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# Studying and visualising the routes taken by Sarakatsani in the western part of Greece based on oral witnesses

*Summary:* The Sarakatsani are an ethnic population group of Greece, whose origin can be traced back to the ancient Dorian tribes that inhabited the mainland of Greece. Historically, they were located in mountain ranges in continental Greece, mainly in the Pindus mountains and they were traditionally transhumant shepherds. Their social organisation was structured into "tseligkata", governed by a leader, who was responsible for their movement, housing, profit sharing, as well as for the education of their members. Tseligkata had two places of residence, closely linked to pastoralism: during the winter, they dwelled in the lowlands, while during the summer, they migrated to the mountainous regions of the country. Until the mid-20th century, the Sarakatsani were scattered in many parts of Greece, with those of the northern Greek regions moving frequently for the summer months to neighbouring countries, such as Albania, southern Yugoslavia, Bulgaria and East Thrace in Turkey. Nowadays, most Sarakatsani have abandoned the transhumant way of life and have been urbanised. The history of Sarakatsani is based mainly on oral tradition, wherein knowledge, art, ideas and cultural material are received, preserved, and transmitted orally from one generation to another.

In this paper, we will try to document and visualise routes used by these people for their movement from one place to the other in the previous century and we will study respective changes on these routes caused by the evolution of technological means, based on interviews with eyewitnesses who experienced this nomadic life. The recorded information will be organised and connected to the specific places traversed by the caravans on a geographic information system, through which it will be also visualised providing more information and explaining the selection of the specific routes on each case based on the topography and the natural characteristics of the terrain.

## Introduction

The Sarakatsani are a Greek nomadic tribe originating from the ancient Dorian tribes. Their name's origin is unclear, with many theories existing, none of which can be proven definitively. Their homelands were in the mountainous Pindus range. By the 1950s-1960s, the Sarakatsani began gradually their settlement in permanent bases, buying land, and engaging in agriculture and animal husbandry, with many of the younger generations pursuing various professions.

The Sarakatsani had to move en masse twice a year. The first migration occurred in mid-April, moving from the lowlands (winter pastures) to the mountainous areas. In mid to late October, they would move back from the mountains (summer pastures) to the lowlands. This process was repeated annually, mainly due to their pastoral profession.

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Specifically, Sarakatsani families moved with all their flocks of sheep, lambs, and goats. In summer, the lowland pastures did not have sufficient vegetation to feed their large flocks, and the high temperatures were detrimental to the animals. Therefore, they moved to the mountainous regions of mainland Greece, which offered abundant grazing and cooler temperatures. Conversely, in autumn, when temperatures in the mountains dropped, they moved back to the lowlands where winter conditions were more favourable for their flocks. The place to which they moved to spend the summer months often changed, depending on the pastures the chief could secure for grazing. In contrast, the place where they stayed during the winter was mostly the same every year (Carsten, 2006).

The Sarakatsani migrations were particularly challenging, especially before the advent of mechanized transport. Their journeys usually lasted two weeks, choosing routes with accessible stops for overnight stays and places to feed and water their flocks. Migrations were conducted collectively in tseligkata, consisting of many families led by a chief called tselingas. Among his duties was finding pastures, securing supplies, and managing the trade of the goods produced by the tseligato community (Hatzimichali 1957 (2007); Kavadias 1991). Each family carried all their belongings on pack animals like mules and horses.

The daily process of moving began at dawn, when they woke up to milk the sheep, and then set off for the next stop of their journey, ahead of the rest of the group. The shepherds started first, as the flocks moved slowly, grazing along the way. They were followed by the elderly, the children, and a group of young animals that could not walk at the pace of the main flock. Finally, the young adults who dismantled the camp, loaded the belongings onto pack animals, and set off for the next stop. Upon their arrival, they would set up tents, light fires, and prepare food. This process was repeated daily until they reached the place where they would stay for the next few months (Hatzimichali 1957 (2007)).

## Purpose of the study

The Sarakatsani, a distinct ethnic group within Greece, lack a written historical record. Existing literature concerning their culture and traditions stems primarily from the initiatives of various researchers, both domestic and international, who have endeavoured to document their knowledge and experiences. The rich traditions, customs, and cultural practices of the Sarakatsani have traditionally been transmitted orally from elder generations to younger ones through narratives, teachings, and songs that vividly recount their nomadic lifestyle.

Over the years, as the Sarakatsani increasingly abandoned their nomadic way of life, many of these invaluable stories have been lost, particularly as the elder members of the community who once lived this lifestyle have passed away. Consequently, it has become imperative to preserve the narratives of their nomadic existence, the routes they traversed, and the motivations behind these migrations. This study is grounded on interviews with Ioannis Nanas, a retired shepherd who maintained the nomadic lifestyle until 2001, and Dimitris Boutlas, an architect who experienced the nomadic traditions of his parents during his childhood.

The primary objective of this research is to meticulously map and document the migratory routes undertaken by the Sarakatsani nomads, utilizing Geographic Information Systems (GIS) for spatial analysis. Previous research on Sarakatsani migration has predominantly focused on ethnographic or historical perspectives. However, this study pioneers a geospatial approach, providing an unprecedented visual and analytical representation of their movement patterns. By employing GIS technology, this research not only captures the physical pathways traversed by the nomads but also

offers insights into the geographical, environmental, and logistical factors that influenced their traditional way of life.

This study is particularly groundbreaking, as it represents one of the first comprehensive recording and analysis of the routes followed by Sarakatsani caravans, which encompass the entirety of their seasonal migrations, extending from the lowland plains, where they resided during the winter months, to the mountainous regions they inhabited during the summer.

