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Exploring Agricultural Heritage Landscapes in the Balkans: Insights from the Danube Delta and the Valley of Roses

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ABSTRACT: Archaeology has the potential to address environmental challenges in the Anthropocene by offering valuable lessons from historical experiences. However, its application in mitigating the climate crisis and enhancing community resilience still needs to be explored. This analysis positions archaeology as a novel perspective for characterising and managing Agricultural Heritage Landscapes (AHLs)—traditional farming systems with exceptional cultural and environmental value shaped by their unique landscapes. In the Balkans, rich yet understudied landscapes and vulnerable communities practising traditional farming provide intriguing study cases. The present article focuses on the fishing traditions in Romania's Danube Delta (focusing on Letea village, Mila 23 and Crisan) and rose oil production in Bulgaria's Valley of Roses (mainly Kazanlak). Using the AHL methodology, these practices are examined, particularly emphasising their archaeological dimensions and integration within a food systems framework. This approach uncovers innovative management strategies and advocates for revising the AHL methodology to incorporate archaeological and food systems perspectives. The urgency of protecting AHLs in the Balkans is underscored, highlighting the essential role of archaeology in proposing solutions such as diversifying land use, fostering community education, and understanding the evolution of cultural traditions. Additionally, the discussion emphasises the need for robust policies and more quantitative analysis to safeguard cultural heritage and landscapes. By drawing on its rich insights into the past, archaeology can inform policies that help AHLs maintain their identity while adapting to the challenges posed by the climate crisis.

KEYWORDS: agricultural heritage, heritage landscapes, environmental archaeology, landscape management, sustainable heritage.

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1. INTRODUCTION

The United Nations (UN) proposed 17 Sustainable Development Goals (SGD), stating that humans cannot thrive without addressing climate change (European Commission, 2021). While no past society perfectly mirrors the 'global village' experience that characterises our present societal landscape, we find striking similarities in their services, including economics and trade, social norms, food, shelter, and belief systems, which, to varying degrees, have influenced and continue to shape institutions and settlement patterns that endure today (Rick & Sandweiss, 2020). In this context, archaeology places itself at the intersection of the cultural and natural, offering the possibility of studying the dynamic of the two across time and space (Rivera-Collazo, 2022) and remains an underexplored source of inspiration for policymakers. To date, archaeology (which is mainly represented in the mainstream discourse through a culture's tangible heritage) and climate change have only been addressed together concerning Indigenous

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communities. The US Fourth National Climate Assessment points out that Indigenous communities will have their history and heritage affected by climate change (Markon et al., 2018), which, while correct, is an affirmation based on falsely defined and associated terms. Indigenous communities, archaeology, and heritage are not mutually defined, as they, while having a rich heritage, still belong to contemporary times dealing with contemporary challenges (Rockman & Hritz, 2020).

All human societies have history and heritage affected by climate change, including the development of modern socioeconomic systems that have led to a human-driven shift in climate (Hollesen et al., 2018), but also vulnerable communities, which, in Europe are represented by ethnic minorities and the ones living in the Balkans (Rovolis, 2011). Moreover, communities in Balkan countries present unique traditions, including agricultural practices (Tomova, 2003), which are excluded when discussing heritage conservation regarding food systems and agriculture, as no studies up to the writing of the present analysis appear to have covered them.

The present analysis proposes traditional agricultural landscapes as invaluable cultural and natural heritage that, if protected, could provide a multifunctional strategy to mitigate the effects of climate change and boost local resilience and economy, meaning that trade-offs are minimised. Agricultural heritage is the crystallised expression of material and immaterial culture showcasing the complex human-nature dynamics that have persisted through time and are still present, making it a way archaeology can be integrated into the climate discourse. Agricultural heritage landscapes (AHLs) are "physical space on the earth's epidermis, yet with mental and cognitive attachments to the past, present and future of spatiotemporal characters, and inextricably related to memory" (Gkoltsiou et al., 2021); this relationship to memory creates mental values interpreted as cultural heritage. Agricultural heritage systems possess outstanding universal values and require unique dynamic conservation and management strategies. Currently, initiatives striving for agricultural heritage landscape protection are in their infancy worldwide, with one of the most significant being the Globally Important Agricultural Heritage Systems (GIAHS) initiated in 2022 under the Food and Agriculture Organization (FAO) of the UN (FAO, 2022). GIAHS defines agricultural heritage systems as "outstanding landscapes of aesthetic beauty that combine agricultural biodiversity, resilient ecosystems and a valuable cultural heritage (FAO, 2022)", focusing on the human experiences in a landscape, including resilience to climate and different socio-economic forces (Gkoltsiou et al., 2021).

There are only ten designated systems in Europe and Central Asia, all of them belonging to countries situated in South and Western Europe. Nowadays, Europe has the highest percentage of residential rainfed croplands, residential villages, and residential woodlands, meaning there is a lot of potential for exploring agricultural landscapes on the entire continent (Ellis, 2021). As no site in the Balkans is included in the GIAHS list, and many of the sites that are recognised at a national level do so by separating the traditions from the landscape (Printsmann et al., 2012), the present analysis aims to reveal the importance of a few systems in the Balkans where the two combine.

Hence, the primary objective is identifying and evaluating the Balkan region's farming landscapes and agricultural heritage. Two sites were identified by scanning literature on tourism: the Danube Delta in Romania and the Rose Valley in Bulgaria. This study represents the first attempt at characterizing their natural and cultural heritage as no previous academic literature has compiled this information. While the central methodology is concerned with characterizing the landscapes in the present and planning the future, the present analysis takes a different approach by shifting the perspective to emphasize that research should appreciate the deep time dimension of traditions and inhabitations and how this approach can inform us about the future. Secondly, the foods and other derived products are investigated as additional dimensions to the existing research. The key methodological framework is based on a recent article touching on three agricultural heritage landscapes in Greece (Gkoltsiou et al., 2021). After characterizing the landscapes, the final objective of the study is to identify potential methodology improvements/future steps by addressing its limitations, such as not including the dimensions of food systems and a deeper perspective on the past. This involves emphasising archaeology's role and its potential to impact policy, representing a novel approach in the field.

2. LITERATURE REVIEW

The Balkans is the easternmost of Europe's three greatest peninsulas and usually comprises Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Montenegro, North Macedonia, Romania and Serbia, as all or at least a part of each of those countries is located within the peninsula. The most accepted definition follows the geographical delimitations indicated by the Danube-Sava- Kupa line, meaning the proportion of the mainland south of the three rivers is considered the Balkans (Figure 1)(Jelavich, 1993).

The present analysis deals with land use and the role land plays in constructing heritage, making the physical space of the study a central element, although the landscapes are not separated from their governing entities. Nonetheless, it is essential to acknowledge that the communities inhabiting these regions have actively shaped them and created their identities, meaning "Balkan" does not define a cultural monolith. However, common themes (reliance on agriculture for job security, understudied landscapes, lack of resources for cultural research and finances for culture conservation) (Rovolis, 2011) make the Balkans an intriguing area of European study.

Figure 1. Outline of the Balkan Peninsula, following the Danube-Sava-Kupa line, highlighting the location of the two landscapes analysed (the Danube Delta in the northeast and the Valley of Roses in the center-north of the peninsula.
Source: Made by the author using ArcGIS.

Only four Balkan countries are part of the European Union (EU) (Greece, Bulgaria, Romania, and Croatia). Others are candidates or potential candidates for EU membership (8), which impacts their mitigation strategies, resources and archaeological and conservation work. The EU contains a mosaic of heterogeneity and heritage associated with agriculture, reflected in the number of small farms (two-thirds of the 10.3 million farms were less than 5 ha in size in 2016) (Gkoltsiou et al., 2021). In 2020, the number of farms decreased (9.1 million), although the proportion of small-scale farming remained the same (Eurostat, 2022). It has been shown that these small-scale farmers are more likely to use traditional

methods and rely on their land to gain an income (Toma et al., 2021). Although agricultural landscapes can vary from cropland to wetland, they present great ecological, economic, aesthetic, recreational, and cultural value. They can provide food, pharmaceuticals, forage and fibre, as well as support genetic biodiversity, soil fertility and water purification (Gkoltsiou et al., 2021). Although named an "anathema to conservation" (Power, 2010), if carefully managed, they can help in flood control, carbon storage, waste management, and climate regulation, making them a valuable system often underappreciated (Ortiz et al., 2021).

Innovative solutions must be proposed tailored to the diverse landscapes of the Balkans (Cvijic, 1918; Tonta, 2009). In this analysis, the cultural dimension of the landscapes is considered an essential factor in their quest for sustainability, which will be analysed through time. Potential Balkan agricultural heritage landscapes would benefit from being included in conservation efforts, as more recognition and resources will be allocated. After investigating popular opinions from various countries regarding landscapes considered vital to the national identity of the people who bear a long line of traditional knowledge related to farming and crafts (Hristova, 2022), some of the most appealing sites found were the traditional fishing villages in the Danube Delta, Romania and the Rose Valley of Bulgaria.

