

CULTURE AND NATURE:
THE EUROPEAN HERITAGE OF
SHEEP FARMING AND PASTORAL LIFE



RESEARCH THEME: Routes of transhumance
RESEARCH REPORT FOR GREECE

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1. INTRODUCTION

1.1. Brief historical background

In Greece pastoral nomadism is a system of raising sheep and goats whose historical roots reach back to antiquity. Both the geomorphology of the country and the prevailing system of production in lowland areas were conducive to the development of nomadism as a socio-economic formation. The original system evolved into what is known as transhumance stock farming (Gidarakou, I.& Apostolopoulos C.D. 1995).

Evidence of domesticated animals goes back to the 7th millennium BC. In the early Neolithic modest flocks of ovicaprines (sheep and goats), kept primarily for meat, were integrated into small-scale gardening, grazing on fallow and stubble and supplying manure. More specialized stock-keeping arose in the late Neolithic and bronze age, with increased exploitation of 'secondary products', especially ox traction and ovicaprine textile fibres, culminating in the large-scale wool production of the Minoan and Mycenaean palaces. (<http://www.enotes.com/occc-encyclopedia/pastoralism-greek>)

The system of transhumance broke down with the collapse of Mycenaean civilization. The highly unsettled conditions that ensued were an ideal environment for group transhumance. The ability of transhumance to move out the way of danger was an important aid to survival in a period of societal disintegration. In addition, the steep decline in population levels and in agricultural activity that marked the post-Mycenaean period made extensive areas of Greece newly available as pasture land. This change reflects the transition from individual transhumants supported by the Mycenaean state to group transhumance and direct reliance on flocks for sustenance. Transhumance continued to be practiced throughout antiquity.

Changes start already at the end of the 19th century, when big landowners had to face growing unrest and struggle for reforms from the landless peasants or small farmers, along with growing demand from European markets for their products, as the Ottoman State initiated economic reforms that eased domestic and international trade. Ottoman owners started selling the land to Greeks from Constantinople in the late 19th century, as they were seeing that it was a matter of time before the area would be part of the young then Greek State. After the incorporation in the Greek State, the new owners intensified production by reducing fallow and introducing new management practices and equipment from "the west" (especially France). Customary rights of local farmers were not incorporated in the new legislation and this resulted in stronger local unrest and eventually violence between the police (that supported big landowners) and private



security forces of the landowners on one side and farmers or landless peasants on the other two.

The agrarian reform settled the problem, by dividing big estates to small farmers. This settle caused major changes to the landscape and practices. Small farmers intensified production further and broke the link with transhumant herds that could no longer find the large grazing lands they needed.

This flourishing economy rapidly collapsed during the 20th century due to a number of different reasons. First of all, the Greek State claimed control over communal lands and forests and the, sometimes unfair but at all times local, systems of sharing common resources stopped, giving their management to a few, politically powerful inhabitants. Second, the civil war of 1945-1949 divided local populations.

Given that all the fights were conducted on the mountains and that after the end of the war many of those who lost fled the country, it is no surprise that this war is regarded as the sign of the end of many of the mountain communities. Third, agriculture on the plains was intensified and mountain cultivations and products could no longer compete even in local markets. Finally, the comparison of the new quality of life in the cities to that on isolated mountain settlements reinforced the population exodus.

1.2. Types of transhumance

Transhumance is the seasonal movement of people with their livestock over relatively short distances, typically to higher pastures in summer and to lower valleys in winter. Herders have a permanent home, typically in valleys. Only the herds travel, with the people necessary to tend them. The term "transhumance" is also occasionally used for nomadic pastoralism – migration of people and livestock over longer distances. A very outspoken way to deal with both summer droughts in the lowlands and winter cold and snow in the mountains, is the transhumance, which once occurred all around the Mediterranean :a nomad-like system with seasonal migration of large herds of sheep and goats (in former times together up to many millions) between lowlands and mountains. The animals moved along more or less fixed droves that became main landscape elements for centuries.

The three structural elements of a space in a transhumance system are: a) summertime camps=*mountains*, b) the wintertime camps=*plains*, and c) *the road*.

Traditional or fixed transhumance occurs or has occurred throughout the inhabited world, including Scandinavia, Scotland, England, Caucasus, Chad, Morocco, France, Italy, Ireland, Lebanon, Romania, Bulgaria, Greece, Spain, Iran, Turkey, the Republic of Macedonia, India, Switzerland, Georgia, the United States, and Lesotho.

Transhumance

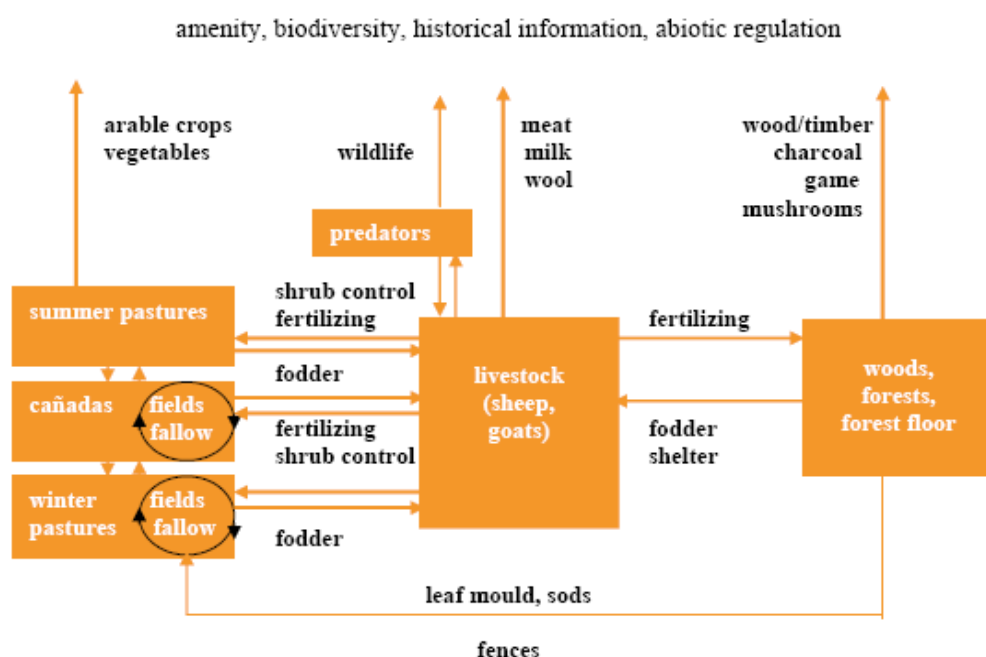


Figure 1. Scheme of the *transhumance* land-use system. Source: Pinto-Correia & Vos, 2004.

Greek transhumants, drawn by relatively abundant vegetation and mild temperatures, spend the months from October to April in various coastal plains. As summer approaches, they move to upland areas where melting snow produces rich forage. Greek transhumants rely almost exclusively on sheep and goats.