This work is anticipated to make significant contributions to the fields of cultural geography, anthropology, and historical cartography by preserving and visualizing a crucial aspect of the Sarakatsani's migratory heritage. In doing so, it not only honours the memory of this unique nomadic group but also enriches our understanding of their cultural significance within the broader context of Greece's rural history.

## Methodology

The methodology section outlines the processes and techniques used to collect, document, and analyse the data on Sarakatsani routes and it is based on the cartographic procedure (Boutoura, 2015; Livieratos 1989, 2006; Tsorlini, 2019) and methodology we followed on other similar studies the previous years (Boutoura et al, 2006; Tsorlini et al., 2016, 2017, 2021, 2023; Voulgarakis et al., 2019). In this study particularly, interviews were conducted and the oral histories were transcribed so that the described routes visualised on maps using GIS technology. The goal is to create a comprehensive visual representation of the Sarakatsani's migratory patterns and understand the factors influencing their route choices.

The first step was the *data collection process*, which commenced with the scheduling of in-person interviews, arranged at pre-determined times to ensure thorough preparation and organization. These interviews were conducted in a semi-structured format, utilizing a set of guiding questions designed to provide direction while allowing for a conversational flow between the interviewer and the interviewee. This approach facilitated a more natural and detailed exchange of information. Each interview session was fully recorded to ensure that all responses and insights were accurately captured for subsequent analysis.
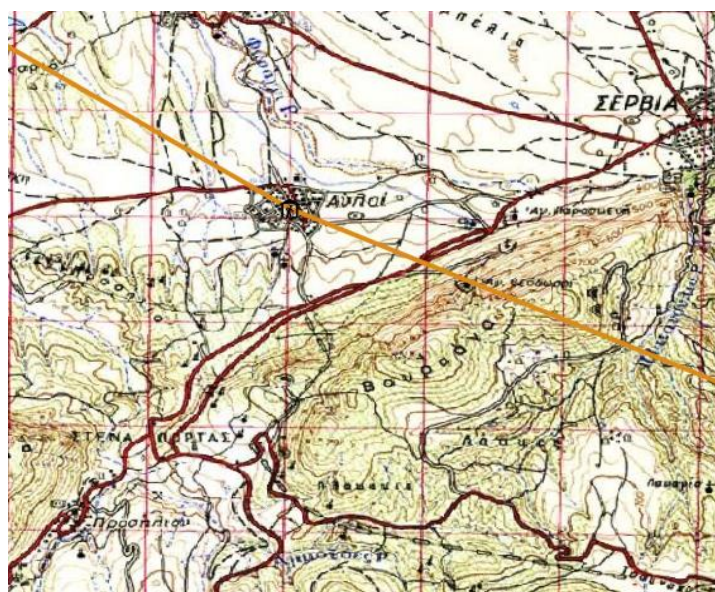


Figure 1: Part of diagram Livaderon, in scale 1:50,000 by the Hellenic Military Geographical Service

Following the completion of the interviews, the next step involved *the transcription of the recorded conversations*. This meticulous transcription process ensured that the qualitative data obtained during the interviews was fully documented and preserved for further examination. Additionally, a comprehensive review of relevant literature was undertaken to provide supplementary context and background information, enriching the understanding of the subject matter. An essential aspect of this phase was the identification of the geographical locations mentioned by the interviewees, many of which had become obscure or were no longer in use. Due to the passage of time, several place names referenced during the interviews had fallen into disuse, making it necessary to consult external resources. To accurately locate these sites, topographical diagrams in scale 1:50,000 by the Hellenic Military Geographical Service were georeferenced and carefully examined (Figure 1). This cartographic analysis was crucial in correlating historical place names with their modern equivalents. Furthermore, the input of local residents proved invaluable, as many older place names had been preserved in oral tradition and continued to be used colloquially within local communities. Their contributions greatly facilitated the accurate identification of these locations, ensuring that the historical data gathered could be anchored to precise geographical coordinates.

Upon identifying the place names, the subsequent phase involved *the determination of the migratory routes*. The most complex route to map was the one undertaken on foot, as it required reconstruction based on oral testimonies and educated assumptions regarding the movement patterns between various water sources. This reconstruction process necessitated logical deductions, including the identification of potential crossings over mountain ranges through established passes, which would have been utilized by the nomadic groups during their travels.

In contrast, the routes employed for transportation via freight vehicles were more readily established, as they primarily followed the old road network. These thoroughfares largely correspond to the historical pathways taken during the migrations, facilitating a clearer understanding of the logistics involved in the movement of livestock and supplies.