3. RESEARCH METHODS

3.1. Presenting the Geography, History, Culture and Landscape

A literature review was conducted to offer a comprehensive overview of the sites and their agricultural heritage. For each site, keywords were chosen as follows:

- Danube Delta, heritage, traditional agriculture, landscape, fishery, fish, ancient, Histria, Halmyris.
- Rose Valley, Kazanlak rose, Damask rose oil, traditional agriculture, Rose Valley, Bulgaria.

These keywords were used to find articles relevant to the topic using SOLO (Search Oxford Libraries Online) and the Central and Eastern European Online Library. Moreover, Google Scholar was also used to find articles about the sites in the local languages. Web resources were also included, such as official websites of the UN and EU, Romanian and Bulgarian Government websites, and local NGOs. Accessing resources available remotely enabled finding elements of material culture associated with the traditions in the two sites.

3.2. Landscape Assessment

The present analysis uses the Agricultural Heritage Landscapes characterisation methods described in a recent article (Gkoltsiou et al., 2021). Hence, the methodological framework comprises geography, archaeology, landscape architecture and ecology theories. In their article, the authors use LCA, a framework published by the Countryside Agency and Scottish Natural Heritage (The Countryside Agency, 2002). LCA is a two-stage process comprising landscape characterisation and landscape assessment. While the former concerns understanding how the identity and type of landscape were created, the latter deals with landscape quality. Besides the LCA, a review of both the GIAHS criteria (FAO, 2022), focused on landscape, and the World's Heritage List (UNESCO, 2008), concentrated on the requirements for a site to be considered of universal value, was applied to the sites chosen for their analysis. These three sets of criteria were combined, and their interrelation was proposed as a new way of assessing landscapes, titled the Proposed Criteria for Acknowledgement and Conservation of AHLs (Gkoltsiou et al., 2021). The authors go further, compiling criteria for managing these sites to identify potential development areas in a section titled Proposed Criteria for Management of AHLs. The analysis applies the combined criteria to the Danube Delta and the Valley of Roses. This theoretical framework can be applied using the existing literature, as Gkoltsiou et al., 2021 did. Thus, it does not include any terrain work.

3.3. Food Systems and Products

Agriculture and production are the initial steps in a food system (Ingram & Zurek, 2018), meaning their impact goes beyond the landscape. While the primary focus of GIAHS and AHLs is to highlight the human dimension, this can only be fully achieved by considering the broader value of the landscape in the lives of the people, which could include food and other derived products (Gora, 2018), how people connect to local foods, and how food systems create work opportunities. This analysis will address

essential questions about the evolution of a food system to its current extent, the number of people who rely financially on it, and how management strategies could improve their lives.

Hence, the methodological framework of this analysis includes food and other derived products throughout history, as well as a deep time perspective of history and culture associated with the landscape (Figure 2). The integration is beneficial and crucial for a comprehensive understanding of landscape management

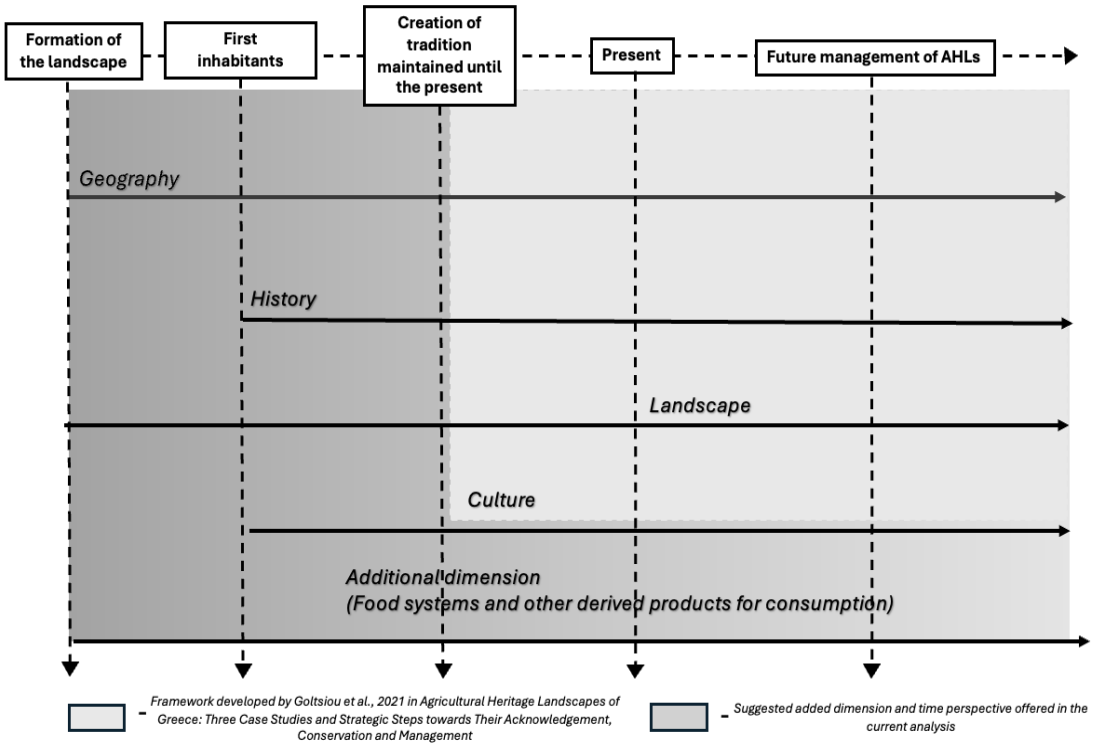

Figure 2. Diagram showcasing the expansion of the base methods.
Source: Made by the author.

4. RESULTS

4.1. The Danube Delta - Traditional Fishing Villages

The Danube Delta (Figure 3) is the second-largest wetland area in Europe and one of the continent's least populated areas in the temperate region (Romanescu, 2013). Most of the Danube Delta lies in Romania, the county of Tulcea, although a small part is found in Ukraine. It is the youngest territory of the Dobrogea region of Romania (also known as Dobruja) and marks the final stretch of the Danube's journey to the Black Sea (Figure 3, A). Tracing its origin to the end of the Würm glaciation (around 12,000 years ago), only 9% is permanently above water, with the constantly developing landscape resulting in a labyrinth of freshwater lakes, great fields of aquatic vegetation and flooded islets (Figure 3, C-E) (Péter, 2004). Much of the alluvium and major surface expansion since its formation resulted from soil erosion after anthropogenic forest clearing in the past two millennia (Giosan et al., 2012).

The Danube Delta is also part of the UNESCO World Heritage list, meaning it already fulfils the biodiversity criteria required to be considered an AHL. The Rewilding Europe initiative describes the region as economically depressed, harboring low living standards and a high percentage of rural depopulation, making it highly susceptible to unsustainable development and the loss of traditions associated with the landscape (Rewilding Europe, 2024). Although there is an effort to create new opportunities for the local communities to construct nature tourism infrastructure, traditions in the area appear to be mentioned rarely.

The Danube Delta Biosphere Reserve (DDBR) is almost entirely rural, comprising 26 villages and a town (Sulina) with around 15,000 inhabitants (Lup et al., 2017). The traditional fishing villages of the

Danube Delta are those in the Crişan commune (Caraorman, Mila 23, and Crişan), Sf. Gheorghe and Letea, although this analysis will mostly mention Letea. Mila 23 and Crisan. In the context of climate change, it is essential to acknowledge that the condition of the landscape features is declining, with the small tributary rivers being projected to face significant runoff reduction in the summer (by around 5-30%) by 2050, accompanied by an increase in droughts (Mauser et al., 2018). As a result of the rising sea level, eutrophication will increase while water quality will decrease, affecting biodiversity and agriculture (Crăciun et al., 2022). The effects of climate change on water and biodiversity are of extreme urgency in the Delta, as fishing and fish farming (to a lesser degree) are at the heart of the local economy (Damian, 2019). Moreover, deforestation and intensive agriculture in the northern part of the Delta increases erosion and, thus, water flow in the north distributary, Chilia, causing the northern part of the landscape to sink slowly (Winiwarter et al., 2013).

