of urban transportation by taking into account feasibility factors, utilizing successful case studies, and taking

proactive measures to address obstacles.

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Intervening in Pustec: Development of a matrix for evaluating intervention models, promoting sustainable tourism in the Prespa Lake area.

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Abstract - *Intervening in protected areas, such as Prespa Lake and Pustec Municipality (AL), is delicate due to the sensitive environment and the rural nature of the lifestyle. Protected by UNESCO since 1979, it strives to defend the area from extreme human interventions that could devastate the ecosystem. However, considering its significant distance from cities, lack of essential services, and job opportunities, it faces ever-increasing abandonment. To avert this scenario and recognize the value of the natural environment, the studio aims to explore opportunities, measure potential impacts generated from the interventions, and encourage sustainable tourism. One of the challenges lies in the unique aspects of the area, which necessitate a thorough analysis of the context and the potential impact on the natural and rural environment.*

A methodological framework is proposed, based on the connection and classification of each category of actions. Specifically, a visual matrix was developed to evaluate tourism-related interventions based on seven key indicators—including green impact, pollution risk, cultural enhancement, and susceptibility to mass tourism—across three categories: services, activities, and transport.

The matrix draws on data collected during a field survey in November 2023 across Albania, North Macedonia, and Greece, integrating stakeholder input, infrastructural analysis, and landscape assessment. The tool aims to support participatory decision-making among municipalities and residents, encouraging strategies that promote nature-based tourism while preserving local identity and natural heritage. Though tailored to the Pustec area, the matrix can be adapted to similar rural contexts, particularly when paired with tools such as Life Cycle Assessment (LCA) or social impact analyses. Limitations include the exclusion of non-documented activities and emerging literature, underscoring the need for continuous refinement and local engagement.

Keywords - Sustainable tourism, Decision tool support, Intervention strategies, Scale interventions.

Introduction

Since the 1990s, rural and sustainable tourism has emerged as a promising alternative to conventional mass tourism, offering the potential to foster sustainable development while preserving the cultural and ecological integrity of sensitive regions (Hardy, Beeton, and Pearson 2002). However, the expansion of tourism in rural areas, if not carefully managed, can lead to significant environmental degradation, sociocultural disruption, and unbalanced economic growth (Alaeeddingol, Turker, and Can 2016). This is particularly relevant in the border area of Prespa Lake, encompassing the Municipality of Pustec (Albania), North Macedonia, and Greece, a region characterized by high ecological value, rich cultural traditions, and a protected area by UNESCO since 1979 due to its significant nature

and cultural heritage (UNESCO).

The object of this research is to develop a visual decision-making tool – specifically, a matrix – that allows local authorities, tourism stakeholders, and travel agencies to assess the sustainability of various tourism-related interventions. This matrix connects environmental, social, and economic criteria derived from both literature and field research. It aims to guide investments and policy decisions toward sustainable tourism development, while minimizing the risk of mass tourism in a holistic view that aims to be used in a participatory design and integrating more precise analysis for environmental sustainability that, at the moment, have no other design or management tools (De Camillis, Raggi, and Petti 2010).

The research adopts a participatory and place-based approach, combining theoretical frameworks with a field survey conducted in November 2023 across the three national territories. It examines tourism potentials and threats by analysing key elements: the natural environment and the landscape, the agricultural and rural lifestyle of the local population, the availability of tourism services, and existing infrastructure. The resulting matrix enables a preliminary visual evaluation of activities, identifying their potential impacts and supporting dialogue between local communities and policymakers. In doing so, it promotes an integrated, cross-border vision of tourism planning, aligned with sustainability goals and UNESCO protection frameworks.

Literature Review

Tourism is one of the most important sectors in the global economy (Gössling 2002) and plays a key role in the socio-economic development of countries (Campos et al. 2023). Several studies in the academic literature highlight the positive correlation between tourism and improved quality of life for local populations (Alaeddinoglu et al. 2016), while also warning against tourism strategies that marginalise local communities (Alaeddinoglu et al. 2016).

In 2023, Albania was ranked 4th globally in terms of growth in international tourist arrivals, with a 56% increase compared to 2019. The country welcomed 7.5 million international visitors in 2022 and 10.1 million in 2023 (UNTO 2024). This strong rebound in tourism contributed to an economic growth rate of nearly 5% in 2022, reaching a Gross Domestic Product (GDP) in 2023 of approximately 23 billion USD dollars (UNTO 2024), which led the United Nation for Tourism (UNTO) to produce guidelines for tourist development in Albania, highlighting the importance of the topic nowadays, in order to avoid mass tourism development. Such development can pose risks to the surrounding environments, particularly due to large-scale infrastructure projects (Akin 2021). In fact, tourism is also a major contributor to environmental degradation, accounting for approximately 8% of global greenhouse gas emissions (WTTC and Oxford 2018). Not only, mass tourism is huge social threat, risking

increasing marginalization of the local community, and social disparities (Kumar and Mandal 2025).

In response, theories from research try to solve this issue: the concept of sustainable tourism began to emerge in the 1990s, as a response to the negative impacts of mass tourism, aiming instead to promote tourism that respects environmental and social systems (Hardy et al. 2002). During this time, the international community started to define sustainable tourism within the broader framework of sustainable development (Bac 2014).

Sustainable tourism is defined by the Worls Tourism Organization (WTO) as meeting the needs of present tourists and the host community while protecting and enhancing opportunities for the future, aiming to manage resources in a way that meets economical, social and aesthetic needs while preserving cultural integrity, ecological processes, biodiversity and life-support systems (WTO 2005). A balance among sustainability principles as the environmental, economic, and socio-cultural aspects of tourism, is crucial for long-term sustainability (WTO 2004). Including tourism activity and environmental quality as reported by Middleton and Hawkins (Middleton and Stabler 1997). Nevertheless, good tourism performance should not only be evaluated based on short-term economic returns or visitor satisfaction, but also on the environmental and sociocultural consequences it produces (Huang et al. 2019).

Challenges to sustainable tourism include inadequate green logistics, limited public infrastructure, poor road networks, increasing air pollution, and insufficient wastewater treatment systems (Perkumiené et al. 2020).

Tourism marketing, widely implemented by destinations and organizations, has attracted growing attention in the academic literature (Huang et al. 2019). Education in certification and sustainability marketing plays a crucial role in ensuring the success of ecotourism initiatives, helping to build a shared philosophy between operators, visitors, and local residents (Bustam and Stein 2012). At the same time, tourism activities can be understood as extensions of the brand-consumer relationship, meaning that providers must meet visitor expectations to encourage loyalty and return visits (Chang and Katrichis 2016).

Pustec Area geography and context

Pustec is an Albanian municipality protected by UNESCO since 1979 due to its unique landscape and cultural heritage (UNESCO).

Located in the Korça region of Albania, within the broader context of the Prespa Lake, which extends across the border of North Macedonia and Greece (Figure 1). The region hosts several natural parks and two other lakes, Ohrid and Small Prespa.

The commune historically developed mainly through the primary sector. In the Albanian part of the lake, farming was the predominant activity, while the North Macedonian side was known for apple cultivation. Tourism was not considered a relevant sector until the 1990s (Muslli 2016). Later, by 2003, around 30 families were employed in tourism (Muslli 2016). Despite this, the villages are experiencing high emigration rates, particularly among young professionals, as reported during the survey of the area (paragraph 3.1), due to a lack of job opportunities and their remote location.

Given the growing international interest in the area and the economic investments by the European Union in Albania, it is crucial not to overlook both the opportunities and risks associated with tourism development in this sensitive zone. Tourism could

promote a more sustainable future for the local population, biodiversity, and landscape, while also improving quality of life (QOL) and supporting economic growth (Alaeddinoglu et al. 2016).

Nevertheless, tourism expansion poses potential threats to key environmental elements such as the landscape, water bodies, and aquatic ecosystems (Kokkranikal and Morrison 2002). While low cost can be an advantage for service providers, a lack of environmental awareness and poor tourism resource management undermine the long-term success of a destination (Rodríguez Díaz and Espino Rodríguez 2016). Therefore, decision-making processes must prioritize environmental and cultural preservation alongside the pursuit of sustained economic benefits.

Tools Methodology

This research aims to develop a visual matrix that can be used by the Municipality of Pustec and other stakeholders or Municipalities across the borders to identify potential environmental, economic, and social threats and avoid mass tourism through informed investment, to be used accompanying other analysis such as Life Cycle Assessment (LCA), gap identified by De Camillis et al. (De Camillis et

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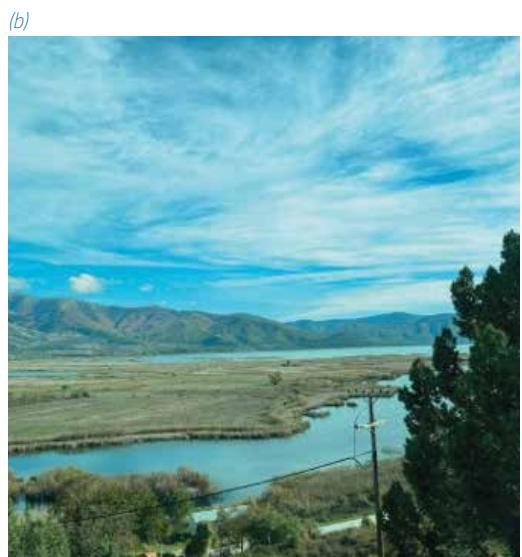
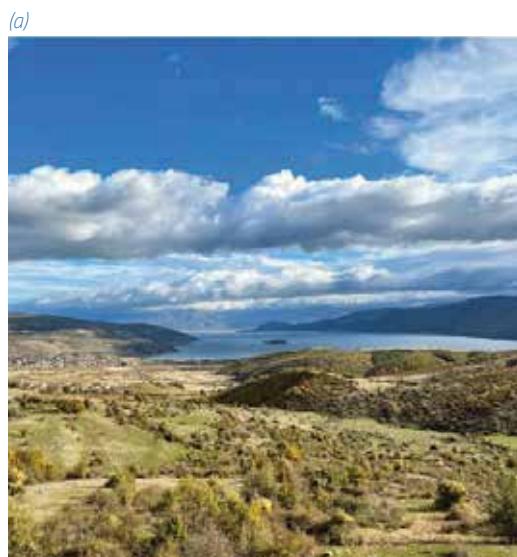


Fig. 1. Survey documentation: natural environment. (a) Pustec municipality, (b) Greek area, (c) North Macedonia area.

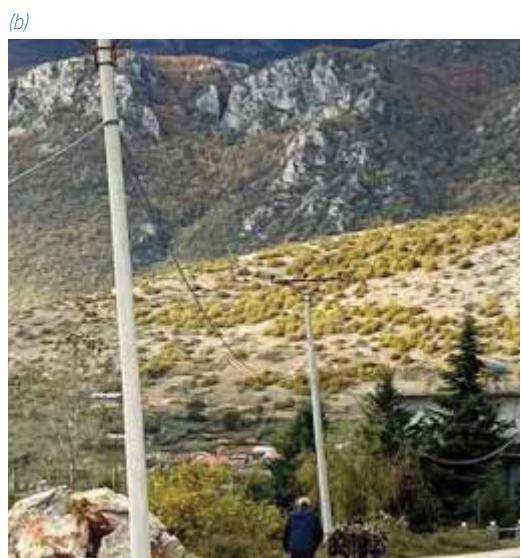


Fig. 2. Rural life and agriculture. (a) Albania, (b) North Macedonia, and (c) Greece.

al. 2010) The matrix also serves as a guideline for travel agencies to identify and propose more sustainable actions to their clients, promoting cultural understanding of the local population and offering unique and meaningful experiences.

A field survey was conducted in November 2023, which included visits to the surrounding areas of Albania, North Macedonia, and Greece, meetings with local authorities, and the organization of workshops. The goal of this survey was to gain a deeper understanding of the territory, the lifestyle of the local population, and the area's tourism potential, in order to support the development of a guidance matrix for responsible tourism implementation.

The survey focused on four main topics: the naturalness of the area (Figure 3); the rural lifestyle and agricultural nature of the region (Figure 4); existing tourism services and cultural heritage (Figure 5); and infrastructure (Figure 6). These elements were compared with the scientific literature to assess environmental threats and evaluate the feasibility of sustainable tourism strategies. This analysis led to the creation of a matrix, designed through a local survey and scientific evidence interpretation, to connect

different types of activities and assess, through a visual representation, their potential impacts on this specific protected area. The matrix adopts a holistic approach, encouraging cross-border cooperation to establish a unified natural park recognized by UNESCO.

Survey Results and connection with literature

The survey aims to assess four key parameters of the analysis in the area: 1) Natural features of the landscape (Figure 2); 2) The agricultural and rural lifestyle (Figure 3); 3) The existing tourism services, natural hiking opportunities, and cultural heritage (Figure 4); 5) Infrastructure and transport connection (Figure 5).

Natural areas are the most vulnerable to the effects of mass tourism, which threatens local cultural identity, and degrades ecosystems. It often leads to the commodification of indigenous identities, historic rituals, and religious practices, while destroying biodiversity and natural landscapes (Akin 2021).

The agricultural tradition and respectful interaction with the environment make this region particularly suitable for the development of rural tourism. Rural

(b)



(c)



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source/ author (2023)

(b)



(c)



source/ author (2023)

tourism focuses its concept in the interaction of tourists with the material characteristics of the countryside, together with the culture of the area, aiming to revitalize the area (Saparov et al. 2024). However, many areas lack adequate infrastructure, such as hotels, road networks, and public transport, making access tricky; together with challenges in rural communities adaptation of these new changes (Saparov et al. 2024), which highlights the importance of controlling investment and activities in order to create the infrastructure needed in balance with the social, economic and environmental aspects (Middleton and Stabler 1997; WTO 2004). Surveyed services include: Churches and traditional villages (Figure 4a); Traditional restaurant and typical lake cuisine (Figure 4, b.2, c.2); Equipped beaches (Figure 4, b.2); Hiking trails (Figure 4, c.1). While heritage villages offer cultural and architectural value that can attract diverse tourists (Zhang, Wei, and Nie 2022), they are highly vulnerable to pollution, overdevelopment, and resource exploitation caused by mass tourism, endangering both their authenticity and sustainability (Zhang et al. 2022). Similarly, service beaches, if not properly managed, could attract mass tourism and result in overuse. By contrast, hiking and local restaurants can enhance tourists' experience without harming the environment. According to Torabi et al. (Torabi et

al. 2025), environmental interpretation significantly strengthens the link between tourists and local operators, increases tourists' awareness and engagement. These evidences align with previous research highlighting the role of interpretation in converting environmental intentions into responsible tourism behaviors (Ballantyne and Packer 2011). Tourism activities, energy sources account for nearly 100% of the environmental impact, and it is a predominant component also in the water scarcity component, in which water consumption contributes 23% (Campos et al. 2023). Tourist accommodation, as well, has a crucial environmental impact, in particular, food and beverage consumption ranging from 32% and 77% (Campos et al. 2023). These data enlighten once again the need for accurate tourist planning. The current infrastructure in the region is a light structure that would not stand the arrival of mass tourism. This helps preserve the surrounding environment by protecting the social, environmental, and landscape integrity. However, the Korça region lies relatively close to two of the EU corridors, specifically the 10th (from Salzburg/Budapest to Belgrade, Nis, Thessaloniki/Igoumenitsa) and the 8th (from Varna/Burgas to Sofia, Skopje, Tirana, Durres). If transport and infrastructure investments are managed carefully, the area could achieve better connectivity with suppliers and tourists without

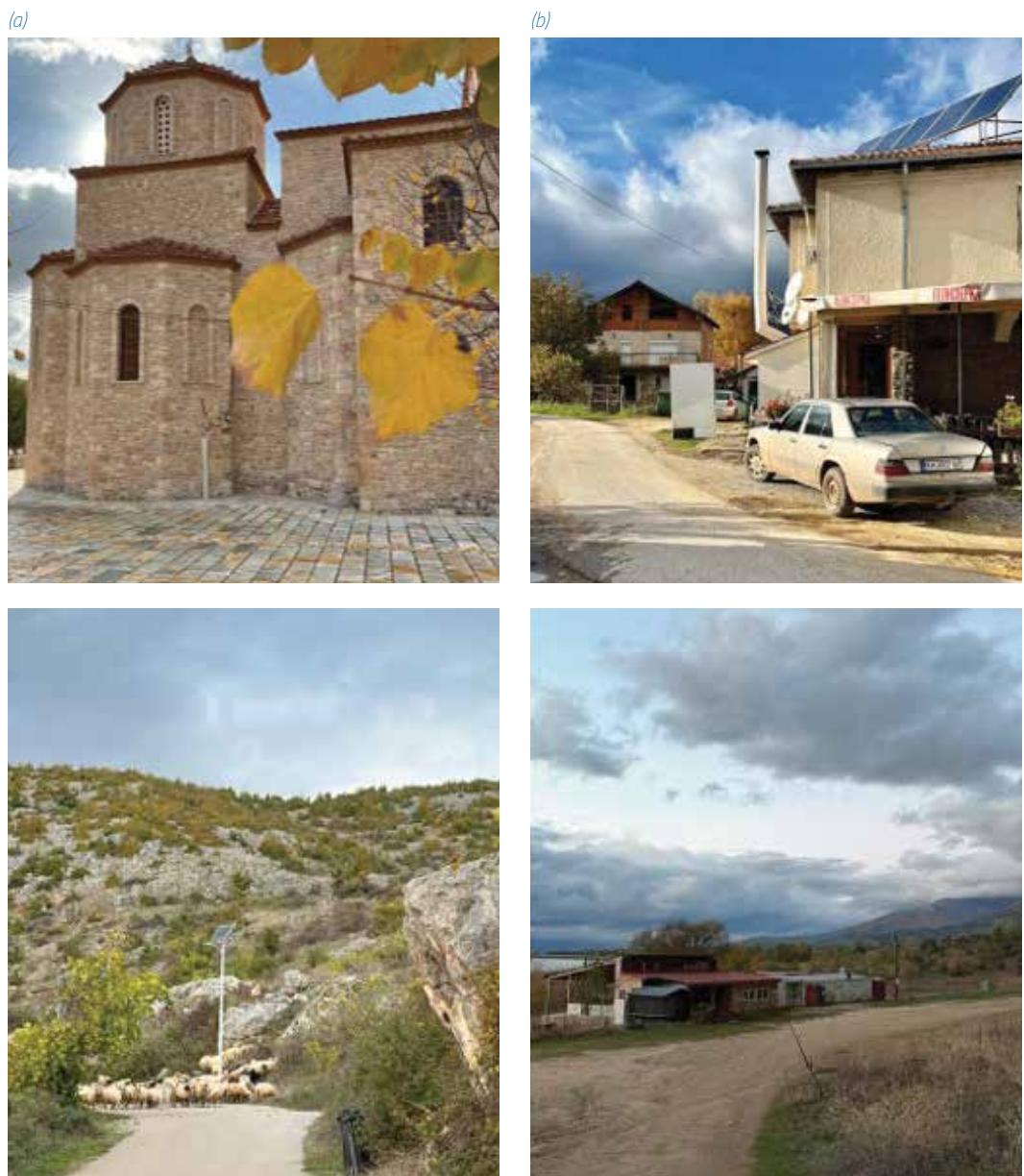


Fig. 3. Survey documentation: existing services for tourism and cultural heritage. (a) Albania, (b) North Macedonia, and (c) Greece.

collapsing existing systems or requiring invasive new developments aimed at mass tourism. Instead, developing a circular lake route connecting Albania, North Macedonia, and Greece could enhance regional accessibility while supporting the creation of a cross-border protected park without physical boundaries. The absence of a railway system is notable, but it presents an opportunity: a sustainable train connection could reduce environmental impact and improve access to the region.

As noted by Campos et al. (Campos et al. 2023), transport is one of the leading contributors to tourism's environmental footprint, requiring substantial energy, land, and resources (Gössling 2002).

Matrix Development

Based on the considerations developed so far, the matrix was created using all the parameters developed in Table 1 and derived from the field survey. It is intended to maintain a broader perspective when planning tourism development; in fact, often, the need for balance is overlooked in the rush to attract tourists, leading to fragmented analysis focused only on one of the three main aspects. The matrix is designed to be read systematically by intersecting pairs of selected parameters. This approach allows users to assess whether and how an activity/service/transport investment might

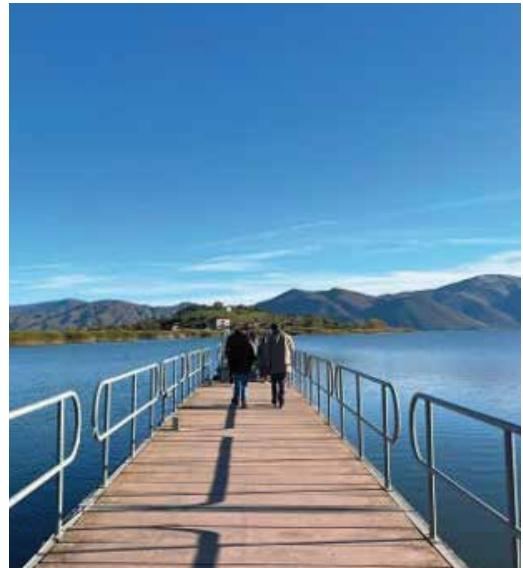
affect the balance between social, economic, and environmental dimensions (Middleton and Stabler 1997; WTO 2004). The goal is to avoid the simplistic judgments that label intervention as inherently "good" or "bad". Instead, the matrix provides a nuanced scale that aims to scale the interventions and enables more informed decision-making. For instance, rather than investing solely in highway connections to the area and then taxi/private hire of cars and boats, the matrix suggests considering balanced solutions such as railway (in the future), public transport, or non-motorized rental options. This compromise acknowledges that tourism will inevitably arrive and must be managed responsibly. In addition, the categorisation of tourism interventions into services, activities, and transport allows for a cleaner understanding of the consequences of each decision, promoting a more holistic planning approach. The methodology can be replicated and adapted in other regions, and the matrix can be expanded with new activities, especially those emerging from participatory engagement with local communities.

The matrix was developed by classifying selected tourism activities – derived from common tourism practices – and analysing them through seven key indicators (Table 1).

(b)



(c)



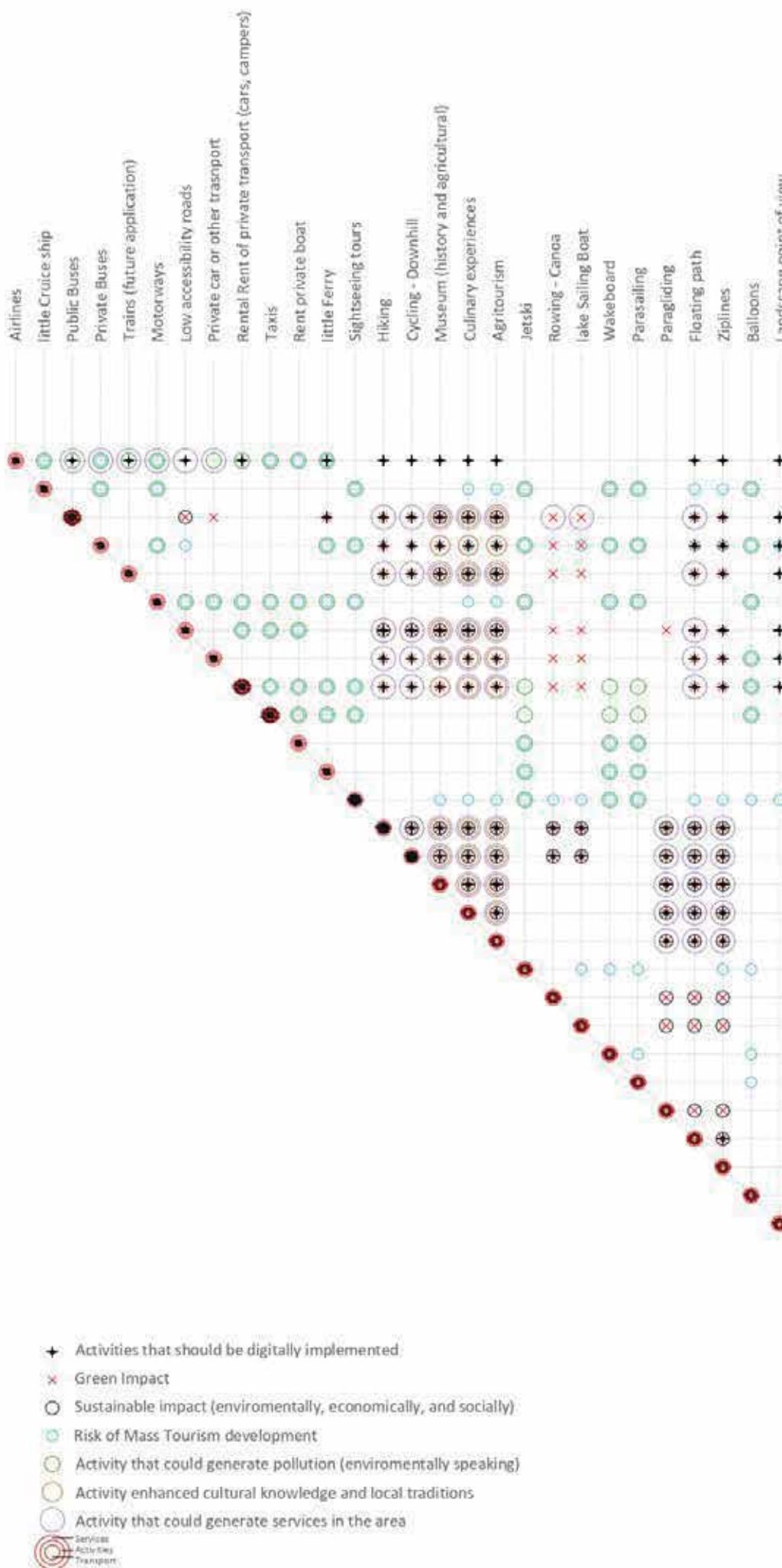
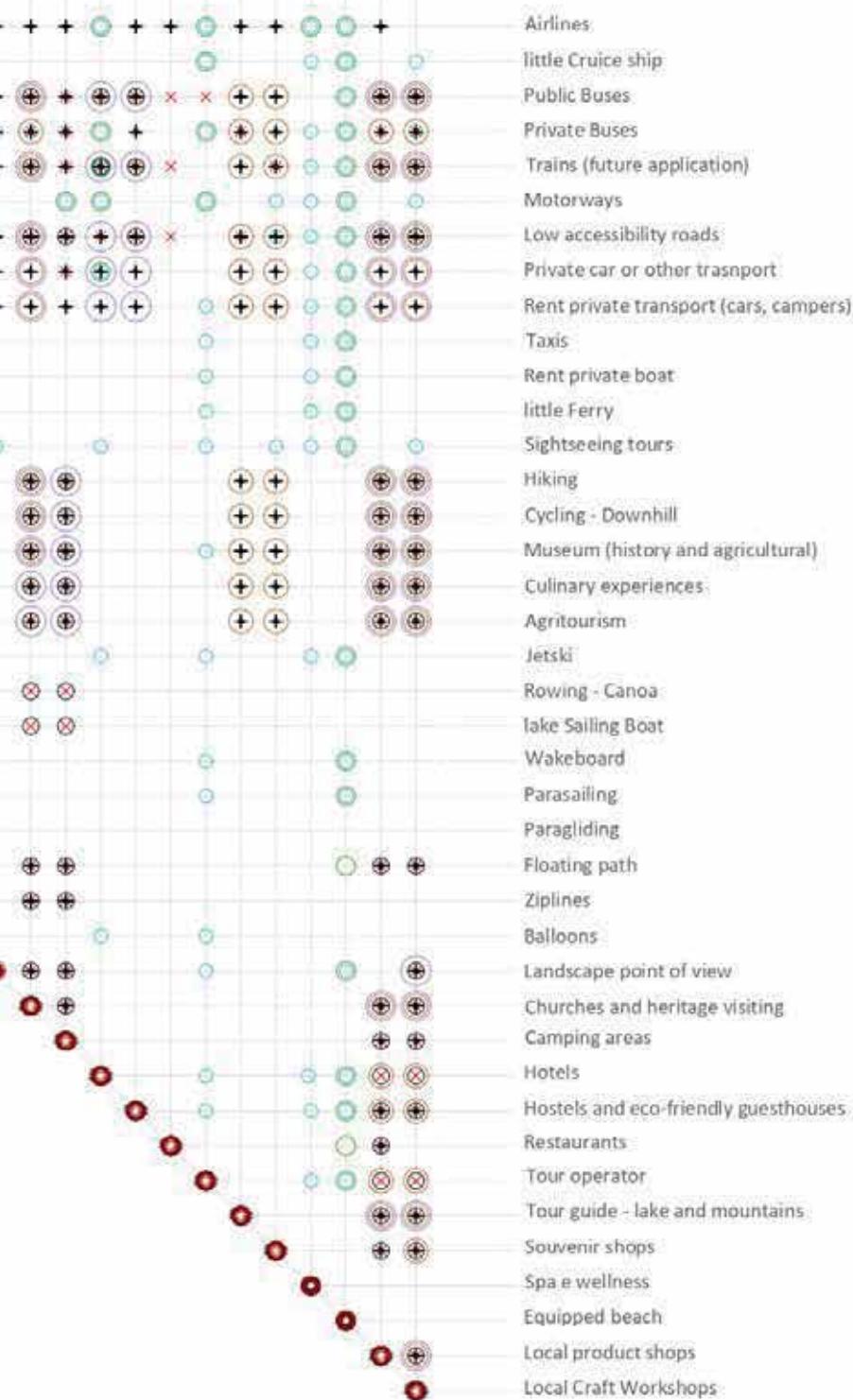


Fig.4. .Matrix of intervention. Scale the impact actions for tourism interventions.