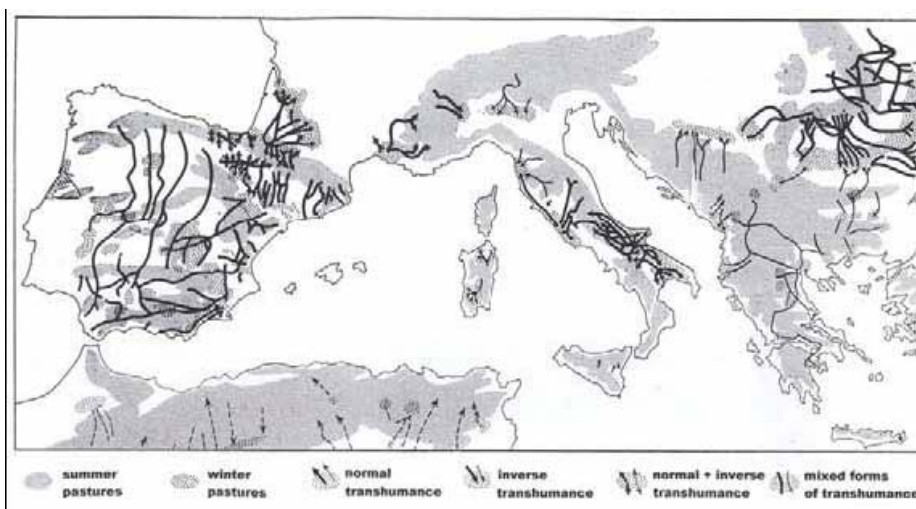


Figure 2. Transhumance routes, mapped before WWII (after F. Braudel 1966, with reference to E. Müller 1938. Die Herdenwanderungen im Mittelmeergebiet. In: Petermanns Geographische Mitteilungen)

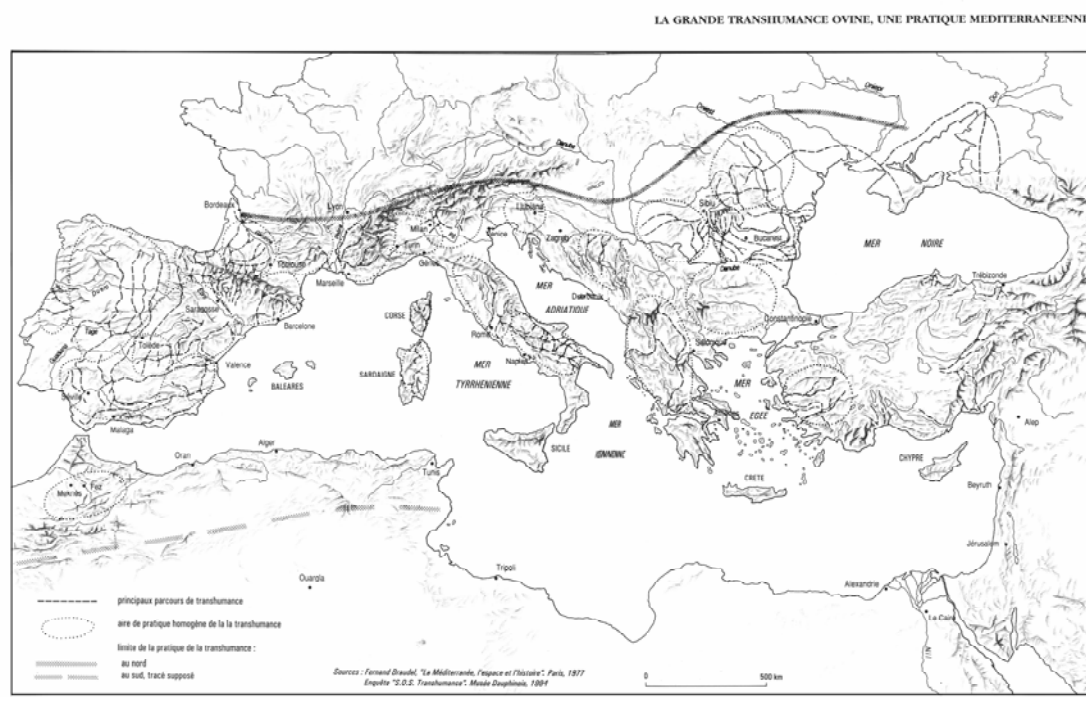


Figure 3. Map by Nora Esperguin, Conservation document, Isere, Grenoble, 1994. Sources: Fernand Braudel "La Méditerranée, l'espace et l'histoire", Paris 1977. Enquête "SOS Transhumance". Musée Dauphinois, 1994.



According to Houston (1964) and Braudel (1966) there are three possible forms of transhumance in the Mediterranean:

- **The normal transhumance** with shepherds from lowland farms that move in the summer to mountain pastures that frequently were their property.
- **The inverse transhumance** with shepherds from the mountains who move to lowlands in winter and seem to 'occupy' them, which frequently causes tensions with the settled farmers, who have herds too (e.g. McNeill 1992). Examples are the movements in Greece from the Pindus and the Peloponnese mountains towards coastal plains.
- **A mixed form of transhumance**, where the shepherds lived half-way between the mountains and the lowlands.

In Greece, transhumance can take on of two different forms. In some case it involves more than individual shepherds migrating with their flocks. Typically, such shepherds are employed by large landowners who provide the animals and grazing lands. In other cases transhumance is a form of societal organization in which large, independent family groups migrate with and organize their lives around the care of flocks. While the latter form of transhumance is the more common and probably the more ancient, the earliest documented instance of transhumance in Greece is an example of the former.

There are two main types: the first where the shepherds are drawn from lowland communities, but use the mountains for pasture in the summer; the second, so-called "inverse" transhumance, where the shepherds are themselves mountain dwellers, and only come to lower areas in winter or for markets. In recent transhumance may involve the movement of whole communities, requiring winter and summer settlements. In medieval Crete the main communities was over considered the winter one, often situated at less than 200m, but the mid-19th century the reverse was true with the communities choosing to make the summer settlement the main centre

However, in Greece, especially in the areas of Macedonia, Epirus and Thessaly, people were moving with their families. Characteristic examples of nomadic pastoralism are the Sarakatsani and the Vlachs. The first one was occupied exclusively with pastoralism and the second one was involved more in the management of animal products, which led to the creation of commercial social class.



A guide was leading the flock and the shepherds with the sheep and dogs were following. Further behind, women and children were helping to carry their household. Horses and mules were carrying all the goods as well as the small children.

2. MOST REPRESENTATIVE CASE STUDIES IN GREECE

2.1. Historical background

“Until the 19th century stockbreeding in Greece was almost entirely nomadic. Descendants of those stockbreeders, who once flooded the mountains and plains with their flocks, continue even today to follow the age-old habits of going up and down every winter and summer to winter pastures and summer meadows, respectively. Most of these remaining nomads move to areas around the mountains of Epirus and Thrace, but one can come across moving flocks in the Peloponnesus, Macedonia, and Crete” (Anastasiadi, 2011).

The mountain range of Pindos (more than 2000 m high) serves as a backbone of the main continental peninsula and forms a natural barrier between the east and the west coast. In antiquity, this area was uncharted and regarded as “wild” country. In Byzantine times the first nomadic and semi-nomadic herders established themselves (Laiou, 1992) and transhumant sheep and goat husbandry has been practiced constantly since. The relative freedom from authority made these mountains attractive places for Christian populations during Ottoman times and the population increased, forming a complex cultural landscape.

Animal husbandry and timber trade were the main occupations of the people. The animals kept were mainly sheep and goats (used for cheeses, meat and wool) with different transhumance practices. Some tribes were permanently located in their settlements or worked as shepherds for big transhumant herds, others moved only their herds (and not their households and families) seasonally to the plains in the winter and returned in the fall and others moved their households and families along with the herds seasonally to summer seasonal settlements. Forestry was integrated with agriculture and animal husbandry and forest management included: (a) Tree planting; (b) Pollarding, coppicing and other practices for wood fuel and timber (Grove and Rackham, 2002; Nitsiakos, 1995); (c) Hunting; (d) Collecting wild fruit and nuts (acorns, mushrooms, berries, snails, etc.); and (e) Grazing.