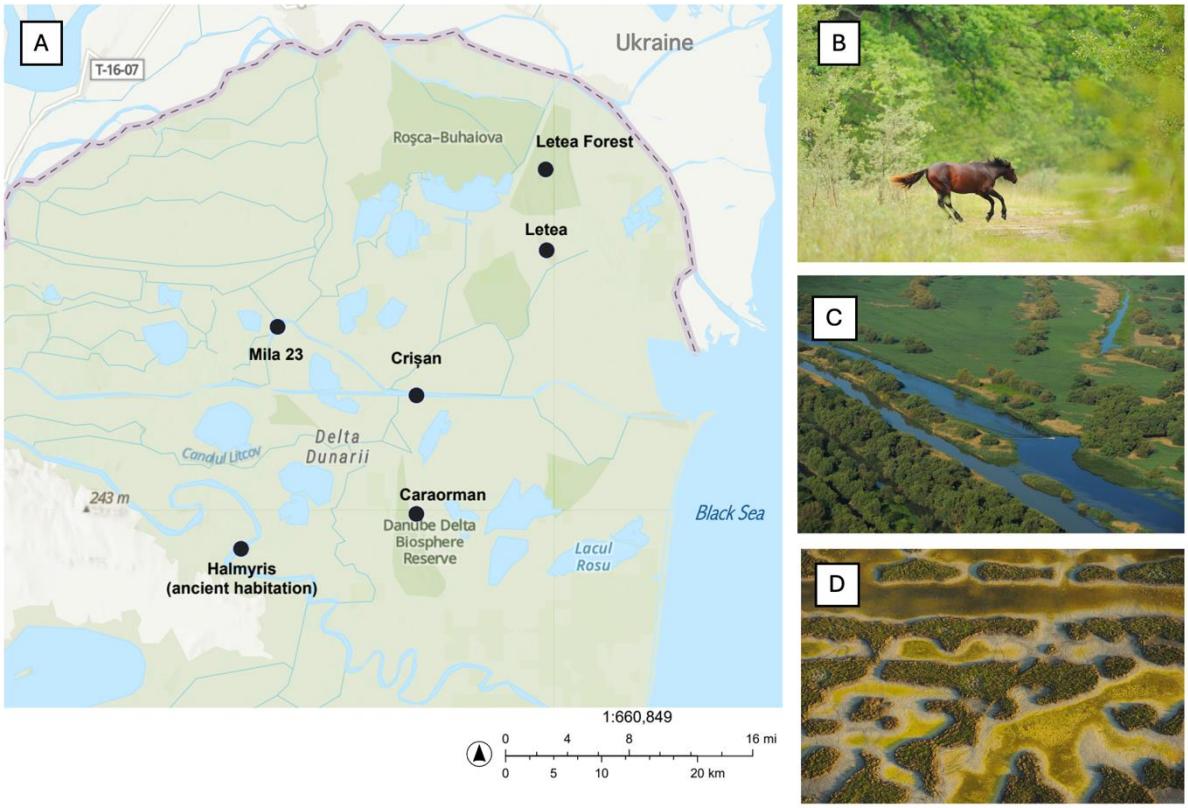

Figure 3. Overview of the Romanian Danube Delta **A**) Map of settlements mentioned in the text. **B**) Image of wild horse in Letea forest. **C-D**) Aerials of the Danube Delta Biosphere Reserve . **C**) Image of flooded islets forming in the Danube Delta. **D**) Image highlighting the formation of inland lakes and alternation with wetland vegetation.
Source: **A**) Map created by author in ArcGIS. **B-D**) Rewilding Europe, 2024.

4.1.1. History - Inhabitation, Land Use and Archaeology

As ceramic evidence suggests, villages such as Letea and Crisan have been populated since the 6th century BC, dating to the Greek period (Micu et al., 2016). After the Greek stage, there were Roman (1st century BC to 7th century AD) and Byzantine stages (7th to 14th century AD) and Turkish domination of the area (1417 to 1878 AD). During these stages, populations were dynamic and exploring natural resources on a large scale, although material culture remains regarding fishing is scarce (Micu et al., 2016). One of the most comprehensive studies on the region's environmental history focuses on the Roman settlement of Halmyris, where a complex picture of the subsistence practices of inhabitants during the 5th and 6th century AD was revealed (Stanc et al., 2023). Phytolith investigations identified strong signalling for cereal processing. The exploited animal resources varied, including mammals, fish, and molluscs. Still, the study does not go into the implications of the role fishing played in the economy,

despite the Roman inscriptions potentially referring to Halmyris as a mariner's village (vicus classicorum) (Stanc et al., 2023).

Remains such as fragmentary weights for a fishing net dating to the 10th-11th centuries, have been found in southern Dobruja (Paraschiv-Talmaţchi, 2018), giving the earliest fishing instrument recovered, although no such early tools have been identified from the Delta region. Between the 11th and 15th century AD, sturgeon harvesting became an integral activity in the Lower Danube (Hungary, Serbia, Romania), with several traditional fishing villages being established alongside the Danube close to the spawning site of sturgeons (specifically in Hungary)(Dinu, 2010). In 1878 AD, the Delta rejoined the other Romanian provinces, altering its ethnic structure and resulting in a complex mix of cultural identities, languages, and traditions.

4.1.2. Landscape – Architecture, Agriculture and Biodiversity

As most distances are covered by foot and vehicles are rare, the sand-covered country lanes give the deltaic villages a certain degree of isolation and a perspective that focuses more on the human scale than other more well-connected communities. They experience increased isolation during winter, which has led to the preservation of the vernacular architecture in the area, as seen in Letea village (Figure 4, C), an architecture inspired by the Russian populations settled in the Danube Delta (Maio, 2018).

Figure 4. Images from Letea village. **A**) Aerials of Letea, highlighting the small size of the traditional village. **B**) Lady from Letea in her garden. **C**) Vernacular architecture in Letea and an example of a garden attached to the house. **D**) Ladies in Letea use traditional hoes to weed corn.
Source: (Rewilding Europe, 2024)

Moreover, the remoteness makes the range of building materials to choose from relatively narrow, making traditional architecture blend subtly with its surroundings. One of the Deltaic people's most notable traditions is the roof thatching techniques using reed (Figure 4, A) (2). In terms of agricultural practices, the villages of the Delta present an intriguing landscape, where agricultural plots are primarily situated on the continental edge, although houses in the villages have their own gardens. Moreover, people use traditional agricultural tools such as hoes, making the plots a testament to persistent agricultural practices (Figure 4, D). Sheep, pigs, and cattle are the main animals bred in the area, and wheat, maize, sunflower, and soybeans are the main crops.

Regarding overall biodiversity, the Danube Delta is considered a protected area and included in the Natura2000 project (Anghel & Iordache, 2020; Spiliopoulou et al., 2023). Moreover, the Letea forest is home to a population of feral horses among the continent's last untamed equines (Stejskalova et al., 2019). The landscape contains endangered birds, such as the Dalmatian pelican (Pelecanus crispus)(Barboutis et al., 2021) and many species of fish (69 in 2021)(Năstase et al., 2021)with sturgeons being one of the most well-known types. Two out of the six species of sturgeons are extinct, while four are critically the highest threat category before extinction (Pekárik et al., 2019; WWF, 2019).

Romania banned sturgeon products indefinitely in 2021 (Ludwig et al., 2023) and aquaculture represents an intriguing possibility of fighting the decline of sturgeon stocks. More efforts are going into constructing sustainable aquaculture practices, the earliest recorded ones being from the 1990s (Directorate-General for Maritime Affairs and Fisheries, 2023). A general fishing ban occurs annually and can vary from 45 to 60 days between April and June, allowing the local fish population to reproduce and migrate. The DDBR is the most biodiverse section of the Danube, although it is also one of the most fragile, given the number of micro-ecosystems it encompasses (Gogaladze et al., 2022). Compared to the wider Danube basin, it becomes apparent that the is one of the least perturbed parts (Anđelković et al., 2022; Baldan et al., 2023; Csagoly et al., 2018), a unique landscape where salt and freshwater mix, with more than half of the entire number of fish species in the Danube (estimated at around 100)(Schletterer et al., 2018).

4.1.3. Culture – Traditions, Instruments and Social Initiatives

The ethnographic studies paint a dynamic life in the traditional fishing villages, emphasizing the variety of tools they used for fishing and the importance of cultivating one's garden. Thus, it can be argued that agricultural heritage in the DDBR comprises two strands: cultivation in private gardens using traditional tools and fishing heritage, although the latter has been recognized as unique to the region.

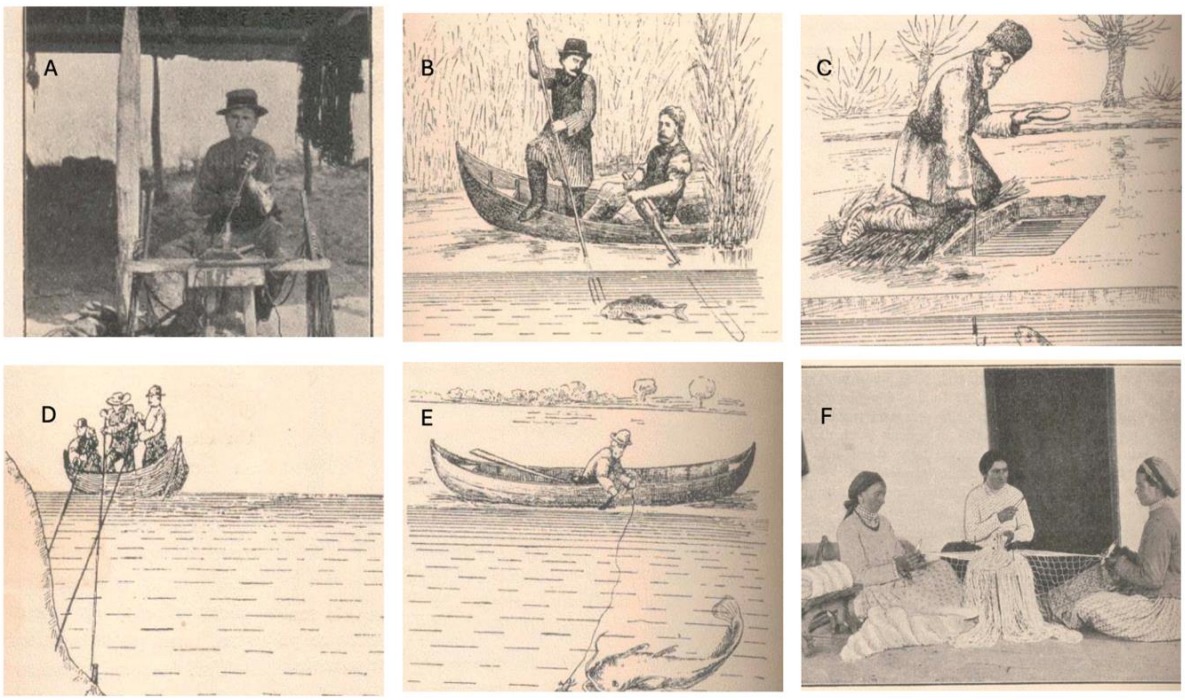

Figure 5. Examples of fishing with different tools and other related activities: **A**) Sharpening the hooks for "carmace". **B**) Fishing with an instrument called "osie". **C**) Fishing with a hook and a mirror that misleads the prey. **D**) Fishing with an instrument called "ghin". **E**) Fishing with a "clonc". **F**) Women working on a fishing net.
Source: Antipa, 1916.