No	Symbol	Action	Description and Assignment parameters	
01		Service Activities Transport	S/A/T	Categorises each action as either a Service (e.g., accommodation, restaurants), Activity (e.g., cultural or leisure experiences), or Transport (means by which tourists travel).
02		Activities that should be digitally implemented	Actions that would benefit from digital tools for promotion or management (e.g., tourist planning, group coordination), helping to easily access information and promote the area initiatives, and select the type of tourist the authorities want to attract.	
03		Green Impact	Activities with a positive or neutral effect on the environment, causing no pollution, waste, or ecological losses or harm.	
04		Sustainable Impact	Defined according to the WTO and Middleton et al. frameworks (Middleton and Stabler 1997; WTO 2004), including environmental, economic, and social dimensions. Activities that benefit social, economic, and environmental aspects without evident risks of mass tourism development.	
05		Risk of Mass Tourism development	Actions, investments, activities, or services which, if not size-controlled, might lead to mass tourism of the areas with important consequences on cultural, social, and environmental losses.	
06		Activity that could generate pollution	Action, investments, activities, or services that, if not size-controlled, might lead to air/water and land pollution of the area, waste management problems with consequences on tourism activities, and biodiversity losses.	
07		Activity able to enhance cultural and traditional knowledge	Action, investments, activities, or services that have the potential to be used for the cultural enrichment of tourists and keeping alive local traditions, fostering cultural exchange and appreciation, without evident threat to local traditions.	
08		Activity that could generate services in the area	Action, investments, activities, or services that may stimulate service development (e.g., accommodations, transports, wellness*), with the caveat that poor management could harm traditional architecture and local identity.	

Conclusion and Recommendations

The matrix provides a preliminary overview of tourism activities and their alignment with sustainability goals in Pustec Municipality and the Prespa Lake area. It is designed to support future participatory decision-making processes involving local communities and municipal authorities across borders. Rather than evaluating individual actions in isolation, the matrix considers the cumulative impact of various activities, helping to scale interventions appropriately and assess their social, environmental, and economic implications. Following the methodological framework and criteria detailed in Table 1, the matrix can be adapted and personalized through local dialogue, encouraging collaborative planning that reflects the specific needs and values of the region. Its use is particularly recommended within participatory processes to foster Pro-Environmental Behaviour (PEB) (Huo et al. 2025), which is especially impactful in rural areas (Wang et al. 2018). However, several limitations should be acknowledged. The indicators and activities included were selected based on the available literature and field survey data. As such, the matrix may exclude relevant activities or impacts not identified during the research. Additionally, although the guidelines are generally applicable, the tool is context-specific, developed for the unique geographic, cultural, and ecological features of the Pustec Municipality and Prespa Lake, and may require adaptation or a new survey before being blindly applied in other contexts.

This matrix is intended as a holistic tool, not a stand-alone solution. It should be complemented by more specialised instruments, such as Life Cycle Assessment (LCA) for environmental impacts, or socio-economic/cost-benefit analysis, to ensure comprehensive planning. Future research should aim to refine and expand indicators based on stakeholder input and empirical data, and to test the matrix in similar rural contexts.

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4.1

Valorising Earth's Ancient Landscapes: The case of Lake Prespa and Lanzarote

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4.2

Remote sensing digital models for supporting landscape and urban planning. The case study of the Big Prespa Lake area and the municipality of Pustec (Albania)

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Proposals for the protection and conservation of biodiversity and the Environment

Valorising Earth's Ancient Landscapes: The case of Lake Prespa and Lanzarote

DOI: 10.37199/o41010117

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Abstract - *Despite their geographical separation, Lake Prespa and Lanzarote share intriguing similarities rooted in their geological formations and tourism potential. Lake Prespa, nestled within the larger Ohrid-Great/Small Prespa system, part of the greater Drin Basin, stands as one of the world's most ancient and expansive tectonic lakes which retain scientific significance for its ecosystems and biodiversity richness, that, despite recent international initiatives within Albania, North Macedonia, and Greece, are currently endangered by a drastic loss of water volume and pollution caused by uncontrolled anthropic activities. The region's cross- border fragmentation, coupled with remoteness and limited infrastructural investments, has led to an overall underdevelopment, abandonment, and population decline of the towns and villages in the Albanian side of the area. On the other hand, born from volcanic eruptions around 20 million years ago within the Canary Islands, Lanzarote boasts a dynamic landscape resembling extraterrestrial terrains, captivating the scientific community's curiosity due to its resemblance to the Moon and Mars. Despite experiencing a surge in tourism, Lanzarote still retains its authentic character, safeguarding its heritage and landscapes. The present research aims to investigate the relationship between the actual environmental challenges that Lake Prespa is facing and the past-current development of the area, to visualize current issues and possible futures. To do so, Earth Observation data from the Google Earth Engine Data Catalog and GIS are used, also to outline possible future scenarios within a timeline referred to 2050. Eventually, the case of Lanzarote is taken as a virtuous case study from which it is possible to extract an approach that promotes scientific and sustainable eco-tourism, which applied to the study area of Lake Prespa and its the lake towns, such as Pustec (AL), would promote cross-border initiatives aimed at valorizing their unique landscapes, local heritage, and traditions.*

Keywords - Ohrid Lake, Prespa Lake, Lanzarote, Google Earth Engine, Remote Sensing, QGIS

Introduction

Located in the south-west of the Balkan Peninsula, the Drin River Basin (Fig. 1a) is a hydrological system that takes its name from the Drin River that crosses Albania, Greece, North Macedonia, Kosovo, and Montenegro, eventually discharging into the Mediterranean Sea. Its basin and sub-basins extend over a geographical area of around 20.000 km² and support many human activities such as energy and water supply for households and irrigation, tourism, recreation, fisheries, and local labour [1]. On top of that, this complex system acts as one of Europe's biodiversity hotspots, providing habitats to many species of flora and fauna (MIO- ECSDE, 2018). At its very start, the Drin River Basin comprises two of the largest and oldest tectonic lakes in Europe and the world: Lakes Ohrid and (Small and Great)

Prespa. With an estimated age of 2 to 5 million years (Stankovic, 1960), the lakes can be considered a unique system (Fig. 1b) that is of high national and international importance for its geology, biodiversity, and cultural heritage (Popovska and Bonacci, 2007; Stankovic, 1960). Shared between Albania, North Macedonia, and Greece, this system is currently threatened, with consequences that might potentially endanger the overall Drin River Basin. During the last century, the level of the Great Prespa Lake has been dropping continuously, but starting from around years 1986-87 (Popovska and Bonacci, 2007; Soria and Apostolova, 2022) a dramatic water loss was registered, causing the lake to lose more than half of its volume (Kuzmanoski et al., 2022; Soria and Apostolova, 2022), with

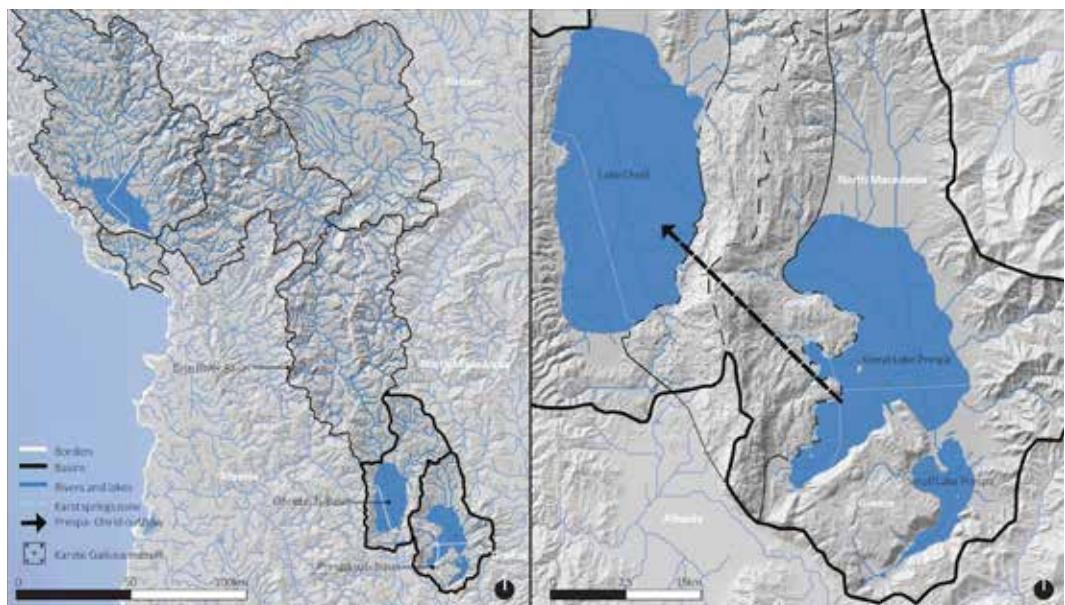


Fig. 1: a) Drin River Basin; b) Ohrid and Prespa Sub-Basins.

source/ Drin River Basin (Drin Coordinated Action); Ohrid-Prespa system (Popovska and Bonacci, 2007).

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changes in its elevation, surface extension, and shores. The causes of this steep decline aren't clear. While it is possible to account for some of the loss due to natural causes such as climatic changes, there are strong indicators that uncontrolled water abstraction for human activities such as agriculture has played a pivotal role (Popovska and Bonacci, 2007; Soria and Apostolova, 2022). With the scope of coordinated management of the shared water resources of the Drin Basin, the safeguard and restoration of the endangered ecosystems, the initiative "Drin Coordinated Action" was established in 2011, with the signing of a Memorandum of Understanding from Albania, North Macedonia, Greece, Kosovo, and Montenegro. Initiatives such as the Drin Coorda and the EU for Prespa [2] not only aim to preserve the natural environment, but also to promote the sustainable development and valorization of the area, which in some of its parts is currently facing challenges such as underdevelopment, unemployment, and depopulation [2] (Catsadorakis and Malakou, 1997). The term "valorisation" is understood here following Rakitovac and Urošević (2017) as a strategic process of recognising, preserving, and activating the cultural, environmental, and economic value of heritage assets. This includes promoting local identity, improving quality of life, and fostering sustainable development through culture-driven tourism and community-based partnerships, which, in the case of Lakes Ohrid and Prespa, involve the peculiar cross-border nature of shared environments, histories, and values. For these reasons, gaining a deeper understanding of the opportunities and threats that may lie ahead, by considering the variables that might influence the possible outcomes of these endeavours, is very important. This study uses GIS and Earth Observation data to link the history of recent human development in the Ohrid-Prespa area with its effects on the natural environment. The outcomes of this analysis are used along with the practice of Scenario Thinking (Meinert, 2014; Di Giulio et al., 2018) to outline four possible scenarios within the timeline of the EU Long Term Strategy for 2050 [3], which compare business-as-usual with sustainable development. Although geographically distant,

the case of the island of Lanzarote, in the Canary Islands, is taken here as a reference for the latter, due to its successful integration of environmental preservation and sustainable tourism development (Crespi and Salvi, 2021), but also due to its remoteness condition, somewhat similar and even more extreme than Prespa's, due to its isolated location in the Atlantic Ocean. Lanzarote successfully overcame these criticalities by achieving experimental planning decisions and the creation of narratives that fostered a strong local and international identity based on the valorisation of its cultural heritage and landscapes. Given the shared features of ancient, distinctive landscapes and cultural heritage, we believe that Lanzarote could act as a reference for the Lake Prespa region to develop similar strategies to support its sustainable development and valorisation.

Literature Review

Ancient lakes: a worldwide network

Ancient lakes are a rare feature on Earth. Most of the world's lakes are less than 18,000 years old, while ancient lakes have existed for hundreds of thousands or even millions of years (Albrecht and Wilke, 2008; Hampton et al., 2018). Less than thirty of these lakes exist, and most of them originated in tectonic features such as grabens (Hampton et al., 2018). Because of their age, having experienced a wide range of climatic conditions and long history of association with human activities (Fritz et al., 2010; Stager et al., 2011; Nomokonova et al., 2010), ancient lakes constitute a worldwide network of archives of past environmental change and human history (Hampton et al., 2018), also acting as biodiversity hotspots, hosting highly endemic species found nowhere else on Earth (Rossiter and Kawanabe, 2000; Kostoski et al., 2010; Albrecht and Wilke, 2008). Most of these lakes are vital for many human communities and local and major economies, such as tourism, fisheries, and agriculture. Unfortunately, anthropogenic threats, coping with climate change, are putting these rare and delicate ecosystems in crisis: hydrogeological modifications, es. with the construction of dams, unregulated water abstraction for irrigation and urban use, heavy tourism, inappropriate

LAKE

Ohrid



Altitude (m. a.s.l)

683°

Length max (km)

30,3°

Width max. (km)

15,6°

Surface (km2)

358°

Volume (km3)

55°

Av. depth (m)

155°

Max. Depth (m)

288,7°

Water Residence time (yr)

70°

Watershed (km2)

1002°

Countries (% of km2)

29,8 (AL); 70,2 (MK)^f

Inflows (%)

53 (karst aquifers, Prespa and other groundwater); 23 (direct precipitation); 23 (river inflow)^g

Outflows (%)

32 (evaporation), 1 (irrigation/ urban use), 67 (surface flow to Black Drin)^h

Great Prespa



Altitude (m. a.s.l)

max.852°(1951); min. 842°(2022)*

Length max (km)

27,3°

Width max. (km)

17,0°

Surface (km2)

max. 278,5°(1963); min. 250°(2022)

Volume (km3)

max.4,86°(1963); min. 2,76°(2022)

Av. depth (m)

14°

Max. Depth (m)

58°

Water Residence time (yr)

11°

Watershed (km2)

1391°^d

Countries (% of km2)

18 (AL); 65 (MK); 17 (GR)ⁱ

Inflows (%)

56 (rivers/ catchment runoff); 35

Outflows (%)

(direct precipitation); 9 (Small Prespa and ground water)

Small Prespa



Altitude (m. a.s.l)

853°

Length max (km)

14,3°

Width max. (km)

6,5°

Surface (km2)

53°

Volume (km3)

0,22°

Av. depth (m)

4,1°

Max. Depth (m)

8,4°

Water Residence time (yr)

3,4°

Watershed (km2)

260°

Countries (% of km2)

100(GR)^d

Inflows (%)

23 (catchment runoff); 30 (direct precipitation); 57 (surface flow)^j

Outflows (%)

and ground water)

49 (evaporation), 14 (irrigation), 37 (surface flow to Great Prespa)^k

Tab. 1: Characteristics of the Ohrid and Prespa Lakes.

source/ a Matzinger et al., 2006; b Soria and Apostolova, 2022; c Zacharias et al. 2002; d Poposka and Bonacci, 2007; e Albrecht and Wilke, 2008; f Kuzmanoski et al., 2022; g <http://drincorda.iw/learn.org/drin-river-basin/lake-prespa-sub-basin>; h Kolaneci, 2004; i Bojkovska, 2022. *max. and min. values according to the source.

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wastewater, and sewage treatment plants cope with massive amounts of pesticides and fertilizers due to unsustainable industrial and agricultural practices are contributing to exacerbating natural lake level changes, pollution, and eutrophication, with cascading and devastating effects to local human communities and biodiversity (Wulf, 2016; Hampton et al., 2018; Kaneko et al., 2003; Matzinger et al., 2006; Stankovic, 1960; Albrecht and Wilke, 2008). Lakes Ohrid and Prespa are not immune to these threats. They are already suffering from them.

Europe's ancient lakes: Ohrid and Prespa.

Located in the south-west of the Balkan Peninsula, Lakes Prespa and Ohrid (40°40'-41°10'N; 20°38'-21°08'E) are cross- boundary lakes, part of the greater Drin River Basin and of the European lake group called "Dessarettes" which consists of Lake Ohrid, Lake Megali Prespa, Lake Mikri Prespa, and the now drained Lake Maliq. With their shores shared by North Macedonia, Albania, and Greece, these two lakes are considered the only largest ancient tectonics lakes in Europe and among the eldest in the world, with an age estimated between 2 to 5 million years (Popovska and Bonacci, 2007; Albrecht and Wilke, 2008; Salemaa, 1994). The Lakes formed inside tectonic depression valleys bordered by high mountain reliefs and separated by a karst massif, the Galicica Mountain. Although they appear to be separate, they are connected or were in the past: until recent times, Lake Small (Mikri) Prespa was a gulf of the Great (Megali) Prespa, but due to erosion and sedimentation, they are now separated by an isthmus (Papoutsi-Psychoudaki & Psychoudakis, 2000). In 1969, the excavation of an artificial canal allowed the control of the water level of the Mikri Prespa. The Great Prespa and Ohrid are connected via karst underground conduits through the Galicica and Mali Thate karstic massifs: water from Lake Prespa flows into Ohrid on its southeastern and southern sides (St. Naum and Tushemisht Springs) (Popovska 2006). In addition to these unique characteristics, which underline these lakes cannot be analyzed independently, both have an incredible degree of biodiversity and endemism: Lake Ohrid is often

considered the lake with the highest biodiversity/surface ratio in the world (Stankovic, 1960; Albrecht and Wilke, 2008), while Lake Prespa not only hosts a wide variety of endemic fish species, but mammals and plants enlisted in the annexes "EU Habitats Directive" [4], such as the juniper woods and the birds coming to spend the winter months above its waters and wet meadows, being one of the most relevant locations of the world for the breeding of the European Pelican species such as the Dalmatian Pelican (Management Plan of the Prespa National Park 2014- 2024, 2014; MIO-ECSDE, 2018). Due to these precious characteristics, in 2014, UNESCO declared the Ohrid- Prespa Transboundary Biosphere Reserve [5], and large parts of the lakes and their watersheds are National Parks (Soria and Apostolova, 2022). As for many other lakes, Ohrid and Prespa have a long history of association with human civilisations that dates from the Neolithic Age to the present times. For its outstanding heritage, the Ohrid Region was included in the UNESCO World Heritage list [6]. Concerning the Great and Small Prespa, a formal request was submitted by the Permanent Delegation of Greece in 2014 [7].

Current challenges: water loss, biodiversity, depopulation

Starting from 1986-87, the Great Prespa Lake began to experience a dramatic fall in its water level, which registered its greatest peak between 1987-1995, with significant falls between 1998-2004 and, more recently, 2012-2022 (Popovska and Bonacci, 2007; Soria and Apostolova, 2022; Kuzmanoski et al., 2022; Management Plan of the Prespa National Park 2014-2024, 2014). Between 1987 and 2000, the water level decreased to around 29,7cm/ year (Popovska and Bonacci, 2007). Recent calculations performed with the use of Earth Observation data from the NASA/ USGS Landsat satellite constellation [8] showed that from 1951 to 2022, the water level of the lake declined from 852 to 842 m a.s.l (Soria and Apostolova, 2022; Kuzmanoski et al., 2022). The data becomes increasingly dramatic when the surface and volume of the lake are considered: in 1963, the lake covered an

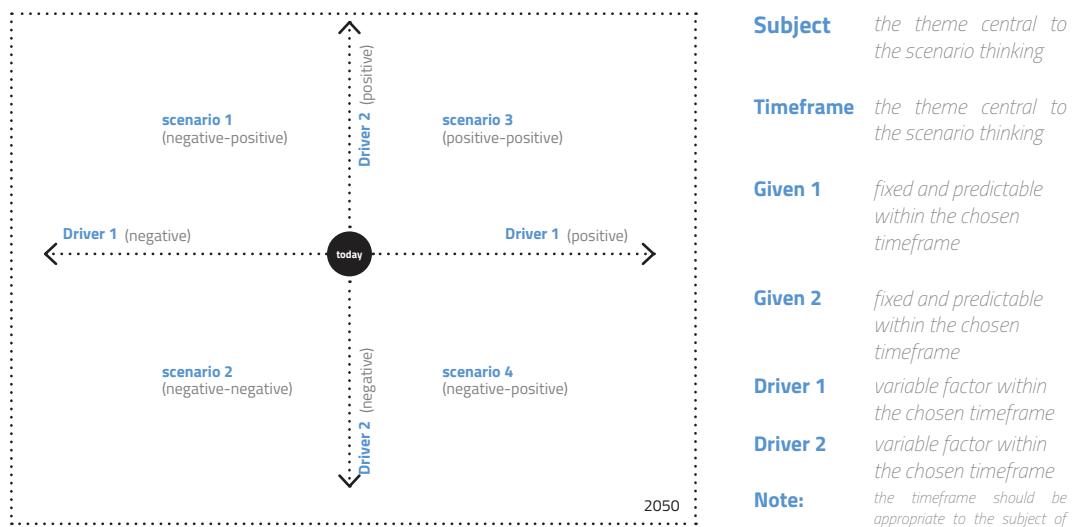


Fig. 2: framework for the definition of the scenarios.

source/ scenario thinking scheme created following the instructions defined in Meinert, 2014.

area of 273,85 km², with an estimated volume of 4,86 km³. In 2022, calculations show a surface of 250,17 km² and a volume of 2,76 km³. During the last 70 years, the water level dropped by 10 m, the lake shrank by around 23,68 km², and more than half of its volume was lost (Table 1)(Kuzmanoski et al., 2022). Until 1975, the Micro and the Macro Prespa had the same level. The two started to diverge significantly in 1976, also because of the artificial channel excavated between the lakes, which allowed to maintain a stable level in the Small Prespa (Management Plan of the Prespa National Park 2014-2024, 2014; Albrecht and Wilke, 2008). Over the same period, Ohrid hasn't had particular volume variations (Soria and Apostolova, 2022). Ancient lakes are susceptible to shifts in climate (Hampton et al., 2018), and the decrease in the surface area of water bodies is a natural phenomenon occurring due to sediment deposition and siltation of the basin (Soria and Apostolova, 2022). However, in the case of the Great Prespa Lake, there is a general agreement that even if the water level drop was made worse by a regional drought, it is mainly accountable to uncontrolled anthropogenic activities such as hydrological modification and water abstraction for irrigation and urban uses, at least for the period 1986-87 to 1995 [9] and possibly also for current times (Popovska and Bonacci, 2007; Soria and Apostolova, 2022; van der Schriek & Giannakopoulos, 2017). Agriculture and human settlements are also connected to another challenge for the Ohrid-Prespa System, posing a threat to its biodiversity and endemism: eutrophication. Due to rudimentary or low-efficiency wastewater treatment and sewage management, all human settlements can contribute to an increase in the concentrations of phosphorus and nitrogen in the lake water. Intensive agricultural activities are also a source of nutrient input into water bodies, because of the high amounts of fertilisers and pesticides used. The increased concentration of nutrients is the cause of eutrophication in lakes that irreversibly affects their ecological integrity, causing the loss of endemic species (Hampton et al., 2018). Due to the connection between Prespa and Ohrid, the increase of nutrients in the first might, in the long

run, also affect the second, where progressing eutrophication was identified and related to the increased amounts of tourists and residents since the 1940s (Soria and Apostolova, 2022; Albrecht and Wilke, 2008). As for Lake Prespa, a similar trend has occurred on the Albanian side, where the resident population has increased significantly from the 1900s to today, growing from 2,320 to 5,634 individuals. (Management Plan of the Prespa National Park 2014-2024). On the other hand, areas such as the North Macedonian side are currently facing depopulation and unemployment, especially among younger generations. From 2016 to 2018, the population aged 15-29 decreased by 1% [2]. Despite the uniqueness of the site and its ecological importance, tourism is small-scale and seasonal, without appropriate services and infrastructure [2]. Also, on the Albanian side, rural households lack adequate insulation to survive the harsh winter conditions, so locals harvest wood from the forests, causing impacts on the biodiversity of the area (Management Plan of the Prespa National Park 2014-2024, 2014).

Sustainable development and cultural tourism: the case of Lanzarote

In the context of development, tourism is recognised as one of the driving forces that can enhance local economies. In particular, cultural tourism—"which cares for the culture it consumes while culturing the consumer" (Richards, 2007, 1)—has the potential to act as a sustainable alternative to mass tourism, by strengthening local identity and communities, creating new jobs, and increasing the overall quality of life for residents. However, for it to be lasting and to guarantee the safeguarding of the involved communities and the natural environment, it must meet sustainability criteria. The definition of sustainable development was coined in 1987 in the United Nations Report of the World Commission on Environment and Development titled Our Common Future, also known as the Brundtland Report, stating that it corresponds to the development that meets the present needs without compromising the ability of future generations to meet their own (United Nations, 1987). In this sense, in 1995, the United Nations World Tourism Organisation



Fig. 3: Earth's ancient landscapes: Lanzarote and Lake Prespa.

published the Charter for Sustainable Tourism (UNWTO, 1995) as the outcome of the World Conference on Sustainable Tourism, held in Lanzarote, in the Canary Islands. In its 12 aims, the Charter states that sustainable tourism should make optimal use of environmental resources, help conserve natural resources and biodiversity, respect the socio-cultural authenticity and heritage of host communities, and provide socio-economic benefits to all stakeholders. Lanzarote's trajectory as a sustainable destination was rooted in a pioneering vision of territorial and cultural planning. Much of this success is due to the shared vision of César Manrique, an internationally renowned artist native of Lanzarote, and José Ramírez Cerdá, president of the Cabildo de Lanzarote, the island's maximum authority. Starting in the 1960s, supported by the political will to promote growth and tourism, they fostered a vision for the modernisation and cultural heritage, volcanic landscapes, vernacular architecture, and agricultural traditions (Scarpa, 2019). These efforts led to the Island Plan of Territorial Organisation in 1973, a pioneering instrument of urban regulation for the Canary Islands. It enabled the preservation of Lanzarote's distinctive characteristics, such as whitewashed, flat-roofed buildings, and prevented the uncontrolled expansion seen on other Canary Islands (Crespi and Salvi, 2021; Scarpa, 2019). It also supported the creation of the Art, Culture and Tourism Centres (CACT), a network of spatial interventions in areas of high natural and cultural value, whose lands were specifically acquired by the Cabildo for this purpose (Peñate, 2019). Their hybrid nature—part natural monument, part museum, part public artwork—offered a new model for sustainable territorial valorisation (Crespi and Salvi, 2021; Peñate, 2019). Manrique was well aware of the great impact that sustainable tourism would bring to the island and was convinced that the key to long-term success lay in the promotion and branding of Lanzarote's unique characteristics. Together with collaborators such as Jesús Soto and Eduardo Cáceres, he designed each CACT to valorise its specific setting—vernacular, agricultural, or natural—aiming not only to attract tourism but also to serve as sites of cultural

exchange and to promote local craftsmanship and products (Crespi and Salvi, 2021). In this regard, it is important to note that several of these sites—such as Jameos del Agua, Cueva de los Verdes, and Jardín de Cactus—were located in landscapes that were previously degraded or neglected (Peñate, 2019). Manrique also strongly advocated for the protection of natural environments that could be endangered by mass tourism. This commitment led to the establishment of the Timanfaya National Geopark in 1974, which encompasses the entire volcanic area created during the eruptions from 1730 to 1736 (Don Andrés Lorenzo Curbelo, 2007; Sánchez et al., 2019). As a result, Manrique's pioneering vision successfully crafted a cultural tourism framework that not only endures but remains deeply embedded in the island's identity and its current sustainability and conservation efforts. Thanks to the continued engagement of local institutions, such as the Cabildo of Lanzarote and the public entity CACT, the island manages to attract millions of visitors annually, drawn to its unique character. For example, in 2016, the iconic site of Jameos del Agua received 750,552 visitors (Peñate, 2019). The island also boasts high employment rates in the tourism sector and offers several training initiatives for local youth (Crespi and Salvi, 2021). According to a recent Deloitte report, CACT activities generated €186.7 million in revenue, translating into €231 million in GDP, sustaining 6,624 jobs and returning €16.2 million in taxes—on an island with only 145,000 inhabitants (Peñate, 2019; VV.AA., 2016). Furthermore, due to its remarkable volcanic features, Lanzarote attracts scientists from all over the world for studies and international conferences, such as the recent 4th International Planetary Caves Conference [10]. Among these visitors are also astronauts and space agencies such as NASA and ESA, who train and conduct research on the island due to its similarities to the Moon and Mars, particularly concerning lava tubes (Sauro et al. 2020; Tomasi et al., 2021; Romio, 2021; Romio and Lobosco, 2025).



source/ the author. (2023)

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Tools and Methodology

GIS and Earth Observation Data

A Geographical Information System (GIS) is a computer system that allows the analysis and display of geographically referenced information by attaching data to a unique location on the Earth's surface. GIS technologies are commonly used in many applications, such as Earth sciences, biology, landscape architecture, urban planning, and resource management [11]. The GIS software used in this review is QGIS, which is free, open-source, and maintained by an active community of developers and users who also provide numerous additional plugins that enhance the base capabilities of the tool [12]. One of these is the QGIS Google Earth Engine plugin [13] that integrates Google Earth Engine (GEE) with QGIS, enabling the users to access the GEE Data Catalog [14] and its capabilities directly from QGIS, allowing the users to access incredible amounts of Earth Observation datasets coming from shuttle missions [15], satellites, and constellations such as Landsat [8] (National Aeronautics and Space Administration), Copernicus [16] (European Space Agency) and many others. On the 22nd of June 1802, the naturalist and scientist Alexander von Humboldt climbed the volcano Chimborazo in Ecuador. From that point of view, he claimed that all the natural systems are connected "like a single fabric made of thousands of threads" (Wulf, 2016), a very different concept of nature from what was the general thought at the time of his discovery. Nowadays, we can observe the interrelation of natural and anthropogenic phenomena with satellites, confirming von Humboldt's theory of the Naturgemälde. For what regards lakes Ohrid and Prespa, previous research successfully used GIS and Earth Observation data (EO) for hydrogeological studies (Kiri, 2016), to quantify the water loss of the Great Prespa between 1984 to 2022 (Kuzmanoski et al., 2022) and to observe variations in landcover (Soria and Apostolova, 2022). In the present article, the combined use of QGIS and EO allows the visualization and investigation of the interrelations between the factors identified to be the key to during the period 1986-87 to 2022, with particular attention on the relationship between

the environmental systems and the human settlements development. The EO data utilised for the present study have been retrieved from the open-access Google Engine Data Catalog [14]. The datasets employed in this study are listed below (refer to Section 6.2.2 for dataset access links):

1. *JRC Global Surface Water Mapping Layers v1.4: this dataset, developed by the Joint Research Centre (JRC), provides raster data on global surface water occurrence from 1984 to 2022, with a spatial resolution of 30 meters per pixel (Pekel et al., 2016);*
2. *MODIS Land Cover Type (MCD12Q1) Version 6.1: this raster dataset, derived from the Terra and Aqua MODIS instruments and made available by the NASA LP DAAC at the USGS EROS Center, offers global yearly land cover classifications from 2001 to 2022, at a spatial resolution of 500 meters per pixel (Friedl and Sulla-Menashe, 2022);*
3. *World Settlement Footprint 2015 (WSF2015): this is a 10-meter resolution raster dataset representing a global map of human settlements for the year 2015, developed as part of the World Settlement Footprint initiative (Marconcini et al., 2020);*
4. *GHS-UCDB R2019A - GHS Urban Centre Database 2015: this raster-based dataset identifies urban centres worldwide based on population density and built-up surface within a 1x1 km global grid. The reference year is 2015, with historical attributes reaching back up to 40 years, depending on data availability (Florczyk, A. et al., 2019).*

The technique of Scenario Thinking aims to depict multiple possible futures in which the current present might result within a set timeline appropriate to the Scenario Thinking Project. Scenarios depend on factors already influential to the specific matter in analysis and the general framework. The development of Scenario Planning happened mainly during the 1950- the 60s as a military strategy to depict possible future conflicts or possible economic and social developments. Very soon, it started to be adopted by companies, scientists, politics, and a wide variety of users because it proved to be great for policy advice, regional and urban planning, infrastructural developments, social challenges, and conflicts (Meinert, 2014; Di Giulio et al., 2018). In the present work (Fig.2), this methodology allows the presentation of four

equally complex and plausible futures in which the Ohrid-Prespa system might evolve, with a focus on the Great Prespa Lake. The timeframe of this exercise is 2050. The choice of this temporal horizon is due to both the literature on the subject, which suggests a temporal horizon of 20-25 years for regional and development planning (Meinert, 2014), and the current European Union Long-Term Strategy for 2050[3], which, at the moment, represent the heart of EU commitments towards tackling climate change. These resulting scenarios aim to make evident and allow the preventive evaluation of potential impacts that the decisions of today's governments and policymakers might have

on the future of the Great Prespa, in the context of the global and local environmental challenges and need for the development of the study area to tackle major societal and economic issues (Mayor of Pustec, Personal communication).