Particularly, in Tzoumerka Area -a mountainous region between Ioannina and Arta- are 200 families of transhumants who breed 70.000 sheep. These are the last transhumants of Tzoumerka, Pindus and Agrafa. This type of farming was mostly

developed between 1740-1881. At this period, the most remote areas of the mountains were the ideal refuge of the Greek revolutionists. Under these circumstances, 50 big folds (*tseligata*), with 150.000 sheep each one, were developed. Till today, there 200 young people 25-35 years old, who continue the old traditional transhumant way of pastoralism.



Fig. 4. Sarakatsani in the transhumance route to Pagaio mountain. Archive V. Skafida. Source: Fraternity of Epirotes Sarakatsani in Athens

In Peloponnesus and more specifically in Arcadia pastoralism is reflected by the appearance of small bronze dedications during the 6th century BC. These can show shepherds wearing a distinctive conical hat, sometimes wearing a cloak and boots. Often the shepherds carry a sheep or ram under their arms, though one from Mount Lykeios had a small calf on his shoulders. Many of these Arcadians figures were probably dedicated in the sanctuary of Zeus Lykaeos or the sanctuary of Pan (described by Pausanias 8,38, 5)" (Wilson, 2006).

In Crete, secondary transhumance has been affected and partly eroded by road making, part of the ministry of Agriculture's programme to encourage herding on Crete. Roads are creeping over towards even the remotest *mitata*. Processing and cheese making are becoming centralized at factories in upland villages, or even in towns (*Khania, Hrakleio*). "The first evidence for sheep and goats on Crete as well as mainland Greece comes in the early Neolithic period, that is to say the late 7th millennium BC.



Evidence for pastoralism on Crete in the Bronze Age has been presented by excavation of the Early Minoan II site of Myrtos. It has been suggested that the settlement of Myrtos was possible seasonal. Also, from Crete come some models of sheep pictured inside a Middle Minoan I bowl found at Palaioakastro” ((Wilson, 2006). People follow the growing season between winter and summer pastures. Summer pastures (*madhares*) are usually located in the mountains where herbs and grasses persist through the summer, winter pastures are on the foothills, coastal plains and peninsulas. But the seasonal transhumance of flocks and people is often much more complicated. It may involve only the men folk, or else households or entire village.

Whole households or villages migrate in pursuit of other things besides herbage. Low hamlets or villages are sited at 200m or less, and grow mainly olives. High hamlets and villages are at 700-1.000m, where vines, apples, pears and other fruits thrive. Until recently high villages were considered the main or home settlement. In high mountains there may be additional moves. In the Lassithi, individual households would leave the plain and move in summer to farmsteads (*metokhia*) higher in the mountains. Cheese making was the main activity, but there were also terraces and enclosures for vegetables, fruits and nut trees, and grain.

The secondary transhumance practiced in the White Mountain is rather different. Women and children remain in the upland villages tending the summer crops. Only the shepherds move to *madhares* at 1400-1950. During the Mycenaean period (c.1600-1100BC) Greece was divided into a number of kingdoms, each with a ruler and an elaborate bureaucracy. These rulers controlled very large numbers of sheep that were assigned, flock by flock, to individual shepherds. In return for sustenance provided by the royal household, the shepherd was responsible for tending the animals assigned to him and for producing a specified amount of wool each year. Extant records indicate that the ruler of Crete owned 80.000 sheep which produced nearly 68.000kgr of wool each year.

2.2. Some transhumance routes

Many southern mountain pastures were grazed for centuries by sheep and goats that wintered on coastal plains and moved to the mountains during early spring (transhumance). Nowadays they are transported in autumn in trucks or even trains to industrial farming regions and almost all of them have turned to agriculture as well and the big pastoral communities have been largely eliminated or have turned to small family farms. Their main residence is now down at the plains and the mountain has become a summer resort, especially for younger generations. However, we are going to present



some of the transhumance routes that were used, in order to describe the pastoral life during this journey. Their itinerary is described by their stops (*konakia*), where all the activities were taking place (milking the sheep, preparing the food, resting and negotiating the prices of milk and dairy products with the merchants of nearby villages and towns).

1st transhumance route used by the Sarakatsani of Epirus: Aitoloakarnania-Zagoria

1. **1st konaki:** “Paliavli (Παλιουαλή). Area nearby the town of Amfilohia in the county of Aitoloakarnania. The Sarakatsani were arriving in the afternoon for the 1st milking of sheep. During the night they were living and were crossing the mountain called “Makrynoros” (Μακρινόρος).
2. **2nd konaki:** Koprena (Κόπραινα). Area of Arta’s prefecture. Milking in early morning.
3. **3^d konaki:** Hanopoulo (Χανόπουλο). Nearby the town of Arta. They were passing the night. Milking night and early morning.
4. **4th konaki:** Sklivani (Σκλίβανη). Area of Ioannina prefecture. They were passing the night.
5. **5th konaki:** Harokopio (Χαροκόπιο). At the outskirts of the old airport of the city of Ioannina. They were staying for 1-2 days, in order to sell their dairy products and to shop various goods. The shepherds during their journey were making cheese.
6. Driskos mountain, they were stopping temporarily in order to milk their sheep.
7. **6th konaki:** River Grevenitiko, Tsipianis’ bridge, was their 6th konaki
8. **7th konaki:** Elatochori (Ελατοχώρι), in the area of Plaka or nearby the lake of the Aoos river, was the 7th and last stop (konaki), where the shepherds were spending the summer.

This transhumance route was kept till the 1970. Nowadays the flocks are transported by tracks and the shepherds are taking the national highway.