Traditionally, women mainly worked in the fields and cared for the vineyards while also making and repairing fishing nets (Antipa, 1916) (Figure 5, F). Various other jobs were required to maintain fishing instruments, such as sharpening the hooks (Figure 5, A). To braid fishing nets, cotton was twisted in four

or six threads to create the braids, and women generally carried out this activity in winter (Revista de Lingvistică şi Cultură Românească, 2016). Fishing occurred primarily in inland waters, with different species being caught within specific time frames of the year and with specialised instruments. This showcases how folk ecological knowledge in the area balanced the resources exploited and the inhabitants. Fishing has left an imprint on the traditions associated with the region and shaped the cultural identity present to this day, primarily through constructing traditional fishermen's shelters and fishing tools specific to certain fish types, one example being the "carmace", now banned by law.

As fishermen used to be away from their homes for the entire season, they built shelters close to their fixed fishing spots, with some reflecting the traditional architecture of the houses (Maio, 2018). While away from the village, fishermen salted or fermented the fish to keep it fresh and met merchants to sell their catches, rarely returning home (Antipa, 1916). They would also prepare fish borscht, which is now considered a traditional dish.

Besides the efforts in the architectural sector, which aim to transform traditional fishermen's shelters into energy-efficient tourist housing that utilizes local materials and maintains the aesthetic, various other NGOs have proposed ways of rural development through the capitalization of traditions. The National Association for Rural, Ecological and Cultural Tourism (ANTREC), Tulcea Branch, has been organising from 2013 to 2018, in Crişan, the Danube Delta Fish Borscht Festival (ANTREC, 2018). This initiative celebrated traditional gastronomy and brought forward local chefs and folklore performances. ANTREC has also organised, from 2012 to 2019, the Danube Delta Pike Fishing Championship in Mila 23 and Crişan, encouraging participants to "catch, kiss, release" pike fish, hence encouraging sensible fishing practices (2019).

Another initiative that aims to bridge traditional knowledge and technology with modernity comes from the Ivan Patzaichin – Mila 23 Association. Ivan Patzaichin was a Romanian canoeist, born in Crişan commune, in the village of Mila 23, who came up with the idea to revive the traditional boat of the Danube Delta ("lotca" in Romanian) (ROWmania, 2020), after noticing the noise pollution caused by motorboats. Patzaichin observed that local workshops no longer build lotcas. Thus his association started advocating for a new boat, called the "canotca", that combines the canoe with the traditional boat, aiming for a more sustainable solution using local materials. The canotca would stand as a short-distance tourism option. This initiative spawned workshops for younger generations, teaching them to build canotcas (ROWmania, 2021). Moreover, some initiatives aim to bring back crafts, such as roof thatching with reeds, so that they can be acknowledged as intangible heritage (Maio, 2018). However, the available information did not reveal how the Covid-19 pandemic and subsequent crisis affected the intitiatives in the Delta.

4.1.4. Shortcomings and Future Perspectives

Although material evidence depicting the evolution of traditions is scarce, the perpetual use of terminology describing the fishing villages as preserving traditional agriculture and fishing techniques (ANTREC, 2018, 2019; Damian, 2019; Lup et al., 2017) reflects the status of this area as a center for agricultural heritage in the minds of its inhabitants and beyond.

One of the main shortcomings regarding the heritage built around fishing, especially the material culture element (such as instruments and boats), is the lack of research creating a timeline for its evolution. Although challenging for various reasons, including taphonomy, a general history of these traditional instruments through time could be compiled by integrating multiple lines of evidence, such as material culture alongside the Lower Danube and historical sources. Currently, museums in Tulcea County possess material culture elements that date back to the 18th century related to fishing, although earlier tools may be held in private collections. Knowing that recovering and promoting traditions about ecological knowledge help socio-ecological systems maintain social resilience when facing disruptions, as shown in other areas of Romania (Chitonu & Cîrstolovean, 2013), means that archaeology is more valuable than previously thought in this type of understudied landscape. Moreover, ethnographic sources focus on the physical description of the tools rather than their meaning and evolution (Antipa, 1916).

Fish farming and its history have yet to be studied in the DDBR. However, in recent years, the intensification of aquaculture in freshwater inland lakes in the Delta has garnered more attention. Exploring its archaeology in the region and the broader Danube would reveal how aquaculture evolved in the area and the interplay between traditional fishing and farming, which has been hinted at in ethnographies (translocation of species in freshwater lakes for increased accessibility)(Antipa, 1916).

4.2. The Rose Valley – Rose Oil Production

The Rose Valley is a region in Bulgaria, delimited north by the Balkan Mountains and south by the Sredna Gora chain, which includes cities such as Klisura, Karlovo (both part of the Plovdiv Province), and Kazanlak and Pavel Banya (situated in the Stara Zagora Province) (Baser & Arslan, 2014).

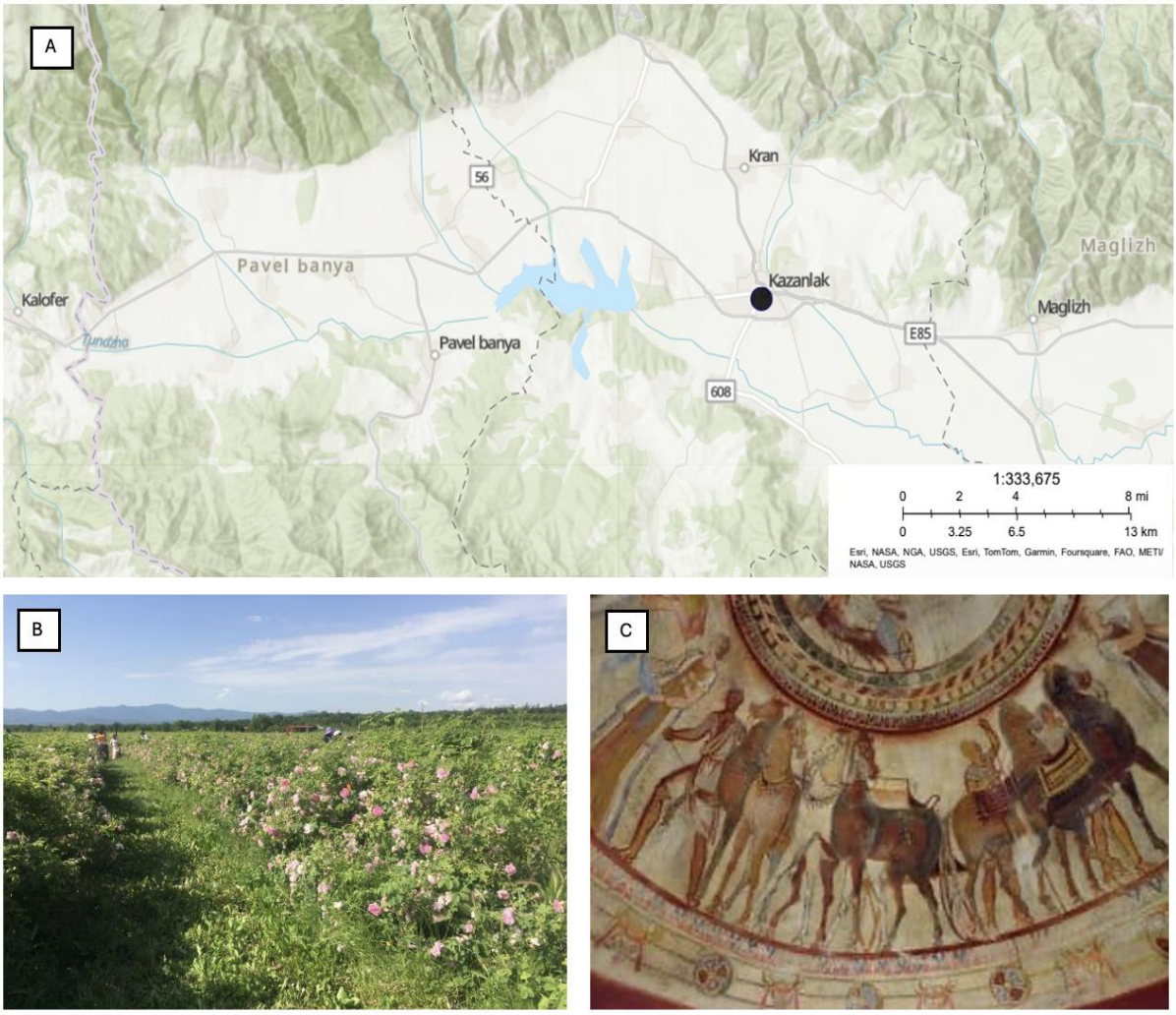

Figure 6. Map and Images of the Rose Valley, Bulgaria. **A**) Map of Tundhza Valley, showcasing the eastern location of Kazanlak. **B**) Image highlighting the aesthetic value and landscape features of Kazanlak. **C**) Image of the Tomb of Kazanlak, highlighting the rich archaeological potential of the region. Source: **A**) Map made by the author in ArcGIS online; **B-C**) Bulgaria Rose Festival. (2020).