| ΣΤΑΘΜΟΣ ΕΚΚΙΝΗΣΗΣ | ΔΙΑΔΡΟΜΗ | ΤΟΠΟΘΕΣΙΑ | φ | λ | GOOGLE MAPS | ΠΛΗΡΟΦΟΡΙΕΣ | ΣΥΜΠΛΗΡΩΜΑΤΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ |
|---|---|---|---|---|---|---|---|
| ΛΑΡΙΣΑ | Λουτρό Λάρισας | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 39.544713 | 22.209222 | https://maps.app.goo.gl/ZyKUo2W6NjUMdYKV9 | ΣΤΑΘΜΟΣ ΕΚΚΙΝΗΣΗΣ | Η εκκίνηση γινόταν συνήθως το 1ο 10ημερο του Απριλίου όταν πήγαιναν με τα πόδια. Η διαδρομή διαρκούσε περίπου 15 μέρες. Από εκεί μέχρι την Μάνδρα όπου ήταν και η 1η στάση τους, ο Μπάρμπα Γιάννης λέει ότι ήταν περίπου 10 χλμ |
| | Μάνδρα | | 39.615334 | 22.26049 | | 1ος Σταθμός (Κονάκι) | Παλιά ονομασία Θωαμή. Στο 1ο κονάκι ενώνονταν μαζί τους και άλλες οικογένειες από τον Αλμυρό και τα Φάρσαλα και συνέχιζαν μαζί το ταξίδι για τα χειμαδιά |
| | Δαμάση | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 39.712204 | 22.186399 | https://maps.app.goo.gl/D9vzp2TjEswg1dps5 | 2ος Σταθμός (Κονάκι) | Περνούσαν ποτάμι και έφταναν Δαμάσι |
| | Μεσοχώρι | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 39.747975 | 22.103456 | https://maps.app.goo.gl/vXYXcKpp96aafRj2A | 3ος Σταθμός (Κονάκι) | |
| | Γαλανόβρυση | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 39.847059 | 22.17366 | https://maps.app.goo.gl/2kbctvjFtkMgyWJ66 | 4ος Σταθμός (Κονάκι) | |
| | Ελασσόνα | Πλακόπετρες (στην κορυφή μετά από την Ελασσόνα) | | | | 5ος Σταθμός (Κονάκι) | |
| | Χάνι Χατζηγώγου | - | 40.024638 | 22.109029 | https://maps.app.goo.gl/YhWmVJBtph8bZbeZ6 | 6ος Σταθμός (Κονάκι) | |
| | Πλησίον Σαρανταπόρου | Βίγλα (προς το Σαραντάπορο δίπλα στο βουνό) | | | | 7ος Σταθμός (Κονάκι) | Για να φτάσουν στην τοποθεσία Βίγλα, ανέβαιναν από το Χάνι Χατζηγώγου δεξιά από το Σαραντάπορο. Περνούσαν κάτω από το βουνό δίπλα από το ποτάμι όπου και σταματούσαν |
| | - | Παλάτι Βασιλειά | | | | 8ος Σταθμός (Κονάκι) | Ανάμεσα στην Λάβα και την Βίγλα βρίσκεται η τοποθεσία Παλάτι του Βασιλειά. |
| | Λάβα | Λαβανίτσα | 40.154178 | 22.019705 | https://maps.app.goo.gl/DSfdimiVxJ5hetN69 | 9ος Σταθμός (Κονάκι) | |
| | Αυλές | - | | | https://maps.app.goo.gl/GJajLLFFJ5EhF88q9 | 10ος Σταθμός (Κονάκι) | Από εκεί, έβρισκαν ένα αβαθές σημείο για να διαβούν με τα κοπάδια τον Αλιάκμονα |
| | Κρόκος Κοζάνης | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 40.177759 | 21.962231 | https://maps.app.goo.gl/Km9wdSfsT72Dc3i78 | 11ος Σταθμός (Κονάκι) | Παιρνούσαν δεξία έξω από τον οικισμό |
| | Δρέπανο Κοζάνης | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 40.349704 | 21.834093 | https://maps.app.goo.gl/FXYXtP3pwDZLb37n8 | 12ος Σταθμός (Κονάκι) | |
| | Αγ. Δημήτριος | - | 40.413347 | 21.925308 | https://maps.app.goo.gl/FHjU1dnhRDZUEC846 | 13ος Σταθμός (Κονάκι) | |
| | Ακρινή | ΕΚΤΟΣ ΟΙΚΙΣΜΟΎ | 40.434773 | 21.905888 | https://maps.app.goo.gl/YThziar2Gz63mRC2A | 14ος Σταθμός (Κονάκι) | |
| | Βέρμιο | Καρά Τσαΐρ | | | | ΤΕΛΙΚΟΣ ΠΡΟΟΡΙΣΜΟΣ | Ονομασία του λιβαδιού στο οποίο κατέληξαν |

Figure 2: Database created in Microsoft Excel

Finally, the most straightforward route to ascertain was that of the railway, as this segment of the rail network has remained largely intact over the years. The continuity of the railway infrastructure provided a reliable means of mapping the transport routes, allowing for a clearer representation of how the Sarakatsani and other pastoral groups may have utilized this mode of transportation in conjunction with their traditional migratory practices. This multifaceted approach to route identification not only enhances the accuracy of the mappings but also provides deeper insight into the logistical considerations that shaped the migratory patterns of the Sarakatsani community.



Figure 3: Digitized route in Qgis environment over Openstreetmap background and georeferenced topographical diagrams

Following the completion of the previous processes, the next step was the *data digitisation and processing* (Figure 3). The qualitative data gathered from these interviews were meticulously organized and processed using Microsoft Excel before being integrated into a Geographic Information System (GIS) for spatial analysis (Figure 2). The data were digitized within the QGIS

environment, employing the UTM Zone 34N global projection system to ensure accurate spatial representation. For this digitization process, cartographic backgrounds were sourced from the orthophotomaps viewing WMS provided by the Hellenic Cadastre, which facilitated a comprehensive visual context for the mapped routes.

The routes corresponding to the old national road network and the railway network were extracted from the geofabrik.de service of OpenStreetMap. This resource offered detailed and reliable geographic information that was essential for accurately representing the pathways utilized during the migrations. Each route, along with its associated locations, was subsequently exported in shapefile format, a widely recognized vector data format used in geographic information systems.

This export allowed the seamless transfer of the digitized data into the ArcGIS Online environment, where further analysis and visualization were conducted. The integration of these datasets within ArcGIS Online not only enhances accessibility but also facilitates the sharing of the cartographic representations with a broader audience, thereby promoting a deeper understanding of the migratory routes and practices of the Sarakatsani community.