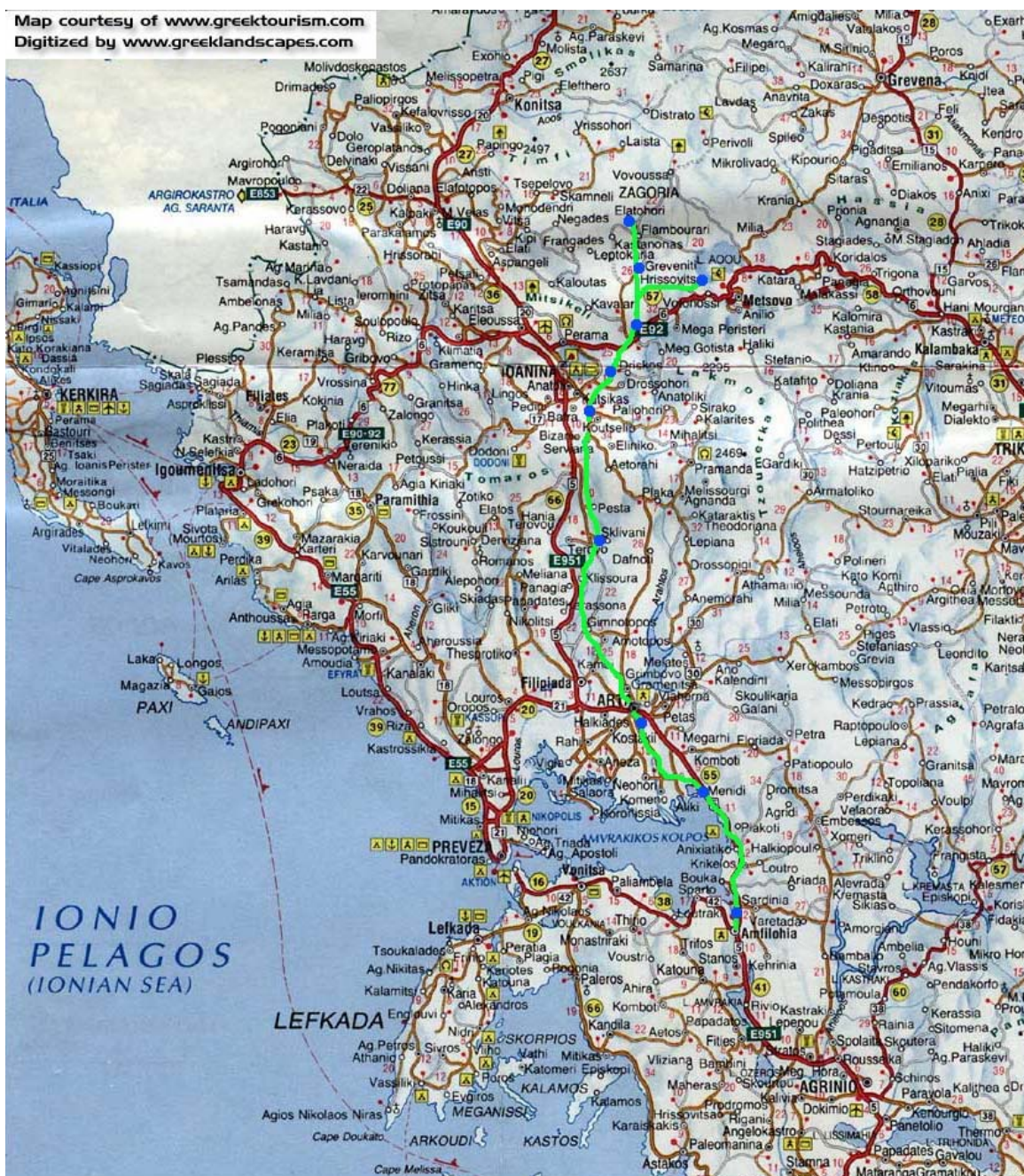


Figure 5. 1st transhumance route used by the Sarakatsani of Epirus:Aitolokarnania-Zagoria. Map of Western Greece (Epirus, Aitolokarnania). Created by Aikaterini Gkoltsiou

2nd transhumance route used by the Sarakatsani of Epirus: Preveza-Zagoria

1. **1st konaki:** Thesprotiko (Θεσπρωτικό). Area at the county of Preveza.
2. **2nd konaki:** Dervizena (Δερβίζενα).
3. **3^d konaki:** Area of ancient Dodoni (Αρχαία Δοδώνη).
4. **4th konaki:** Neohoropoulo Ioanninon (Νεοχορόπουλο). At the outskirts of the city of Ioannina. They were staying for 1-2 days, in order to sell their dairy products and to shop various goods. The shepherds during their journey were making cheese.
5. **5th konaki:** Perivleptos (Περίβλεπτος). At the outskirts of Ioannina.
6. **6th konaki:** Koukouli village or Vradeto village or Astraka village.
7. **7th konaki:** Gyftokampos (Γυφτόκαμπος). Today there is a small exhibition of a typical sarakatsani structures.
8. **8th konaki:** Atarahi (Αταραχή) or Plinos (Πλίνος) or Tsouka (Τσούκα) or Kokkino Laistas (Κόκκινο Λάιστας). Last stop (konaki), where the shepherds were spending the summer.



Fig. 6. Konaki at the Transhumance route Krania Grevena. 1928. Source: Fraternity of Epirotes Sarakatsani in Athens

This transhumance route was kept till the 1970. Nowadays the flocks are transported by tracks and the shepherds are taking the national highway.

The above routes are described by the Fraternity of Epirotes Sarakatsani in Athens.



Figure 7. 2nd transhumance route used by the Sarakatsani of Epirus:Preveza-Zagoria. Map of Western Greece (Epirus, Aitolioakarnania). Created by Aikaterini Gkoltsiou



3rd transhumance route used by the Vlachs of Samarina: Dotsiko- Stefanovouno Ellasonas (Karamanes, 2011).

The following transhumance route lasted 15 days and was taking place in 1995, and one week in 1997.

1. **1st konaki:** Spring at Nidrouzi (Πηγή στο Νιντρούζι).
2. **2nd konaki:** Kaliraxi (Καληράχη).
3. **3^d konaki:** Elatos (Έλατος).
4. **4th konaki:** Grevena (Γρεβενά)
5. **5th konaki:** Eleftherohori (Ελευθεροχώρι).
6. **6th konaki:** St Theodoroi (Άγιοι Θεόδωροι)
7. **7th konaki:** Karpero (Καρπερό).
8. **8th konaki:** Dimitra (Δήμητρα).
9. **9th konaki:** Paliouria (Παλιούρια)
10. **10th konaki:** St Paraskevi (Αγία Παρασκευή)
11. **11th konaki:** Deskati (Δεσκάτη)
12. **12th konaki:** Krania (Κρανιά)
13. **13th konaki:** Kefalovrisso at the village Valanida (Κεφαλόβρυσσo μέσα στο χωριό Βαλανίδα)
14. **14th konaki:** Agioneri (Αγιονέρι)
15. **15th konaki:** Stefanovouno Ellasonas (Στεφανόβουνo Ελασσόνας)

However, there are more to detect, but unfortunately we do not have any written statements or sources. In order to record all the transhumance routes of Greece, a throughout anthropological research should be conducted.

Map courtesy of www.greektourism.com
Digitized by www.greeklandscapes.com



Figure 8. 3rd transhumance route used by the Vlachs of Samarina: Dotsiko-Stefanovouno Ellasonas. Map of Western Macedonia, Epirus, Thessaly. Created by Aikaterini Gkoltsiou



3. TRADITION OF THE THEME AND ITS HERITAGE

3.1. Huts and surroundings

The purely nomadic farming of sheep in Greece was carried out mainly by the Saracatchani and Vlachs in the area of Thrace, in the mountains of North Western Greece, in Thessaly, in Pindos Mountains and by others in the mountains of Crete. This type of sheep rising involves the transfer of the sheep in the highlands around St. George Day in April, where they spend the rest of spring and summer, and their return to the warmer lowlands near St. Demetrious Day in October to spend the winter. The main residence of the shepherds is in the lowlands; while in the summer grazing fields they keep either permanent or temporary structures. Due to the need for cheese production in the summertime as well, it was common to develop cheese-making facilities. In Crete the characteristic 'mitata' typically serve for cheese-making as well as shepherds residence. Another type of structures is that of the Saracatchani, whose huts were constructed from natural material found on the spot, namely wood, twigs, grasses and clay.

Typical structures in nomadic sheep farming include constituents like the following:

- a place for milking, often called "strougga",
- the pen or corral, called "mantri"
- an area where the animals can stay during the midday, often called 'stalos'
- other makeshift shelters for sheep and shepherds called 'konaki'
- the hut or 'kaliva' where the shepherd stay
- the 'yiataki', an open air shadowed place where one can sleep
- the fire hearth called 'fotanama' or 'pyrovoli'
- the cheese-making facility and storage called 'tyrias' in the mainland, 'tyrokeli' in Crete etc. (Eustathiou, 1996, Deligiannakis, 2003)

The planning of huts and their size were in accordance to the social hierarchy which existed in nomadic societies. Tseligas who was the leader occupied the biggest hut.



Large families owned a small group of huts and the small families stayed in more secluded huts.

Sheep products include milk and cheese, wool and leather. In traditional sheep farming these products are processed by the farmers and shepherds themselves in the premises of their households, or in the summering grounds. Wool was processed by the women, turned into fibres and then woven in looms.

3.2. Landmarks

In many there are stone walls marking the boundaries of grazing for every shepherd. However, in Crete, boundaries are seldom marked on the ground; goats and their sheep followers inevitably stray; and good will does not always prevail between neighbors. Grazing disputes have led to bloody feuds since Roman times, if not before. A feud can change transhumance customs. We know of several Sphakian families opting to rent distant summer pastures, rather than use their own, in order to avoid a particularly nasty vendetta. The importance attached to high mountains pastures is also demonstrated by township boundaries. The ancient coppiced and pollarded cypresses that line the routes up to high mountains are witnesses to this peculiar institution (Rackahm & Moody).