Implementation of Lanzarote's Strategy

The present work suggests implementing practices and strategies derived from the case example of Lanzarote because of its sustainable balance between preservation and development, which are here considered similar to the needs of the area of the Great Prespa. Both are ancient landscapes of very high cultural and scientific importance (Fig.3).

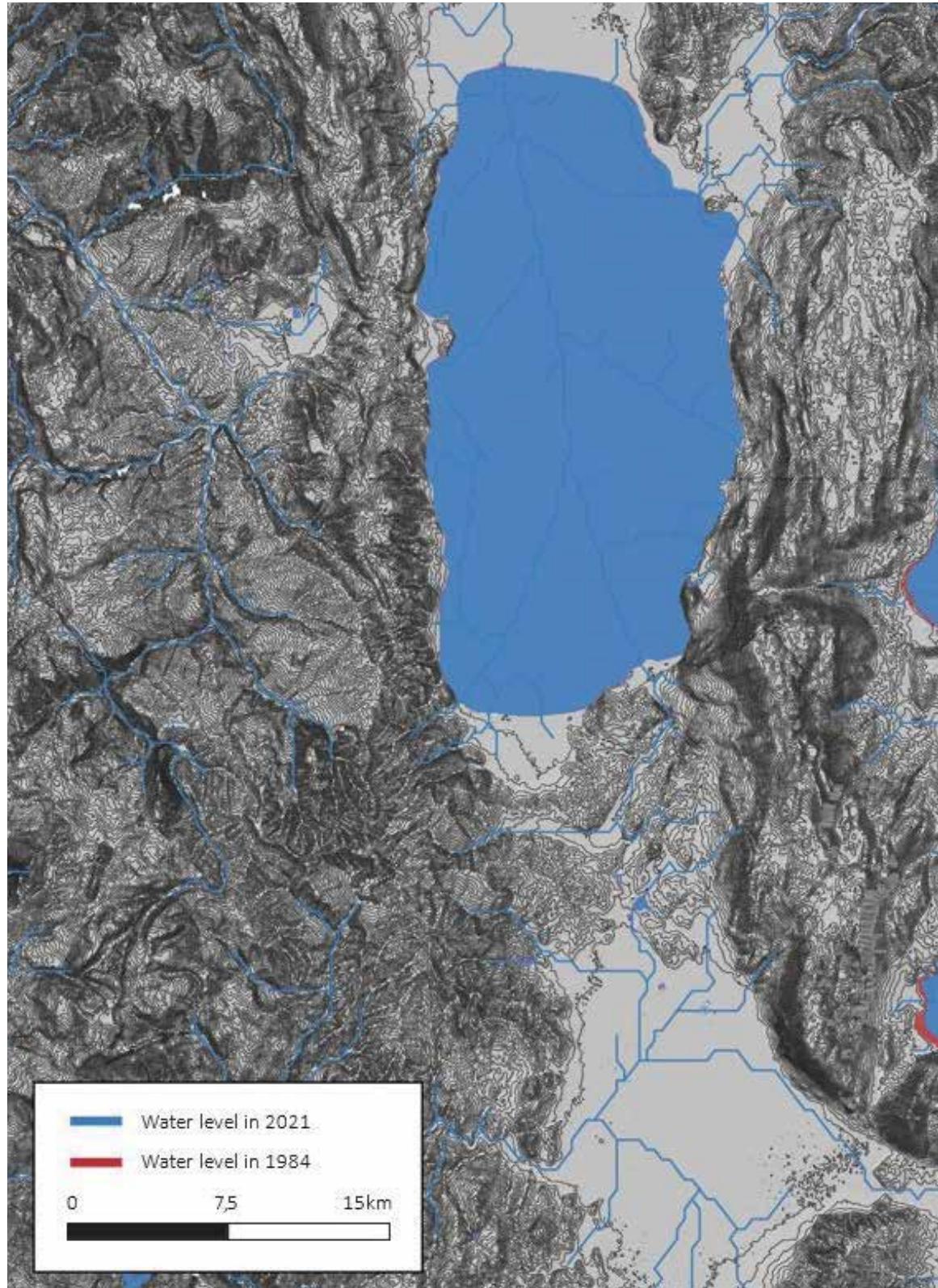


Fig. 4: changes of surface water in the Ohrid-Prespa system from 1984 to 2021.

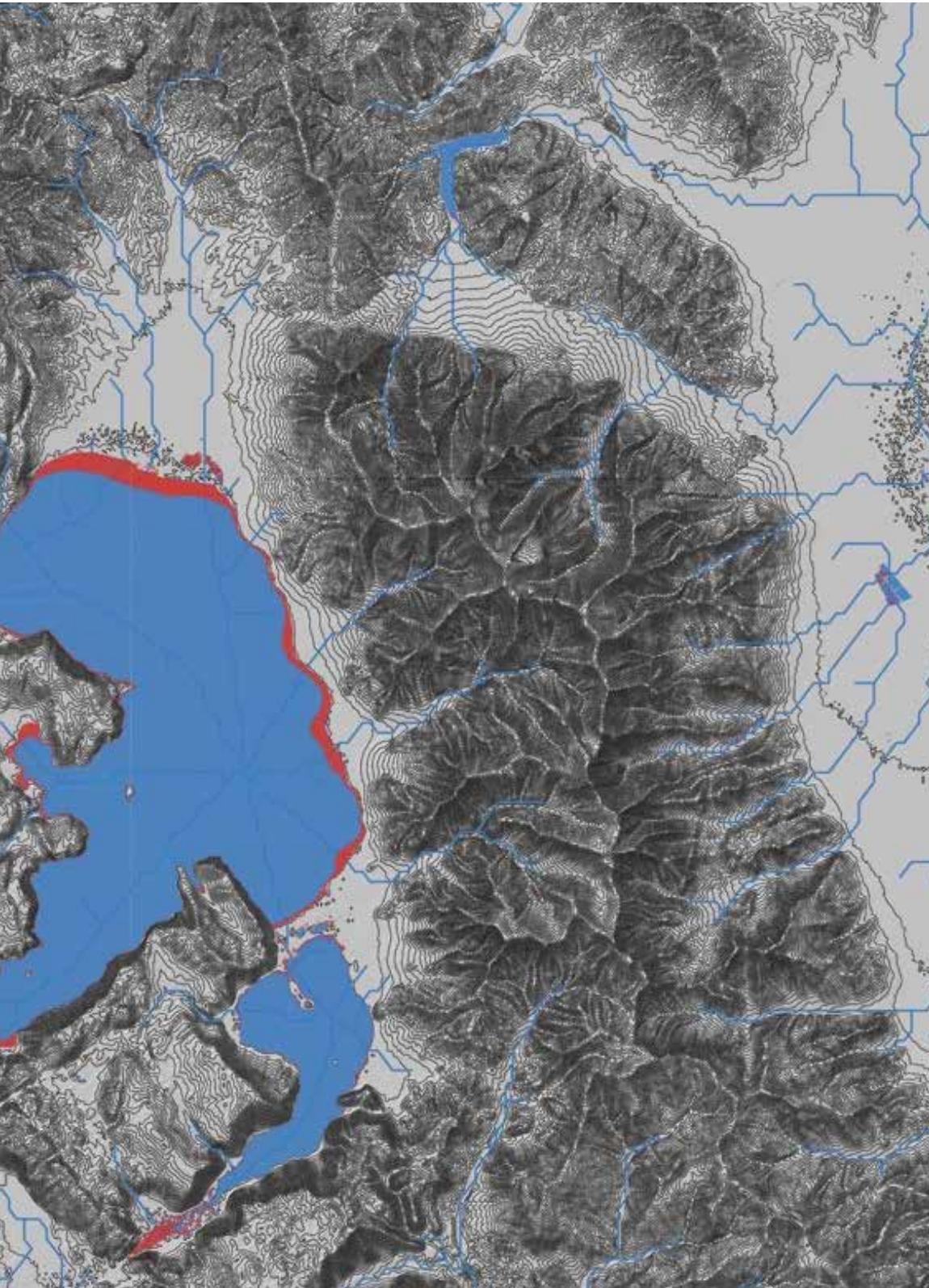
Moreover, the strategies adopted by Lanzarote are here associated with specific actions already depicted in the Management Plan of the Prespa National Park 2014-2024 and documents such as EU for the Prespa Action Plan[2] (See Section 4.2, scenario n.4).

Discussion and Results

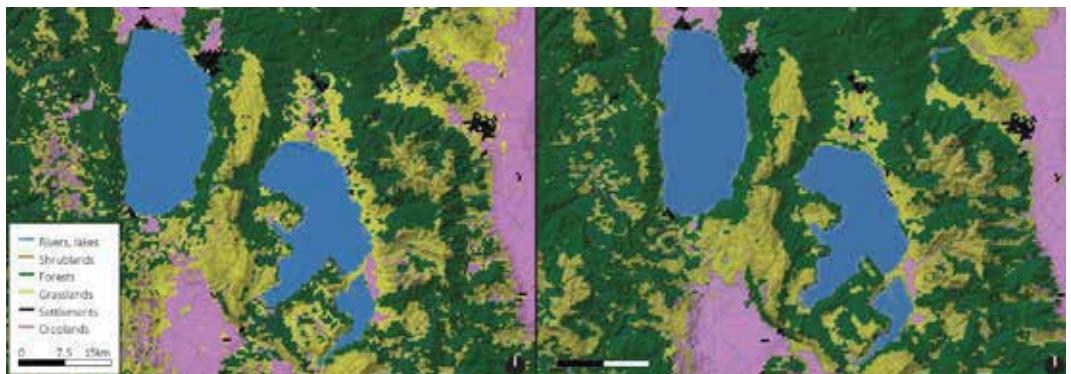
Environmental systems and development

From 1986-87, Lake Great Prespa suffered a loss of around 54% of its volume. Earth Observation (EO) data coming from the JRC Global Surface Water Mapping Layers, v1.4 dataset (Pekel et al., 2016) are used to investigate this phenomenon:

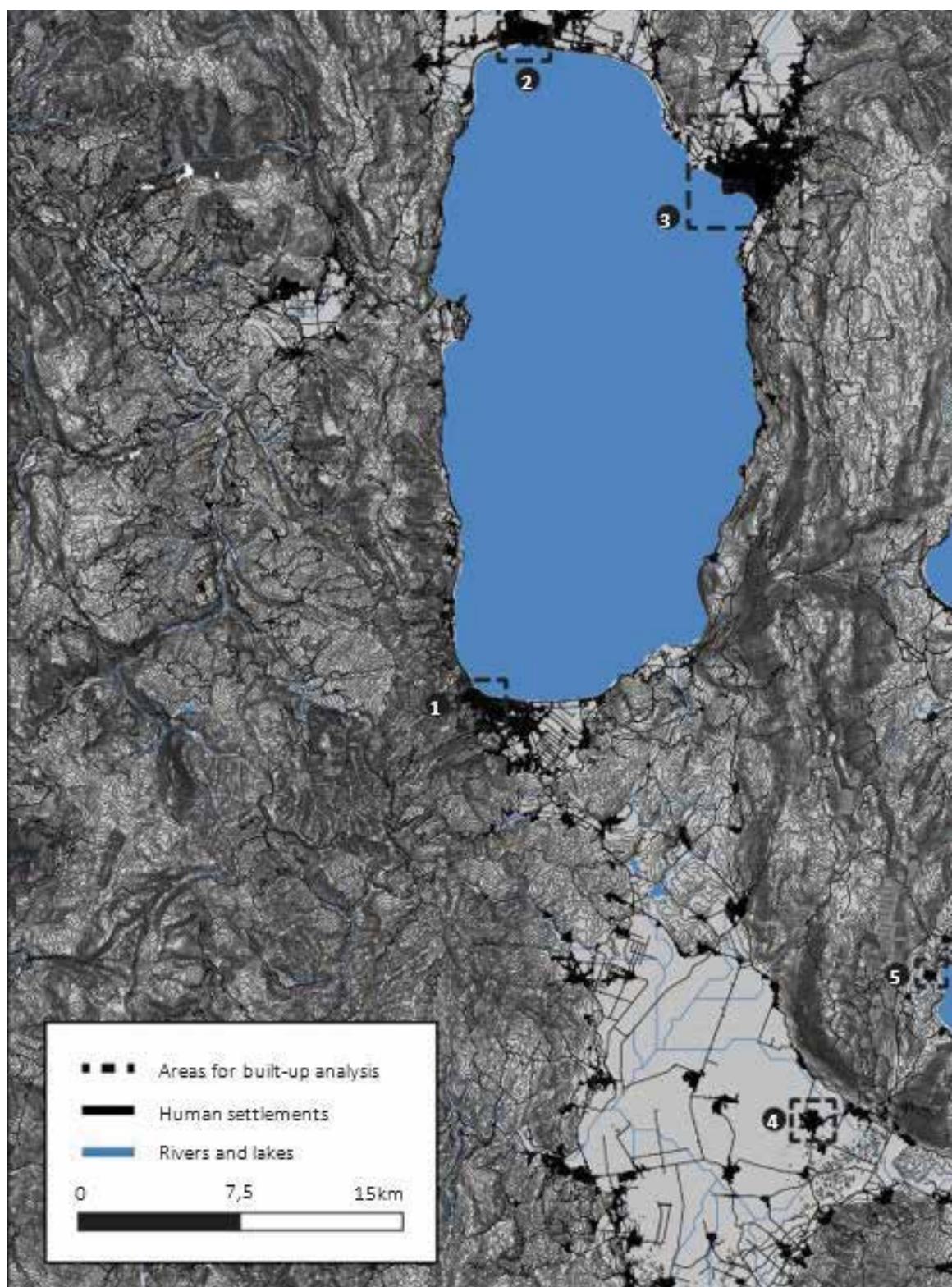
the dataset contains the distribution of surface water from 1984 to 2021, providing statistics on the extent and changes of global water sources, including the Ohrid-Prespa system. Implementing this data into QGIS, it is possible to notice the stability of Lake Ohrid's surface water compared to the shrinkage in the southern region of Lake Mikri Prespa and the dramatic water loss faced by the Great Prespa (Fig.4). In particular, such change has had significant effect on the landscapes and shores of the latter: on the northern part, the shoreline has, in some areas, shifted more than 1km from its position in 1984. The causes of these dramatic changes were mostly related to unregulated water



source/SRTM DEM (NASA); JRC Global Surface Water Mapping Layers, v1.4 (Pekel et al, 2016)

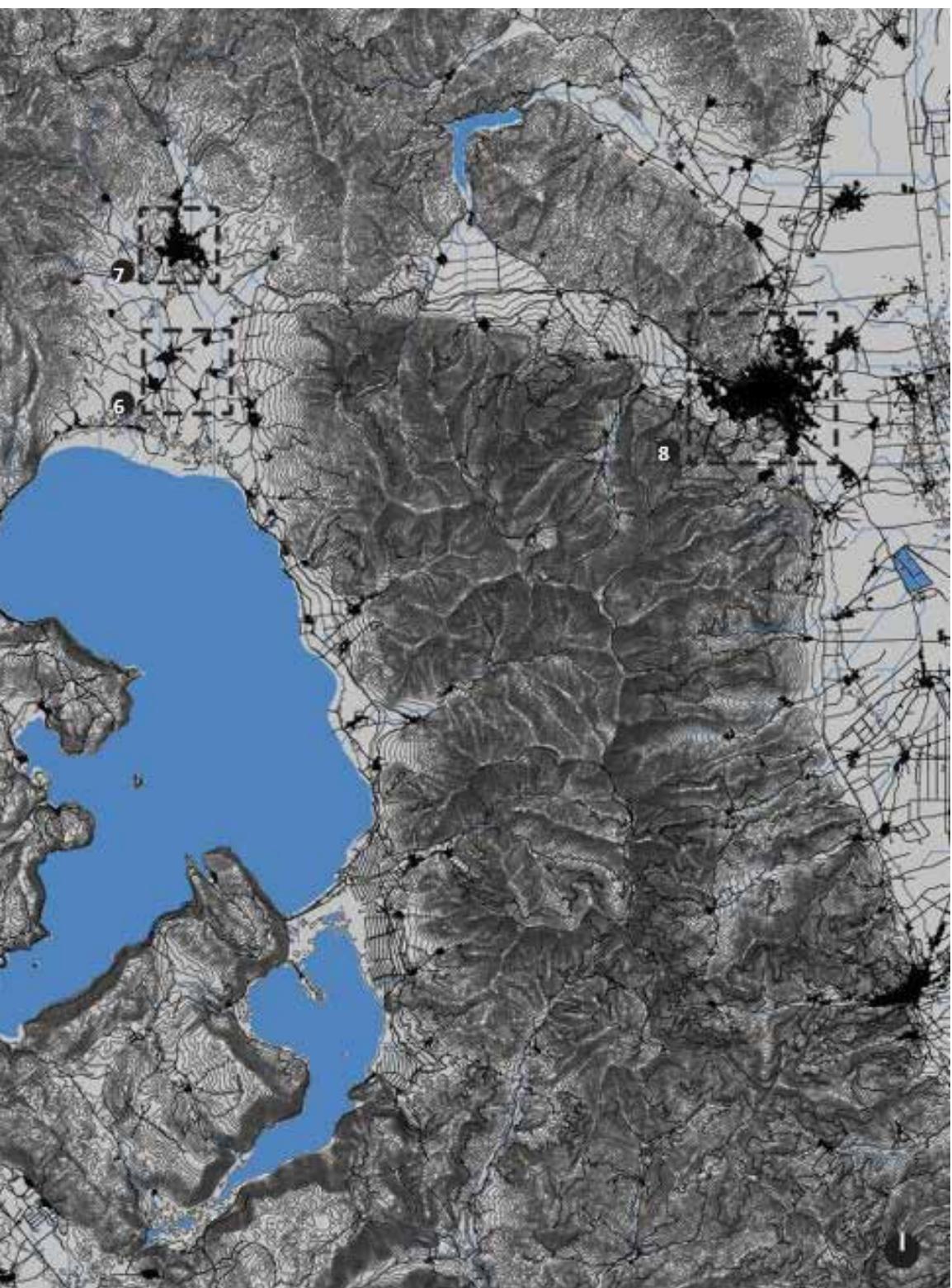


source/ SRTM DEM (NASA); MODIS (Friedl and Sulla-Menashe, 2022)



abstraction for agricultural and urban use. To better understand the link between development and deterioration of natural resources, land usage between 2001 and 2022 in the Ohrid-Prespa area is observed with publicly available EO datasets: the Terra and Aqua combined Moderate Resolution Imaging Spectroradiometer (MODIS) Land Cover Type (MCD12Q1) Version 6.1 (Friedl and Sulla-Menashe, 2022). From the analysis of these datasets, it is possible to notice that the agricultural development of the Ohrid-Prespa area was carried out well before 2001 and that from 2001 (Fig.5a) to 2022 (Fig.5b) no large-scale significative changes happened: an overall increase in forested areas

can be observed, with some decrease in cropland north and west from Lake Ohrid and above the Great Prespa, while croplands increased south of Ohrid and Prespa and northeast of the latter. Also, the World Settlement Footprint 2015 dataset (Marconcini et al., 2020)(Fig.6), which provides information on the extent of human settlements up to 2016, and the Global Human Settlement Layers, Built-Up Grid 1975-1990-2000-2015 (Florczyk, A. et al., 2019), which gives information regarding how the aforementioned settlements have developed between pre-1975 until 2015 (Appendix A), are used to analyze the urban development. A total of 8 settlements around Ohrid and Prespa



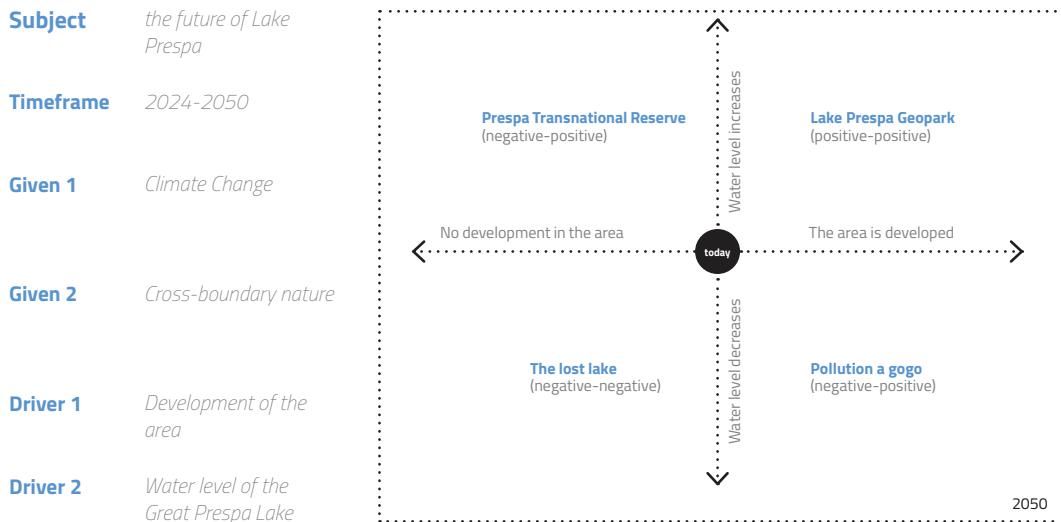


Fig. 7: creation of the scenarios

source/ the author, based on Meinert, 2014

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are selected (Fig.6) and analysed (Appendix A). The outcomes of this cross-study clearly show that the main developments happened between 1975 and 1990: some settlements developed almost entirely during this timeframe (Appendix a: fig.4, 6), while only small built areas existed already in 1975 (Appendix a). Development continued until the 2000s, with only a little growth from 2000 to 2015. Matching this data with the Great Prespa lake water loss, it is possible to point out that during periods of intensive development of both agriculture and built environments, there may have been unsustainable abstraction and use of lake water, which would support claims previously made by other authors[9] (Popovska and Bonacci, 2007; Soria and Apostolova, 2022; van der Schriek & Giannakopoulos, 2017).

Future scenarios for Lake Prespa

The Lake Prespa area is currently facing several issues, such as biodiversity loss and declining lake water levels, which have led to the transformation of formerly sandy beaches into shallow, muddy coastal zones[2]. At the same time, the area holds great potential due to its unique geology, rich biodiversity, scenic landscapes, and cultural heritage. To solve these issues, local authorities seek to develop infrastructure, economies, and tourism. However, outcomes of the present and previous studies have established a clear link between past development and the deterioration of the Lake environment and resources. To explore possible futures for Lake Prespa, here it is used the methodology of Scenario Thinking (Fig.7). In particular, it is chosen a timeframe from today to 2050, within which there will be some fixed boundary conditions (given 1, 2), that climatic changes will happen and that Lake Prespa will retain its cross-boundary nature which needs cooperation between the parties, and variables (driver 1,2) which might lead to four different scenarios, all equally plausible. The variables identified in this study are: the Great Prespa water level and development. Each of these variables can either be positive (water level increases; the area is developed) or negative (water level decreases; no development in the area).

■ **Scenario 1: Lake Prespa Transnational Reserve**
 Due to the alarming drop in Lake Prespa's water level, Albania, North Macedonia, and Greece agreed to establish the Lake Prespa Transnational Reserve. Within this protected area, no further development was allowed, and water abstraction was limited strictly to food production and the sustenance of the local population. After 26 years, the lake's water level has risen and is now stable: pollution has been reversed, the eutrophication process halted, and biodiversity has increased once again. On the other hand, the local population is now ageing, and younger generations are increasingly drawn to opportunities in nearby cities and municipalities, where tourism infrastructure to support eco-tourism has gradually developed over the years.

■ Scenario 2: the Lost Lake

After the severe drought of 2026, a more drastic trend of water loss began, bringing dramatic consequences for the local population, the Korça region, and the area's biodiversity. Lake Ohrid, once more resilient than Prespa, reached alarming levels of pollution and eutrophication due to the reduced inflow from the karstic springs that were once fed by Great Prespa. Now, 26 years later, Lake Prespa has vanished. A new, altered natural landscape has emerged on the polluted lakebed, while the once-picturesque lakeside towns now lie abandoned.

■ Scenario 3: Pollution a Go Go

Despite warnings from the scientific community, local authorities in North Macedonia prioritised the development of the Lake Prespa area to prevent the depopulation of surrounding towns and cities. Albania and Greece soon followed, drawn by the potential for business opportunities. In 2026, after two intense years of planning and highly successful marketing campaigns, tourism in the Lake Prespa region experienced a dizzying surge, bringing significant economic growth and employment opportunities. However, year after year, the lake's water level dropped significantly, accompanied by increasing pollution and a cascade of local species

extinctions, eventually giving way to alien and invasive species. By 2036, after a decade of touristic success, the lake's surface had shrunk to just half of its 2024 extent. The complete loss of biodiversity and the site's former uniqueness triggered a collapse of the local economy, ultimately leading to the abrupt depopulation and abandonment of the area's towns and cities.

▪ Scenario 4: Lake Prespa Geopark

In 2024, principal authorities from Albania, North Macedonia, and Greece gathered together to develop a strategy that could match the need for restoration and protection of the Prespa environment with the development sought by local institutions and the population: EU funds and national incentives were used to adopt prescriptions already enlisted in the Management Plan of the Prespa National Park 2014-2024, such as better insulation for the houses, installation of renewable energy systems and improvement of the heating systems of the households, to tackle illegal woodcutting for heating during the winter months. Also, young agronomists and agriculture specialists were offered employment to work with local farmers to favour the transition from unsustainable and intensive practices to sustainable agroforestry practices. These actions fostered international attention to the Prespa Lake, favouring the adoption of similar strategies in the Ohrid-Prespa system and at other locations, such as Lake Skadar. Today, in 2050, the water level of the Great Prespa has been stable for the last 20 years, and pollution is at the lowest recorded levels. Since the '30s, thanks to the balance between protection and development, the Ohrid-Prespa system became one of the cultural and ecological hotspots in the world, attracting tourists every year who reach the destination to visit its Natural Parks, attend international conferences on biodiversity and environmental protection, visit the local cultural and art centers and the local town and sustainable food festivals.