Within the ArcGIS Online environment, a topographic background was selected to provide a comprehensive visual context for the mapping project. Subsequently, five distinct maps were created to illustrate the migratory routes and significant locations pertinent to the Sarakatsani nomadic lifestyle. Each entity within the shapefile representing the locations is supplemented with detailed information concerning the area's relevance to the movements and routines of the caravans. This includes contextual data about the various stopping points and resources utilized by the nomadic groups during their migrations. Additionally, the maps incorporate photographs that capture distinctive features of the Sarakatsani's nomadic lifestyle, enhancing the visual narrative of their cultural heritage. These elements are made accessible through an interactive pop-up application, which allows users to select specific points of interest within the locations layer. By clicking on these points, users can explore the associated information and images, thereby fostering a more engaging and informative experience (Figure 4). This interactive approach not only aids in the understanding of the historical and cultural significance of the routes taken by the Sarakatsani but also promotes broader public interest and appreciation for their rich nomadic heritage.
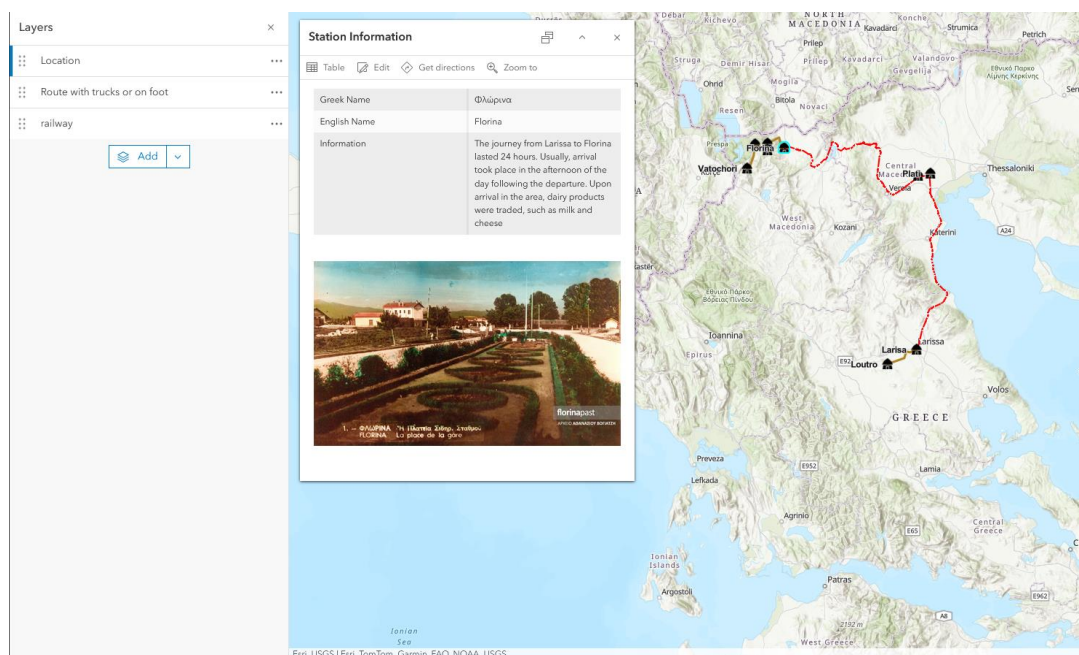


Figure 4: Part of a map created in ArcGIS Online

The data gathered from the ArcGIS Online platform were utilized to *develop story maps* (Figure 5), designed to make the mapping of the migration routes more accessible and comprehensible for the general reader. This approach enhances the visualization of the routes, allowing for an easier understanding of the Sarakatsani's migratory patterns and lifestyle.

The movement to Florina region was conducted using motorized vehicles to transport only the flocks while families of the tseligkato followed on foot. Specifically, all the goats and sheep were loaded onto commercial trains from Larissa to Florina, after which they continued the journey on foot. This method significantly reduced travel time, allowing the departure date to be shifted from early to late April. Similarly, the return from the mountains was postponed, typically until late October or early November, as the shortened journey permitted a later departure. This timing adjustment was also driven by economic considerations, as delaying the move to the plains provided additional grazing opportunities for the flocks.
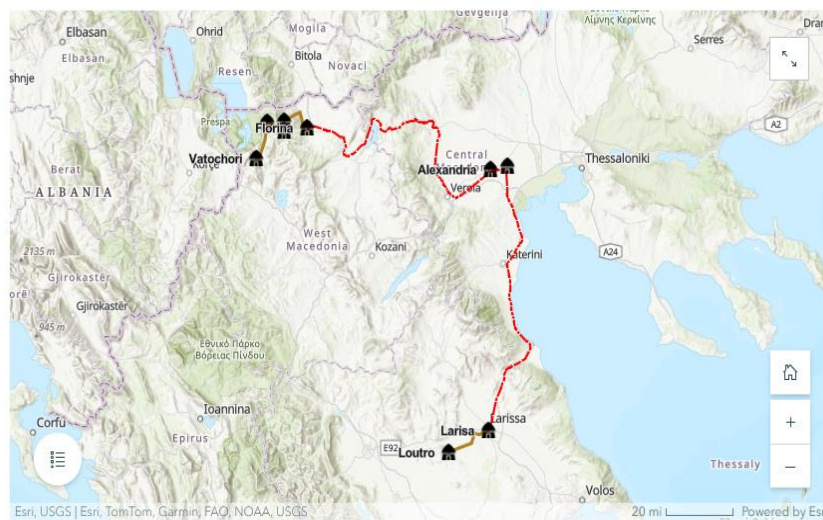