Footpaths that range from simple passages through fields to paved and broad paths (figure 7) are the strongest marks of the previous pastoral life, where transhumance activities were alive. Today, they are either replaced by dirt or asphalt roads or abandoned and covered by vegetation. However, many of them are restored and serve for ecotourism activities.



Figure 9. Paths are the strongest marks of the previous pastoral life, where transhumance activities were alive. *Source: Aikaterini Gkoltsiou*



3.3. Traces, marks, messages let by shepherds (on stones, wall, huts)

In the world of transhumants, time is defined by the nature: *σκάρος, άρμεγμα κοπαδιών, πήξιμο, αλάτισμα τυριού, στάλος, νυχτοβράδιασμα, νυχτοβόσκημα, γρέκιασμα προβατιών.*

“Evidence of Pastoralism appears in the faunal material from excavations at Greek sanctuaries. Sheep and goats appear to have been favored for sacrificial victims at many sanctuaries. Ethnographic evidence shows that culling of flocks can take place in the early summer before there is a lack of suitable pasture for large flocks, or for younger animals in the spring.

Pastoralism can be detected in epigraphic record (5th, 4th century BC the Attic demes of Marathon, Thorikos, Archia were sacrificing a number of ewes in their festivals. Pastoralism also makes its appearance in literary sources. Hesiod was taught to sing as he tended flocks on Mount Helicon. Aristotle (Politics, 1319a 19-23) noted pastoral communities as one of the best form of democracy (after arable farmers). However, one reason for the low profile of pastoralism in ancient sources is that shepherding was probably a humble occupation compared to that of arable farming.

The evidence of inscriptions and to lesser extent literary sources suggests that flocks are usually owned by members of the social elite. The flocks themselves appear to have been cared for by individuals of much lower status, sometimes slaves” Wilson, N., 2006).

3.4. Bells

Bells have been used throughout the ages in stock farming for locating the animals of the herd. Shepherds hang a variety of type and size of bells in each herd “arming the herd” as they say. The bells vary according to the age and the size of the animal, the time of the year, and of course the sound. Each shepherd chooses the sounds of the different bells in the herd match. In earlier times he matched the sound of the bells with the music of his flute and thus he spent long pleasant hours with his herd.

Shepherds tune their bells by pounding on the body of the bell, choosing the sound to match the other bells of the herd. Shepherds often construct their own bells and their craft is transmitted from generation to generation. Blacksmiths also construct bells and there used to be workshops specialized in bell-making, employing specialist craftsmen (koudounades), who would also undertake the repair of bells.



In Crete, during the Venetian period, there were many regulations about stray animals. Pasturage went all over in the island; numbers of animals are not mentioned. By a regulation of 1349, one animal in 25 was supposed to wear a bell. Those who fed in Psilorites, as we are told, had gold teeth from the herbs that they fed on and some of the sheep had swiveling horns like an heraldic yale.

Bells have different names depending on their use, sound, shape, value and size.

- **Use**

Lirakokoudouna: the small bells that are suspended from the bow of the lyre.

- **Shape**

Gavanouza: large bell that resembles a basin shaped container (gavana).

Diplokoudouno or dicheilo: large bell that has a smaller bell as its clapper.

Koudouna: the large bell

Leri: the large bell of the billy-goat that leads the herd.

- **Material**

Kypri: bronze bell that took its name from the island of Cyprus.

Batali: forged bell

- **Sound**

Bouzouka or pipa: the largest bell in Evrytania with a distinct sound

Lagarokoudouna: with a clear sound

Slim bells (psilokoudouna), husky bells (vrachnokoudouna).



Figure.10. Bells are suspended from the neck collars of the animals. *Source: Prisma*

3.4 Flock

Flocks were usually comprised by thousands of sheep (2000-5000 sheep/ tseligato), but nowadays due to pastoralism and farming dedication, big flocks are considered and these of 300 sheep. Families in order to distinguish their sheep from the other families, used to mark sheep's ear with a knife. Today, usually, they put plastic marks of one color characteristic of their flock.



Figure 11. Flocks in Papiko Zagori. 1990. *Source: Fraternity of Epirotes Sarakatsani in Athens*

The breeds which are mostly concerned by transhumance were the following ones:

ZACKEL BREEDS



- **VLACH- MOUNTAIN EPIRUS (common breeds)**

The Vlach is classified by MASON as a mountain variety of the Greek Zackel. The breed is the most numerous in Greece, contributing 21% of all sheep in Greece, or 1 797 000 head, and originated in the Pindus Mountains according to ZERVAS and BOYAZOGLU (1977).

Today, almost all Vlachs in Greece are settled in towns and cities, but the sheep to which their name is given are widely distributed throughout the Greek mainland and in the Peloponnesus. The remaining migratory flocks are no longer walked to the seasonal grazing areas but are transported by trucks.

Vlach sheep were seen during the survey at the Yannitsa Animal Breeding Experimental Station, in village flocks at Koutsocheron (near Larissa), and at Orini, near Serrai

The Epirus variety of the Mountain Zackel is classified by GEORGIU as one of the Vlach breeds. It was seen at the Farm Station, Ioannina, where a flock of Epirus are maintained.

The Vlach sheep seen at Yannitsa came from Larissa, and were of the Kozani variety. They had a typical, hairy carpet-type fleece, having staples with a pointed tip. The Vlach sheep seen at Orini were very variable, with black, white and spotted faces, as well as black eyes and nose. The wool was mostly hairy, although in some it was curly.

- **SARAKATSAN**

The Sarakatsan (also Karakachan, Karatsaniko), the breed of the nomadic Sarakatsan shepherds, is another variety of the Mountain Zackel, and is found mainly in Macedonia and Thrace, and in the mountainous parts of Bulgaria. Most of the Sarakatsans, like the Vlachs, no longer follow a nomadic way of life, and fully migratory flocks are few in number. But lowland flocks of Sarakatsan, crossed with other breeds, are still found in northern Greece. Contemporary husbandry includes provision of feed concentrates during the winter and, for transhumant flocks, transportation by truck to and from the mountains (T. ALIFAKIOTIS, 1975, personal communication).

Description. The breed is described by MASON (1967) and by GEORGIU (1960). The colour is predominantly black or dark brown, with less than 10% white. The breed is slightly taller than the Vlach: rams 63–68 cm, and ewes 56–60 cm. The rams have spiral



horns. Most ewes are polled; some have sours. The tail is of medium length (Mason quotes a length of 25 cm).

- **DRAMA NATIVE**

The Drama Native breed, encountered during the survey near the village of Volax, north of Drama is not listed by MASON, but is probably a variety of the Vlach.

Description. Height: the range for four ewes measured was 52–56 cm, with a mean of 55; the one ram was 66 cm. Some animals seen in the course of the survey were closely similar to the (coloured) Vlach sheep illustrated in MASON's Plate 110. The black sheep we saw had a relatively finer fleece than the others, and were also similar to the Chalkidiki sheep (see below).

On the whole, however, as with other Greek breeds, the appearance was very variable: horned and polled animals, black, white and grey fleeces, speckled faces and legs, and a moderately long tail. Black around the eyes, and a woolly “top knot”, were common, as in other Greek breeds.