From Lanzarote to Prespa

As outlined in the previous paragraph, the fourth scenario represents the most favourable outcome in terms of sustainable development and environmental protection. Within the proposed fictional narrative, one can discern the integration of key best practices that contributed to Lanzarote's recognition as a model of sustainable development and cultural tourism. In particular, the preservation of local identity—both of place and community—is safeguarded through planning regulations and restrictions. These measures foster the emergence of sustainable economic and social opportunities, generating long-term benefits for both the environment and the inhabitants of lake villages such as Pustec in Albania, as well as comparable communities in Greece and North Macedonia. In particular, key takeaways that can be extracted from the case of Lanzarote are the following:

▪ Political will, aesthetic values and vision

Lanzarote's success would not have been possible without strong institutional support and the active

engagement of key stakeholders. This achievement was the result of a convergence of vision, political will, and shared interests among several influential figures—most notably José Ramírez Cerdá, president of the Cabildo de Lanzarote, and the artist César Manrique. Ramírez Cerdá had a clear strategy aimed at improving the island's socioeconomic conditions, modernising infrastructure, and enabling the development of tourism. Manrique, on the other hand, gave tangible form to this vision through a series of experimental cultural centres that not only became iconic tourist destinations but also captured and reinterpreted the unique cultural and landscape features of the island. Similarly, the Lake Prespa region could benefit from a comparable convergence of political vision and stakeholder collaboration. A strong, unified, and transboundary strategy would foster the development of shared initiatives, requiring equal standards of modernisation and infrastructure across the Greek, Albanian, and North Macedonian shores. Such coordination could enable a cohesive touristic experience that highlights the region's diverse yet interconnected landscapes and cultural identities, ultimately promoting balanced territorial development and deeper regional integration;

▪ From vision to decades of employment opportunities

As previously discussed in Section 2.4, the shared vision of Manrique and Cerdá not only offered tourists remarkable architecture and landscapes and favoured the protection and preservation of the island's culture and natural heritage, but in doing so it created substantial employment opportunities for the local population of Lanzarote, largely due to the island's strong landscape and cultural branding. Lanzarote has succeeded in generating a multi-layered tourist experience that appeals to visitors on both aesthetic and cultural levels. Tourists are encouraged to explore the volcanic landscapes of Timanfaya, to discover agricultural traditions at the Casa-Museo del Campesino—located near the vineyards of La Gería, the island's primary wine-producing region, where many producers offer tastings and guided visits. They are also drawn underground, into the lava tube of La Corona, visiting sites such as La Cueva de los Verdes and Los Jameos del Agua, where they learn about the island's unique geology and how these caves were historically used by locals for protection from pirate attacks (Romio and Lobosco, 2025). This network of dispersed attractions encourages tourists to explore multiple towns across the island, fostering a desire to immerse themselves in local life. In doing so, visitors support a distributed economy that benefits the island as a whole, rather than concentrating tourism income in just a few areas. Lanzarote thus offers a wide range of experiences: from culinary specialities found only in specific villages, to surfing, and a vibrant local artisan scene involving a large part of the resident population. To help condense these diverse experiences into short stays, a variety of thematic tours led by specialised local guides are available, creating further employment



Fig. 7: postcards from Prespa: an emotional collage of transboundary landscapes and cultural heritage components.

source/ the author. (2023)

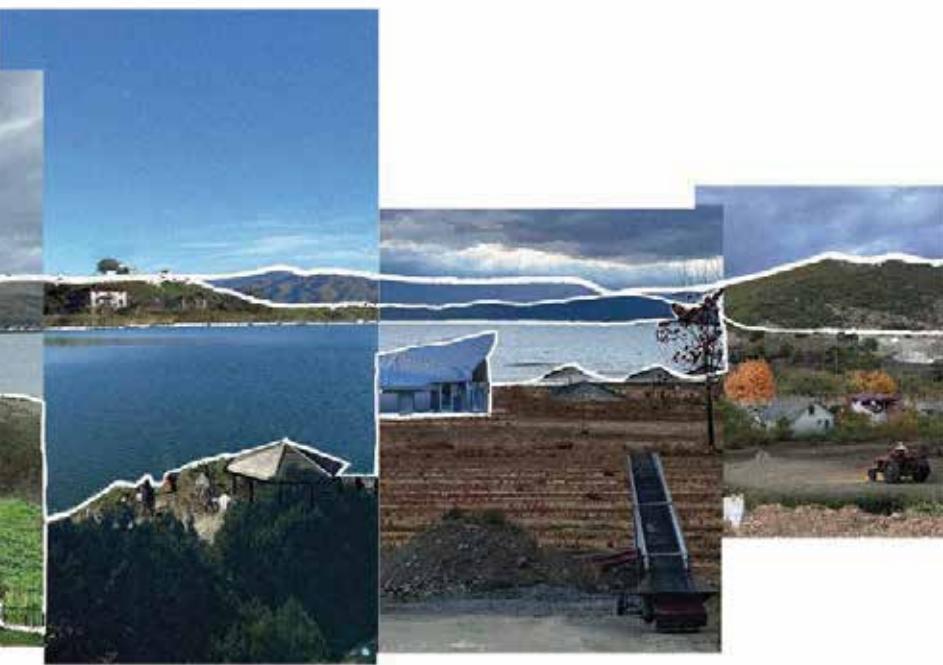
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opportunities. All these factors contribute to the active engagement of the local population in sustaining and shaping Lanzarote's tourism model. A similar approach could be envisioned for the Lake Prespa region. Due to the very nature of the lake, shared across Albania, Greece, and North Macedonia, there is a strong potential for designing a transboundary tourism strategy that highlights the diversity and complementarity of its cultural and natural assets. A coordinated and balanced development of infrastructure, services, and cultural offerings across the three national shores could enable visitors to experience the lake as a unified yet plural landscape. This would not only enhance the overall attractiveness of the region but also ensure an equitable distribution of economic benefits and employment opportunities, fostering local engagement and cross-border cooperation rooted in shared heritage and ecological responsibility. Such a strategy could also revitalise local economies by promoting small-scale, sustainable production sectors—including traditional crafts, agri-food products, and eco-tourism services—that reflect the unique identity of each lakeside community (Fig.8). Supporting the development of locally rooted value chains and new market opportunities, particularly in cultural and environmental fields, could provide meaningful employment for younger generations, while preserving the social and cultural fabric of the region.

Conclusions

In this study, it has been evidenced how the case of Lake Prespa, with its exceptional ecological, geological, and cultural significance, represents both a challenge and an opportunity for rethinking development in cross-border and environmentally sensitive regions. The use of Earth Observation data and GIS systems, provide supporting evidence

to what other researchers had already claimed regarding the on-going decline of the Great Prespa Lake, which poses a serious threat not only to the ecological integrity of the Ohrid-Prespa system, but also to the long-term social and economic viability of its surrounding communities. However, by envisioning alternative futures through scenario thinking, it becomes evident that a different trajectory is still possible. Among the four scenarios proposed in this study, the most desirable outcome—represented by the "Lake Prespa Geopark" vision—demonstrates how restoration and development can go hand in hand when supported by strong political commitment, cross-border cooperation, and community-based strategies. In this regard, the island of Lanzarote provides a valuable precedent. Its success in balancing environmental conservation with economic development through cultural tourism and territorial branding stands as a compelling model for Prespa and other remote, heritage-rich regions. By drawing inspiration from Lanzarote, Lake Prespa could embrace a path of integrated and sustainable development. This would require not only the reinforcement of ecological protection measures but also the promotion of local identity, cultural heritage, and place-based economies, particularly in the fields of agroecology, craftsmanship, and eco-tourism. Crucially, such a strategy would offer long-term employment opportunities and help retain younger generations, reversing ongoing trends of depopulation and underdevelopment. Ultimately, the future of Lake Prespa depends on the capacity of national and local institutions to coordinate across borders, invest in sustainable infrastructure, and engage communities in shaping a shared vision. If supported by coherent policies and adequate funding, this region has the potential to become a leading example of how environmental stewardship



and cultural valorisation can generate resilient and inclusive rural futures.

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■ MODIS Land Cover Type (MCD12Q1) Version 6.1: https://developers.google.com/earth-engine/datasets/catalog/MODIS_061_MCD12Q1?hl=it#description;

■ World Settlement Footprint 2015 (WSF2015): https://developers.google.com/earth-engine/datasets/catalog/DLR_WSF_WSF2015_v1?hl=it;

■ GHS-UCDB R2019A- GHS Urban Centre Database 2015: <https://data.jrc.ec.europa.eu/dataset/53473144-b88c-44bc-b4a3-4583ed1f547e>

Remote sensing digital models for supporting landscape and urban planning

The case study of the Great Prespa Lake area and the municipality of Pustec (Albania)

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Abstract - *The imminent potential accession of Albania to the European Union marks a pivotal moment for the country and its smaller municipalities, such as Pustec, located near the Great Prespa Lake. Serving as a crossroads and border among Albania, Greece, and North Macedonia, the region is moving toward integration into the European community, heralding a new era for the Albanian territory. However, the strategic development of these predominantly rural areas faces the challenge of scarce digitized data on local architectural and building heritage, resulting in a limited understanding of current urban fabric of the municipalities.*

The present paper explores how 3D technologies can serve as catalysts for multi-scale architectural design. It particularly examines the potential of three-dimensional models derived from Geographic Information Systems (GIS) and aerial photogrammetry through a comparative analysis, highlighting the advantages of an integrated approach for territorial comprehension and planning. Unlike traditional planning methods that rely on outdated or static cartography, the integration of digital 3D models enables dynamic, current, and spatially accurate representations that can better inform both preliminary and detailed planning stages.

GIS 3D models, despite limitations due to missing building data in areas like Pustec, allow for landscape-scale digital representations that facilitate visualization and understanding of the broader transnational Prespa Lake area. In contrast, aerial photogrammetry is more effective at the urban scale, offering precise mapping of architectural and building heritage across the region's municipalities.

The combined use of these technologies represents a powerful tool for constructing a foundational knowledge base to support strategic development at both landscape and urban levels, particularly in cross-border contexts. This approach underscores the importance of a comprehensive vision that addresses common territorial challenges while preserving historical and cultural heritage

Keywords - Remote sensing, landscape planning, urban planning, GIS, aerial photogrammetry.

Introduction

The Prespa region, located at the crossroads of Albania, North Macedonia, and Greece, is a unique transboundary area that includes the Great and Small Prespa Lakes and Lake Ohrid. It is home to over 50 medium-sized settlements, inhabited predominantly by indigenous populations, along with minority groups from neighboring countries. The local economy is largely based on agriculture and fishing (Çetinkaya & Kaymaz, 2005). The area's natural and cultural richness has earned it recognition as a UNESCO World Heritage site and inclusion within protected transboundary national parks (Muslli, 2016).

The presence of significant natural (lakes, forests, and mountains) and anthropogenic (customs borders and cultural boundaries) frontiers has

deeply influenced the development of these communities (Makartsev et al., 2016). In particular, the Albanian side of the region faces pressing issues such as depopulation, driven by post-1990s border openings, distance from urban centers, and limited opportunities for youth. These dynamics have fueled ongoing emigration toward larger cities or abroad (Arrehag et al., 2006).

Environmental pressures have also intensified, notably the visible reduction in the lake's size over the past three decades. This change has significantly altered both the physical landscape and the functional relationship between human settlements and the lake ecosystem (Kuzmanoski et al., 2022).

In this evolving context, Albania's upcoming

accession to the European Union raises new opportunities and challenges for the entire region, including the opening of borders and the free movement of goods and people. It offers prospects for cross-border cooperation, economic integration, and enhanced mobility, while also demanding alignment with EU spatial planning standards and addressing the complex dynamics of a historically fragmented border landscape.

To address these evolving dynamics, it is essential to define spatial strategies capable of reactivating local interest while preserving the region's natural and cultural assets. This includes enhancing environmental protection, valuing traditional practices and heritage, and improving accessibility, mobility, and services. Such integrated planning can strengthen the human-environment system and promote sustainable tourism and local development (Vagiona & Mylopoulos, 2005).

However, planning in such contexts requires a reliable and updated knowledge base, something currently lacking due to the scarcity of digitized information on the urban fabric. This absence hampers the formulation of coherent development strategies and underscores the importance of spatial mapping and data integration.

The present paper investigates digital workflows for generating low-cost three-dimensional representations of the Prespa region, focusing on the municipality of Pustec. It explores the combined use of GIS-derived 3D terrain models and UAV-based aerial photogrammetry to support landscape and urban planning at multiple scales. The study stems from field observations and data collected during the international Ph.D. workshop "Intersecting Landscapes" (Polis University, Tirana, November 2023), which focused on identifying new spatial visions for this cross-border region.

Literature Review

Geographic Information Systems for landscape and urban planning

Geographic considerations have long played a critical role in decision-making processes, with cartography and spatial data visualization serving as foundational tools across human activities (DeSanctis, 1984; in Keenan, 2008). The

computational advancements of the 1960s enabled the evolution of traditional cartography into the first Geographic Information Systems (GIS) (Tomlinson, 1969). With the rise of personal computers in the 1980s and their increased capability in the following decade, GIS applications expanded significantly, becoming more accessible through a range of software platforms (Keenan, 2008).

Today, GIS is a mature, versatile tool used in a wide array of sectors such as urban and territorial planning, environmental monitoring, agriculture, infrastructure, public health, defense, tourism, and beyond, facilitating the analysis and modeling of spatial and temporal phenomena (MacEachren, 2000; Fistola, 2011). These systems rely heavily on remote sensing data, especially aerial and satellite imagery processed via photogrammetry, typically at a resolution of 1 meter per pixel (Skidmore, 2022). GIS platforms come in many forms, each designed to support different types of applications: commercial software like ArcGIS (ESRI) enables management of complex datasets, while more accessible tools such as ESRI ArcView and MapInfo are geared toward decision-making (Keenan, 2008). Among open-source solutions, QGIS is particularly noteworthy for its flexibility, rich plugin ecosystem, and widespread use in academic and professional contexts. With the expansion of the internet, web-based GIS services have emerged, providing online access to distributed geodata (Tao, 2001). Applications like Google Maps, Google Earth, and MapQuest offer user-friendly 2D and 3D visualization tools. However, they lack the analytical depth and integration capabilities of full-featured desktop GIS platforms (Keenan, 2008). Despite these advancements, GIS still faces limitations, particularly regarding the accuracy and update frequency of online datasets in under-digitized or remote regions. Inconsistent or outdated information can hinder planning efforts (Skidmore, 2002).

To address these gaps, building information datasets created from high-resolution aerial photogrammetry and integrated into GIS platforms offer a promising complement. These methods allow for precise spatial representations of terrain, infrastructure, and the built environment, thus equipping planners and policymakers with reliable

data for more effective and context-sensitive land and urban resource management.

Unmanned Aerial Vehicle (UAV) photogrammetry for landscape and urban surveying

In recent decades, remote sensing has increasingly become a prevalent methodology in the field of extensive territorial data acquisition, providing significant resources to cartography, as previously mentioned, such as GIS platforms. Traditional forms of remote sensing generally rely on acquiring measurements from satellites or manned aircraft and the post-processing of these for the creation of orthomosaics and Digital Elevation Models (DEMs). Based on the specific objectives to achieve, various types of DEMs can be generated, including Digital Terrain Models (DTM), which represent only terrain elements; Digital Surface Models (DSM), which include both terrain and man-made or vegetal elements, and Digital Building Models (DBM), which encompass only building elements (Gorički et al., 2017).

However, as noted by Whitehead & Hugenholtz (2014), often the data acquired from conventional remote sensing platforms *"do not have the resolution and operational flexibility to address [...] effectively or affordably"* (p. 70) the challenges that more detailed work may require. As a result, within the field of remote sensing, there has been a recent emergence and rapid spread of technologies based on *unmanned aerial vehicles (UAVs) and systems (UASs) or remotely piloted aircraft*.

Furthering the discourse initiated by Whitehead & Hugenholtz (2014), *"UASs are emerging as flexible platforms that, in many cases, have the potential to supplement and/or complement traditional remote sensing methodologies"*. Its applications span various scales, from territorial to urban and individual buildings. UAS may be equipped with Light Detection and Ranging (LiDAR) technology or RGB, spectral, or thermal cameras. Generally, the photogrammetry workflow utilizes a Structure from Motion (SfM) reconstruction process with Multi-View Stereo (MVS) RGB images (Smith et al., 2015).

LiDAR and photogrammetry are two sophisticated aerial surveying methods, each with unique features suited for different application contexts. The choice between LiDAR and photogrammetry ultimately depends on the project's specific goals, environmental conditions, detailed requirements, and budget constraints. LiDAR uses laser pulses to measure distances between the sensor and the ground, excelling in high-accurate data collection even under poor visibility or dense vegetation, making it ideal for projects requiring accurate topographical details, at the expense of a relatively high cost for the equipment (Fernández et al., 2021, cited in Kovanić, 2021). On the other hand, photogrammetry stands out for its accessibility, ease of use, and visual data quality, especially in well-lit conditions. For this paper, focusing on landscape and urban surveys through accessible equipment and automated and semi-automated methodology rather than absolute precision, we will delve into UAV photogrammetry.

According to Picon-Cabrera et al. (2021), *"the automatic reconstruction of urban 3D models has turned out to be one of the most growing sources of UAS photogrammetric research in the last two decades"* (p. 2). The efficiency of the photogrammetric process, particularly when derived from aerial flights, is valued for its high degree of automation and the potential high quality of its outputs.

As stated by Adami et al. (2023), *"the size of the*

surveyed [...] area, and the goals of the survey, drive the choice of the most appropriate technical solutions for the survey, like the type of drone, the camera and its resolution, the quality and mode of image acquisition, the photogrammetric processing parameters, and the georeferencing approach" (p.19). Flight planning optimizes survey times, reduces operator errors, and ensures the acquisition of predefined results by setting parameters like flight area confinement, flight path pattern, overlap percentages between shots, drone type, terrain follow option, flight altitude, UAV speed, flight duration, and battery usage (Śledź & Ewertowski, 2022). The flight altitude is determined based on the desired spatial resolution, represented by the Ground Sampling Distance (GSD), which is the ground distance between two adjacent image pixels. Typically, a GSD of 1-2 cm/pixel is desired for detailed landscape and urban surveys, compared to the 1m/pixel resolution typical of conventional remote sensing. The SfM process outputs include point clouds, classified point clouds, textured mesh models, orthomosaics, Digital Elevation Models (DEMs), and contour lines. From the point cloud, portions can be classified through more or less automated workflows, allowing filtering specific interest classes and going further processing only the

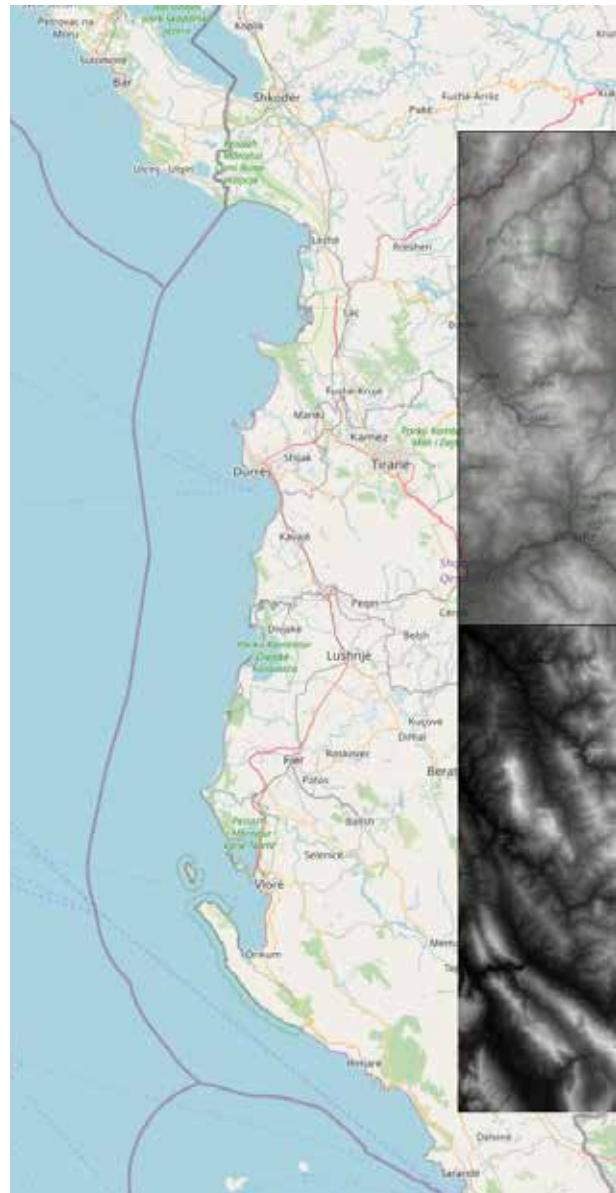


Fig. 1: Quadrants of interest for the Great Prespa Lake. In red, is the specific area of interest.

interested one to achieve specific outputs, as the different types of DEMs mentioned earlier. As noted by Adami et al. (2023), "the density of the point cloud generated by UAS photogrammetry varies based on flight altitude and camera resolution" (p. 19). Precision and accuracy of the results depend on the possible combination with a GNSS terrestrial survey (measuring the coordinates of so-called Ground Control Points) or Real-Time Kinematic (RTK) technology and are gauged by comparing the coordinates of specific reconstruction points (Check Points) with their actual coordinates (Nex & Remondino, 2013; Štroner et al., 2020).

In Section 3.2, it will be shown how to structure this set of variables to develop various workflows useful for the surveying of landscapes and urban areas. This is aimed at producing outputs that might be beneficial to decision-makers in planning strategies for conservation, enhancement, and service implementation in the Prespa Lake region and, in particular, for the municipality of Pustec.

Tools and methodology

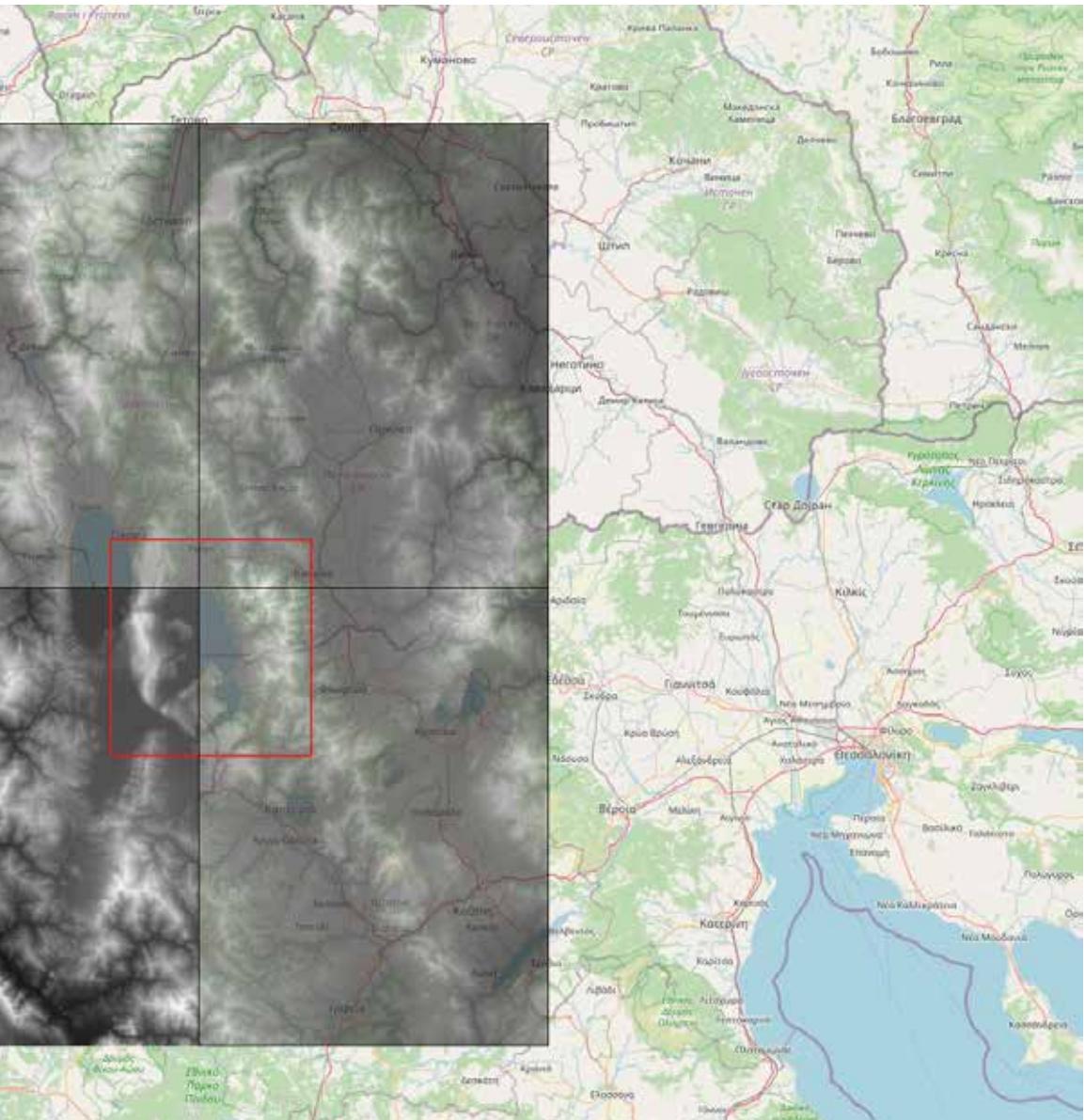
GIS models for strategic environmental and urban planning

To support the preliminary phase of the study and

the strategic proposal, the effective utilization of GIS archives can offer valuable resources that third parties have already digitized. These resources may include cartographic, physical, geological, and meteorological analyses, as well as demographic flows and processes, from a bi-, tri-, and even four-dimensional perspective with the incorporation of the temporal variable.

Focusing on GIS tools, particularly those derived from remote sensing technologies, interesting opportunities arise. Despite limited accuracy in metric data, these tools can provide invaluable resources for communicating the current state of environments and human settlements. This is particularly useful for the analysis phase and for communicating preliminary strategic intentions before design.

To analyze terrain elevation data, we introduce the first workflow, which involves the use of the open-source software QGIS. Initially, it is advisable to set the appropriate reference system, such as WGS84 Pseudo Mercator EPSG:3857. QGIS natively allows for the display of satellite orthophotos with variable resolution depending on the scale and zoom settings used for navigation in the interface. It also provides access to a wide variety of informational layers, either built-in or importable using our own



data or via dedicated plugins. It is crucial to ensure that all layers used share the same coordinate system to maintain consistency in the projection of different data.

Among the most useful plugins, *'QuickMapServices'* deserves mention for enabling map navigation through the OpenStreetMaps (OSM) interface, while *'SRTM-Downloader'* is valuable for accessing and utilizing existing elevation data. *'SRTM'* refers to the "Shuttle Radar Topography Mission,"

which, as reported on the NASA website (National Aeronautics and Space Administration), "during the STS-99 mission (February 11-22, 2000), collected topographic data over nearly 80% of Earth's land surfaces, creating the first-ever near-global topographic maps of Earth."