Geologically, it consists of two river valleys, with the valley of Stryama to the west and the Tundhza to the east (Figure 6). The Rose Valley of Kazanlak stretches for about 10-12 km, spanning an area of about 1995 square kilometres, and the Kalofer Valley of Roses covers an area of about 1387 square kilometres (Shishkova et al., 2022). Although the exact geographic boundaries of the Rose Valley are hard to find, it represents a vast area in the heart of the country, known for the production of the Bulgarian oil-bearing rose – or Damask rose, or Kazanlak rose (Rosa damascena Mill. F. trigintipetala Dieck) (Shishkova et al., 2022). The region is characterised by sandy, clay-free soils suitable for growing herbs. Moreover, compared to the rest of Bulgaria, the winters are milder, as the two rivers and the mountains shield the region from atmospheric volatility (Paskova, 2018). This fluctuation in temperature causes the roses to produce more oil as a defence mechanism, which makes the area a suitable place for rose oil production (Nenov et al., 2016; Rutherford, 2022).

The Rose Valley was formed during the Quaternary Period, when the Balkan and the Sredna Gora Mountains rose, and the Fore-Balkan fields submerged (Eftimoski et al., 2017). With Europe being the faster warming continent (WMO, 2023), the effects of climate change begin to be visible in the Rose Valley,

as in 2024, the onset of rose blooming took place almost a month faster than the historical average (between the 10th and the 20th of June). Although this might not seem initially like an alarming sign of a declining landscape, it is vital to understand that this unusually warm winter followed by a warm spring, causing the early bloom, is consistent with the broader patterns associated with general climate change dynamics (Georgieva et al., 2022).

Moreover, it will not only influence the blooming time, but it can also have catastrophic effects on the activity of pollinating insects. Plant stress will increase due to exposure to inappropriate external factors, leading to decreased production quantity and quality and a decline in the overall aspect and function of the landscape (Vasileva et al., 2021). There is already a decline recorded in the production of rose oil, as in 2021, the quantity declined by 33% compared to the previous year, causing farmers to rely mainly on subsidies and state aid (Georgieva et al., 2022; Rutherford, 2022).

The present analysis focuses on the tradition of making rose oil and other rose-derived products in Kazanlak, which is among the 15 biggest industrial centres in Bulgaria, with a population of approximately 45,000 people in 2017.

4.2.1. History – Land Use, Archaeology and Settlement Pattern

Seuthopolis was a city founded in the Rose Valley in the 4th century BC, 8 km west of Kazanlak, marking the area of the present analysis as a hotspot for archaeological research (Boyadzhiev, 2020). It was the capital of the Odrysian kingdom and the preferred burial ground for nobility for centuries (Nankov, 2008, 2012), with the Thracian tombs underneath the Valley of Roses dating to the 4th century BC (Nankov, 2008). The Valley of the Thracians Rulers contains over 1500 burial mounts, among which the Kazanlak Tomb, included in the UNESCO World Heritage Sites in 1979, decorated with striking murals exemplifying Thracian burial rituals (D'Onofrio, 2022). This tomb is a window into Thracian culture (Slavova, 2022) and also the best-preserved art from the Hellenistic period on the territory of Bulgaria (UNESCO, 2024).

Agriculture in Seuthopolis was focused on farming and stockbreeding. Ploughs had iron parts, proof of high technological innovation and viticulture was a central activity, as indicated by curved knives made of iron used for pruning vines (Zyromski, 2004). There is less research on agriculture in Philippopolis and Serdica. However, the fertile land is mainly associated with viticulture (Georgieva, 2021) and cereal production (wheat, barley and oats)(Andonova-Katsarski & Stoyanova, 2023).

In the Middle Ages, the area of Kazanlak became an administrative centre for the Krun region before joining the Ottoman Empire in 1370 (Tomova, 2003). The modern city appeared in the 15th century, and it was initially a fortress serving military purposes, later developing as a city of craftsmen (Shepard, 1999). The oil-producing rose was imported from central Asia during Ottoman times, with the most accurate sources placing the date somewhere in the 17th century, quickly becoming incorporated into the local economy, with the locals taking pride in their organic farming tradition (Bruman, 1937). Rose production has been a staple since Bulgaria's liberation from the Ottomans in 1878, marking a significant stage in national history (Palairet, 1999). Moreover, the landscape is strongly connected with the area's socioeconomic systems, as it represents the source of employment for a large portion of inhabitants (above 65,000 employees in the entire Valley, although most of them are seasonal workers) (Kovacheva et al., 2010), be it through tourism or rose oil processing (Tomova, 2003).

4.2.2. Landscape – Agriculture and Biodiversity

Current agriculture in the Rose Valley is concentrated around growing roses, although other activities, such as viticulture, play an important role in the local economy. The region grows mostly black grape varieties in vineyards, with occasional fruit orchards, sunflower and cereal fields (Sobotkova & Ross, 2020). The agricultural plots containing the roses do not appear to be part of a diverse land use system but rather a monoculture, except for legumes/cereal mixtures planted between the rows to enhance the properties of the soil (Georgiev, 2016). A possible explanation for why the roses are isolated could be related to preserving particular aesthetics associated with the Rose Festivals (Hristova-Vladi, 2023).

The farmers in the region are known to increase biodiversity by leaving strips of land in the rose fields with natural vegetation. Moreover, farmers in the Rose Valley apply manure and compost mixtures to increase soil fertility and as a means of disease control, which supplements the sowing of cereal and legume mixtures between rose rows in autumn (Chalova et al., 2017). The Damask rose is not resistant to

major diseases and pests, such as black spots and powdery mildew (Kovacheva et al., 2010). While in conventional farming systems, this issue is usually controlled through chemical treatments, organic production prohibits it, and modification using gene transfer (Rusanov et al., 2009). The roses are planted in autumn, and there is an all-year-round effort to maintain the fields through fertilizing and insect and weed removal. The cultivation of the Damask rose is not unique to the Rose Valley since the rose is also grown in Iran, Turkey, France, and India, with cultivation in Persia being known since Roman times.

Although overall biodiversity research in the area has yet to be conducted, the Rose Valley is bordered by natural parks and protected areas included in the Natura2000 project (the natural reservation of Tsentralen Balkan and the riverbanks of Stryama and Tundhza)(EEA, 2024). Given the geographical proximity, some species might overlap through ecosystem connectivity, and landscape management in one environment could have tangible effects on another.

4.2.3. Culture – Traditions, Instruments and Social Initiatives

The traditional method of extracting rose oil in Bulgaria involves a labour-intensive process passed down through generations (Kovacheva et al., 2010). The rose petals are hand-picked (Figure 7) at dawn when the essential oils are at their peak concentration, usually during the Festival of Roses (Tomova, 2003), which attracts many tourists and is considered one of the most important cultural events in the country. Women and young girls would do the rose-picking, although nowadays, everyone participates in the activity (Bulgaria Rose Festival, 2020) and usually wears a flower crown during the festival (Fig. 7, C).

Kazanlak is at the center of the rose oil industry and organizes the biggest festival (Paskova, 2018). After Bulgaria became a People's Republic in 1946 (Vassilev, 2009), the festival's fame declined, although the tradition persisted in towns such as Rozino, based on local initiatives (Chalova et al., 2017). However, it is speculated that the country's then-leader, Todor Zhivkov, attended this celebration in 1957 (Hristova, 2022), which led to the festival being declared a national holiday in 1967 (Zheleva, 2019).

Figure 7. Rose picking in Kazanlak. **A-B**) Women and men are involved in the rose picking activity. **C**) Rose crowns are made to be worn on the day of the festival. **D**) Great quantities are collected during the festival.
Source: Paskova, 2018.

The Rose Festival of Kazanlak has a long history, being founded in 1903 (Hristova-Vladi, 2023). In 2024, the Festival took place on the 1st and 2nd of June in a few villages in Kazanlak and generally involves the election of a Queen of Roses in a beauty contest, followed by a parade on the main square, where folkloric performances occur. A rose-picking ritual associated with the festival involves folklore groups (kukeri) men wearing scary masks who perform and dance to celebrate rose-picking (Tomova, 2003).