Route from Larissa to Mountain Varnountas

Figure 5: Part of a story map created

## Results

The information gathered from the interviews pertains to two primary routes. The first route extends from the region of Larissa to Mount Vermio, which was the path followed by the tseligkato to which I. Nanas belonged between 1940 and 1944, including its return journey. The second route involves the movement from the Larissa region to the mountains of Florina, specifically to Agios Germanos. It is important to note that I. Nanas and D. Boutlas were part of two distinct tseligkata, each with different starting points and routes, though they ultimately arrived in the same general area, albeit in different locations. The movement to and from Florina region was conducted using motorized vehicles to transport both the flocks and families of the two tseligkata. Specifically, all the goats and sheep were loaded onto commercial trains from Larissa to Florina, after which they continued the journey on foot. This method significantly reduced travel time, allowing the departure date to be shifted from early to late April. Similarly, the return from the mountains was postponed, typically until late October or early November, as the shortened journey permitted a later departure. This timing adjustment was also driven by economic considerations, as delaying the move to the plains provided additional grazing opportunities for the flocks.

It should be noted that some of the locations mentioned in the interviews could not be precisely identified and were instead approximated. This approximation was based on the routes of movement, the areas selected for overnight stays, and the topographical features of the landscape. Additionally, it is possible that the mentioned toponyms were not the official ones, but rather informal names used by the Sarakatsani community for clearer communication among themselves.

*1st Map: Road from Loutro Larisas to Mount Bermio (from 1940 to 1944)*

In the first map (Figure 6), the depicted route is tracing the movement of a particular Sarakatsani group from the Thessalian plain to the mountains, specifically toward Mount Vermio, at least from 1940 to 1944, based on the interviewed person's witness[4]. The migration occurring in the form of a caravan, involving the entire shepherd community, including families, elders, and herds, all traveling on foot. The journey typically commenced in the first ten days of April.
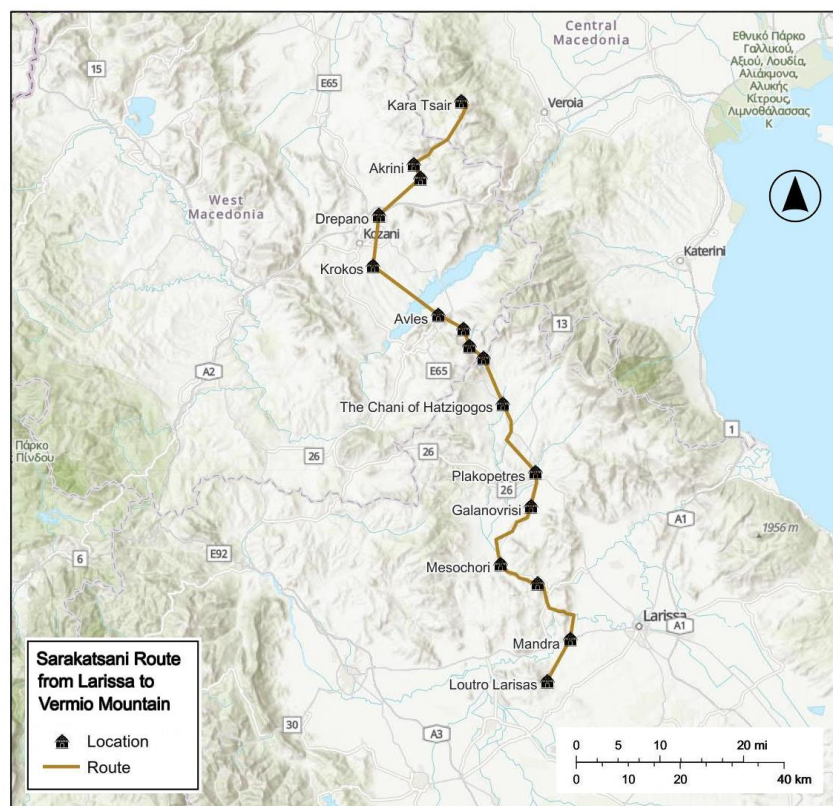


Figure 6: Map showing the route taken from the village of Loutro in Larisas to Mount Bermio.

The map illustrates the route followed by the caravan, based on the interviews taken by a member of this caravan. The brown line represents the path and symbols of huts mark the locations where the caravan made overnight stops. These stops were identified using place names mentioned in the interview, which were later mapped. However, as mentioned before, it is important to note that some of the place names could not be precisely located, so their positions are approximated. This is partly because the Sarakatsani often used their own toponyms, rooted in their traditions, making it difficult to find exact matches. The approximate locations were determined based on the area's topography, as it is known that the caravan selected areas near water sources for overnight stays.

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[4] https://storymaps.arcgis.com/stories/42855ae160b0414eb812ba8c2c3a8f98

In this case, the journey started from Loutro, a village close to Larissa. At Mandra, the first stop, other families joined the caravan to continue the journey together towards the mountains. The caravan typically covered 10-15 kilometres each day, moving to the next resting and overnight stop (known by the Sarakatsani as konaki[5]). A notable detail is that these stops were always made outside of established settlements, where the group would set up tents for the night. As shown on the map, the journey lasted approximately 15 days, with the final destination being the mountainous region of Vermio. Specifically, I. Nana's shepherd community settled in the Kará Tsair meadow. It is also important to mention that the artificial Polyfytos lake of Aliakmon riven depicted on the map didn't exist at that time. The caravans were crossing the river from its shallow points.