The obtained DEM is a raster image displaying the quadrants of interest; the grayscale pixels represent the elevations of individual 30m² cells, following the SRTM-30 standard. It is possible to crop this area

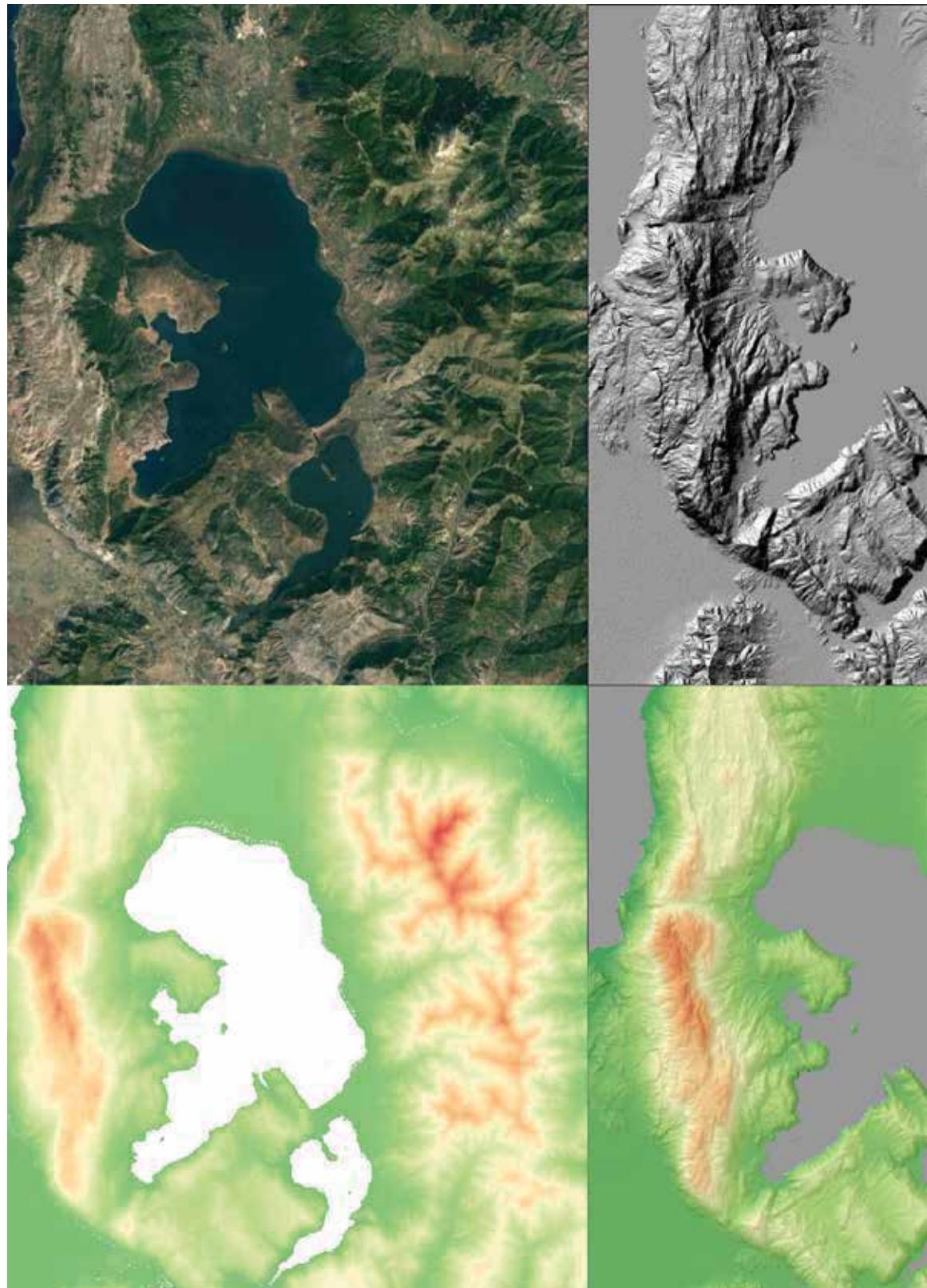
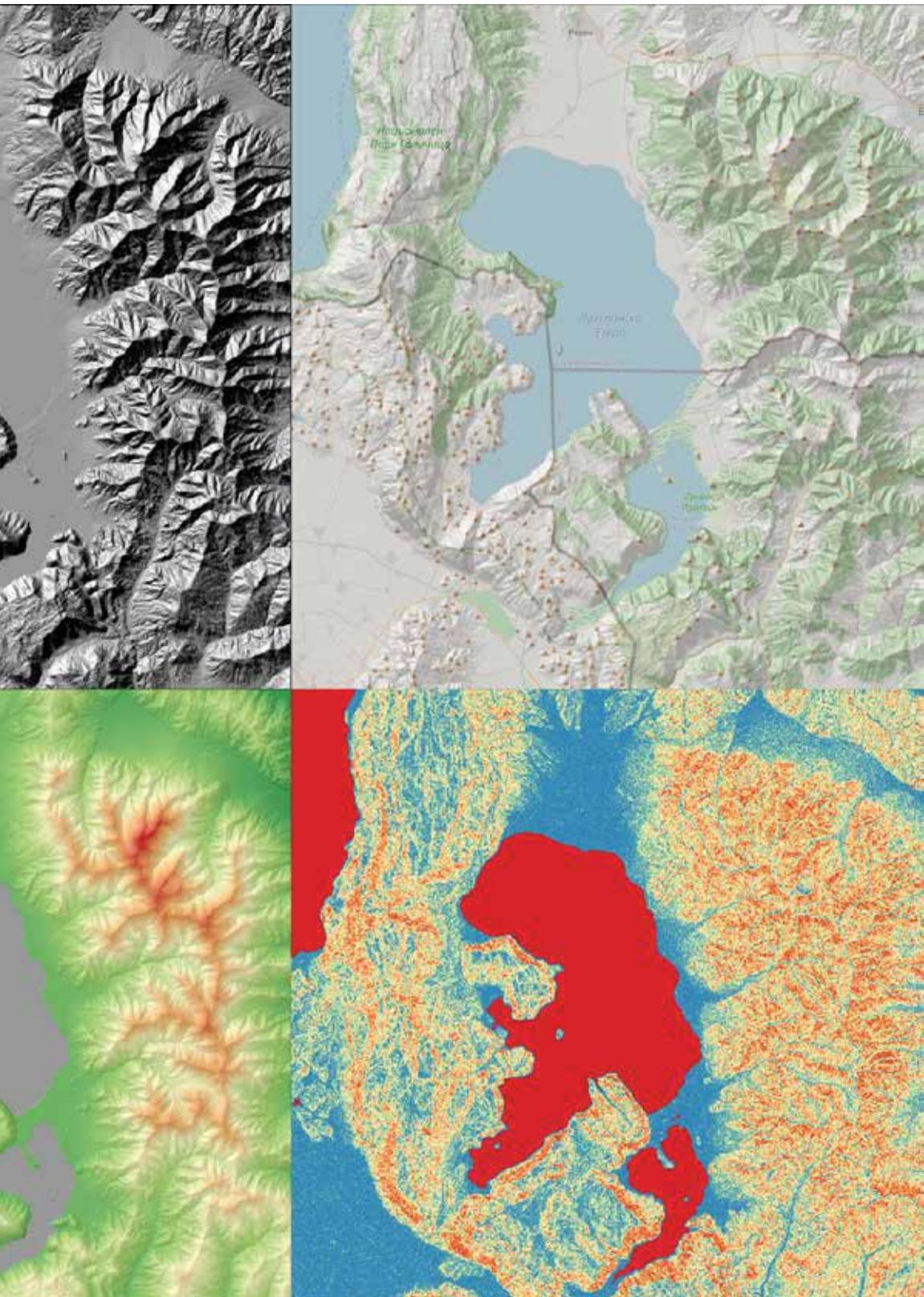


Fig. 2: GIS analysis on the Great Prespa Lake area. Above, from the left: satellite map, hillshade map, OSM map. Below, from the left: DEM, DEM + hillshade, slopes.

further to focus specifically on the Great Prespa Lake, as shown in Figure 1. The 30m² limit is due to open access reasons of the DEM data, which, however, cannot go below 10m for international security reasons unless justified by operational needs. As reported in Figure 2, the visualization and reading of elevation data are facilitated using customizable color scales and the possible overlay of various layers—such as satellite images, DEM, OSM maps, and hillshade visualizations—

through skillful use of the transparency tool. Such representations allow for effective communication of the model's characteristics depending on the specific message to be conveyed.

The elevation data provided by DEMs enable the creation of three-dimensional models and the transformation of raster images from various layers into textures, as shown in Figures 3 and 4. These models can be viewed, navigated, or exported as



images or 3D models using the native commands or specially designed plugins like qgis2threejs. The ability to export 3D models opens up opportunities for conducting analyses or modifications on software dedicated to specific 3D modeling tasks. It should be noted that high resolution on a large scale can pose a complex technical challenge and sometimes be prohibitive. The resolution of the 3D model's texture depends on the scale factor of the view, and it is not possible to achieve both a model with extensive territorial coverage and high texture resolution simultaneously, due to computational issues that could lead the software crashing and failing to export the model.

To address the problem of exporting 3D models from QGIS, an alternative methodology based on the BlenderGIS plugin for Blender, an open-source software specifically designed and used in the field of three-dimensional modeling, is proposed. The issue of the relationship between geometric extension and texture resolution observed in the previous workflow remains, but, through the zooming tool used for acquiring image data from satellite resources, BlenderGIS allows for slightly better texture image resolutions.

The first step is to define the project's coordinate

system. It's essential to ensure consistency between the coordinate system in use and that of the source data. Notably, in this case, the plugin draws data from the Web Mercator system, which can introduce significant local distortions. For accurate measurements, it is advisable to use coordinate systems and projections optimized for specific geographic regions, often represented by national grids. Since the plugin does not automatically reproject maps between different coordinate systems, it may be necessary to prepare the map in external software like QGIS and import the raster with the already reprojected DEM into BlenderGIS.

The next step involves importing the basemap limited to the area of interest. The basemap, viewable as a satellite image obtained from one of the engines like Google, ESRI, OSM, and Bing, has a resolution dependent on the zoom level of the view and, at a certain point, will be "printed" at a certain resolution. The higher the zoom value, the higher the resolution and the more numerous the satellite data tiles to be mosaic, with the potential for the process to collapse in case of excessive dimensions. For this reason, and the purposes of this paper, this workflow was chosen to create



Fig. 3: The Great Prespa Lake 3D model from QGIS (through the qgis2threejs exporter plugin), with satellite-derived texture.

source/ QGIS plugin qgis2threejs exporter graphic extrapolation.

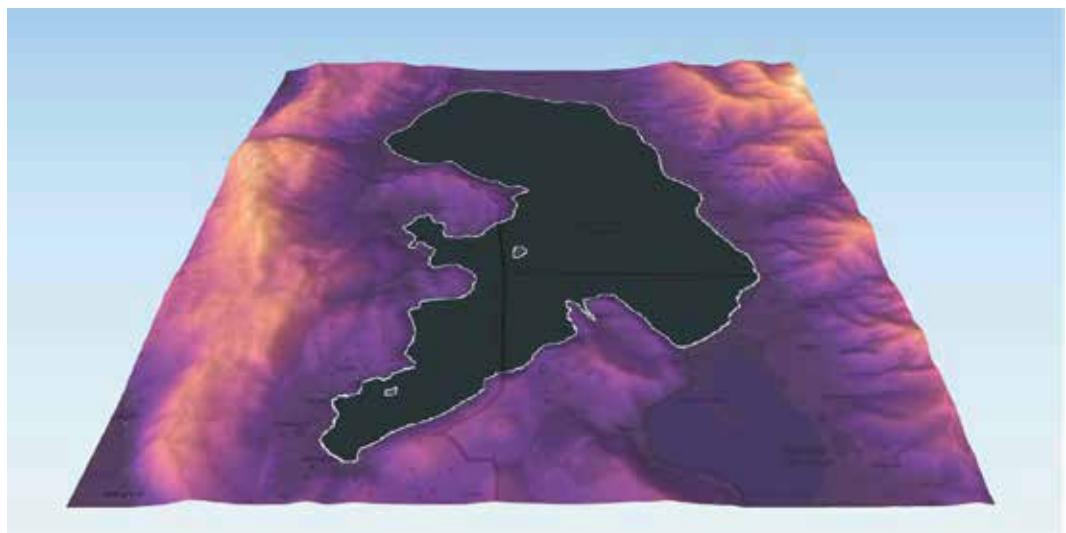


Fig. 4: The Great Prespa Lake 3D model from QGIS (through the qgis2threejs exporter plugin), with DEM + OSM derived texture.

source/ QGIS plugin qgis2threejs exporter graphic extrapolation.

two distinct models: the territorial area of Great Prespa Lake (Figure 5) and the urban area of the municipality of Pustec (Figure 6).

The basemaps are now transformed into three-dimensional form through the integration and processing of DEM-STRM30 elevation data. Access to this information is provided by BlenderGIS itself by entering an API key, which can be obtained for free from OpenTopography (OpenTopography, 2021) for non-commercial or academic use. It is important to note that excessive zooming can cause the software to crash.

BlenderGIS enables the study of topological features such as elevation and slopes, creating a new associated material that features customizable color scales based on the analytical aspects one wishes to highlight. Although OpenStreetMaps offers the potential to extract features such as roads and buildings, data for this specific area are unavailable, leaving us without relevant information. Given the need to depict the current urban fabric of Pustec for preliminary communication and the absence of concrete and reliable data on building heights at this initial stage, it was decided to develop a script for Grasshopper (a visual programming language plugin for

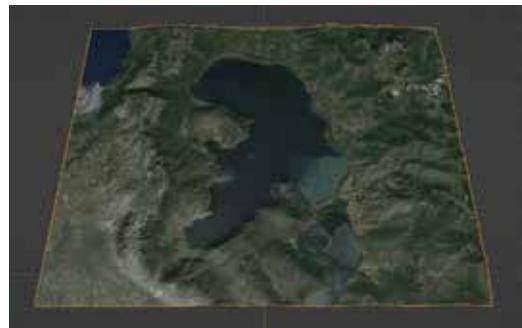


Fig. 5: The Great Prespa Lake 3D model from Blender (through the BlenderGIS plugin), with satellite-derived texture.

source/ Blender graphic extrapolation.



Fig. 6: Pustec 3D model from Blender (through the BlenderGIS plugin), with satellite-derived texture.

source/ Blender graphic extrapolation.

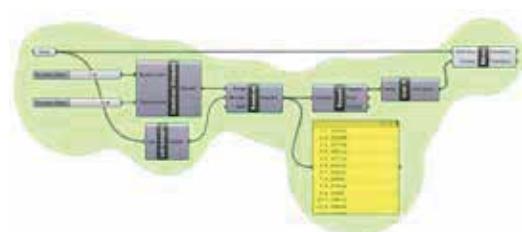


Fig. 7: The Grasshopper script used to reconstruct the buildings.

source/ Blender graphic extrapolation.

Rhinoceros) to provide an intuitive representation of the current state. Initially, using Rhinoceros, the terrain mesh derived from BlenderGIS was split with curves traced following the buildings' outlines from an aerial perspective. This process yielded two sets of meshes: the terrain mesh and the building meshes, particularly representing the roofs. The script depicted in Figure 7 extrudes the building meshes by a random height ranging from 5.0 to 8.0 meters, mirroring the assumed average height of the buildings in the area. The outcome is an approximate three-dimensional model of Pustec's buildings, distinguishing residential from production or service buildings based on empirical evaluations (Figures 8 and 9). This outcome offers a swift and highly cost-effective solution as a foundational work base to understand the plausible current state of settlements for which there is no downloadable information from online portals, as in the case of Pustec. It also serves as a valuable tool for communicating potential future project intentions, particularly considering that it is a rapid, low-cost approach developed remotely by leveraging open-access data from online GIS platforms, requiring minimal manual effort.

Should genuine interest arise in developing an urban, infrastructural, or environmental plan for a specific area, it will then be necessary to provide a far more reliable three-dimensional work base. In such instances, an essential and inevitable task will be field surveying using detailed remote sensing techniques through UAS, such as Lidar or aerial photogrammetry.

Aerial photogrammetry models for urban planning design

Mapping the current state of the urban fabric could be useful, if not fundamental, in phases after the preliminary strategic one. In the absence of data on elevations, the number of floors, and the types of buildings in an urban complex, an effective, accurate, and sometimes economical solution could be aerial surveying using UAS technologies. Focusing on the case study of the urban area of the municipality of Pustec, a technical comparison between two possible planned aerial survey strategies for photogrammetry aim is presented below.

For this purpose, the Dronelink software solution was chosen, which offers a web application for flight mission planning on PC and a dedicated smartphone app for planning, connecting with the drone, and controlling it during flight. Dronelink stands out for the variety of its features, which vary according to the chosen license plan. For this case, the "growth plan" was chosen, which proved ideal for planning in areas with flight modes at variable altitudes depending on the terrain.

This discussion will analyze two missions that focus on the same area but differ due to the type of UAS chosen and, consequently, the characteristics of the onboard camera. Therefore, some specific parameters will be proposed during flight programming for one case or the other. The selected *UAV models* are two *DJI*s at the entry and medium levels: the *DJI MINI 2* and the *DJI Mavic 3 Enterprise (M3E)*, the latter equipped with RTK technology that allows accurate georeferencing of shooting positions.

After creating a new mission and selecting a destination repository, public or private, flight planning can begin. Maps that will compose the main mission are then drawn, defining their respective extensions with care not to exceed 10 hectares of covered area to avoid potential application dysfunctions. As illustrated in Figure 10, the urban

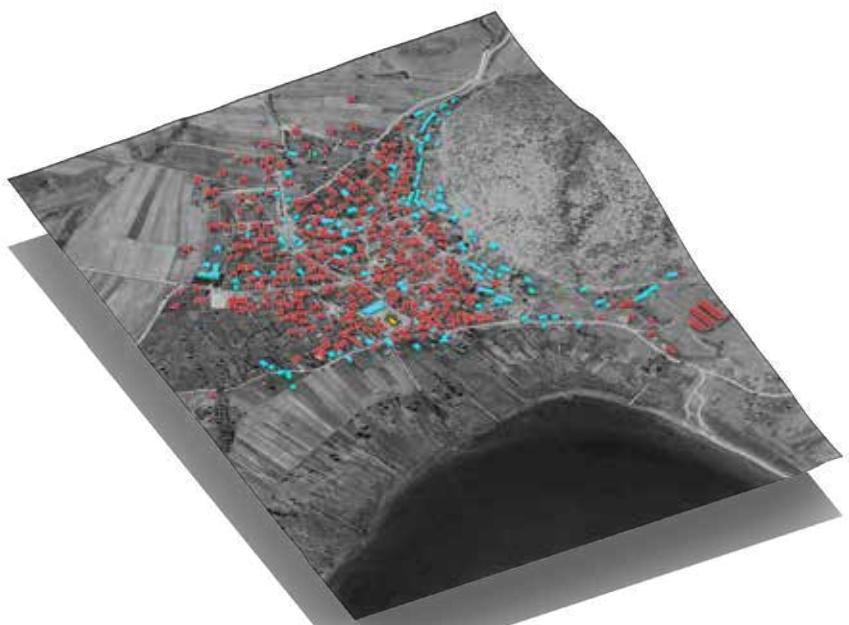


Fig. 8: Pustec settlement 3D representation. In red: dwellings; source/ Rhinoceros graphic extrapolation. blue: production buildings, yellow: services.

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Fig. 9: Pustec settlement 3D representation, final output.

area of Pustec was divided into 6 maps, partially overlapped, to facilitate the camera alignment of adjacent maps in the photogrammetric processing phase. The maps of the two missions may have slight differences between them, designed to optimize the flight plan of the specific mission.

Tables 1 and 2 illustrate the configurations set for the missions conducted with the *DJI MINI 2* and the *DJI Mavic 3 Enterprise*, respectively. The settings were selected to adapt to the specific requirements of the survey and to make the most of the capabilities of the two different drones.

One of the initial strategic decisions was to activate the terrain follow mode, which allows for programming flights at a constant height relative to the ground, based on elevation maps provided by *ESRI*. This approach ensures a uniform Ground Sample Distance (*GSD*) across the entire area of interest, set at approximately 3 cm per pixel. The flight height necessary to achieve this *GSD* was calculated based on the specifications of each drone's camera, resulting in two different flight altitudes for the *MINI 2* and the *M3E*.

The drone's speed was set to 16 km/h to prevent excessively rapid flights that could compromise the

clarity of the photos. The flight path configuration was chosen to be grid-like rather than linear, to ensure complete and consistent coverage of the area, thereby optimizing data acquisition in both travel directions. Additionally, both the vertical overlap between shots and the lateral overlap between strips were set at 80%, following best practices in aerial photogrammetry.

Finally, instead of orienting the camera in the nadir direction (directly downward), a tilt angle of 60 degrees relative to the horizon was preferred. This choice aims to improve the survey of the vertical surfaces of buildings, crucial for an accurate three-dimensional reconstruction of the built environment.

Figures 11 and 12 refer to the mission with the *M3E* and offer a two-dimensional and three-dimensional preview of the flight plan.

In Figure 11, the flight path designed for the six different maps can be observed, with a particular focus on the path of the first map, including a pin indicating the starting point and a red dot marking its conclusion. At the end of the survey for each map, the subsequent behavior of the drone can be programmed, choosing whether to return it to the base or proceed directly to the starting point of





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Fig. 10: The six maps composing the flight mission.

source/ Dronelink graphic extrapolation.

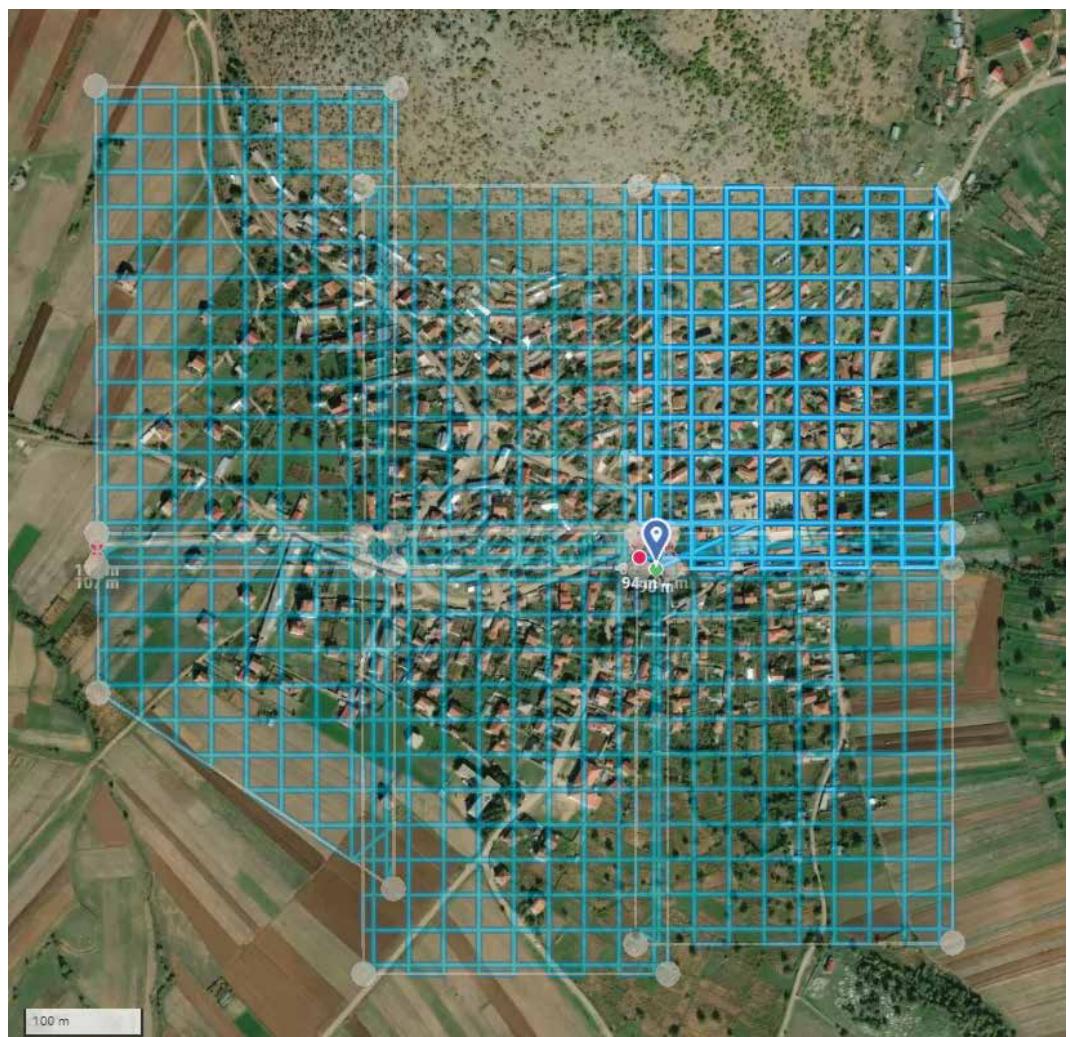


Fig. 11: M3E bi-dimensional flight path. Focus on the first map.

source/ Dronelink web app graphic extrapolation.



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Fig. 12: M3E three-dimensional flight path.

source/ Dronelink web app graphic extrapolation.

Mission	Altitude reference	Altitude AGL (m)	Flight speed (km/h)	Path pattern	Image frontal overlap	Image lateral overlap	Horizon angle	GSD (cm/pix)
DJI Mini 2	Terrain follow	70	16	Grid	80%	80%	-60°	2.87
DJI Mavic3E		90						2.78

Map	Hectares (ha)	Flight duration	N° batteries	Photos
1	8.2	00:33:15	3	425
2	8.9	00:36:16	3	480
3	9.4	00:36:59	3	482
4	8.1	00:33:31	3	419
5	9.7	00:39:19	3	508
6	5.3	00:24:50	2	286
Total	46.3	03:23:32	14	2600

Map	Hectares (ha)	Flight duration	N° batteries	Photos
1	8.2	00:27:14	2	267
2	9.0	00:29:44	2	298
3	9.3	00:30:25	3	309
4	8.1	00:26:22	2	267
5	9.7	00:33.19	3	339
6	5.3	00:19:38	2	182
Total	46.3	02:46:59	12	1662

Tab. 2: DJI MINI 2 mission estimate.

source/ Dronelink mission estimate.

the next map. This operational flexibility allows for optimizing the efficiency of flight sessions. In case of battery depletion, the mission is automatically interrupted, allowing the drone to be recalled for battery replacement. Once replaced, the drone is capable of resuming flight exactly from the point of interruption, thus ensuring the continuity and integrity of the survey. The "mission estimate" feature provides useful predictions regarding the duration of missions, the number of batteries required, and the number of photographs that will be captured, allowing for accurate and predictable planning of operations.

Tables 2 and 3 present a detailed account of the settings and expected results for the missions conducted with the DJI MINI 2 and the DJI M3E, respectively.

The estimate of battery usage for survey missions with the DJI MINI 2 and M3E drones is based on a maximum expected autonomy of 15 minutes per flight, to ensure a safe return to base. This estimate varies depending on weather conditions: in the presence of stable wind, autonomy might exceed 15 minutes, while in strong wind conditions, energy consumption would increase to maintain drone stability, consequently reducing battery life.

Tables 1 and 2 provide a forecast of survey times and battery consumption for each survey map, considering also, for the total count, transfers between the various start and end points of the sub-missions, without including the necessary breaks for battery replacement.

The comparative analysis of the two strategies highlights that the time required for the survey campaign with the *DJI MINI 2* is 23% higher than that required with the *M3E*, a difference not significant in terms of total time (about 3 and a half hours). It is also interesting to note the estimated number of photographs, which, with a 56% increase for the *MINI 2*, would lead to an extension of data processing times in the post-survey phase.

The most significant distinction between the two methodologies concerns the accuracy of the image geolocation. The *M3E*, thanks to the support of *RTK* technology, guarantees high accuracy in the georeferencing of each shot. In contrast, with the *DJI MINI 2*, a *GNSS* (Global Navigation Satellite System) ground survey is necessary to compensate for the unreliability of the *GPS* coordinates associated with the photos. In this case, it will be necessary to place visible targets from 70m on the ground and beat their geographic coordinates with *GNSS* tools such as antennas or total stations. The *GNSS* survey could be useful in the case of the strategy with the *Mavic 3 Enterprise* almost exclusively as a check on the accuracy of the georeferencing information of the cameras, however, it is not as fundamental as in the case of the *MINI 2*. This is the major difference between the two survey strategies.

At the end of the survey campaign, the collected data will be processed using *Structure from Motion (SfM)* software for image alignment, point cloud generation and classification, as well as 3D mesh creation for the production of digital surface models (*DSM*), terrain models (*DTM*), or building models (*DBM*). The process will conclude with the texturization of the models to obtain detailed three-dimensional representations of the surveyed area.

This approach will thus enable the provision of comprehensive three-dimensional data on the urban area of the municipality of *Pustec* to urban planning decision-makers.

Conclusions

The study explored the potential of remote sensing technologies, specifically *GIS* and *UAV photogrammetry*, to support spatial analysis and planning at both urban and landscape scales in data-scarce contexts such as the municipality of *Pustec* and the broader Great Prespa Lake region. It demonstrated the effectiveness of open-source platforms like *QGIS* and *BlenderGIS* in generating Digital Elevation Models (*DEMs*) using publicly available datasets. By employing visual processing techniques like color gradients and transparency effects, these tools enabled the creation of multi-layered two-dimensional and three-dimensional representations. In the absence of detailed data on building heights, a scripting-based method was implemented to estimate building volumes based on hypothetical empirical values, resulting in a preliminary yet functional urban model to support strategic planning discussions.

To address the lack of information on building heights and typologies in the urban fabric of *Pustec*, the research proposed a comparative analysis between two *UAV photogrammetric survey strategies*. These involved the planning of flight paths aimed at producing high resolution Digital Surface Models (*DSMs*) and Digital Building Models (*DBMs*). The strategies differed in terms of

UAV models used, and their respective advantages and limitations were assessed regarding flight duration, challenges in data processing, and the necessity to complement aerial photogrammetry with terrestrial *GNSS* surveys.

The presented methods are highly relevant for professionals and institutions involved in conservation, enhancement, or redevelopment efforts in areas like the Greater Prespa Lake or under-documented municipalities such as *Pustec*. The resulting digital models can function as dynamic, continuously updatable databases supporting long-term environmental and urban monitoring.

Integrating these approaches into local governance processes can enable more agile, responsive, and context-sensitive planning. Supported by open-source tools and periodic *UAV*-based data acquisition, the system remains cost-effective, adaptable, and scalable. Furthermore, the replicability of these integrated methodologies makes them applicable to other rural or cross-border regions with limited geospatial data, offering a solid foundation for territorial diagnostics, strategic planning, and funding applications.

This study lays the groundwork for more structured, evidence-based planning workflows in data-poor environments, paving the way for future research and implementation in similar contexts.

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5.1

**Navigating the Intersection
of Geology and Architecture.
The conceptualization of the
cave churches in Pustec as the
convergence of geo-morphic
agents.**

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**St. Mary's Church on Maligrad
island in Lake Prespa Critical
analysis of the restoration project**

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5

Proposals for landscapes and heritage

Navigating the Intersection of Geology and Architecture

The conceptualization of the cave churches in Pustec as the convergence of geo-morphic agents

DOI: 10.37199/o41010119

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Abstract - The research examines the intersection between geology and architecture in the Pustec and Prespa region, where ancient geological formations converge with rich cultural heritage. Central to this study is Prespa Lake, whose geology significantly influences the surrounding landscape and human-built structures. The interplay between geological forms and cultural monuments creates a unique dualism, where natural landscapes and human activities coalesce seamlessly. Historically, figures like Ruskin and Charles Smith have explored the potential of geology to inform architecture beyond mere engineering concerns, suggesting a deeper, creative integration. Ruskin viewed geology as more than a technical science, proposing that it could inspire architectural design through its intrinsic understanding of the earth's history and processes. Charles Smith, a Victorian geologist and stonemason, furthered this idea by positing that geological formations narrate the earth's past. Building on these historical insights, the research employs a multidisciplinary approach, combining geological mapping together with cultural heritage mapping. This methodology includes both qualitative analyses (such as visual interpretations of layered maps) and quantitative methods using Geographic Information Systems (GIS) to analyze spatial relationships. By superimposing cultural heritage maps onto enhanced geological maps, the study reveals significant patterns, particularly the concentration of heritage sites on ancient geological layers. This suggests that older geological formations provided stable and strategic locations for human settlement and construction, highlighting the importance of geological context in cultural heritage preservation. A detailed case study of the Maligrad cave church exemplifies the integration of natural and built environments. Located within a karst landscape on Maligrad Island, the church embodies Alonso's 'Material-Event,' where architecture and geology converge. The karst formations, characterized by limestone and natural caves, create a dynamic backdrop for the church, which has been meticulously adapted to fit the natural contours of the cave. This integration reflects a deliberate effort to harmonize human design with geological features, showcasing architecture as a mediator between human creativity and geological forces. The findings advocate for a broader acknowledgment of geology's role in architectural and cultural heritage studies, suggesting that an integrated perspective enriches our understanding of historical human-environment interactions and guides future conservation efforts. This approach, embracing both scientific and humanistic dimensions, underscores the deep symbiosis between the earth's physical history and the cultural legacy it supports.