Figure 8. Rose distillation through time. **A**) Zlatyo Boyadzhiev's "Rose distillation" showcases the gyulpanas close to rivers. **B**) Improved copper kazan. **C**) Modern industrial rose-distillation machinery. Source: **A)** Tomova, 2003. **B-C)** Bulgaria Rose Festival, 2020.

Following the harvest, the rose petals are transported to traditional rose distilleries and subjected to steam distillation. A clear timeline regarding the evolution of technologies emerged from the first gyulpanas (rose distilleries using an instrument called gyulap, which is a cauldron used in distillation) to the modern industrial rose distilleries (Figure 8) (Bulgaria Rose Festival, 2020, Hristova-Vladi, 2023). Initially gyulpanas were built close to rivers, and a fireplace was built for one or more cauldrons (Figure 8, A). The gyulap had four handles and consisted of two parts: the cauldron and the lid. The first cauldrons were described as bigger than the ones used in France and India, which might have influenced how the water vapour gathered. Records state that in Kazanlak in 1860, there were 1,271 gyulpanas (Bulgaria Rose Festival, 2020). With a gyulap, about 3,000-3,500 kg of rose blossoms are necessary to obtain 1 kg of rose oil (Tomova, 2003). However, the traditional gyulap was improved by the local distillers, being transformed into a "kazan" (copper cauldron), covered by a sealing lid and having a side pipe that passes through a barrel of cooling water (Figure 8, B), which helps condense the outflow (Bulgaria Rose Festival, 2020).

The European Commission approved the oil produced in Bulgaria as a new Protected Geographical Indication in 2014, meaning the product is recognized as a staple of the local culture (European Commission, 2014). While it is established that the Rose Valley has created a brand name for itself, its agricultural products are also becoming increasingly recognizable, which have been the subject of proposed branding. Besides the famous rose oil, this includes rose honey (or rose petal jam), with its distinctive color and aroma, and rose brandy or gjulovitza. Although these two products have yet to be

recognized internationally, the efforts of locals and business developers continue to advocate for acknowledging their value.

4.2.4. Shortcomings and Future Perspectives

While the roses and their cultural associations are well-researched in the area, and a clear timeline exists for the evolution of the tools and celebrations, efforts to promote and preserve the heritage appear primarily focused on expanding tourism. This community-centric approach to leveraging heritage to boost the economy presents opportunities and downfalls, particularly as it can lead to unverifiable claims and biased information. Consequently, the main shortcoming in researching the Rose Valley is the dominance of information on the festival, with other facets, such as biodiversity and alternative agricultural occupations, such as viticulture, being understudied.

Heritage in the region is presented as unidimensional, mostly related to the roses, with viticulture and other traditions dating back to the Thracians receiving insufficient attention. It's crucial to note that roses are a recent addition to the landscape, previously dominated by extensive alternative farming. The underrepresentation is a significant gap, as it overlooks a potential strategy for landscape management. Given the threat to the rose fields by climate change, alternating rose cultures with medicinal plants known in Bulgaria (such as borage, yarrow and clover) and traditional crops (grapes) might prove the right step towards sustainability, maintaining the traditions while diversifying sources of income. Clover (Trifolium spp.) is a nitrogen-fixing legume proven to enhance yields in organic crop production (Płaza et al., 2022), while borage (Borago officinalis L.) and yarrow (Achillea millefolium L.) attract a variety of pollinators and increase nutrient cycling (Griffiths-Lee et al., 2020). In this context, the potential of archaeological investigations into past land use to inform policymakers on landscape management directions that combine the cultivation of long-term species adapted to local conditions in the area with the roses is significant. This form of ecological restoration has the potential to foster biodiversity and expand the ranges of currently threatened species.

4.3. Comparing the Sites

After compiling the information gathered on the sites, the results (Table 1) indicate that both meet most of the requirements for AHLs (the Danube Delta – 15/16 and the Rose Valley – 12/16) and display proactive actions for managing their cultural heritage. Both landscapes present unique tangible and intangible heritage and provide extensive ecosystem services (cultural, provisioning and regulating). Nonetheless, they both lack documentation on current laws protecting landscape quality and recovery from natural disasters. There was no information on whether dialogue between governing bodies and local communities exists or was attempted, meaning ruling institutions have not formally considered local views. Plenty of primary quality research should be conducted on the landscapes, traditions, and interactions between the two. Research must acknowledge the differences and variations across the sites and other AHLs in terms of geography, land use, populations, and agricultural activities and be tailored to address current gaps in knowledge (in the Danube Delta manifested as a lack of ethnographic investigations and in the Rose Valley as lack of biodiversity and land use exploration). Another critical aspect of gaps in the literature regarding both sites is represented by the lack of previous academic studies analyzing the landscapes and them only being covered in tourist literature and guides. Thus, fieldwork and ethnography are essential in revealing insights about the sites.

Although the table below might indicate that the two analyzed landscapes are taking most of the necessary steps to achieve sustainability and protect their heritage, the case studies reveal that solutions should be found outside of the ten proposed management criteria. While the sites fulfill most of the requirements (Danube Delta and Rose Valley – 6/10), it becomes apparent that the critical aspect of research is missing from the existing list of factors. This might result in trade-offs, such as further eco-tourism development altering the region's balance between humans and nature. The concept of eco-tourism is challenging, as the practice appears to lack a cohesive framework, with studies pointing out their environmental impact similar to conventional tourism (Torsney & Buckley, 2023). Hence, while appearances indicate a good current grasp on management, criteria regarding solutions are somewhat superficial and based on a short-term view of sustainability.

Moreover, the base methodology presents vague criteria, such as "landscapes provide significant ecosystem services," which is insufficient, as every agricultural landscape that is to be considered in such an analysis must provide cultural and provisional services. Exploring the food and other products derived from the landscapes is the first step in narrowing the scope and aiming to find solutions for one of the key features that define the landscape (its provisioning aspect), which will be explored in the next section.

Table 1. Comparative analysis of the criteria and strategic steps for acknowledging and conserving the two landscapes.

Proposed Criteria for Acknowledgement and Conservation of AHL		**Danube Delta**	**Rose Valley**
Landscape Character	1. Aesthetically remarkable agricultural landscapes of exceptional aesthetic beauty and importance.	x	x
	2. The morphological characteristics (form, shape) of landscapes and/or seascapes and their interlinkages are characterized by long historical persistence, representative culture and a strong connection with the local socio-economic systems that produced them.	x	x
	3. Diversity of spatial structure of agricultural plots	x	-
	4. Agricultural infrastructure and settlements contribute to the spatial pattern of the landscape and illustrate a significant stage in national or global history.	-	x
Landscape Quality	5. Dynamically evolved landscapes. The process of evolution is reflected in the form and elements and features. The condition of landscape features and elements might be poor/declining/good.	x	x
	6. Landscapes shaped by unique, traditional distinctive agriculture and farming methods (in relation to the effective use of natural resources, adapted to the local environmental conditions) representative of a culture, which still contribute to the local economy.	x	x
	7. Agricultural plots part of a diverse land-use system	x	-
	8. Agricultural landscapes with significant ecosystem services	x	x
Landscape Value	9. Landscapes valued as a resource because they are rare	x	-
	10. Landscapes reflecting a particular cultural identity	x	x
	11. To be acknowledged by the public about their importance	x	x
	12. To be associated with invaluable local and traditional knowledge, ingenious adaptive technology, local traditional, cultural, spiritual, religious and social initiatives (e.g., agricultural events, festivals) and traditional management systems of natural resources.	x	x
	13. Presence of social organisations for the transfer of agricultural culture, implementation of educational activities and practices, institutions to share and transfer knowledge and technology	x	x
	14. To contain significant features of wildlife, earth science or archaeological or historic interest for in—situ conservation.	x	x
	15. Remarkable landscapes under dynamic conservation	x	-
	16. Globally significant biodiversity and genetic resources for food and agriculture and their importance for conservation	x	x
Proposed Criteria for Management of AHLs			
Landscape Aspect	17. The values of agricultural landscape heritage are retained, through a balance between people and the environment.	x	x
	18. Capable of recovering from natural disasters and changes in ecosystems of local traditional systems	-	-

	19. Mechanisms/networks that ensure that the agricultural landscape heritage is reliably inherited by future generations	x	x
Social Aspect	20. Governance through dialogue and agreement among key stakeholder	-	-
	21. Participation of various local stakeholders and development of a shared vision for the future	x	x
	22. In place initiatives to facilitate public participation	x	x
Legal Aspect	23. Laws support the maintenance of the territory potentialities and protection of landscape quality	-	-
Economic Aspect	24. Development of alternative forms of tourism (e.g., agrotourism)	x	x
	25. Brand name for the agricultural landscape and products	x	x
	26. Promotion of new business model associated with the Agricultural Heritage Landscapes	-	-

4.4. Food Systems as an Additional Dimension

4.4.1. The Danube Delta from a Food Systems Perspective

In the Danube Delta, fishing is a full-time occupation for traditional fishermen and a subsistence activity in most cases. The commercial aspect of fishing in this landscape is highly relevant, as in 2022, catches from inland waters across the country amounted to 62 tonnes (Eurofish International Organisation, 2023). While the exact numbers are lacking, it became apparent that nowadays, the fish caught in the Danube Delta is intended for internal consumption within the country, mainly by the locals and tourists (Năvodaru & Staraş, 1998). Nevertheless, a black market exists for sturgeons and caviar primarily for export, although it appears to be diminishing due to international sturgeon conservation efforts (Directorate-General for Maritime Affairs and Fisheries, 2023; WWF, 2019).