- **FLORINA**

The Florina, not listed by MASON, is a local breed in northwestern Macedonia that is said to be a cross between the Mountain and Lowland Zacks. Sheep of the breed were seen at the Yannitsa Experimental Station and in several flocks near the town of Florina

Description. The coat is predominantly white (Fig. 13c). The colour of the face is variable - all white, or with black around the eyes and the nose. The ears are predominantly black. The fleece appeared to be less hairy than that of the Karagouniko (lowland) or Vlach (mountain) breeds seen at Yannitsa. The mean height of the three ewes that were measured was 67 cm. Rams have

- **KARAGOUNIKO**

The Karagouniko (a common breed, the second most numerous in Greece) is one of the two varieties of the Lowland Zackel. The Karagouniko is found in the Palamas-Trikkala area of Thessaly, and, also, in the Macedonian plains and in Boeotia. It is mainly white or black, but there are also brown, pied or spotted animals. Those seen at Yannitsa had a typical hairy fleece with pointed staples; and a black and white speckled face.



- **SFAKIA-PSILORIS-SITIA**

GEORGIU (1960) and MASON (1967) describe two varieties of the Greek Zackel on the island of Crete - the Sfakia of the western lowlands, and the Psiloris (also known as the Anogia) of the Ida (Psiloris) Mountains in central Crete. MASON (1967) considers “Sitia” and “Psiloris” to be synonymous. However, it was found during the survey that local owners regard the Sitia of eastern Crete as a distinct variety. Management is extensive for all three varieties, with the sheep in family flocks of 200–400 head kept on open grazing throughout the year. In contrast to the Sitia, which remains at relatively low elevations throughout the year, the Sfakia and the Psiloris are taken to the mountains and remain there from late March to December.

Description. Mature rams of the Psiloritis and the Sfakia are about 64–66 cm at the withers, compared to about 57 cm for the Sitia; ewes of the three varieties are about the same height, 52–55 cm. Owners and others who are knowledgeable of sheep on the island attribute the divergence in the size of the varieties to qualitative differences in the forage available in their respective areas, with the poorest grazing being in the eastern part of Crete, where the smallest of the three varieties, the Sitia, is found. It was noted that the muzzle of Psiloritis rams and ewes is straight; Sitia ewes have a straight profile also, but rams have a convex muzzle. Rams of the three varieties have laterally spiralled horns; most ewes are polled.

UNIFORM-WOOLED (RUDA) BREEDS

Each Balkan country has a finer-fleeced type, in addition to the predominant coarse-wooled Zackel. A common name for these is Ruda (uniform-wooled) sheep, and MASON (1967) states that they perhaps are derived from the Romanian Tsigai. However, the primary breed may be the Kivircik of Turkey (see p. 41).

The primitive type of fleece structure discovered in the present study suggests instead that such sheep represents a relic of an ancient fine wool with a generalized medium type of fleece.

- **KATAFIGION**

The Katafigion is a migratory breed of the Pieria Mountains in South-eastern Macedonia, Greece. It has almost disappeared as a result of cross breeding and socio-economic changes in the area.



Description. White is the prevailing colour of the Katafigion breed. Speckled or brown sheep are not regarded as pure breed. The face, legs, and (commonly) the belly are bare of wool. Most have a top-knot. The tail is thin and of medium length. Rams are horned, and ewes polled. The nose is slightly convex, and the ears horizontal and of medium length. The wither heights of eight mature ewes ranged from 58 cm to 65 cm, with a mean of 62 cm. For the one ram that could be accepted as “probably purebred” the wither height was 70 cm.

- **ROUMLOUKION**

Theo Roumloukion (a common breed) is found throughout the plain of Thessaloniki, and extends northwest to Florina in the mountains near the Yugoslav border. According to MASON, the colour is usually white, although the head is sometimes black or speckled. He quotes a staple length of 75 mm and a quality of 48s to 50s.

3.5. Other animals

3.5.1. Shepherds dogs

The Hellenic Shepherd dog called *ellinikos poimenikos* (*Cannis familiaris*) is a medium to large size dog, with solid body and great physical strength that is capable of escorting the flock and fight with the enemy maintaining the physical superiority. Its head is massive with muzzle-skull. The skull is normally curved, with obvious hyper eyebrow arches and wide nearly as far as its length. The muzzle and cheeks are wide and deep. It has a scissors or plane bite and is covered by fat and slightly loose lips. Their skin is thick and is covered by dense fur. Cropping the ears is not permitted and dogs without ears cannot be shown. The brown eyes are of average size, egg-shaped, placed symmetrical in parallel lines of the oblong axon of the skull, far enough the one from the other. From the oblique side of the head their position is a little under the muzzle level as it is imaginary extended towards the skull. More dark tints are preferred. The eyelids must be tight without revealing their mucus membrane. It has a serious penetrating, calm look about him. The chest must be wide and deep up to the height of the elbows. The thorax consists of arched ribs with medium curvature that are extended backwards enough and let enough space for the heart and the lungs. The tail is thick at the base. Some have long tails while others have short or no tails. The double coat is dense and abundant. Coat colors include black, grayish-brown and white.

This flock guardian dog is proud, and hard-working, but never gathers or directs the flock. Working in pairs the dogs prefer to move at the sides of the flock, guarding against

wolves and other predators. An independent, brave, decisive, loyal, working dog, with a high sense of duty and strong protective instinct towards the animals and its environment. Naturally wary, loyal only to the flock leader- shepherd. The Greek Sheepdog's dog can be characterized as the Big Mountain shepherds dog of Greece. It does not tolerate violent behavior. It is extremely dominant and requires an owner with very strong leadership; one who understands its flock guardian ways. When placed in a pack situation, this breed will seek to be top dog by intense fights. Suspicious but tactful in the presence of strangers, he doesn't make friends easily. They may appear calm, but are ready to protect at all costs at anytime. When protecting his flock he moves along the border, selecting places from where he will be able to see a wide area. He's aggressive towards the wild animals and able to drive them back with his deep bark. If his deep bark does not drive them away he will pursue the intruder and attack. Early socialization is vital if the dog is to be a trustworthy companion. He can be trained and has a tendency to judge a situation before taking any action. This breed is best trained by an experienced handler who understands how to earn the dogs respect. The objective in training this dog is to achieve a pack leader status. It is a natural instinct for a dog to have an order in their pack.

Height: Males 25-29 inches (65-75 cm.), Females 23-26 inches (60-68 cm.)
Weight: Males 84-110 pounds (38-50 kg.), Females 70-92 pounds (32-42 kg.)



Figure.12. The Hellenic Shepherd dog.



3.5.2. Predators

In the mainland mountainous country, where transhumance takes mostly place, the predators such as wolves and bears tend to extinct. However, there are always wild dogs which remain a danger for the flock.

3.5.3. Mixed transhumance

In Greece, very rarely, we find a mixed transhumance system. Mostly, sheep and goats are separately from the cattles. However, other animals such as horses and mules were helping the shepherd to carry the various products.

4. PRESENT SITUATION

Nowadays the flocks are transported in spring by trucks to the mountains. However, there are some shepherds who persist in using the traditional system of transhumance in a smaller scale. Their house is the plain and move the flock to the mountain in summertime (e.g. from Samarina to Abelona-Larissa) (Tsokli, 2008). The traditional way of nomadic life (Sarakatsans and Vlachs) is completely abandoned. Most of the times the routes are fixed, but are not used for touristic purposes.



Figure 13. Transportation of the animals by tracks. *Photographs by Aikaterini Gkoltsiou*



Figure 14. Transportation of the animals by tracks. Papiko Zagori. 1990. *Source:* Fraternity of Epirotes Sarakatsani in Athens

A traditional nomad's life: In spring time the shepherds started the long journey to Smolika mountain. The small children were tightened up on the horses during the journey and they were helping their mothers and grand fathers to set up the temporal accommodation named *konaki*. After some months they were all coming back to the plains.