Keywords - Architecture, Geology, Cultural Heritage, Deep-Time

Introduction

Pustec and the Prespa region present a very particular context where division happens between the geopolitical borders, however the interconnectedness of the natural landscape is very apparent when emphasized by its geological identity. At the core of this expansive region lies Prespa Lake which together with its adjacent lake Ohrid comprise two of Europe's most ancient

lakes [1]. This ancient and intricate geological formation plays a pivotal role in shaping, informing and influencing the surrounding landscape. This geological foundation serves as the bedrock upon which both the vast and diverse natural environment and the human-built infrastructure coexist. Cultural heritage monuments from different time periods are scattered around the area in a way that seamlessly

blends with the natural one. It is this dualism between the geological forms and the cultural ones which gives rise to the intersection between the two. In this context we can observe Architecture and Geology as two wide notions with a relation quite apparent at first glance, yet very ambiguous if inspected. Their connection is likely contrived from the immediate link between the building and the earth, the latter being always geologically complex. This complexity is more often than not, dealt with in engineering terms and appears to rarely go beyond it. The necessary acknowledgment of its broader dimension is often trampled by the inherent disregard as a superfluous science that belongs to another discipline altogether. It is its perception as a foundational science that informs our understanding of the earth's history and processes that brings a disregard in favor of more utilitarian perspectives. However, when extended beyond mere pragmatism, it has the potential to reveal a deeper understanding of the interconnectedness between the natural and the built environment.

Literature Review

Ruskin and Charles Smith

Ever since Ruskin, there has been a conscious effort to dissect the potential of this science as a means for one to influence the other. Through his lens, geology was a source of insight that transcended mere economic or technical considerations and opted for the creative processes of design and construction it could delve into, insisting on the understanding geology could provide. Often considered a theological geologist, his interpretation even bordered the poetic when he elaborated that the Gothic churches are a sum of parts in the same way the chemical composition of minerals suggested a union of elements [2]. Beyond the literal interpretation and the untenable reach of this statement, his insight contributed to broadening the perspective from which geology can be viewed and recognizing its architectural potential. In this sense, beyond serving as a catalyst for expanding the discourse, this statement can be viewed as a much larger base for claiming that the geological composition of the material can be used to instruct the way in which matter can take shape.

An initial idea for this was put forth by the British geologist Charles Smith, who extensively elaborated on the novel way architecture could be informed by geology, which even preceded Ruskin, during the Victorian times. This wasn't coincidental because as Gillin states [3], the chain reaction of industrialization and its economic interests brought forth a fascination with geology that was unprecedented. Charles Smith being a geologist as well as a stonemason and builder can be considered to be the figure where these fields intersected to produce the first research on the matter. Gillin examines works of the Victorian period where this influence is first noticed, however, most of it is rendered to the study and use of particular stones to envelop the facades. This merely aesthetic action pales in comparison to the articulated ideas that were written down and put forward at the time. In his writings, Smith introduces the idea that the solid earth was once in a fluid state because of heat and that every geological formation was a narrator of the past and its form [3]:

'The entire materials of the great globe we inhabit, were at one time in a fluid state; and that the cause of this fluidity was heat.'

Geology became a way of reconceptualizing Earth's history [4] and this was done through the notions of perpetual movement and erosion.

Flowing Matter

What Charles Smith claimed during the 19th century would be more than a century later solidified not only in the studies of geology but also into a proper branch of physics that studies the flow of matter, namely "rheology". Despite the fact that he is never cited, the term itself describes the same concepts presented by Smith, although of course in a much more specific sense than he intended. Marcus Reiner who coined the term, used Heraclitus' "Panta Rhei" to express the idea that matter constantly flows, even if to an observer it may seem the opposite. This pivots around one particular constant called the Deborah number [5], which beyond the scientific technicalities in studying the properties of fluids with industrial applications, actually serves as a philosophical inquiry into the perception of time and matter. What this conundrum addresses

is the limited human perception in contrast to the vast temporal scale where the universe operates. This disparity leads to a constrained temporal perspective and as a result a static interpretation of it. Whereas mountains appear robust and unmoving when posited against a short time span, they appear liquid when the movement of matter is observed on a much wider time span. In this case, this can very well be applied into the geological perception, being that when opposed to the human perception, the geological time spans can be very extended. The latter consists of billions of years, as research shows the oldest geological strata on Earth to be 4.4 million years old [6]. The same can be said for the built environment. Latour and Yaneva [7] stated that architecture is by no means static but rather dynamic because its past and future act as agents that continuously shape a building beyond its construction. In their influential article "Give Me a Gun and I Will Make All Buildings Move" they express the need for a method of representation that would be the quintessential opposite of Etienne Jules Marey's photographic gun which through freeze-framing each second of a rapid movement succeeded in dissecting the latter into fixed and static images. Latour and Yaneva

proposed the reversal of this process to achieve a flowing image of architecture that would do justice to its fluctuating nature. However, as Harman deduces, the very act of joining single instances and fixed frames of a building through time, goes against the very principle of continuous flux as understood by Aristotle and later Bergson who claim that movement and time is indivisible [8]. This very sharp swerve in attempting to ontologically analyze the object of architecture is what illuminates the conundrum it tries to solve. Contrary to their claim "we too need an artificial device (a theory in this case) in order to be able to transform the static view of a building into one among many successive freeze-frames that could at last document the continuous flow that a building always is", Latour and Yaneva's proposal is very much distanced from purely theoretical devices and conceptions while it actually strives for a reproductive device in the milieu of architectural representation. This reproduction of the image would become the device itself which produces further.

Geomorphic agents

In architecture theory and practice there have been various attempts, such as the one exemplified by

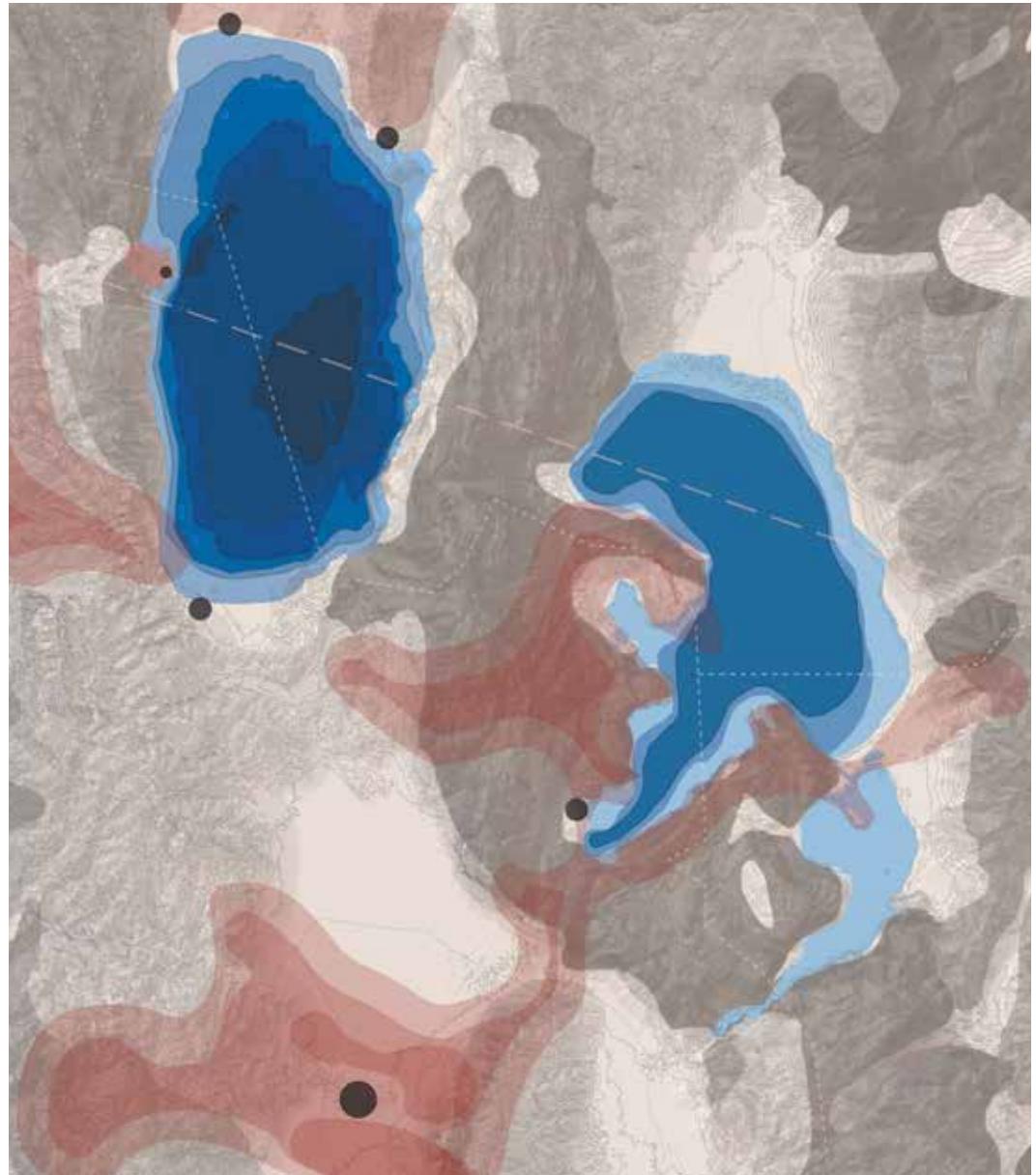


Fig. 11: The superimposed map of Pustec's chronological geology and concentration of cultural heritage
source/ author (2023)

Tschumi's drawings and his view of Space Event [9]. Nevertheless, this framework often encounters the risk of becoming a utilitarian instrument within the design process, which falls into the trap of capturing movement and freezing it in time, achieving the opposite of what is intended and undermining dynamism and movement altogether. Hence the very temporal conception of architecture should not be dissected with the intention of turning it into a design tool, as much as understanding the very act of building and of the formalized matter as an entity that undergoes temporal mutations, which are not only transformed in itself but also transform the "Space-Event" around it. Cristina Parreño Alonso takes it a step further into suggesting that viewing architecture through such vast temporal time spans reveals a fluid view and implicates a much more radical paradigm shift that transposes "Space-Event" into what she calls "Material-Event" [10]:

"Reorienting architecture toward the 'material-event' renders the building not as an isolated object-instance in a human timeline, but rather as a moment of convergence of material and energy that flows across deep temporal scales. It situates building at the intersection between human timescales and Earth cycles, between geology and technology in their act of world-making, both equally translated into actions that relate to material, place, and process—collapsing, eroding, releasing, capturing, calcifying, diluting, flowing—inevitably blurring the boundary between culture and nature. It suggests the possibility of a deep-time architecture that fully embraces tectonics in its multiple meanings: tectonics in architecture, as the science of construction and techniques of material assemblies, and tectonics in geology, as the structure of the crust of the Earth, its processes, and its evolution through time."

Tools and Methodology

Methodology

The concept of "Material Event" emphasizes the moment of connection between earth and architecture on a spatial-temporal scale. One influencing the other, it is suggested that tectonics in architecture and geology can have instances of intersection in this scale. For this reason, a comprehensive and layered mapping approach was employed, where the methodology combines geological mapping with cultural heritage mapping to visually demonstrate the spatial and temporal connection between the natural and human-built structures.

The phase of the analysis involves both qualitative and quantitative methods where the former tackles historical documents, architectural records and previous research studies conducted on the heritage of the site. This research was examined to contextualize the findings within the theoretical framework. A visual analysis of the geological maps of Pustec was also conducted to interpret the patterns and their prominence within the scope of the research. While, quantitatively, GIS tools were used to perform spatial analysis on the territorial map, quantifying the extent to which cultural heritage sites were disbursed within the area.

Geological Map

The methodology itself branches into two different scales: the regional scale and the architectural scale. The regional scale takes into account the administrative area of the Pustec municipality together with parts of the neighboring areas and consists of a visual display of its geological features

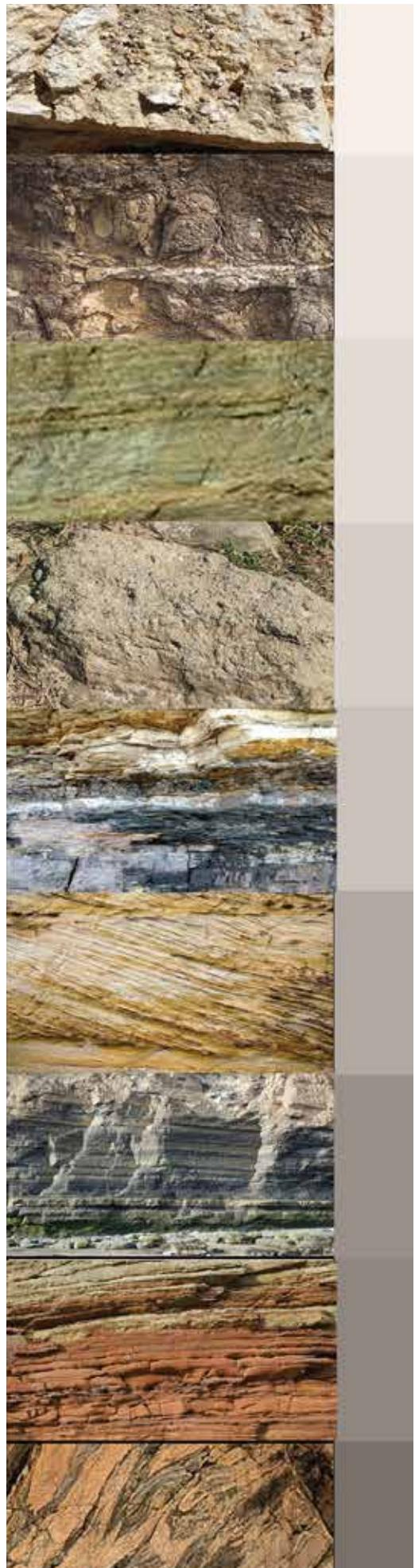


Fig. 12: The superimposed map of Pustec's chronological geology
source/ author (2023)

and heritage centers. This data was extracted from local archives, historical records, field observations, and the Geographic Information System. The derived heritage map plotted the locations of sites where objects of cultural importance are situated and this information was visually interpreted into concentrated areas with a red gradient of intensity. We can see that a large cluster of built heritage is concentrated on the western side of Prespa. The result is superimposed on a processed geological map which used the existing geological map of Pustec as a base layer. The latter included various geological strata such as Precambrian, Triassic, Jurassic, and Cretaceous, however, it did not predominantly illustrate their ages. To address this, the map was reprocessed with a technique similar to William Smith's first geological map in the first publication of a geological map of a country. [11] Smith's innovation was in using color as a way to represent the underlying strata within each other as a way to indicate their age. Similarly, the processing of Pustec's geological map consisted in ordering the strata from oldest to newest and a gradient of color was attributed to each geological timeline where the oldest strata (precambrian) is represented by the darkest color. The colors gradually become lighter according to the strata's age, resulting in a chronological map of the site's geology. In this map

we can clearly see that the Prespa Lake (and also Ohrid) is surrounded by old strata. The scientific evaluation of Ohrid and Prespa being the oldest lakes is now visualized. This processing provided a clear visual representation of the geological history of the area, which made it easier to correlate the geological formations with the cultural heritage sites. The superimposition of the map of cultural heritage concentrations and the chronological map of the site's geology allows for the identification of patterns and correlations between the two polarities (Figure 1).

Case Study

On the architectural scale, the focus shifts to specific case studies of cave churches in the Pustec region. These structures represent a unique convergence of natural geological formations and conscious human design, embodying the principles of Alonso's "Material-Event." The karst landscape, characterized by its limestone formations and natural caves, provides a dynamic backdrop for these architectural interventions. This notion can be encountered particularly in the philosophies of the East where a fundamental emphasis is placed on the constant metamorphosis of geological formations, particularly evident in the processes of erosion which shape limestone

Fig. 13: *Maligrad island cave section and plan showcasing the cave-church*
source/ author (2023)



and karst landscapes as a product of partially dissolving and re-solidifying mass. Loo when analyzing the aesthetic and philosophical value of rocks to the Chinese literati as a focal point of contemplation says: "The most admired specimens were sedimentary rocks easily shaped by nature but also craftsmen"(p.7)[12]. It can be said that the karst landscape and its transforming nature is the meeting point of nature and man as geo-morphic agents. Prespa region is a site where this kind of landscape has been used to merge natural erosion with conscious architecture. The karstic formation of the region has allowed for a unique form of architecture to emerge such as that of the cave-churches.

The southern and western shore of Prespa is composed of karst rock. The Galičica Mountain (Mali i Thatë), which stands between Prespa Lake and Ohrid Lake is itself a karst massif with a high presence of sinkholes near the two shores. It is this sort of topological formation that allows a hydrological relationship between Lake Ohrid and Prespa, among which the latter recharges the former with water [13]. The same geological formation has formed natural caves around the southern and western shores of Lake Prespa altogether with the shores of the Maligrad island which is positioned in the middle of the lower half

of the lake, close to Pustec.

The island's area is relatively small at only 0.05 km² with a tadpole shape while the elevation to 850 m is abrupt and steep, forming a circular cliff which stands as a monolith laterally eroded where the caves are formed. Besides the presence of the cave churches used as hermitage places, the island has been and still is inhabited, favoring the presence of snakes and vegetation to thrive.

The Maligrad cave church is one among six known rock monuments and chapels that were constructed as memorials by minor local nobility. They were either hermit foundations or shrines/mausoleums. Now monuments of cultural heritage, they date back to the XIV century, among which the most noted one is the Saint Mary church on the island of Maligrad built in 1369 by Kesar Novak who also appears in the valuable fresco paintings of the church [14][15].

The church is located within one of the southernmost caves of the island, situated at an elevation approximately midway between the island's highest and lowest points. It is a small single-aisle basilica that initially was built in 1344 by Boyko and his spouse Evdokia with a low-pitched roof, but under the patronage of Cesar Novako in 1369 extensive renovation and painting endeavors ensued. These efforts resulted in the church's enlargement, the substitution of its wooden roof with a semi-cylindrical arch which is visible only inside, and comprehensive interior and exterior fresco adornment. This ornamentation bears remarkable significance where the surviving mural fragments from the initial phase of 1344 exhibit intricate calligraphy, decorative motifs, and vivid portraits showcasing the artistic ethos of the time which suggest a direct influence from Ohrid, a prominent ecclesiastical hub of the time and the presence of renowned workshops active during the 14th century. The subsequent phases' frescoes exhibit dynamic compositions, emotive facial expressions, and a rich palette emblematic of the artistic flourishing during the Palaeologan Renaissance era. [16]

The church is interestingly positioned near the edge of the cave, its lateral wall facing the opening, whereas its rear wall though nearby does not adjoin the cave walls. The position of the church very obviously adheres to the tradition of facing eastwards, however, the choice of building the left wall in very close proximity to the cavern's periphery also appears as a conscious choice. This incorporates the very form of the church to that of the cave, making the church into an element of confinement to the naturally eroded space. (Figure 2)

Results

The superposition of the geological map and the cultural heritage map revealed significant patterns in the area of Pustec. Importantly, the cultural heritage buildings are mainly concentrated on the oldest geological features, predominantly the Precambrian and Triassic layers. One conclusion we can draw from these findings is that the geological age of the landforms is strongly associated with the presence of heritage sites. The geological context in which these sites are found, intersects with both historical and architectural understanding, grounding them in the cultural landscape, and reflecting how the natural landform has shaped human history over time. The geological impact of the oldest layers fixed the most stable and attractive locations for population and construction and affected the distribution and preservation of cultural heritage in the specified region.



The intersection of geology and architecture is further illustrated in the case study of the Maligrad church, which, situated within a naturally formed cave on the karstic Maligrad Island, exemplifies Alonso's concept of "Material-Event". The church's adaption and intersection with the existing geological features in the karst landscape, make it a meeting point between two temporal timescales: the geological one and the architectural one, both fluid and everchanging. This merge of Earth's and human actions as geomorphic agents reflects the transformative power of their intersection.

The results from GIS analysis also supported these qualitative observations of the visual and spatial characterization of the map. The spatial analysis, found that cultural heritage sites are correlated with distinct geological formations, and showed strong match between cultural heritage sites and the geological features of the earth's crust. Such a quantitative approach encapsulated this relationship in a straight forward, graphical form that separated cultural heritage sites neatly adjacent to the most ancient geological features. Finally, color gradients were applied on the map where geological timelines overlapped again to enhance the clarity by highlighting the spatial relationships allowing the reader to identify and analyse these correlations. This comprehensive approach to mapping both illustrated the historical connections between geology and architecture and offered a methodological structure to the investigation that can be replicated in studies that focus on the interactions between natural landscapes and cultural heritage.

On a temporal scale, although the human perception and the geological timespans are vastly different, on the map they graphically appear with the same weight suggesting a comparison between two spans that appear equal. Although Bruno Latour's ambition and representational concept were not achieved through a tangible technological technique, the effect produced by the map shows Earth presents human activity and geological activity as one holistic matter that has flowed through time.

Conclusions

Pustec and the Prespa region thus present a very particular context where the intersection occurs in many planes of knowledge. Its landscape is the temporal-spatial void where the natural geological formation, heritage, and architecture have their meeting point, blurring the boundaries.

By methodological study it is indicated that the oldest geological formations in Pustec significantly influence the distribution and preservation of cultural heritage sites and likewise the concentration of these heritage buildings on ancient geological layers suggests that these foundational geologies have historically provided stable and strategic locations for human settlement and construction. This predicament suggests the importance of considering geological context in cultural heritage preservation, highlighting how natural landscapes have shaped human activities and architectural developments over centuries.

The insights gained from this research advocate for a broader acknowledgment of geology's role in architectural and cultural heritage studies. Such an integrated perspective not only enriches our understanding of historical human-environment interactions but also offers valuable guidance for future conservation and development efforts in geologically significant regions. This holistic approach, embracing both the scientific and the

humanistic, reveals the deep symbiosis between the earth's physical history and the cultural legacy it supports.

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St. Mary's Church on Maligrad island in Lake Prespa Critical analysis of the restoration project

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Abstract - *This paper critically examines the ongoing restoration of St Mary's Church, located on the Maligrad Island in the Albanian part of Lake Prespa. Built in 1369 by the Serbian nobleman Kesar Novak, this Orthodox church is located within a natural cave on the cliff and is a historical and artistic jewel, as it is embellished with centuries-old frescoes and characterised by its close connection with the surrounding nature.*

The current restoration project is multifaceted, aiming to refurbish various aspects of the church, particularly its surfaces and the frescoes. A significant aspect of this project includes enhancing the church's accessibility from the lake and improving its lighting, particularly to augment its night-time ambience.

This paper critically analyses the restoration project, assessing in particular its adherence to established theoretical principles of historical restoration and understanding the methodology adopted.

In the broader spectrum of the ongoing discourse concerning the synergy between restoration theory and practical application, this critique meticulously examines the design decisions made during the restoration. In particular, it is investigated how the new access routes and lighting systems are in harmony with the historical authenticity of the church and how the symbiotic relationship of the church with its natural environment is emphasised.

This interdisciplinary study contributes significantly to the broader discourse surrounding the challenges and opportunities inherent in executing restoration projects. By delving into the specifics of St. Mary's Church's restoration, the paper tries to bridge the gap between the execution of this project and the general principles of restoration theory. The results of this analysis offer valuable insights that serve as a guide for future conservation and restoration initiatives, particularly those that aim to safeguard unique cultural heritage sites such as St. Mary's Church, overlooking Lake Prespa, in order to pass them on to future generations.

Keywords - Architecture, Geology, Cultural Heritage, Deep-Time

Introduction

This article is intended as an initial contribution to the broad debate on the relationship between theory and practice in the field of restoration. To achieve this, it is first necessary to define the main theoretical positions on the subject, in order to frame the current state of research and resume the discussion where previous studies left off. While existing literature has long debated the theory-practice gap, a number of studies tend to treat theoretical frameworks and operational methodologies as separate domains, rarely examining how they interact in concrete case studies. This paper aims to address this gap by combining critical analysis with empirical observation. The primary research questions that

guide this paper involve evaluating how restoration theory is applied in practice, particularly in terms of the preservation of material integrity, contextual harmony, and the challenges posed by increased accessibility demands.

In particular, the first section will review the 'official' occasions on which the theory-practice relationship has been the focus of reflection, as in the case of International Declarations or Italian Ministerial Decrees. In addition, explicit reference will be made to the thought of Professor Giovanni Carbonara, who was able to systematically and organically organise his reflections on the most diverse topics in his numerous writings.

Professor and architect G. Carbonara, who

developed the school of thought known as 'critical-conservative restoration', has consistently identified the theory-practice relationship as a weak point requiring careful study and methodological rigor. Beyond diagnosing the issue, he also proposed solutions to ensure that restoration practices align more closely with theoretical principles.

Afterwards, the ways in which the distance between theory and practice can be shortened and eliminated were illustrated. Referring to the studies of professor and architect Alessandro Ippoliti, the role that history plays in the field of restoration is unquestionably crucial, not only as a tool of knowledge, but also and above all as a means capable of guiding design choices, approaching the concrete reality of restoration that coincides with making architecture. To make the importance of history in restoration more tangible, some virtuous cases have been exemplified in which a correct "hermeneutic circle" has been established between history and restoration. After this necessary theoretical background, the case study was presented, namely the church of St. Mary on the island of Maligrad, in the lake of Prespa, in the municipality of Pustec (Albania) (Figure 1).

This church boasts ancient origins, a rich pictorial apparatus and a strong and preponderant relationship with the surrounding natural environment. A restoration of the church has been proposed and is currently being carried out, involving the roof, the iconostasis and the wall paintings. Previous interventions date back to the years after 1990. The aim of this paper is to move from theoretical reflections to an operational approach, studying the design choices that have been made and analysing whether they are consistent with the theoretical dictates of restoration. This includes a critical assessment of the interventions support the legibility of the monument's history, preserve its physical and spiritual integrity, and respect the site's unique environmental and cultural context. In particular, this paper seeks to critically examine the balance between historical fidelity and modern demands, such as structural safety, tourist accessibility, and the symbolic meaning of the site. The study of case studies such as the one proposed in this article is fundamental for experimenting

with a methodological approach to the theme of the relationship between theory and practice in restoration, and for outlining new operational practices that are more effective than those used to date. The case chosen is, moreover, very illustrative, as it is affected by the tourism drives of recent years, which can often lead to more hasty operational choices to the detriment of the monument.

Literature Review

The relationship between theory and practice in restoration

The relationship between conservation theory and practice has long been acknowledged as problematic. In 1997, Prof. G. Carbonara identified the significant gap between theory and practice as an ongoing issue, which often results in a decline in the quality of operational outcomes. Even before this, there had been important reflections on the subject. For instance, both the Italian Decree and Ministerial Circular on the Restoration of Monumental Buildings (1882) emphasized the need for planning and executing restoration work in a way that ensures the best conservation of historical and artistic heritage, while avoiding common mistakes. Later, the 1938 Instructions for the Restoration of Monuments underscored the State's responsibility

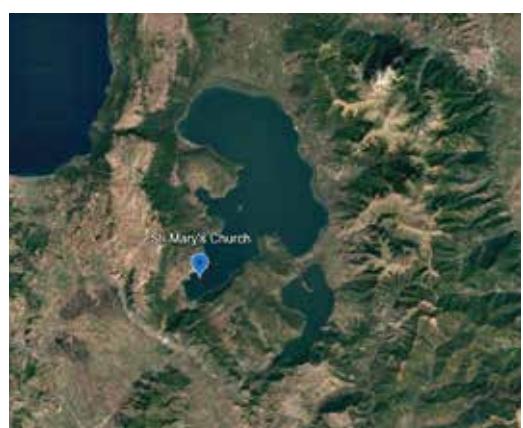


Fig. 1: Location of St. Mary's Church
source/ <https://earth.google.com/>

for safeguarding artistic heritage, stipulating that restoration activities must be conducted under the supervision of professionals from the Ministry of National Education (now the Ministry of Culture). Even today, officials in the Superintendence Offices remain the only ones with a high level of professionalism, as access to these positions requires a specialization diploma or a doctoral degree in a field related to the tasks within the organization.

In 1975, the European Charter for Architectural Heritage reiterated that integrated conservation necessitates the development of several key elements: legal means (including the creation or updating of laws and regulations, when necessary); administrative means (ensuring that administrative structures are properly equipped to manage the entire intervention process, from planning to execution); financial means (with specific financial aid being essential); and technical means (the need for highly specialized professionals, including both experts and contractors).

In the same year, and in alignment with the previous statement, the Amsterdam Declaration further emphasized the importance of strengthening legislative and administrative measures, alongside the critical need for specialized skills in restoration. It highlighted the urgent requirement for highly qualified personnel through multidisciplinary programs, as restoration integrates a wide range of skills in a coherent way, including drawing, topography, surveying, building materials, applied chemistry, building science, consolidation, technical physics, technical installations, exhibition design and museography, architectural composition, building legislation, town planning, economic estimates, and more.

In tracing the gap between theory and practice that has become evident over the decades, it emerges that, particularly in the last thirty years of the 20th century, there has been a growing interest in cultural heritage. This has led to a significant increase in restoration work, carried out using the same approach as during the building boom period, which has resulted in a deterioration of the practical component and, simultaneously, a weakening of theoretical reflection.

This shift has led, on one hand, to a crisis within the Superintendencies, which have become severely understaffed, and, on the other hand, to poor-quality outcomes. Whether the issue lies in the method itself or in the inadequate practical application of the principles, the result is the same: the well-established theoretical principles are often sidelined in the face of technical, bureaucratic, and economic challenges.