*2nd & 3rd Map: Road from Loutro Larisas to Agios Germanos and back (from 1950 to 2001)*

The next two maps depict the route followed by the same shepherd moving from the Thessalian plain to the region of Agios Germanos in Florina, and specifically at Mountain Barnoudas. By the 1950's, the use of motorized vehicles for transporting large loads had become common practice. Consequently, the herds were transported by train, while the families continued the journey in a caravan style. The reduced travel time due to the use of trains allowed the departure date to be shifted to the end of April.
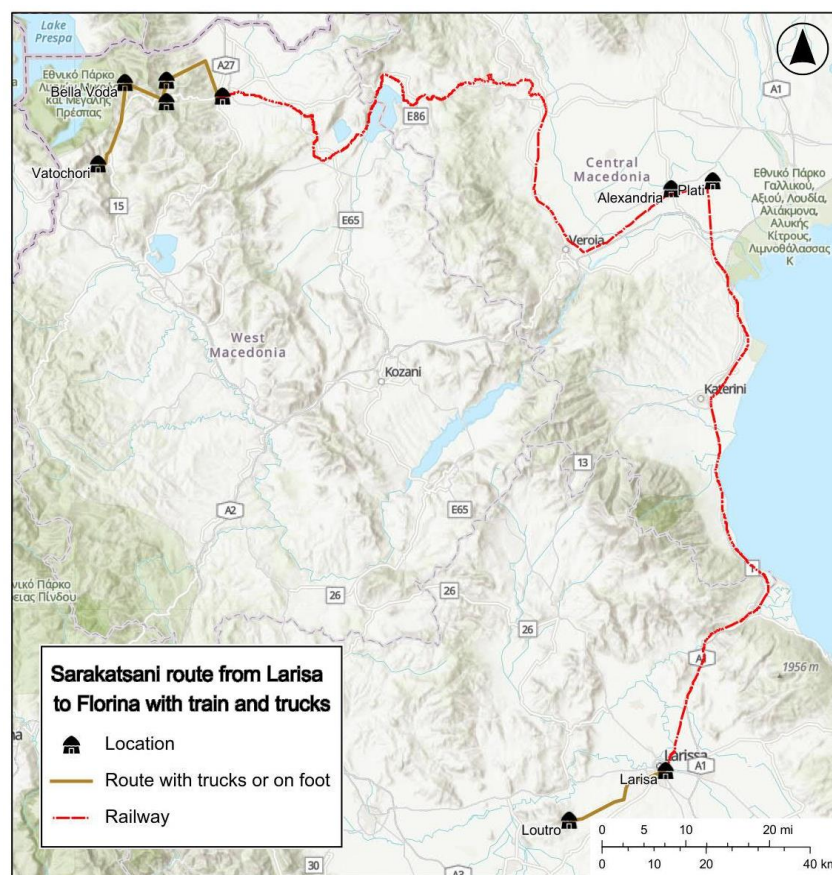


Figure 7: Map showing the route taken from village Loutro in Larisa to Mount Varnoudas in western Macedonia.

The second map (Figure 7) illustrates the route followed by the herds, accompanied by the necessary men responsible for their care, from Loutro, Larissa, to the mountains, including Ioannis Nanas

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[5] Konaki: term, with which Sarakatsani meant both the place that will be their next overnight stop and the place that they will make their permanent camp when they arrive at their destination.

himself[6]. The brown line represents the part of the journey that the men and the herds travelled on foot and then, the railway route is depicted, showing where the journey continued with freight trains that transported the herds. Symbols of huts mark the locations where the group stopped for overnight stays along the way. The journey from the village of Loutro to the city of Larissa and its railway station took approximately half a day. Upon arrival in the afternoon, the herds were loaded onto freight cars, and the 24-hour journey to the city of Florina began. During the train ride, the shepherds moved between the train cars whenever possible to milk the animals, as they could not go an entire day without doing so. Once they arrived at the Florina station, they spent the night on its outskirts before continuing the journey to the mountains. This final leg of the journey took around three days. The ultimate destination of this route according to Ioannis Nanas's witness, was the Bella Voda area, where they settled, while the herds grazed in the meadows of Bella Voda, Yovanitsa, and Siroka.
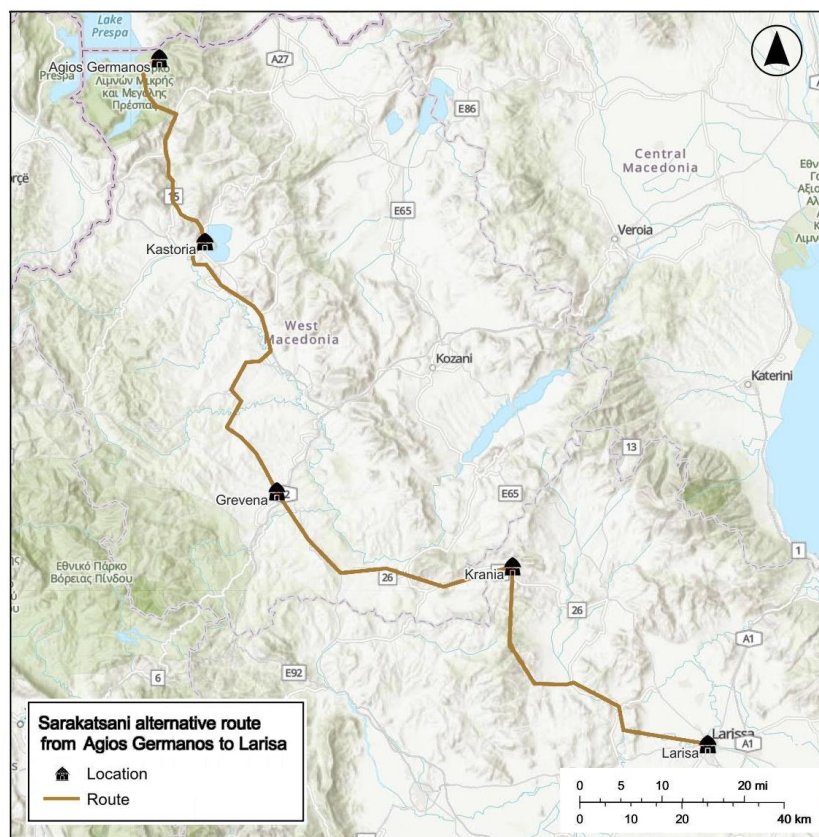