Fig. 15. Towards to Neohori Paramithias. 1963. *Source:* Fraternity of Epirotes Sarakatsani in Athens

All the social activities (traditional celebrations, festivals, matchmaking etc.) happened in the summertime. The preparation of the cheese was taking place on the mountains. In the autumn, the shepherds had to prepare the flocks for the transportation to the plains, as well as all the farming activities (nighttime grazing, breeding, milking, etc.). In wintertime, the shepherds had to do all the farming activities in combination with

the difficult climatic conditions and to confront all the dangers which occurred for the animals. Today there are not any sources or records on transhumant shepherds left.

The traditional coat named *kappa* was keeping the shepherd warm although it was very heavy when became wet by the rain. Today shepherds are equipped with all the recent clothes and materials.



Fig. 16. *Tsopanos. Skamneli, Zagori. 1955.* Source: Fraternity of Epirotes Sarakatsani in Athens

5. SOCIAL DIMENSIONS

5.1. Shepherds

Sarakatsani were a group of Greek transhumant shepherds inhabiting chiefly Greece, with a smaller presence in neighbouring Bulgaria, southern Albania and Fyrom. Historically centred around the Pindus mountains, they have been currently urbanised to a significant degree. Most of them now reside throughout Central and Northern Greece and are of Greek Orthodox faith. As national states appeared in the former domain of the Ottoman Empire, new state borders came to separate the summer and winter habitats of many of the Sarakatsani groups. However, until the middle of the 20th century the crossing of borders between Greece, Albania, Bulgaria and Yugoslavia was relatively unobstructed. In the summer, some groups went as far north as the Balkan mountains while the winter they would spend in the warmer plains in vicinity of the Aegean Sea. After 1947, as inter-state borders were sealed with the beginning of the Cold War, some Sarakatsani were not able to migrate anymore and were subsequently settled down outside Greece.



Traditional Sarakatsani settlements were located on or near grazing lands both during summers and winters. The most characteristic type of dwelling was that with a domed hut, framed of branches and covered with thatch. A second type was a wood-beamed, thatched, rectangular structure. In both types, the centrepiece of the dwelling was a stone hearth. The floors and walls were plastered with mud and mule dung. Since the late 1930s, national requirements for the registration of citizens has led many if not most Sarakatsani to adopt as legal residence the villages associated with summer grazing lands, and many Sarakatsani have since built houses in such villages. Therefore, Sarakatsans became slowly, farmers, civil servants and scientists, gave up pastoralism, and this traditional way of life is only in our memory.

Another group of nomadic shepherds were the Vlachs who are considered descendants of Romanised peoples. The Vlach villages are dispersed all around the Balkan peninsula. Therefore, they are named accordingly to the place they lived. For example, in Greece, they are recorded as *koutsovlachoi*, in FYROM as *Tsintsaroi*, in Roumania as *Macedoroumanians* and so on (. However, they call themselves *Aromouni* or *Armani*, who speak *Armaniaste*. In Greece, the biggest concentration of Vlach villages is in the areas of Pindus, Epirus, Western Macedonia and at the plains of Thessaly, Preveza, Vonitsa. Usually, Vlachs were renting the pastures accordingly to the best conditions found for them and their families. The journey from the alpine villages to the plains called “diava” (διάβα) lasted approximately one month. Along the route many procedures of pastoral life, such as watering, milking, resting and producing the cheese, were taking place.

5.2. Situation of the shepherd in the society, in the family, within other shepherds

The most common social organization was the *tseligato*, a co-operating organisation of herdsmen under a powerful leader (typically elected, but in practice the most financially powerful families ruled these associations). The whole system offered security and a stable way of life, based on tradition and loyalty, very inward directed (Damianakos, 2002). It worked along with the winter fallow lands of the big cereal holding in the plains, as the herds paid a low rent to graze in them. Summer communal grazing lands were divided in a public meeting in the settlement according to the number of animals each *tseligato* had (Nitsiakos, 1995). Herdsmen employed many shepherds (usually from poor families) that followed their movements. The fragile and harsh environments and the increasing population made migration a necessity for some of the members of poorer households, seasonally to seek employment and incomes in the plains or permanently.



Shepherds who owned more than 300 sheep, were called “*smihtes*”. Each tseligato had three and more “*smihtes*”. The other shepherds who had 100 sheep were called “*tsopanoi*”. However, they all had equal rights and obligations. Each tseligato had the shepherds for the protection of the flock, the guide (*αγωγιότη*) who was in charge of carrying the products and the equipments and the milkman. Sarakatsans had also a teacher for their children education and a priest.

Tseligas was the owner of the *tseligato* and was responsible for all the commercial activities between the shepherds and the state. Therefore, he had to know listening and writing, to be honest, moderate and a good negotiator.

According to Braudel (1985), shepherds were considered poor and outlaw people. People from the cities confronted them as barbarians or semi savages. Till today there is discrimination, but most of them are also owners of the flocks. The level of income from farming of livestock mainly depends on the size of the flock, irrespective of the animal's productivity (Apostolopoulos and Rogdakis, 1996). The Greek government was giving subsidies mostly funded from the E.U., offering an important economical support. The accession in the EU in 1981 and the Common Market mechanisms resulted to an economical growth for shepherds. Farmers relied more on the increase of the flock size which results in increasing family income from subsidies and other compensations, rather than increasing production efficiency. On the other hand farmers are more interested in improving labour efficiency rather than making capital investments (Spathis et al., 1998). In most cases, the above subsidies were leading to circumstantial occupations and not to serious investing projects. Nowadays, this support is towards an extensification system of farming according to the Measure 214, action plan 1.3. The subsidies are more carefully spent, and more intellectual people are involved in sheep farming, giving a more serious business profile to pastoralism.

5.3. How many shepherds per transhumance and per flock

In the previous centuries, where transhumance existed, a tseligato had at least 3 and more herdsmen and 2000-5000 sheep. Today the average amount is about 300-400 sheep. For example in Crete an average flock comprises 400sheep and a few goats, and it is tended by two or three men. The milking season lasts 8-10 weeks. When herbage or water give out or when snow falls, at latest in October, the shepherds return with their flocks to their families and villages. Whistling was the most common way of communication among shepherds.

5.4. How do shepherds learn their job

This is a job mostly learned from father to son. Their life centres year-round on the needs of their flocks. Men and boys are usually responsible for the protection and general care of the flocks, like shearing and milking, while the women occupy with the building of the dwellings, sheepfolds and goat pens, child care, the domestic tasks, preparing, spinning and dyeing the shorn wool, and additionally they try to keep chickens, the eggs of which provide them with their only personal source of income. Women also keep household vegetable gardens, with some wild herbs used to supplement the family diet. When children are very young, child care is the province of the mother. When boys are old enough to help with the flocks, they accompany their fathers and are taught the skills they will someday need. Similarly, girls learn through observing and assisting their mothers.



Fig. 17. Women dressed in traditional costumes of Vlachs. Metsovo. Easter 1969.
Source: Archive of Panagiotou-Pavlopoulou A.

5.5. Sociability among shepherds

This need of transhumance of Sarakatsans and Vlachs in a cyclical and repetitional procedure was decisive for their social system and institutions. The particular characteristic among the above nomadic societies was their relationship. Accordingly all the members of a tseligato develop a solidarity spirit. In this way tseligato was a form of life, with a goal towards the common interest. Another social aspect of nomadic life is the traditional gatherings among Sarakatsans (adamoma), which turn up big festival events. Today, everyone can participate at these festivals.



Figure.18. Vlach festival (Adamoma). Metsovo. 1974. Source: Archive of Panagiotou-Pavlopoulou A.