Professor G. Carbonara's analysis identifies two fundamental elements whose absence further exacerbates the gap between theory and practice in restoration. The first is the qualification and specialization of workers, managers, technicians, and all those involved in the restoration process, which significantly differs from the work on 'new' sites. The second is the recognition that restoration is a process that thrives in the close relationship between history, technique, and conservation, viewing them not as independent and self-contained skills, but as interconnected components that together constitute the restoration intervention.

Regarding the first issue, specifically in relation to the training of technical personnel responsible for cultural heritage preservation, Professor G. Carbonara emphasized the strategic role of universities, defining them as the 'natural ally' of the Minister of Culture (MIC). Universities, through their degree programs, specialization schools, and



Fig. 2: Piazza Municipio in Naples

source/ <https://www.metropolitanadinapoli.it/linea-1-metropolitana-di-napoli/stazione-municipio/>



Fig. 3: Underground station in Piazza Municipio in Naples – Example of the relationship between ancient and new

source/ <https://www.metropolitanadinapoli.it/linea-1-metropolitana-di-napoli/stazione-municipio/>



Fig. 4: Underground station in Piazza Municipio in Naples – Example of the relationship between ancient and new

source/ <https://www.metropolitanadinapoli.it/linea-1-metropolitana-di-napoli/stazione-municipio/>



Fig. 5: Palazzo Scapucci in 1896

source/ https://www.info.roma.it/roma_sparita_dettaglio.asp?ID_stampa=19



Fig. 6: Palazzo Scapucci today

source/ <https://www.unaguidaturisticaroma.com/blog2/post/28173/palazzo-scapucci-e-la-sua-scimmia>

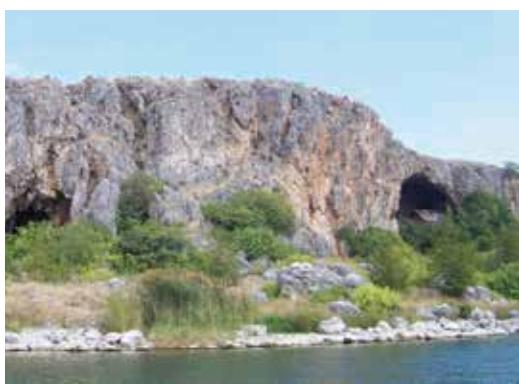


Fig. 7: Island view (2015)

source/ Document sheet for cultural goods – St. Mary Church on Maligrad island



Fig. 8: St. Mary church (2018)

source/ Document sheet for cultural goods – St. Mary Church on Maligrad island



Fig. 9: St. Mary church: pictorial apparatus (2022)

source/ <https://lh3.googleusercontent.com/AF1QipNIEGvbSJ1TAml-10Z3lGvGlx9gYZLDbFhUbY=s1360w13>

PhD courses, serve as the bridge between theory – where methodological thinking is cultivated and disseminated – and practice, by training future architects-restorers. Therefore, the collaboration between the MIC and universities is crucial in fostering high-level, specialized training.

On the second point, given that restoration is a cultural act with a strong interdisciplinary nature, a figure is needed who can continuously synchronize the individual skills involved. It is in this context that the architect-restorer assumes the role of 'a good conductor', ensuring that all disciplines work in harmony towards a cohesive restoration outcome.

Conservation and contemporary challenges

Architectural restoration, since its origins, has evolved under the influence of various theoretical principles that reflect the needs and challenges of each historical period. However, with the advent of modernity and the emergence of global issues, restoration methodologies have had to address new challenges. In recent decades, attention has focused not only on the aesthetic and structural preservation of monuments but also on their ability to withstand environmental and climatic changes. Climate change, in particular, has introduced a new set of challenges, shifting the perception of restoration from a static intervention to the idea of dynamic conservation that responds to the evolving surrounding environment. In this context, several recent studies have begun to address restoration problems with modern technologies and ecological requirements in an integrated manner. Specifically, Bonazza and Sardella (2023) highlight how climate change has prompted a new reflection on conservation criteria, proposing the integration of innovative techniques that can minimize environmental damage during interventions. Similarly, the GREENART project, through the use of eco-friendly materials and technological solutions, demonstrates how sustainability can be incorporated into restoration practice, maintaining a strong connection to historical traditions while ensuring the durability of structures.

These new challenges lead to a fundamental reflection on the future of restoration theory. Practice can no longer be seen merely as a replication of established historical principles but must be reinterpreted in a context that addresses contemporary needs, both environmental and technological. The introduction of innovative solutions, while preserving the historical identity of the monument, represents a direction that enriches restoration theory, bringing a new perspective to interventions on architectural heritage.

Tools and methodology

In reviewing the numerous writings of Professor Alessandro Ippoliti, it is necessary to dwell on the role that the subject of architectural history plays in the field of restoration.

First of all, ever since the Renaissance, the study of past architecture was aimed at a practical action, namely that of design. In recent times, it was Gustavo Giovannoni who asserted the autonomy of the discipline of art history, redefining its methodology, starting from the assumption that the most important characteristic of architecture is the historical processuality that manifests itself as transformations over time on the material. It is from this thought that the Roman school would come to life and, subsequently, it is with the fundamental contribution of Arnaldo Bruschi that the new figure of the historian-architect will be defined, the only one "able to fully understand architecture in its

historical dimension, through the application of the specific operational tools of the trade and in particular with the experience of drawing as an instrument of representation, investigation, reading and critical expression of the specific characteristics and values of the building".

From the thoughts of Giovannoni explained above, it follows that the history of architecture is a close interlocutor of restorative action. In fact, as the monument is the architecture that par excellence manifests transformations in its material over time, then the discipline of history becomes fundamental during a restoration project. However, it cannot be understood as preliminary research for the project, but rather, it is necessary that between history and restoration a "hermeneutic circle develops through which the comprehension process takes place according to a circular path", i.e. the deep historical knowledge suggests correct operative directions and, vice versa, from the restoration site can emerge "new contributions to the knowledge of the historical process".

On the one hand, it is in the fruitful relationship between history and restoration that the design outcomes are respectful towards the monument and respond to the principles of restoration theory. On the other hand, it must always be kept in mind that working on historical heritage inevitably brings with it the confrontation with different problems inherent in the various disciplines. Hence the character of restoration as a highly interdisciplinary field, which makes use of different technicians to pursue the single goal of conservation for future generations.

Thus, the way in which the different disciplines relate to each other also influences the design outcome. In fact, taking up metaphorically and somewhat freely what Cesare Brandi expresses in his Theory of Restoration (1977), they cannot be parts of the total, but must be parts of a Whole, identifying the restoration project in the Whole, which, having listened to all the different instances, will ultimately result in a unitary text coherent with the monument and its stratifications over time, thanks to a highly specialized figure capable of overseeing the entire process of knowledge, design, and execution.

A fruitful dialogue between the different technical disciplines, combined with a strong and deep-rooted historical awareness, is the key to the operational success of a restoration project and, thus, the alignment of practice with the theoretical principles of restoration.

There are many fortunate cases in which the successful combination of different techniques has led to well-calibrated and informed interventions. This is the case, for example, of the construction of the underground station in Piazza Municipio in Naples (Figure 2), where the difficulty of the site was not only due to the archaeological pre-existences in relation to the new construction, but also to an intricate archaeological stratification spanning very different epochs that needed to be clarified. The use of an interdisciplinary and transversal methodology led to a project for the use of the ancient site juxtaposed with the new (Figures 3 and 4), in order to preserve the historical evidence for future generations. The successful outcome is explained by Collovà, who writes: "For once, archaeology enters our time as a present thing. It is not a mute and cumbersome remnant to be put under glass, but an active fragment of the architecture of the past that becomes concretely, constructively, and meaningfully part of contemporary construction". Furthermore, the restoration of Palazzo Scapucci (Figures 5 and 6) in Rome represents a successful example of interdisciplinary collaboration and

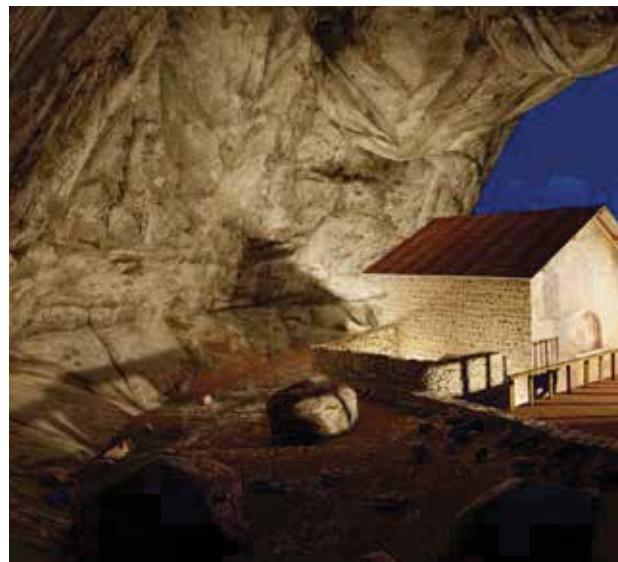


Fig. 10: Design rendering in night conditions



Fig. 11: Project rendering in which the roofing (copper sheets) is visible



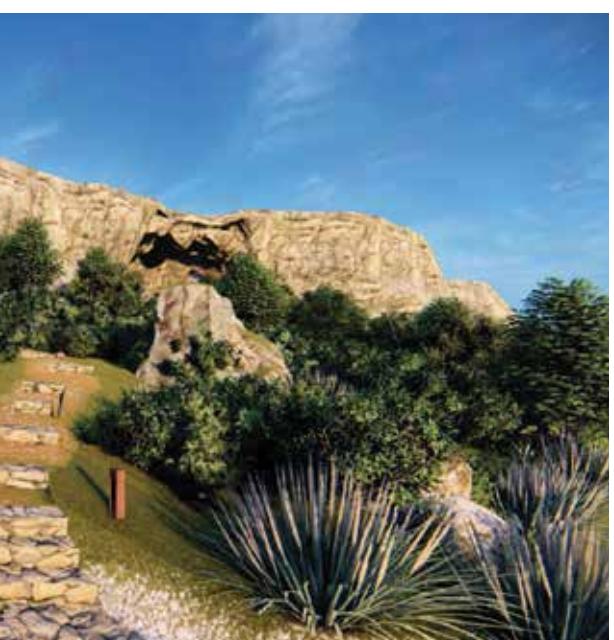
Fig. 12: Render of natural stone stairs



source/ Regional Directorate of Cultural Heritage, Korça



source/ Regional Directorate of Cultural Heritage, Korça



source/ Regional Directorate of Cultural Heritage, Korça

how the integration of historical knowledge in restoration has coherent operational implications. In this regard, Professor Daniela Esposito writes, "The restoration experience carried out in Palazzo Scapucci represents an example of interdisciplinary study that has resulted in a critically controlled reading of the values of the architectural work". She also emphasizes how the intervention responds to the theoretical principles of restoration: "The result manifests itself in a careful design aimed at distinguishing the new intervention from the pre-existing, ensuring reversibility, chemical-physical compatibility, minimal intervention, and aesthetic control of the architectural whole, in a careful 'balancing' of historical and aesthetic elements". Fortunately, although they still do not represent the majority of heritage interventions, there are numerous other exemplary cases in which restoration theory and practice have come together successfully. In Rome, the restoration of the Domus Aurea adopted a scientific and highly reversible approach, with minimal interventions aimed at ensuring structural safety and historical legibility, while avoiding invasive solutions. Similarly, the restoration of Sant'Ivo alla Sapienza managed to balance conservation and functional needs, employing non-invasive technical solutions to preserve the Borrominian structure. Another theoretical consideration, which should be addressed before moving on to the case study, concerns the importance of context when approaching a monument for restoration. Although the case study will be adequately introduced in the following section, it is evident how the physical location of the church has influenced its origin, development, use over the centuries, physical transformations, and even its current function. For this reason, it is the author's opinion that St. Mary's Church on Maligrad Island shares several similarities with the historical city context. In fact, just as the "city constitutes a privileged environment for the study of the relationship between man and the territory", similarly, the system consisting of St. Mary's Church, the hermit churches, Lake Prespa, Pustec municipality, and the surrounding villages represents the essence of the history and identity of that area—the Albanian region of the Prespa Lakes Park. Therefore, it is essential to implement appropriate operational practices and ensure moments of convergence between theory and practice: only by broadening the perspective to include the historicized context can we define a project that adheres to the cardinal principles of restoration while remaining coherent with the various historical and aesthetic considerations.

The setting

The church is located in a cave on the high rocky outcrop along the coast of Maligrad Island in Lake Prespa (Figures 7 and 8). It is accessible by water via fishing boats and attracts many visitors, who are interested not only in the lake's waters but also in the history, culture, and biodiversity of this unique place.

In fact, the Prespa Lake region, which spans the three countries of Albania, Greece, and North Macedonia, is a cross-border protected area, established on February 2, 2000, specifically due to the biodiversity and endemic species found there. Moreover, the Albanian portion of the park is home to a rich cultural heritage, including the Train and Hermit Caves on Maligrad Island, where capitals, columns, and tiles have been found, suggesting the presence of an early Christian church in the area. Additionally, on the island of Maligrad, there are the ruins of Tsar Simeon's 11th-century summer villa.

A comprehensive overview of the history of the church discussed in this article was provided by Antonio Poshnjari as part of the Art and Architecture course (taught by Dr. Elio Hobdari) at University College LOGOS, Master of Science in Religious Tourism.

The earliest confirmed date associated with the church is 1345, as indicated by an inscription around the apse. It is also well-established that in 1639, the church underwent reconstruction under the direction of Kesar Novak, a Serbian nobleman who controlled the Lake Prespa region during the 14th century.

The church's location, situated on a high rocky outcrop, made it an ideal retreat for hermit monks, who sought isolated areas near lakes to lead their ascetic monastic lives.

Architectural and artistic description

The plan of the church is quadrangular, with dimensions of 4.60x3.30 m. It is a single-storey building and is covered with a pointed barrel vault and a gabled roof.

The entrance to the church is through a small door in the western wall, above which is an arched niche that creates the feeling of height for the low doorway. The church is lit by three windows: one square-shaped window for the main altar area, while the other two windows illuminate the nave. The nave is separated from the altar area by two carved wooden iconostases. The more recent of the two was installed in 1604, while the first dates back to 1345, that is, from the first construction phase of the church.

In the altar area, as you approach the apse from the outside, there are niches for the prothesis and the diaconicon.

In the first construction phase, the church was covered with a pitched roof supported by a wooden structure, with rough stone walls bonded with mud mortar. Later, the walls were raised, and the church was covered with a cylindrical vault at a higher level. The walls of the second construction phase are bound with lime mortar, and there is also brickwork on the inside. The walls on the west and south sides are plastered, thus forming surfaces suitable for covering with wall paintings, which are present on the west wall.

The church reaches a total height of approximately 6 meters.

The Church of St. Mary is the most representative monument in the Prespa Lakes Park area, and on Maligrad Island in particular, which is renowned for its historical, architectural, and artistic values: it still preserves the mural paintings in good condition, which were created in three different phases, and numerous inscriptions, which have also made it possible to date the main construction phases of the monument, as well as the family portrait of Kesar Novak on the western façade of the church. These testimonies constitute an important historical source, providing valuable data on the artistic tastes of the local nobility, as well as the organization of the iconographic program in 14th-century churches in the area.

The church, located in a natural rock cavity on the southern side of Maligrad Island, has attracted the attention of numerous Albanian and foreign researchers, such as V. Djuric, UN. Stranski, Th. Popa, Dh. Dhamo, and A. Meksi, who have studied and explored its architectural, pictorial, and historical features, based on the authentic material, frescoes, and inscriptions preserved.

Regarding the frescoes (Figure 9), three phases of painting are preserved on the walls of the church:

- the first phase is dated to the year 1345



Fig. 13: Example of an explanatory panel

source/ Technical report restoration project (May 2019)



Fig. 14: St. Mary's Church with a view of the gateway (2018)

source/ <https://lh3.googleusercontent.com>

and is primarily found in the altar area.

- The second phase of painting is dated to 1369 and, according to the surviving inscription, corresponds to the year of the foundation of the nobleman named Kesar Novak, whose family portrait is painted on the western façade of the church. This phase includes most of the scenes in the nave, but also those on the southern façade. These wall paintings are considered a typical example of the artistic style of the Palaeologue Renaissance of the 13th-14th centuries, due to the liveliness of the compositions, the movement of the faces, the expressiveness of the portraits, and the density of the colors. According to the research by Prof. E. Tsigaridas, the scenes in the church of Maligrad belong to the same iconographic tradition as the monuments that were painted by the Thessaloniki studios of the early Palaeologian period.

- The third phase is dated to the 17th century, around 1607, and some fragments are preserved only on the western façade of the church.



Fig. 15: Design rendering with detail of access door
source/ Regional Directorate of Cultural Heritage, Korça

The restoration project: critical reading

The critical analysis of the restoration project was carried out by comparing the interventions to the main theoretical frameworks presented in the first part of the essay. The aim was to assess the degree of consistency between theory and design practice, taking into account not only core principles of conservation, such as reversibility, material compatibility, distinguishability of the intervention, and minimal intervention, but also the project's ability to respect and enhance the specific identity of the monument, namely the Church of St. Mary. The building's essence, symbolic value, and its unique relationship with the surrounding natural environment were considered key elements in critically interpreting the design choices. The analysis was developed by comparing the stated intentions, achieved outcomes, and the theoretical framework, to understand whether and how the design decisions preserved the original spirit of the place.

The latest restoration project for St. Mary's Church on Maligrad Island dates back to 2019 and was carried out by the following design team: arch. Amanda Cici, arch. Fotjon Qirinxhi, arch. Mariola Gjoka, and Eng. Xhuljana Avdolli.

The project's objectives were essentially twofold:

- To make the site safe, which includes ensuring both the structural stability of the building and safety conditions in the surrounding area;
- To attract more visitors by improving accessibility to the site (i.e., the path from the pier to the church) and providing adequate explanatory signage.

Interventions related to the first objective include repairs to the church roof, which is badly deteriorated, as well as securing the perimeter wall and the wooden platform in front of the church.

The interventions linked to the second objective, on the other hand, involve the improvement of the natural path leading from the wharf to the church, both during the day and at night (Figure 10), and the installation of signs to help visitors reach and understand the monument.

The wall paintings are not included in this intervention, and may be addressed in a future project.

Even in the definition of the objectives, it is necessary to consider that, as G. Carbonara explains in his Approach, reuse in restoration is a means (not an end, as in recovery) to reach the ultimate goal: the transmission of the monument to future generations. Therefore, the objective is the transmission to future generations and the preservation of authentic materials. The means by which this is achieved can include compatible reuse, such as opening the monument to tourists, and not the other way around.

The monument is the focal point of the intervention, and its identity drives the design choices.

Moving on to the individual interventions, they will be analyzed in the following order:

- a. restoration of the roof;
- b. fixing of the perimeter wall;
- c. access route to the church;
- d. creation of explanatory panels;
- e. main door.

A) Restoration of the roof

The roof is the main issue concerning the church's

physical and material integrity, rather than its surroundings. In fact, the wooden ceiling is in an advanced state of decay, and to ensure the site's safety, the project calls for its restoration.

The current roof consists of a double-pitched wooden structure, with copper metal sheets resting on top. The original roof is unknown due to a lack of documentary evidence.

The project foresees the dismantling of the existing roof and the installation of a temporary structure. Due to the rocky terrain, where scaffolding cannot be attached, it was decided to temporarily cover it with plastic material, given the small area involved. The dismantled wooden elements will be inspected, consolidated, and, if necessary, replaced. Everything will then be reassembled as it was, including the copper sheets (Figure 11).

It is noteworthy that in the technical report, the designers explicitly reference the possibility of modifying the design during construction, should new information about the roof emerge.

The lack of historical data constituted an obstacle to a new cover, hopefully similar to the original. Therefore, the choice was to leave everything unchanged, albeit with greater static safety. Certainly, this intervention respects the criterion of minimum intervention and does not lead to daring and grossly unsuccessful solutions.

Critical restoration, in particular the first strand, which is the critical-creative restoration, affirms that where there is no support from the historical datum, the architect resorts to his more design-oriented and "creative" side, guided by the strong identity that the monument manifests.

Abstaining from making a choice, as happened in this case, is an action that does not fully honor the role of the architect in the restoration project.

What is certain is that the restoration project always opens up new challenges because it cannot be framed in strict rules that can be applied like an instruction manual. It is the task of the architect-restorer to disentangle himself from the difficulties related to sources, interpretations, ensuring a clear and not misleading reading of the monument.

B) Fixing of the perimeter wall

The perimeter wall, which is severely deteriorated, is in need of intervention to ensure the safety of the area in front of the church. It will be restored by grouting it with a mortar based on hydraulic lime and volcanic sand, in order to make it similar to the existing material.

Once again, the principle of minimal intervention is respected, ensuring visual unity.

C) Access route to the church

The path from the pier to the church is currently a natural path with no signposts. The design proposal consists of placing stone steps in the steepest sections, while in the areas with the steepest slopes wider steps will be placed, as if they were 'platforms'. The idea of the final result is shown in figure 12.

Although not explicitly stated in the technical report, this project proposal clearly follows the dictates of the so-called 'naturalistic engineering', which is a discipline that studies how to use plant parts associated with materials such as stone, earth, timber, or steel as building materials. The goal is to create interventions with a low impact on the landscape and in full harmony with the surrounding natural environment.

In this case, the need to secure the path skillfully aligns with the theoretical principles of restoration, proposing a solution that is compatible, even

from a material perspective, with the surrounding environment.

D) Creation of explanatory panels

The signage, which is currently absent, will be created through panels made mainly of wood and, in some cases, light metal structures (Figure 13). Again, it was decided to use compatible and lightweight materials. Additionally, the panels will be placed away from walls or archaeological structures to preserve the authentic material, in line with the principles of modern restoration, and to achieve a better integration into the landscape.

E) Main door

In the May 2019 and March 2020 project reports, no reference was found to the access door to the church, the current appearance of which can be seen in Figure 14.

However, in the rendered images that have been produced, it can be seen that a new wooden door has been proposed (Figure 15).

The design of this new door is not random, but traces the remains of a 14th-century church door from Korça and preserved in the National Museum of Medieval Art in Korça (Figure 16).

Certainly, the designers raised a subject for discussion: how can the gateway be reinterpreted if its original appearance is unknown? The answer given by this project was that of analogy in terms of place and time, i.e., to study gates from the same period that are found in neighbouring areas.

This is a critical approach that allows for a result consistent with the identity of the monument. The attention to be paid in these cases concerns the blurred boundary between copy and reinterpretation, in order to ensure a clear and coherent reading of the monument.

For this reason, proposing a wooden door (principle of material compatibility) similar to those present in the same historical period and geographical area, but with a simplified design, would have allowed the monument to be interpreted clearly without generating a non-authentic reconstruction, as in this case.

Conclusion and recommendations

This article is set within the debate on the relationship between theory and practice in the field of restoration. After an excursus on the major positions that have developed around the subject, we applied them to a case study, that of St. Mary's Church on the island of Maligrad. The restoration project dates back a few years and skilfully took advantage of the monument's privileged location, in an isolated, unspoilt place, difficult to reach, surrounded by nature and in perfect harmony with it. These characteristics have always been present since its foundation, as an ideal place for a relationship in which the faithful could communicate with God, and have been maintained in the project proposal. On the other hand, what emerges is the attention paid to tourism needs; tourism is a useful means of passing the monument on to the future, and should not be the ultimate goal of the intervention nor should it guide design actions. Rather, it is history that guides design choices. History is the main tool that restoration must use. Historical research must not be an action aimed at mere theoretical knowledge, but must become action and, therefore, architecture, guiding the project. Careful and punctual historical research must accompany the project, enabling the monument's identity to be understood and ensuring that this identity is preserved. Lastly, it must be specified that the interdisciplinary nature

of restoration cannot be disregarded, deferring areas of intervention. Rather, synergistic work between the different disciplines is required in order to make the monument-organism adequately readable: architects, engineers, chemists, botanists, restorers, etc.

The lack of these two aspects, profound historical knowledge and strong interdisciplinarity, can easily lead to partial and uncoordinated restoration interventions, not guaranteeing the correct reading of the architectural text.

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6.1

Diversity in Public Spaces. A transformative Journey for regional revitalization

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Proposals for settlements, public spaces and dwelling

Diversity in Public Spaces

A transformative Journey for regional revitalization

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Abstract - In the year 2000, the European Union adopted the motto "United in Diversity" to promote cohesion through cultural and artistic richness. While the removal of internal borders has fostered unprecedented exchange across member states, many rural and border regions remain excluded from the benefits of integration. This paper focuses on the Pustec Region in southeastern Albania, located along the borders of Greece and North Macedonia. Comprising nine small villages nestled along Lake Prespa, the region is marked by extraordinary natural beauty, agricultural traditions, and deep cultural layering. Yet despite these assets, Pustec faces demographic decline, geographic isolation, and limited infrastructure—conditions that threaten its long-term viability. This study investigates how public space, when shaped by participatory and artistic practices, can serve as both a symbol and tool for regional revitalization. It argues that diversity in public space is not merely a reflection of demographic plurality but a strategic resource for identity-building, social cohesion, and economic sustainability. Through a mixed-methods approach and comparative analysis of three international case studies—Superkilen in Denmark, the East Side Gallery in Germany, and Favela Painting in Brazil—the paper demonstrates how art-led interventions can activate neglected spaces, support local agency, and reframe peripheral regions as sites of resilience and cultural vitality. In the case of Pustec, creative placemaking offers a pathway to preserve the region's meditative atmosphere while introducing low-impact, high-value cultural initiatives that engage both residents and visitors. Temporary artistic actions—such as murals, outdoor exhibitions, and cross-border cultural events—can evolve into permanent spatial transformations that reflect local narratives. Art becomes a lifeline: not only enhancing aesthetics but reviving community bonds and symbolizing continuity across histories and identities. Ultimately, the Pustec Region presents a replicable framework for rural regeneration rooted in respect for local identity, inclusive participation, and cultural innovation. Its revitalization affirms the EU's foundational ideal that unity can be constructed through diversity, particularly when place-based creativity is positioned as a driver of sustainable development.

Keywords - European Integration, Pustec Region, Cultural Diversity, Public Space Revitalization, Participatory Art

Introduction

At the start of the new millennium, the European Union adopted the motto "United in Diversity," expressing a commitment to openness, cooperation, and cultural pluralism. The removal of internal borders has allowed for unprecedented movement of people, capital, and ideas, fostering a more interconnected and culturally rich continent. However, this process has also revealed persistent geographic imbalances. Many rural and border regions remain excluded from the benefits of integration, facing economic decline, population loss, and infrastructure neglect.

The Pustec Region in southeastern Albania, bordering Greece and North Macedonia, exemplifies this challenge. Composed of nine small villages along the shores of Lake Prespa, Pustec is characterized by its natural beauty, cultural diversity, and strong sense of place. Yet the region has experienced significant demographic decline and limited economic opportunities. Closed borders and minimal investment have deepened its isolation—both socially and spatially.

This paper examines whether and how diversity in public space can serve as a catalyst for revitalization

in such peripheral areas. It argues that diversity should not be viewed merely as a demographic condition but as a strategic and symbolic resource. When reflected in the design and use of public spaces, diversity can support identity formation, social cohesion, and local development. Artistic interventions, inclusive planning processes, and culturally sensitive design approaches have the potential to activate public spaces as platforms for community engagement and renewal.

In the case of Pustec, public art and creative placemaking are proposed not only as aesthetic enhancements but as tools for long-term resilience. By embedding artistic and cultural practices into the fabric of daily life, the region can strengthen social bonds, attract new visitors, and empower local communities. This approach aims to preserve the region's unique character while offering new opportunities for economic and social sustainability. The revitalization of Pustec is not an isolated case but a model for how other marginalized rural and border areas in Europe might respond to the challenges of depopulation and disconnection. Through culture-led spatial transformation, these regions can redefine their roles within the broader European context—not as passive recipients of aid but as active contributors to a diverse and dynamic European identity.

Ultimately, this paper seeks to highlight the role of public space as more than physical infrastructure. It is a stage for collective memory, cultural expression, and future-making—a critical site where diversity can become both visible and valuable.

Defining Diversity in the Context of Public Space

The concept of "diversity" is often narrowly understood as referring to demographic or ethnic plurality. However, within the context of public space, diversity encompasses a broader and more complex set of dimensions. It includes cultural diversity, reflected in the visible presence of multiple identities, languages, and traditions; social diversity, which speaks to the inclusion of various age groups, abilities, genders, and socioeconomic backgrounds; and functional diversity, referring to the range of activities a space can support, such

as recreation, performance, ritual, education, and rest. Public spaces gain significance when they reflect and accommodate the lived experiences of the communities they are intended to serve. This requires not only symbolic visibility but also meaningful participation in both the design and ongoing use of these spaces. In regions marked by cultural complexity and historical contestation, such as Pustec, public space becomes more than a neutral setting. It emerges as a site of negotiation, where different histories, languages, aesthetic values, and visions for the future intersect and evolve.

Background and Regional Context

Geography and Cultural Heritage

The Pustec Region, located along the shores of Lake Prespa, a transboundary lake shared by Albania, Greece, and North Macedonia, offers a compelling case for examining the intersection of cultural heritage, socioeconomic challenges, and strategies for rural revitalization. Known for its serene landscape and ecological value, Lake Prespa is one of Europe's oldest and deepest lakes and serves as a crucial biodiversity hotspot. The surrounding villages, part of the Pustec municipality, are shaped by a long history of cultural exchange, where Slavic and Albanian influences converge and Orthodox Christian traditions continue to shape local identity. This cultural and environmental richness, however, is increasingly overshadowed by the region's marginalization. Restrictive border regimes, underdeveloped infrastructure, and limited economic diversification have contributed to a growing sense of physical and social isolation.