Figure 8: Map showing the return route taken from Mount Varnoudas to the city of Larisa.

From Mountain Varnoudas, the herds, accompanied by the shepherds, would commence their journey back to the lowlands around mid to late October (Figure 8)[7]. The timing of their departure was directly influenced by the prevailing weather conditions and the availability of food for the goats and sheep. Families typically departed earlier, around mid-September, as their return journey in caravan form required more time. Moreover, they aimed to start the school year, with the intention of sending their children to school. The shepherds remained in the mountains for as long as possible, aiming to conserve food supplies in the lowlands for the winter period. The return journey was undertaken on foot, with the herds grazing along the way. This approach allowed the

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[6] https://storymaps.arcgis.com/stories/f3a49a6e877942588f4585d27134dc9d
[7] https://storymaps.arcgis.com/stories/1d05d22adfe74661ad1fced35e16feb9

shepherds to feed their flocks for several additional days until they reached their winter grazing grounds. The return trip could last up to a month. A notable change during this journey was that they passed through larger settlements and stayed near these areas to acquire food, as they no longer had families accompanying them to assist in meeting the shepherds' needs.

*4th & 5th Map: Road from Piniada Larisas to Agios Germanos and back.*

The final two maps depict the route followed by a distinct shepherding community, tracing their migration from Piniada close to Larissa to Agios Germanos on Mount Varnouda near Florina, in the region of Western Macedonia (Figure 9, 10). Additionally, the maps illustrate their return journey, offering a comprehensive view of the seasonal migration patterns undertaken by this group.
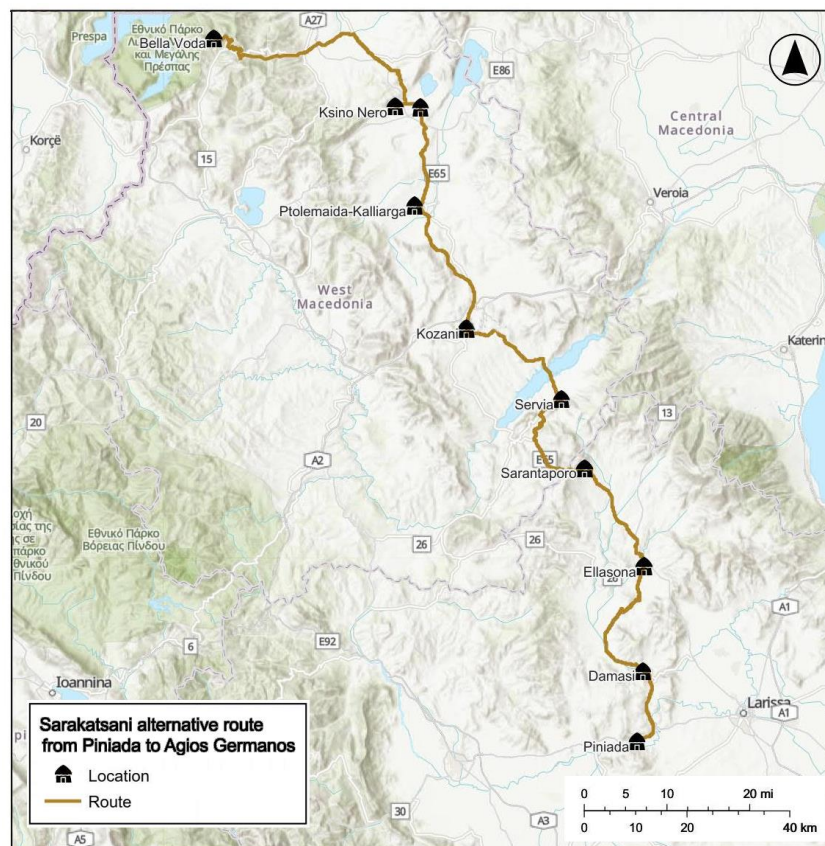
Figure 9: Map showing the route taken from the village of Piniada near Larisa to Mount Varnoudas

The brown line on the fourth map (Figure 9) denotes the route taken by the caravans toward Agios Germanos[8]. As previously mentioned, the journey was conducted in the form of a caravan, which was the standard mode of travel for all Sarakatsani shepherding groups. From this, it can be inferred that the process of traveling in such a manner was consistent and widespread among the pastoral communities.

The route followed by this particular group, although ultimately leading to the broader region of Mount Varnountas and nearby meadows such as Bela Voda, differed significantly from other paths taken to the same destination. Initially, the route was traversed entirely on foot, adhering to the caravan method, which resulted in a longer travel time and more frequent overnight camps.