In Crete, the high pastures have been integrated into Cretan society and economics. Marriage between families on opposite sides of a massif were frequently arranged when the fathers met in the *madhares*. Shepherds own their pastures. In Sphakia, every *mitato*, belongs to a family, and its lands are carefully defined by perambulation from peak to peak; the capacity of a *mitato* is mysteriously measured as so many *oka*. Pastures are also hired: shepherds from Psilorites frequently rent winter pastures in the Asterousia, paying in milk and cheese.



Figure.19. Vlach festival (Adamoma). Politses-Epirus. 1964. Source: Archive of Panagiotou-Pavlopoulou A.



Figure 20. Sarakatsani festival (Adamoma). Pertouli, Trikala. Photos by e. Giannakou.
Source: Fraternity of Epirotes Sarakatsani in Athens

6. ECONOMICAL DIMENSIONS

6.1. The products from the transhumance' breed

From the antiquity, animal bones from this period found at the site of Nichoria in the south Peloponnesus show that the composition of herds differed from that found in the Mycenaean period in such a way as to increase the production of meat and milk and at the expense of wool production. Today most flocks are kept for meat and milk, but in the past wool and goat's hair may have been more important. It is often of high importance to pastoralist societies, the dairy products of transhumance flocks and herds (milk, butter, yogurt and cheese) often forming much of the diet of such populations.

Some of the most famous cheese products related to Greek transhumance are:

1. *Graviera* is the emperor of Cretan's sheep cheeses. The best is made and matured in the corbelled cool of a high *mitato* and stored in deep limestone fissures, some of which contain permanent snow. When enough mule-loads have accumulated it is taken in market. Milk for cheese making is simmered in a culdron. The fuel is cypress-wood, brought up by mule-6Kgr for a day's boiling. Over the 25 or so *mitata* now operating in Sphakia, this adds up to 10 tn of wood a year.

2. *Askotyri* gets its name from the word "asko" which means skin. It is a traditional soft goat milk cheese from Los that ages in goatskins. Although we find lots of similar cheeses of a small scale production all over Greece, this particular one is different in the sense that savory is added before it is placed in the goatskin.



3. *Feta* is a brined curd Cheese traditionally Made in Greece . Feta is an aged crumbly Cheese, commonly produced in blocks, and has a slightly grainy texture. Since 2002, Feta has been a Protected Designation of Origin product. According to The Relevant EU Legislation , only toggle those cheeses produced in a traditional way in some areas of Greece (Mainland and The Island of Lesbos), and made from sheep milk, or from a mixture of sheep and goats 'Milk (up to% on the 30th) area of the same, may bear the name "Feta".

3. *Myzithra* is made from whey of Feta and Kefalotyri. Myzithra is available both fresh and aged. Fresh Myzithra is soft, similar to cottage cheese. Aged Myzithra is shaped like an ostrich egg and is firm and pungent, rather like Italian Ricotta Salata. The aged variety is known as Xinomyzithra and makes an excellent grating cheese.

4. *Kefalotyri* was already well known and respected by the time of Byzantine era. The name comes probably from Greek word "kefalo" that means hat. This hard, pale golden, yellow cheese has a tang flavor and a sharp aroma, reminiscent of Italian Pecorino Romano. Harder and saltier than Kasseri, Kefalotyri is generally served grated over cooked dishes. The colour varies from white to yellow, depending on the mixture of milk. Kefalotyri is described as a "male" or "first" cheese to indicate that it is made with full-cream milk. The cheese ripens in two to three months and has a fat content of 40 - 55 per cent.

6.2. Employment generated by transhumance

Herding has been encouraged by the European Community subsidy since 1985. In some places, there was in increase in sheep number. In spite of these efforts, shepherding is not prospering on Crete: it is the size of the flocks, rather than the number of shepherds, that seems to have increased. Not enough young men take up the profession.

Although it survives as one of the basic forms of extensive animal breeding, the migratory herd and the type of rural production associated with it is undoubtedly in a state of long term decline. The decisive factor in determining a stockfarmer's income in flock size: the yield per animal is relatively low and given the amount of capital tied up in each animal it does not seem that stockfarming offers a particularly propitious field for investment. There appears to be no obvious correlation between the individual characteristics of the stockfarmer and the level of efficiency of his holding.



7. CONCLUSIONS (USE OF TRANSHUMANCE BY POLICIES)

Basic causes of many changes in mountain landscapes are that it is too difficult to make a living and that life looks more attractive in urban centres. Also the use of compound feed and dry forage, more intensive management (daily milking, direct selling of milk and cheese-making), subsidies for transport, and the greater convenience for sedentary farms in claiming subsidies contributed to the decline of mountain pastoralism and transhumance. In regions like lowland Attica, the Provence and the Tuscan and Lazian Maremma it became nearly impossible to rent lowland winter pastures, due to an increasing competition for land. Also forestry and arable farming in the mountains were not profitable anymore, and as the multifunctional integration of *silva*, *ager* and *saltus* at the farm level was the economic backbone of society, many mountain regions were abandoned.

In the years of Tourkokratia, transhumance patterns are dependent on the landholding patterns. The southern Argolid was thought to be a particularly attractive area for flocks, as there were ready markets on the offshore islands of Hydra, Spetses and Poros. The number of goats using such land is hard to estimate, if only because other areas of grazing land would probably have been in use.

In general only a part of the mountain population was engaged in the transhumance as complementary to peasantry, forestry, charcoal burning etc. Sometimes the shepherds also had some arable fields. The stockbreeding with transhumance was altogether rather multifunctional. The sheep contribute to the fertilization of fields from stables and by stubble grazing. It frequently occurred that land that was passed by sheep was leased to farmers because of the enrichment by the manure. Therefore, the transhumance is moreover an important factor in the ecosystems. Open landscapes were maintained together with many outstanding plant species and allied animal species. Many insect species were closely connected with the sheep and goats themselves and their droppings, which attracted predating birds and mammals, together with larger predators such as vultures, raptors, wolves etc. The latter also lived from the dead, sick and young domestic animals.

The nomadic pastoralism associated strongly with the transhumance landscape, points to the fact that this is the only way of forest management. Apart from that this type of farming offers excellent quality of dairy products. Today, there is a tendency of a mix system of nomadic pastoralism and private owned pastures, where we will succeed to have a natural balance, good quality of products, preservation of indigenous species, and to be in accordance with the appropriate sanitary measures.



Some of the socio-political measures which may be taken in order to support transhumance are the following:

1. *Supporting the use of local breeds.* Local breeds use native vegetation more efficiently than others. Support could be financial (e.g. subsidies or prices of the products) or institutional (e.g. only local breeds to be used in certain areas).
2. *Promoting the development of quality animal products.* This will encourage farmers to reduce the high number of animals that cause desertification and concentrate on fewer but more productive ones.
3. *Diversifying the farmer income.* Farmers can diversify their income from grazing lands by promoting other activities such as honey production, wild plants collection and agro-tourism.
4. *Economic support of farmers.* Such support is needed when farmers have to comply with a specific plan to combat desertification in their grazing land (e.g. reduction of the excess animals). It could be direct (subsidies) or indirect (prices of products).
5. *Farmer education.* None of the mitigation strategies will completely succeed unless farmers are properly informed and convinced of the need for combating desertification. This means that they should be educated accordingly about the negative impacts of desertification. Such education can be organized through field days in each desertified landscape, demonstrating what measures to take in order to improve the situation without jeopardizing the farmers' economic prospects.
6. *Administrative conflicts.* Several administrative agencies are usually involved in livestock husbandry, especially where grazing land does not belong to farmers but to the state or community. In this case conflicts arise between these agencies on how to prioritize the use of the land and for what group, for example for protection and reforestation or for grazing; or, alternatively, for livestock or arable farmers.

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