Socioeconomic Challenges

Pustec is experiencing demographic decline, particularly among younger generations who are leaving in search of education, employment, and basic services that are unavailable locally. This pattern reflects broader rural trends observed across the Western Balkans. The lack of job opportunities, limited access to healthcare and education, and the absence of cultural institutions have deepened the region's vulnerability. Tourism remains largely underdeveloped, and public

Aspect	Before	After
Economic Activity	Limited local investment	Increased visibility and cultural tourism
Public Space Function	Underused and generic	Multifunctional and culturally expressive
Cultural Identity	Fragmented or invisible identities	Multicultural presence made visible and celebrated
Community Engagement	Limited influence on urban design	Collaborative selection and planning
Cultural Identity	Fragmented or invisible identities	Multicultural presence made visible and celebrated
Social Cohesion	Ethnic tension, low interaction	Increased civic pride and mutual recognition

Tab. 1. Superkilen - Copenhagen, Denmark - Before and after intervention

Aspect	Before	After
Symbolic Meaning	Wall symbolized division and trauma	Transformed into a site of peace and memory
Public Access	Restricted and neglected	Open to public use and reinterpretation
Cultural Value	Low cultural engagement	Strong national and international visibility
Community Involvement	No initial public input	Space now used for ongoing civic dialogue
Collective Identity	Fragmented due to reunification	Shared narrative of freedom and transformation

Tab. 2. East Side Gallery - Berlin - Germany - Before and after intervention

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investment has been sporadic. As a result, local communities face not only economic hardship but also a weakening of cultural continuity, as traditions become increasingly difficult to sustain when younger generations migrate away.

Between Preservation and Transformation
 There is widespread agreement on the importance of protecting the region's natural beauty and cultural heritage. However, efforts aimed solely at preservation can sometimes hinder necessary development. This study proposes artistic revitalization as a way to reconcile these competing priorities. Rather than treating preservation and transformation as opposing goals, art can serve as a bridge that respects local identity while opening up new avenues for engagement and renewal. By integrating artistic practices into public spaces, residents are invited to participate actively in shaping their environment. This approach fosters a sense of belonging, reinvigorates public life, and offers a low-impact strategy for stimulating economic activity through cultural tourism and community involvement.

A Space for Negotiation and Vision

In regions like Pustec, where diverse identities and historical narratives intersect, public space holds significant potential as a medium for transformation. It is more than just a physical setting; it is also a symbolic arena where languages, memories, values, and aspirations converge. Artistic engagement can help express and navigate this complexity by creating inclusive spaces that reflect and respect local diversity. Through such culturally grounded interventions, rural and border areas can redefine their role within the European context—not solely through economic development, but through cultural resilience and social cohesion.

Tools and Methodology

This research employs a mixed-methods methodology that integrates qualitative and comparative approaches to provide both depth and breadth in the analysis. Ethnographic fieldwork forms a central component of the study, involving site visits to all nine villages within the Pustec Region. During these visits, mental mapping and participant observation were used to document spatial practices, architectural features, and emotional responses to specific places. These techniques allowed for a nuanced understanding of how space is experienced and valued by local communities. In parallel, quantitative data analysis was conducted using demographic and economic indicators sourced from both local and national institutions. This provided a broader statistical framework to contextualize the region's socio-economic conditions. In addition, semi-structured interviews were carried out with a range of stakeholders, including residents, artists, policymakers, and planners. These conversations offered valuable insights into local perceptions of identity, belonging, and the use of public space. To extend the relevance of the findings, a set of international case studies was selected and analyzed based on their comparability in terms of geographic scale, socio-political context, and outcomes related to cultural revitalization. Together, these methods support a comprehensive and multi-layered analysis, enabling the study to generate context-specific insights while also identifying potentially transferable strategies for other marginalized and culturally complex regions.

Case Studies: International Lessons for Local Application

Superkilen – Copenhagen, Denmark

Superkilen, located in the ethnically diverse

Aspect	Before	After
Symbolic Meaning	Associated with poverty, marginalization, and social neglect	Reframed as a site of creativity, resilience, and cultural expression
Public Access	Limited cultural infrastructure; few welcoming communal areas	Streets and facades became vibrant, shared public art spaces
Cultural Value	Local culture undervalued or invisible to outsiders	Cultural identity visibly expressed through color and narrative
Community Involvement	Residents excluded from planning or aesthetic decisions	Full participation in concept and painting; training provided
Collective Identity	Weak sense of pride or recognition	Strengthened local pride and sense of belonging

Tab. 3. Favela Painting - Rio de Janeiro, Brazil - Before and after intervention

Dimension	Superkilen (Denmark)	East Side Gallery (Germany)	Favela Painting (Brazil)	Pustec Region (Albania)
Population Diversity	Wall symbolized division and trauma	Moderate international influence	Strong local identity	Bilingual, culturally layered community
Community Involvement	Collaborative selection of design elements	Limited during initial implementation	Deep participatory engagement	Emerging interest in co-creation
Economic Context	Urban, well-funded	Post-industrial, tourism-driven	Low-income, informal settlement	Rural, underfunded, economically fragile

Tab. 4. A comparative overview illustrates key similarities and contrasts with Pustec

Nørrebro district of Copenhagen, represents a pioneering example of how public space can actively express and celebrate cultural multiplicity. Developed through a collaboration between the artist collective Superflex, the architecture firm BIG, and landscape architects Topotek1, the park integrates over 100 objects sourced from various countries, including benches from Brazil, fountains from Morocco, and signage from Russia. These elements were selected through participatory workshops with local residents, ensuring that the spatial narrative authentically reflects the lived experiences of the neighborhood's inhabitants. The result is a vibrant, symbolic landscape that functions not only as a recreational area but also as a visual archive of migration, coexistence, and transnational identity. Superkilen's success lies in its ability to render diversity visible and approachable through artistic form, which has transformed it into a site of civic pride and a model for inclusive urban design. For the Pustec Region, Superkilen illustrates the potential of using public art to represent multilayered cultural identities, particularly the coexistence of Slavic and Albanian heritage, through locally inspired installations, collaborative storytelling, and community-sourced materials.

East Side Gallery – Berlin, Germany

The East Side Gallery in Berlin stands as one of the most significant public art projects associated with political memory and historical transformation. Stretching over 1.3 kilometers, this remnant of the Berlin Wall was converted into an open-air gallery shortly after the fall of the Iron Curtain, featuring murals by over 100 international artists. The artworks address themes such as freedom, peace, and reconciliation, transforming a former site of division into one of dialogue and artistic expression. Unlike traditional heritage monuments,

the East Side Gallery maintains public accessibility and invites interpretation, serving both as a tourist destination and a dynamic space of civic engagement. For Pustec, which has also been shaped by historical borders and geopolitical fragmentation, this case highlights the potential of reappropriating symbolic or neglected sites—such as former border checkpoints or abandoned buildings, for community-based art that fosters cultural continuity, collective memory, and transnational reflection.

Favela Painting – Rio de Janeiro, Brazil

The Favela Painting Project, initiated by the Dutch artists Haas and Hahn, illustrates the transformative impact of participatory public art in economically marginalized communities. In collaboration with residents of Rio de Janeiro's favelas, the artists designed and executed large-scale murals that covered entire building facades. Crucially, the local community was engaged throughout the process. Participants received artistic training, employment, and the opportunity to contribute creatively to the transformation of their own environment. The project not only altered the visual identity of the neighborhood but also fostered a strong sense of ownership, pride, and solidarity among residents. It attracted positive international attention and reshaped public perceptions of the area. For Pustec, where economic hardship and youth outmigration are major challenges, a similar participatory approach could promote social cohesion, local empowerment, and symbolic renewal. By involving community members directly in artistic initiatives, Pustec could activate public spaces as sites of connection, resilience, and cultural vitality.

Comparative Summary: Insights for the Pustec Region

The three international case studies outlined above offer distinct but complementary approaches to embedding art within public space. Each model presents relevant strategies that can inform and inspire revitalization efforts in the Pustec Region. Superkilen focuses on the visibility of cultural hybridity through participatory design. The East Side Gallery shows how historically charged spaces can be reactivated through artistic interpretation. Favela Painting demonstrates the social impact of co-creation and skill-building in economically marginalized settings. While the contexts differ significantly, they all offer concrete examples of how art can promote civic pride, strengthen community identity, and stimulate local development. These insights reveal that while Pustec faces unique challenges tied to its rural location and limited resources, the principles of participatory design, symbolic representation, and cultural activation can be adapted to fit its specific conditions. Art, in this context, is not merely decorative. It becomes a strategic tool for fostering resilience, social inclusion, and renewed connection to place.

Analysis and Discussion

The three case studies examined, Superkilen in Copenhagen, the East Side Gallery in Berlin, and the Favela Painting Project in Rio de Janeiro, highlight the multifaceted impact of art-led revitalization. These examples reveal how artistic interventions can function simultaneously on symbolic, social, and functional levels, offering valuable lessons for rural and culturally layered contexts such as the Pustec Region.

A central finding across all cases is the importance of representation. In regions where identities are complex and historically shaped by conflict, displacement, or marginalization, visual and spatial representation plays a vital role in affirming community narratives. Superkilen, for instance, translated the multicultural background of its residents into a tangible urban landscape, while the East Side Gallery reinterpreted a divisive historical artifact into a shared canvas for collective memory. Similarly, in Pustec, where Slavic and Albanian influences coexist, art can give form to plural identity through installations, materials, and iconography rooted in local culture. Such representation not only validates lived experience but also enhances visibility and pride.

Equally important is the process through which these transformations take place. All three cases demonstrate that meaningful impact occurs when residents are engaged not merely as beneficiaries but as co-creators. In Favela Painting, community members took part in the conceptual, aesthetic, and practical stages of the project, receiving training and compensation. This participatory model fostered a strong sense of ownership, pride,



Fig. 1: Revitalization of public spaces through small interventions



Fig. 2: Pop Up - Art installation in the nature of Pustec Area

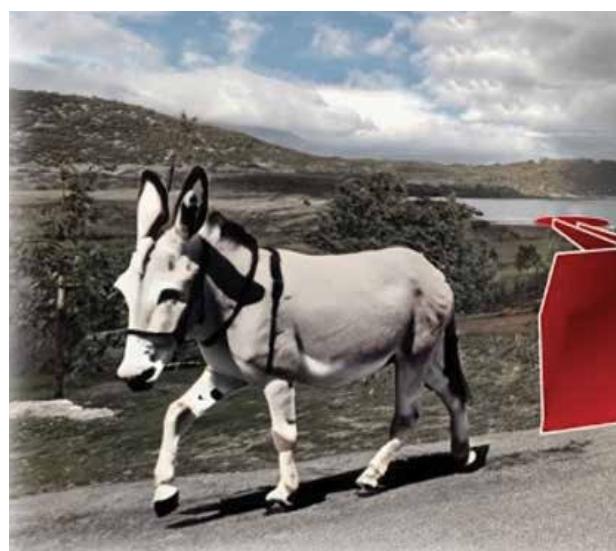


Fig. 3: Prespe Lake permanent Public Installation



source/ Christin Erdmann-Goldoni 2023

and collective responsibility. In contrast, projects that lack genuine engagement risk appearing imposed or disconnected from local needs. For Pustec, which faces outmigration and a weakened civic infrastructure, fostering inclusion through participatory art practices could reestablish local agency and rebuild social trust.

The case studies also reinforce the idea of public space as social infrastructure. Thoughtfully designed spaces serve more than aesthetic purposes; they support everyday life, facilitate social interaction, and anchor shared rituals. In Berlin, the East Side Gallery became not only a monument but a place for gathering and dialogue. In Copenhagen, Superkilen integrated play, rest, and mobility, enhancing urban livability. While Pustec's spatial context differs significantly, even modest interventions in village centers or near former border crossings could establish new focal points for community life and cohesion.



source/ Christin Erdmann-Goldoni 2023

Finally, these examples illustrate the effectiveness of low-cost, high-impact interventions, particularly in under-resourced areas. The murals in Rio's favelas, for example, required relatively modest funding but yielded profound social, visual, and economic returns. For Pustec, where public budgets are constrained and investment is limited, small-scale artistic actions, such as murals, public sculptures, or temporary installations, could spark momentum toward broader renewal without the need for large infrastructural projects. The integration of these lessons in Pustec could begin with temporary interventions, including murals, outdoor exhibitions, and cross-border cultural events, which can serve as catalysts for visibility and engagement. Over time, these activities may evolve into more permanent installations, architectural adaptations, or full-scale redesigns of public spaces that are rooted in local identity and co-created with the community.

Policy Implications (with Comparative Reflections)

To enable diversity-driven revitalization in regions such as Pustec, several targeted policy interventions should be considered. First, the establishment of EU-supported microgrant schemes specifically tailored to rural and community-led public art initiatives would provide critical financial resources to initiate small-scale, high-impact projects. A comparable model can be seen in the Favela Painting project in Rio de Janeiro, where modest but focused funding enabled the training and employment of residents, ultimately generating wide-reaching social and visual impact with minimal investment. Such funding mechanisms, if adapted to the rural Balkans, could empower communities like Pustec to become cultural producers rather than passive recipients of external development aid.

Second, fostering cross-border cultural cooperation between Albania, Greece, and North Macedonia could strengthen regional ties and create



source/ Christin Erdmann-Goldoni 2023

opportunities for shared cultural events, festivals, and exhibitions that celebrate the transnational heritage of the Prespa region. While none of the three case studies directly involved cross-border programming, Superkilen demonstrates how the inclusion of culturally diverse elements, in that case, objects from around the world, can symbolize plural identities within a shared space. A similar approach in Pustec but grounded in the real cross-border cultural dynamics of the region, could reinforce shared heritage and dialogue across national lines. Third, increased zoning flexibility would allow for the temporary or adaptive reuse of abandoned buildings and underutilized public spaces for artistic and cultural programming. This was particularly evident in the East Side Gallery, where a former political boundary was transformed into an open-access cultural site. The success of the Gallery lies in its informal, interpretive nature and its openness to public engagement, demonstrating how symbolic and underused spaces can be reclaimed as cultural assets without the need for large-scale redevelopment. Fourth, capacity-building through artist residencies and training programs is essential for ensuring that cultural revitalization is locally embedded and sustainable. This aligns closely with the model used in the Favela Painting project, where local capacity was developed through skill-sharing, mentorship, and paid artistic work. Establishing similar partnerships between artists, local institutions, and NGOs in Pustec could create lasting infrastructure for creative development and empower residents as agents of change. Finally, robust monitoring and evaluation frameworks should accompany all interventions. While the three case studies vary in their formal evaluation methods, their impacts, ranging from international media attention and increased tourism to improved community pride, indicate the value of tracking not just economic indicators, but also social and symbolic transformations. For Pustec, indicators such as youth retention, tourism growth, and public perception could be central to assessing the long-term success of art-led interventions. In sum, the strategies observed in Superkilen, the East Side Gallery, and the Favela Painting Project illustrate how cultural policy, when paired with community involvement and symbolic recognition, can activate underused spaces and reshape collective narratives. Applying these lessons to Pustec, adapted to its rural and cross-border context, holds significant potential for inclusive and sustainable revitalization.

Conclusion

The challenges facing the Pustec Region, population decline, geographic isolation, and a lack of public infrastructure, are emblematic of broader patterns affecting rural and borderland areas across Europe. What sets Pustec apart, however, is its unique combination of cultural diversity, ecological significance, and historical complexity. These characteristics, if thoughtfully acknowledged and strategically activated, position

the region not as a peripheral space of decline, but as a potential model for place-based resilience and culture-led development. This paper has argued that diversity in public space must be understood not only as a reflection of demographic plurality, but as a strategic and symbolic resource. By drawing on international case studies—Superkilen in Denmark, the East Side Gallery in Germany, and Favela Painting in Brazil—it has demonstrated that art-led revitalization, when grounded in community participation and local identity, can generate significant social, cultural, and even economic benefits. These examples provide compelling evidence that creative interventions, even at small scales, can transform neglected spaces into inclusive environments of interaction, pride, and continuity. The analysis also suggests that the revitalization of Pustec does not require replicating large-scale urban projects but rather adapting their principles to the region's rural context. Temporary installations, participatory murals, adaptive reuse of symbolic sites, and cross-border cultural programming could serve as entry points for more permanent transformations. Such approaches are not merely aesthetic. They carry political and social weight, reaffirming local agency, preserving memory, and enabling dialogue across generations and national boundaries. From a policy perspective, the findings point to the importance of flexible and inclusive frameworks. Targeted microgrants, zoning reforms, artist training programs, and transnational cooperation mechanisms are not abstract recommendations—they are actionable pathways for translating cultural potential into sustainable impact. When accompanied by robust evaluation and guided by the principles of equity and co-creation, these tools can support rural communities in reclaiming their futures on their own terms. Ultimately, the case of Pustec reinforces a broader insight: that European integration, if it is to be truly inclusive, must extend beyond economic alignment to embrace cultural and spatial justice. Unity, as the European Union's founding motto suggests, does not require uniformity. Rather, it is through the recognition and activation of local difference that shared identity is most powerfully expressed. Pustec, in this sense, offers not just a regional case, but a blueprint for how the values of diversity, participation, and creativity can shape a more inclusive European landscape.

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7.1

Conclusions

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Conclusions

Conclusions of Project-Based Issue

Cultural issues and heritage conservation for the enhancement of local identity and as a catalyst for sustainable development

Prof. Dr. Besnik ALIAJ

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In this issue, the articles and contributions focus mainly in 'Project-Based' aspects.

The first part here is concentrated on infrastructure and facilities.

Lisa MENSI – from Ferrara University deals with ways of "intervening in Pustec, via the development of a matrix for the evaluation of intervention models" aiming at promoting sustainable cross-border tourism in the Prespa Lake area in general. Author underlines that by intervening in protected areas, such as Prespa Lake habitat, is very delicate due to the sensitive nature of the environment. The area is protected by UNESCO and national legislations in three countries (not mentioning EU), which strive to defend the local context from extreme human interventions that could devastate the ecosystem. However, considering its significant distance from the nearest cities, it faces ever-increasing abandonment, lacking essential services and job opportunities. To avert this scenario and recognize the value of the natural environment, her research aims to explore opportunities for intervention to encourage nature-based tourism. One of the challenges lies in the unique aspects of the area, which necessitate a thorough analysis of the context and the potential impact on the natural and rural environment, aiming at relating Pustec to adjacent states. Due to these rare conditions, any intervention lacking a strategy to safeguard the environment could lead to undesirable consequences and harm the area. Author proposes a new methodological framework, based on the connection and classification of each category of actions. Specifically, each proposed service or activity is classified, considering the type of mobility that will be generated in the area, ensuring that the suggested services do not result in mass tourism. This leads to the definition of sustainable strategies as a preliminary guideline tool. These guidelines are hopefully valuable for professionals in choosing and evaluating future activities, always considering the landscape's involvement once work commences in the area.

Gregor ANDONI – from Polis University, deals with "Micromobility Solutions in Underdeveloped Areas" by bridging transportation gaps via inclusive developments. Author states that by adopting micromobility solutions, it offers a possible way to address mobility issues and promote inclusive development in developing regions where traditional transportation infrastructure is frequently insufficient. The author examines the particular dynamics involved by putting micromobility initiatives into practice in developing countries, looking at the socioeconomic effects, cultural factors, and technology adjustments necessary for a smooth integration. He looks into how micromobility can help to provide accessible and reasonably priced transportation options, especially for underserved communities that have little access to traditional transit systems. The research examines how shared bicycles, electric scooters, and other micro-transport options help people in developing countries feel more connected, have better livelihoods, and travel less distance, and illustrates it by specific case studies and empirical data. Furthermore, the author explores the difficulties in designing and implementing micromobility solutions in locations with limited resources. It goes over how crucial it is to support these cutting-edge transportation systems with sustainable economic models, local empowerment, and community engagement to ensure their long-term viability and acceptance. In addition, the research looks at how micromobility might help local economic development by promoting ventures like last-mile delivery services and micro entrepreneurship. Through an analysis of the relationship between micromobility and social fairness, author clarifies the ways in which these solutions might enhance community empowerment and general well-being. As a conclusion: by demonstrating the revolutionary potential of micromobility, this research adds to the conversation on sustainable development in developing nations. This means that policymakers and stakeholders may design interventions that harness micromobility to establish resilient, inclusive, and people-centric transportation networks in undeveloped countries by having a thorough grasp of the context-specific obstacles

and opportunities.

The second part here is concentrated on environmental systems .

Francesco AXEL PIO ROMIO – from Ferrara University deals with "Valorizing Earth's Ancient Landscapes" theme. He focuses on the illustrative cases of "Lanzarote" and "Lake Prespa". According him both Lanzarote and Lake Prespa, despite their geographical isolation, share intriguing similarities rooted in their geological formations and tourism potentials. Author says: Lanzarote, born from volcanic eruptions around 20 million years ago within the Canary Islands, boasts a dynamic landscape resembling extraterrestrial terrains, captivating the scientific community's curiosity due to its resemblance to the Moon and Mars. Despite experiencing a surge in tourism, Lanzarote still retains its authentic character, safeguarding its heritage and landscapes. Renowned artist César Manrique dedicated his life to celebrating the island's essence, fostering tourism keen on discovering its natural beauty and cultural heritage. In contrast, Lake Prespa, nestled within the larger Ohrid & Great/Small Prespa lakes system, stands as one of the world's most ancient and expansive tectonic lakes which retains scientific significance for its ecosystems and biodiversity richness, which are currently endangered by the pollution caused by anthropic activities. In fact, despite being shared across three countries: Albania, North Macedonia, and Greece, only portions of the Albanian and Greek territories are protected. The region's cross-border fragmentation, coupled with remoteness and limited infrastructural investments, has led to an overall underdevelopment, abandonment, and population decline of the towns and villages in the area. Addressing these challenges, a proposed parallel between Lanzarote and Lake Prespa seeks to advocate cross-border initiatives aimed at valorizing their unique landscapes, local heritage, and traditions. By analyzing Lanzarote and learning from its preservation strategies and the integration of art and nature, this approach advocates for scientific and eco-tourism promotion, leveraging the distinctiveness of these areas to revive their allure by suggesting possible interventions ... that could potentially revitalize Lake Prespa's appeal and help to mitigate issues related to pollution, underdevelopment, and depopulation. To do so, the author considers the municipality of Pustec, on the Albanian side of the lake, as a case study for the application of the aforementioned strategies. To the author, by connecting and improving main existing road in three countries, and removing border control points, can be a simple investment that can unify all ecosystem in one entity, and from there connect and revitalize existing traditional villages with better hiking/biking access to natural and historical assets, is the starting point that planners, architects and environmentalist can start work together with authorities and communities. Environmental education of kids, youth, communities and authorities is another necessary long term challenge, if success is expected to come soon and in the future.

Andrea STERPIN – from Ferrara University deals with "Revitalizing rural cross-border areas, via 3D technologies for landscape, urban, and cultural planning in Pustec municipality" and further on in the region. The author underlines the fact that the imminent potential accession of Albania to the European Union marks a pivotal moment for the country and its smaller municipalities, such

as Pustec, located near Prespa Lake. Serving as a crossroads and border among Albania, Greece, and North Macedonia, the region is stepping towards integration into the European community, heralding a new era for the Albanian region of Korca, and the specific minority community of Pustec. However, the strategic development of these predominantly rural areas – says the author – faces the challenge of scarce digitized data concerning local architectural and building heritage, resulting in unclear visions of the municipalities' current state with regard urban fabric and historic buildings. His research aims to explore how 3D technologies can act as a catalyst for multi-scale architectural and planning design. In particular, it examines the potential of three-dimensional models derived from GIS and aerial photogrammetry through a comparative analysis. According the author, such analysis aims to highlight the possibilities that an integrated approach can offer in terms of territorial comprehension and planning. GIS 3D models, despite their limitations due to the lack of digitized building data in areas like Pustec, can provide a digital representation at a landscape scale, enabling visualization and comprehension of the entire transnational area around Prespa Lake. On the other hand, aerial photogrammetric surveying, known for its effectiveness at an urban scale, can be a crucial tool for mapping and understanding the architectural and building heritage of the various municipalities in the region. The combined use of such technologies can thus be an effective tool for creating a solid knowledge base, necessary to support the development of strategies at both the landscape and urban levels, and in a transnational dimension. So this emphasizes the importance of a comprehensive vision to address the common challenges of regions eager to embrace new challenges while also valuing their historical and cultural heritage. The author calls for better coordination in terms of data and resources share to reach faster such objective and fairer decision making for all.

The third part here is concentrated on landscape and heritage systems .

Kejsi VESELAGU – from Polis University deals with "Navigating the Intersection of Geology and Architecture" via the conceptualization of stereotomy as a formative process within the geological intricacies, illustrating it with the case of Cave Churches in Pustec. According author Prespa region's varied rock formations and historical processes combine to produce a unique cultural heritage where architecture is closely intertwined with its geological formation. Her research examines the complex interactions between architecture and geology while concentrating on the distinctive cave churches of the Maligrad Island in the municipality of Pustec, which are hidden away within the geographic tapestry of the Prespa Region. An overview of the traditional applications is provided in brief and is framed within the notion of stereotomic principles as a formative architectural process comprised of operations of eroding and cutting through matter, based on the conception of Gottfried Semper, as opposed to a tectonic architecture. The inquiry focuses on a thorough analysis of the Maligrad Island's cave church as a case study, demonstrating how stereotomy serves as a link between the region's intricate geology and the architectural wonder that is formed by the caverns. The emphasis of author also includes the subtle dynamics of material selection and stereotomy application, which are

both impacted by unique geological elements. This leads to a more profound comprehension of the interplay between cultural expression, human craftsmanship and the natural environment. The combination of these components illuminates how stereotomy is adapted to geological formations and how cultural and temporal narratives are expressed in this particular area. With its nuanced analysis, this work adds to the growing body of knowledge on the symbiotic relationship between geology and architecture. Author helps us to better understand stereotomy as a dynamic process that is deeply intertwined into the geological fabric that it shapes, and how this can be used on project that follow with the strong identity of the surrounding landscape, heritage and nature.

Maristella DE FABRIZIO – from Ferrara University, deals also with the case of "St. Mary's Church on Maligrad island in Lake Prespa" via a critical analysis of the actual restoration project. The author critically examines the ongoing restoration of St. Mary's Church, built since 1369. This Orthodox church is located within a natural cave on the cliff and is a historical and artistic jewel, as it is embellished with centuries-old frescoes, and characterized by its close connection with the surrounding nature and Prespa urban center. According to author the current restoration project is multifaceted, aiming to refurbish various aspects of the church, particularly its surfaces and the frescoes. A significant aspect of the existing project, includes enhancing the church's accessibility from the lake and improving its lighting, particularly to augment its night-time ambience. Author, critically analyses the restoration project, assessing in particular its adherence to the established theoretical principles of historical restoration and understanding the methodology adopted. In the broader spectrum of the ongoing discourse concerning the synergy between restoration theory and practical application, his critique meticulously examines the design decisions made during the restoration. In particular, it is investigated how the new access routes and lighting systems are in harmony with the historical authenticity of the church and how the symbiotic relationship of the church with its natural environment is emphasized. Such interdisciplinary survey contributes significantly to the broader discourse surrounding the challenges and opportunities inherent in executing restoration projects in similar cases. By delving into the specifics of St. Mary's Church's restoration, the author tries to bridge the gap between the execution of this project and the general principles of restoration theory. The results of this analysis offer valuable insights that serve as a guideline for future conservation and restoration initiatives in the area and beyond it, particularly those that aim to safeguard unique cultural heritage sites, in order to pass them usefully to the future generations.

The fourth part here is concentrated on settlements, public spaces, and dwelling systems .

Christin ERDMANN – from Ferrara University deals with the subject of "Diversity in Public Spaces" as a transformative journey for regional revitalizations. Author states that by year 2000, the European Union adopted the motto "United in Diversity" with the objective of promoting a cohesive Europe that celebrates its diversity in art and culture. The realization of this goal was facilitated by the abolishment of borders, enabling unrestricted movement of people, culture, and capital among

member countries. This development contributed to strengthening a shared identity and appreciating the diversity of European cultures. The author of this research focuses on the Pustec Region in Albania, situated along the borders of North Macedonia and Greece. Specifically, the nine small villages, arranged like an imaginary chain along Lake Prespa, and constituting the focal point of investigation on broad cross border regional perspective. According to author the villages of Albanian territory, are characterized by agriculture, breathtaking nature, and solitude. They are home to only a few hundred people, due to the massive emigration of population after the collapse of centralized economy. The emotional tranquility emanating from this region defines its uniqueness and warrants its preservation. Despite advancements in European integration, the borders of the Pustec Region with Greece and North Macedonia remain closed or partly operational, leading to continuation of fragmentation and isolation and further decline in population over the years. The challenge lies in preserving this region from extinction without compromising its meditative charm. Preserving the Pustec Region – according to author – requires innovative approaches to prevent impending extinction while safeguarding its unique cultural identity. The targeted integration of art as a tool for revitalization can play a crucial role too. The creation of creative and inspiring public spaces not only enhances aesthetic qualities but also strengthens social communities. Revitalization through local artistic and inns-hospitality initiatives establishes the region as a vibrant place, not only attracting tourists but also fostering stronger connections among locals. It must be clear that preserving and developing the cultural treasures of the Pustec Region not only honors the past, but also creates a sustainable and flourishing future for the communities there. Art functions as a lifeline, reviving the Pustec Region and serving as a living testament to cultural diversity and historical continuity. In seeking solutions, author draws few inspiration from examples where the deliberate integration of art successfully revitalized once considered extinct public spaces. This approach aims to maintain the Pustec Region as a lively cultural and hospitality space, while simultaneously enhancing the quality of life for its residents.



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