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[8] https://storymaps.arcgis.com/stories/0c2b61ce6cf44251b59ef25870ac29d1

The path shares many similarities with the route leading to Mount Vermio, suggesting that the resting points used by various pastoral groups moving through the area were likely similar, if not identical. This consistency can be attributed to the fact that, despite the different family groups involved, the primary objectives and needs during their migrations from the plains to the mountains were the same across the community.

On the return journey from their summer stay in the mountains (Figure 10), the group followed a somewhat different path[9]. It appears they chose a route that led them away from Polyfytos lake and the mountainous areas to the west. This deviation likely occurred because traveling through more lowland terrain provided better grazing opportunities for their flocks and improved weather conditions for both the animals and the herders. By avoiding higher altitudes, they minimized exposure to the colder temperatures that typically set in by mid-autumn.
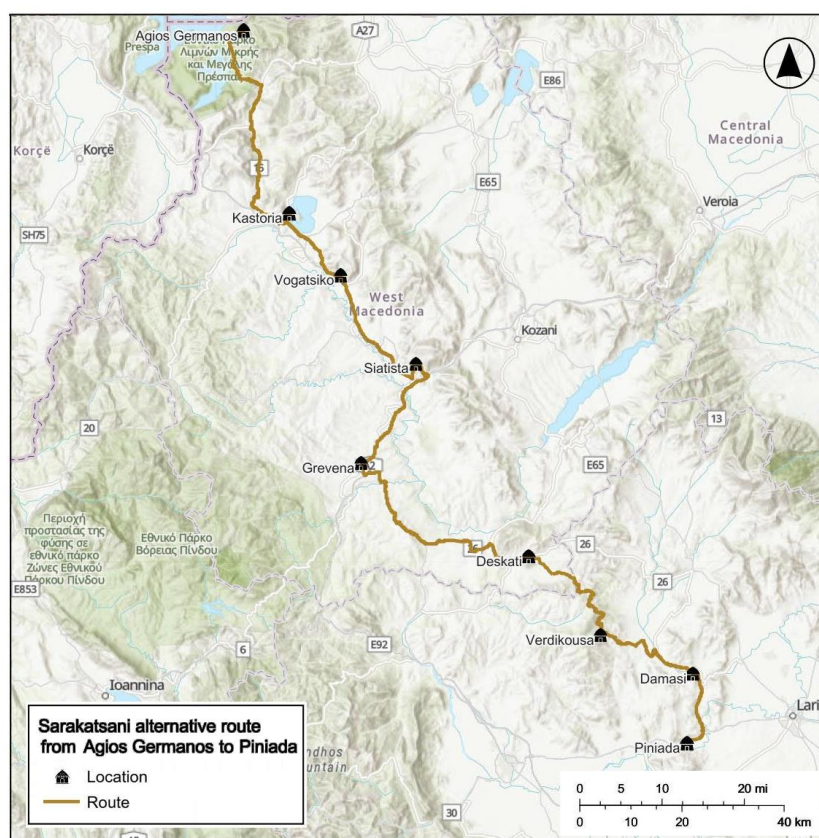


Figure 10: Map showing the return route taken from Agios Germanos on Mount Varnoudas to Piniada.

**Conclusion**

The Sarakatsani are a unique Greek population traditionally engaged in the nomadic practice of sheep and goat herding. Their social structure was organized into units known as "tseligata", each of which consisting of several families who collectively operated under the leadership of a "tseligas", or head shepherd. This hierarchical organization allowed for the efficient management of the community's pastoral needs. The Sarakatsani's nomadic lifestyle required them to undertake biannual migrations, moving towards mountainous regions during the summer months and returning to the lowland plains for the winter. These migrations were crucial for ensuring optimal

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[9] https://storymaps.arcgis.com/stories/a1baba8ba6d144319341579c840829c0

environmental conditions for their herds, providing access to fresh grazing pastures and adequate resources necessary for sustaining their livestock throughout the year.

In this study, the migratory patterns of two specific pastoral groups were systematically mapped, based entirely on first-hand testimonies collected through interviews with individuals who had directly participated in or observed these migrations. The qualitative data gathered from these interviews were meticulously organized and processed using Microsoft Excel before being integrated into a Geographic Information System (GIS) for spatial analysis. This approach facilitated the creation of the first detailed cartographic representation of the Sarakatsani migration routes, based exclusively on oral testimonies.

The significance of this study extends beyond the documentation of migratory paths. By employing GIS, this research offers an innovative visual and analytical representation of the Sarakatsani's traditional way of life, preserving a crucial element of their cultural heritage. The resulting maps serve as both a historical archive and an educational tool, helping to ensure that the unique lifestyle of this nomadic Greek group -one that persisted until the late 20th century- is remembered and appreciated by future generations.

To make this history more accessible and understandable to a broader audience, the use of story maps has been integrated into the study. These interactive maps combine geographical data with historical narratives, enabling a more engaging and comprehensible exploration of the Sarakatsani's migrations. Story maps bridge the gap between complex geographic information and public understanding, making the nomadic history of the Sarakatsani not only more open but also more relatable to the common reader. This format allows individuals to visualize the routes taken by the Sarakatsani, as well as the socio-cultural factors that influenced their movements, in a way that is both informative and accessible.

Ultimately, this study provides a valuable contribution to the preservation of the Sarakatsani's migratory heritage. By mapping their routes, it captures the cultural and environmental factors that shaped their nomadic lifestyle, ensuring that their history remains accessible for future research. Additionally, this work offers a foundation for further exploration into the traditions, socio-economic structures, and rural practices of the Sarakatsani, contributing to a broader understanding of Greece's pastoral communities and their role in the development of rural history.

## Acknowledgements

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