This paints the image that fishing in the Danube Delta is the initial step in a food system that is somewhat enclosed and concentrated around the Delta's geographic borders. Still, throughout history, exports and consumption on a larger scale were more prevalent. The overall fishing production fell from 6,500 tons in 1990 to 2,000 tons in 2022, and the internal fish consumption of the country fell from 96% provided by the socialist fleet catches to less than 10% share of domestic catches nowadays. The overthrow of the Communist regime (1989) and the post-socialist period ended overexploitation, with the subsequent designation of the site as a biosphere reserve initiating more conservation-focused management of the landscape (Nastase & Navodaru, 2023). However, its implementation lacked the integration of the human dimension, leaving a shortage of employment opportunities. Moreover, it can be argued that the economic crisis, low investments, and rapid deterioration of fishing gear and vessels incentivized people to leave the area, with the remaining population trying to make a living out of tourism (Damian, 2011).

Nowadays, besides the over 600 registered fishermen (Boja & Popescu, 2000), the entire population of the Delta is somewhat dependent on the fishing activity in the area and the fish foods, be it for commercial activities, sustenance, or work in the tourism sector preparing fish foods (Ivan, 2017). Thus, this food should be at the forefront of protecting the landscape and local livelihoods. Currently, there are no management strategies targeting food systems (such as sustainable waste management, which could be a great way to bridge the conservation efforts with the unemployment gap).

4.4.2. Rose-derived Products and Food Systems

The products obtained from the roses (such as rose jam, brandy, and oil) are mainly indented for export, with foreign markets in Japan, France, and the US being the leading destinations in the most recent published data (Labban & Thallaj, 2020). The organically produced oil is used in cosmetics, pharmaceutics, and medicine (Nenov et al., 2016). The demand for rose products has been increasing since the beginning of its cultivation in the area. However, the historical trends show a rise and fall in production in tandem with significant political and societal changes, such as the fall in output associated with the collapse of the Ottoman rule following the Russo-Turkish War in 1878 and the rise of the Communist Party post-World War II (Palairet, 1999). Nonetheless, whether the rose oil was intended for

the Ottoman world or the big cities of the current era, the landscape has proven to be part of a system that extends and impacts people on multiple continents, with the local farmers being a small fraction.

In 1849, Bulgaria produced 450 kg of rose oil; by 1881, production had increased to 1,450 kilograms. Data on overall production is lacking from 1941 to 1990, although various articles mention an increase in production in the 60s followed by a decrease in the last years of communism (1985-1989)(Kovacheva et al., 2010). The most recent numbers cover 1990 to 2008, showing an exponential increase in production associated with expanding rose fields (Vasileva et al., 2021). Although it suffered numerous changes, alternating between low and high production years, 2023 1,370 kg of oil were exported from Bulgaria (Hristova-Vladi, 2023), meaning the product is still in high demand. However, production is far lower than the historical peaks. Nevertheless, keeping up the numbers appears challenging as the changing climate and land degradation threats require more sustainable solutions (Yale Environment 360, 2024), including those that aim to tackle production as part of a broader system. Using rose biomass waste as antioxidant supplements and natural color stabilizers is one solution, even if it has yet to be implemented due to challenges regarding waste management investments (Shishkova et al., 2022).

While the extent of the two food systems mentioned varies, with the rose-derived products affecting a higher proportion of people involved in the middle parts of the food system (transport, storage, marketing, and processing) and a broader consumer demographic (although exact numbers are missing), it appears that the farmers are experiencing a similar degree of vulnerability in the face of climate change. In both of the analyzed scenarios, local economies and job markets depend on the landscapes, although it can be argued that local subsistence is also affected in the Delta. Nevertheless, this section underscores the urgent need for effective management strategies, the most prominent concerning waste, and highlights that the current methodology is insufficient in assessing different landscapes. Future steps should ensure local communities' livelihoods and maintain the commodities' global status, a difficult task in severe environmental changes.

5. DISCUSSION

5.1. Conserving Culture within a Landscape – Archaeology as the Link

The landscape's inhabitants are the primary actors in its protection, and its condition will primarily affect them (Fritz et al., 2019). Therefore, safeguarding and addressing their needs is critical to achieving sustainability. A dialogue among local and national stakeholders with diverse worldviews and types of knowledge must thus be initiated. A community linked by cultural heritage displays easier recovery after crises and is more socially cohesive (Granovetter, 2018). However, cultural heritage must be balanced by flexibility in the current context, with solutions built at the interface between modernity and tradition. Studies emphasize the necessity for innovation regarding fast-paced tourism, which has been regarded as an ecological threat (Luekveerawattana, 2024), with others supporting the study of heritage in formal higher education frameworks, aiming to promote the cultural inheritance and address modernization (Yan & Li, 2023).

Education for the entire community, especially regarding the history and archaeology of the landscape, traditions, and food, could be a highly accessible solution. In the Danube Delta, where most of the community is rural and lacks extensive financial resources, education programs focused on the link between landscape and heritage could encourage responsible action regarding daily activities (e.g., understanding the balance between people and environment would foster collaboration for sustainable solutions and would potentially dissuade inhabitants from partaking in illegal fishing) (Dorondel & Mitroi, 2017). Educational programs could encourage proactive community involvement in the Rose Valley, where there is higher anthropogenic input due to the mix of urban and rural populations. For instance, implementing a more diverse land use system based on the landscape existing before the roses could enhance biodiversity and increase pest resistance.

Implementing educational activities as such was proven to help locals overcome barriers and address critical issues regarding adaptive planning (Galan et al., 2023). However, more research is needed to assess how well a community in tune with its heritage can be assertive towards ruling bodies; relevant case studies in Europe have yet to be investigated through this lens. For the AHL framework to succeed and generate the impact it aspires to, it requires as much robust research into the past as it does in the

present, making archaeology, especially environmental archaeology, a valuable link between culture and landscape.

5.2. Current Policies – Inclusion of Archaeology and Heritage

Understanding modern policy dynamics is essential to contextualizing how heritage and archaeology have been incorporated into current legislation and regional development strategies. The SGDs included agricultural landscapes in Goal 2 (United Nations, 2022), advocating for protecting small-scale food producers, particularly Indigenous people, family farmers, women, and fishers, while maintaining ecosystems and genetic diversity of crops, animals, and wild species (Fritz et al., 2019). Besides the UN SGDs, various other programs target the conservation and management of landscapes, such as the Common Agricultural Policy (CAP), which is a partnership between Europe and its farmers, setting ambitious goals such as securing a worthy economic future as well as maintaining the place of agriculture in Europe's heart and ensuring climate and environmental action (Paun & Ivascu, 2021). To implement the SDGs proposed by the UN, the European Commission (EC) adopted the EU Strategy on Adaptation to Climate Change in 2021, setting out how EU countries can adapt and become climate-neutral by 2050.

The SGDs, European Green Deal, and CAP support agricultural landscapes as the path to an ecologically viable future for our planet. However, no initiative links the cultural element (traditional farming practices) to the broader ecological implications, meaning novel initiatives that combine the two must be created. The HEREIN network is another tool that helps track progress across Balkan countries (Council of Europe, 2021), revealing that financing cultural heritage preservation and more administrative capacity in conservation remains an outstanding problem. For example, the latest report for all Balkan countries shows that no registered competent government authorities or organizations have legal responsibility for landscape heritage policy and management.

In the case of the Danube Delta and Rose Valley, NGOs and various local initiatives support the propagation of traditions, and governmental support could boost their success and amplify their message (Escallón, 2020). While it shows that locals self-initiate action, it might be insufficient when facing extraordinary threats such as climate change or even the economic displacement and environmental degradation that high-influx tourism could bring (Luekveerawattana, 2024). Nevertheless, the present paper has shown that the connection to agricultural heritage, expressed through celebrations, tools, and food, plays a critical role in the lives of the locals and beyond, being a valuable aspect of world heritage yet so fragile in the current context. Complex challenges like the climate crisis require interdisciplinary solutions tailored to individual communities and landscapes, which could be better understood through the study of the past. Hence, archaeology and heritage studies can make a real-life difference if included in policy frameworks.

5.3. Limitations and Future Directions

Essential follow-up questions highlight the limitations of the current research, with the most prominent one being the methodology. Moreover, if the sites succeed in being integrated into initiatives such as the GIAHS, how would the change materialize in the landscape and local livelihoods? What is the most efficient way of translating academic thought into real-life scenarios?

While the initial methodology represents a first attempt to assess holistically a landscape and, to a certain extent, succeeds in its scope, limitations became apparent during site analysis. Firstly, subjectivity might be considered an issue when applying LCA (Terkenli et al., 2021), as landscape quality and value (aesthetic and cultural significance) could mean various things to different assessors. Secondly, methods do not account for a "time-depth" perspective regarding culture and landscapes as they evolve, missing valuable potential management strategies, which is the same with food systems.

The accuracy of the analysis relies heavily on quality data, which could be compromised by outdated, incomplete, biased sources or limited availability in different languages (Griffiths, 2018). As this article is an extensive literature review, the quality of the data available is quintessential to ensuring reliable representation. Although there is some documentation of traditions and crafts, it does appear to be limited to tourism literature and created for such purposes. In this regard, a more objective perspective could be achieved by conducting fieldwork investigations to document tourism and other activities. Moreover, the methodology is quite limited by the theoretical aspect of its framework. Fieldwork is not a

required aspect of characterizing the landscape, which could be considered a limitation due to the abovementioned gaps in literature. Thus, fieldwork and ethnographic research should become essential to a revised methodology.

Moreover, the baseline methodology does not offer a comprehensive definition of what traditional agriculture entails; for how long does a tradition have to exist before it becomes heritage? A landscape's maximum or minimum size is not appropriately defined, leading to the potential selection of evidence. Another shortcoming can arise from focusing on one type of heritage, such as fishing in the Danube Delta, despite the likely existence of multiple lines of agricultural heritage (gardening and breeding cattle). This emphasis on precision in definitions is crucial to ensuring as much objectivity as possible. Moreover, integrating and comparing other landscape assessment methods, such as the Living Landscape approach (Warnock & Griffiths, 2015), could emphasize the introduction of wildlife in inhabited regions. In addition to objectivity, this analysis is purely qualitative, with the addition of the food systems dimension aiming to offer a quantitative side. Nevertheless, incomplete datasets and a lack of pre-existing interest in compiling economic and environmental data from these specific landscapes make creating a reliable timeline difficult.

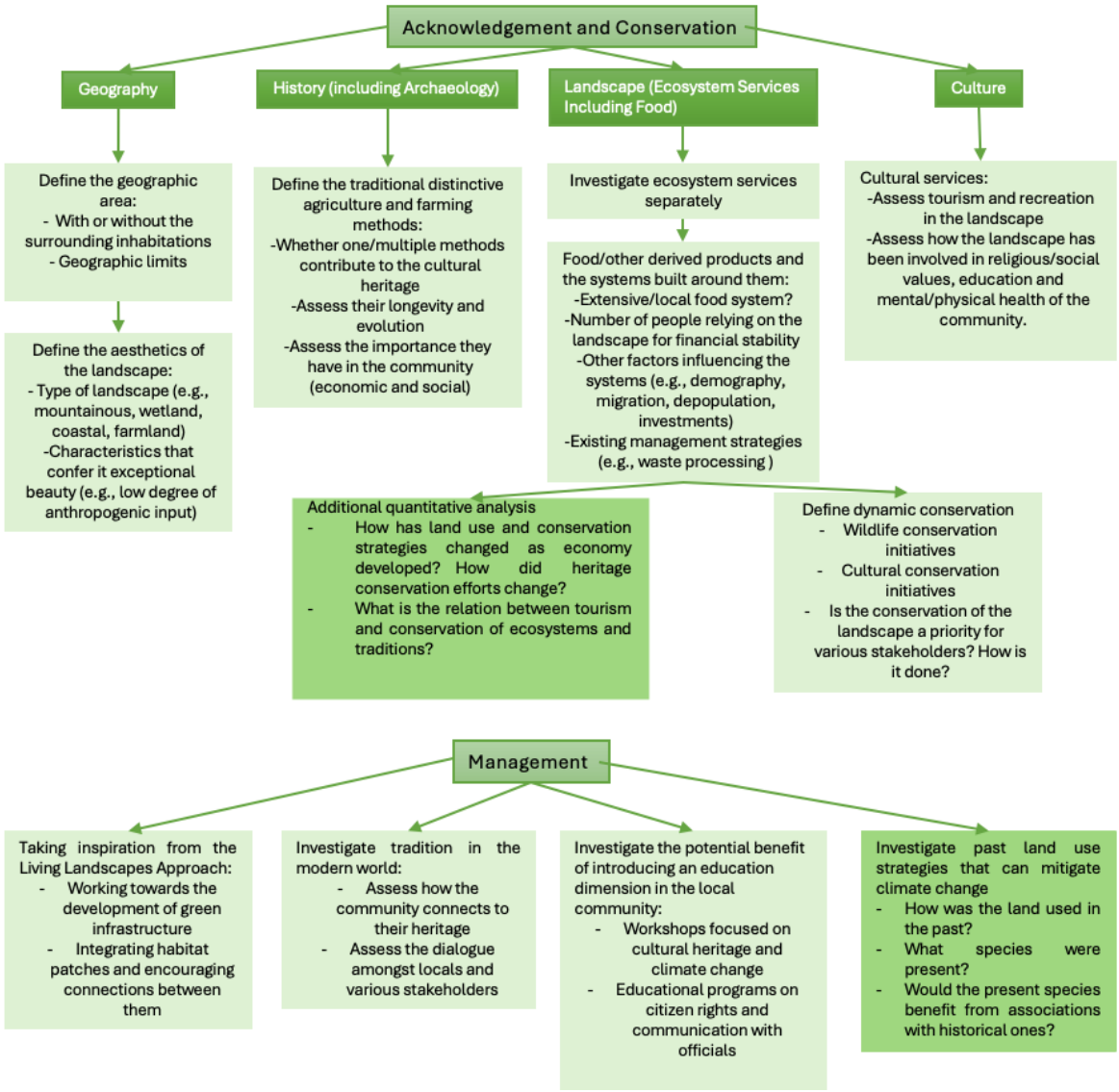

Figure 9. Proposed areas of expansion in the methodology and their associated sections (either belonging to the acknowledgment and conservation part of the framework or the management strategies proposed).
Source: Made by the author.

The literature revealed gaps in addressing essential aspects of landscape characterization. As this is the first study to reveal the history—both natural and in terms of traditions—of the concerned landscapes, its main contribution to the scientific world is revealing the gaps in knowledge that could be addressed through fieldwork and the potential limitations of the current frameworks aimed at protecting these landscapes. The major limitation of the present study is that it gave a general overview of the area but not a focused and detailed study of the different communities inhabiting the landscapes. Future research could focus on conducting more in-depth analyses and adopting a comparative approach to exploring the differences and similarities between landscapes and the practices of their respective communities, as these aspects could alter potential mitigation strategies.

Initiatives such as GIAHS do not offer financial incentives but promote intervention strategies at the global, national, and local/site levels (FAO, 2022), which crystallize into capacity-building workshops for local farmers and government bodies. This aligns with the follow-up education action proposed above. However, it offers a partial solution to the current issues, such as lack of policy, funding, or developing strategies in partnership with experts on local heritage. Nonetheless, communication between governing bodies and locals and ethnographic research could help identify where modernity must meet tradition, whether it is crystallized in modern housing retaining traditional elements or modern tools inspired by traditional ones. Given all these, a revised methodology that should address the abovementioned limitations must be created. Recommendations regarding the expansion of each section are presented in Figure 9.

6. CONCLUSIONS

The present analysis illuminates critical points concerning heritage landscape management. The case studies of the traditional fishing villages in the Danube Delta, Romania, and the tradition of oil production in the Rose Valley, Bulgaria, raise many follow-up questions that can potentially transform the trajectory of climate change mitigation and resilience, especially in rural areas. While both sites could be categorized as AHLs due to their qualities, presented in the results section, this is simply the first step toward their management. The objectives have been achieved (characterizing the landscape, including an additional dimension in the form of food systems, and highlighting the limitations of current frameworks), with the major implication being that the present study represents the first attempt at introducing archaeology into climate policy by protecting agricultural heritage. Another novelty component is that the present study is the first academic attempt at compiling the literature describing the traditions and landscapes. However, it reveals the need for ethnographic inquiry and fieldwork characterizations, as the literature presents outdated, inconsistent findings in most cases.

Recognizing and investigating invaluable landscapes and heritage in academic discourse is the first implication of this study. In the case of the Danube Delta, the heritage built around fishing requires a cohesive history, with material culture being underrepresented and ethnographic investigations focused mainly on describing the objects. On the other hand, the Valley of Roses does not present mechanisms that ensure the reliable inheritance of these traditions or investigations into the region's biodiversity and past land use. Both landscapes should have more dialogue between the governing bodies and the inhabitants and could suffer negative impacts related to high tourism levels, such as the landscape's overexploitation. Further archaeological and ethnographic inquiries could help uncover the history of cultural heritage and how modern communities connect to it. This is of utmost relevance if heritage should be included in the broader climate discourse: heritage can only be preserved if understood.

Moreover, this is the first study to advocate internationally for the conservation of agricultural heritage in the two landscapes analyzed, assessing the tangible and intangible cultural heritage associated with them. It highlights the potential positive impact on policy and rural development that applying innovative associations between culture and nature could have. It encourages the development of legislation bridging tradition and nature and for competent authorities to act, as balancing the two opens the possibility of boosting resilience and social cohesion in a changing climate. The current legislative frameworks strongly advocate for better farming and rural conditions, although most of the practical work is done by NGOs, with no competent authorities protecting heritage. A third point of extreme relevance is a novel methodology that overcomes the shortcomings of the initial one (subjectivity, vagueness, lack of multiple dimensions such as food).

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