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in

Capone R. (ed.), Bottalico F. (ed.), El Bilali H. (ed.), Ottomano Palmisano G. (ed.), Cardone G. (ed.), Acquafredda A. (ed.)
Pastoralism and sustainable development: proceedings

Bari : CIHEAM

Options Méditerranéennes : Série A. Séminaires Méditerranéens ; n. 126

2021

pages 169-175

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=00008179>

To cite this article / Pour citer cet article

AUTHA. **The impact of animal husbandry on Thessaly's landscape, Greece.** In : Capone R. (ed.), Bottalico F. (ed.), El Bilali H. (ed.), Ottomano Palmisano G. (ed.), Cardone G. (ed.), Acquafredda A. (ed.). *Pastoralism and sustainable development: proceedings*. Bari : CIHEAM, 2021. p.169-175 (Options Méditerranéennes : Série A. Séminaires Méditerranéens ; n. 126)



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The impact of animal husbandry on Thessaly's landscape, Greece

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Abstract. Animal husbandry, especially the transhumant sheep and goat farming system, was one of the main factors shaping Greece's rural landscapes for centuries. The last few decades, the abandonment of this traditional, extensive form of animal husbandry, combined with the changes in animal breeds and the increase of animals being kept indoors and given complementary feeds, had a great impact on the landscape. In the area of Thessaly there is a long history of livestock grazing which affected landscape structure. In the lowlands, a characteristic zone with grasslands around the villages is present, contrary to the rest of Greece where it is limited. This study aims to provide an insight on landscape changes during the last century. For this purpose, landscape structure of Thessaly's lowland grasslands was studied using Corine Land Cover 1990 and 2018 in a G.I.S. environment. Overall, the communal grasslands around the urban, lowland areas of Thessaly occupied 7807,1 ha in 1990 and only 4255,8 ha in 2018 (-45,5%). In Western Thessaly these areas were more extensive, probably due to the seasonal movements of transhumants that exploited the lowland grasslands during the winter season. In Eastern Thessaly they occupied a smaller area, probably because transhumants spent the winter at the foothills, leaving the extensive plains exclusively for agricultural exploitation.

Keywords. land use changes, grasslands, transhumance, Corine Land Cover.

L'impact de l'élevage d'animaux sur le paysage de Thessalie, Grèce

Résumé. L'élevage d'animaux, en particulier le système d'élevage ovin et caprin transhumant, a été l'un des principaux facteurs qui ont façonné les paysages ruraux de la Grèce depuis des siècles. Au cours des dernières décennies, l'abandon de cette forme d'élevage traditionnelle et extensive, combinée avec l'évolution des races animales et avec l'augmentation du nombre d'animaux sédentaires et bénéficiant d'aliments complémentaires, a eu un impact considérable sur le paysage. Dans la région de Thessalie, il existe une longue tradition de pâturage du bétail qui a affecté la structure du paysage. Dans les plaines, une zone caractéristique avec des prairies autour des villages est présente, contrairement au reste de la Grèce où celle-ci est limitée. Cette étude vise à donner un aperçu des changements du paysage au cours du dernier siècle. À cette fin, la structure paysagère des prairies de basse altitude de Thessalie a été étudiée en utilisant Corine Land Cover 1990 et 2018 dans un environnement G.I.S. Dans l'ensemble, les prairies communales autour des zones urbaines et les plaines de Thessalie occupaient 7 807,1 ha en 1990 et seulement 4 255,8 ha en 2018 (-45,5 %). En Thessalie occidentale, ces zones étaient plus étendues, probablement en raison des mouvements saisonniers de transhumants qui exploitaient les prairies de plaine pendant la saison hivernale. En Thessalie orientale, ils occupaient une zone plus réduite, probablement en raison du fait que les transhumants passaient l'hiver aux piémonts, laissant ainsi les plaines extensives exclusivement pour l'exploitation agricole.

Mots-clés. Changements d'utilisation des terres, prairies, transhumance, Corine Land Cover

I - Introduction

Animal husbandry is one of the factors that shaped Mediterranean landscapes for centuries (Farina, 1998; Ispikoudis et al., 2004). The way pastoral societies managed natural ecosystems was a combination of a variety of historical and social factors (Sidiropoulou et al., 2015; Basupi et al., 2017). In addition, the impact of grazing on the landscape depended on both the type and

the intensity of livestock grazing (Kakouros, 2008). The huts, the stables, the sheds and the watering points, the paths and the bridges, the impact on the soil and the vegetation, led in the long run to the creation of characteristic landscapes of high ecological and aesthetic value in various parts of the country (Ganatsou et al., 2008; Papanastasis and Ispikoudis, 2012). Transhumance, the extensive animal (mainly sheep and goat) system based on livestock displacement constitutes an important but declining element of the European cultural tradition (Bunce et al., 2004). Since 1960s, there was a decrease in transhumance, which led to land use changes in both winter and summer grasslands (Leffler et al., 2014; Sidiropoulou et al., 2015).

Transhumance in Greece was characterized by sustainable use of pastures, low fixed capital endowments and intensive use of human labor (Laga et al., 2012). According to Chatzimichali (2007) in the 1960s the number of transhumance herd animals was about 2,000,000 but has declined since. In the region of Thessaly, in Central Greece, during the 19th century, animal husbandry was a major economic and social factor of development (Economou, 2007). Especially in Western Thessaly, the intense mountainous terrain and the extensive summer pastures played a decisive role both in the development of animal husbandry and in the general survival of the people, especially during the period of Ottoman rule and occupation (Manolopoulos, 2003). In addition, the presence of transhumant ethnic groups Sarakatsani and Vlachs was very strong. When autumn began, they migrated with their flocks from the mountain pastures of Pindos or Macedonia and set up their camps in the plains, protected from the harsh winter weather (Economou, 2007). Summer mountain pastures were communal, while winter pastures were usually private and transhumants had to pay rent (Nasioka, 2012).

Today in Thessaly, as in most of Greece, livestock activity has changed (Ispikoudis et al., 2004; Mitka, 2009). Livestock farms have been modernized, grazing time has been reduced due to increased use of complementary feeds, transhumance is almost abandoned and animals graze in a small radius around the sheds (Katsaros, 2009; Mitka, 2009; Sidiropoulou et al., 2015). The number of animals nowadays in transhumance herds Greece has dropped to 1,000,000 (PCAGGCA, 2011), of which 400,000 are found in Thessaly (Laga et al., 2012).

The purpose of this research was to study the impact of animal husbandry on Thessaly's landscape and give an insight on the factors that influenced livestock management in the past.

II - Materials and methods

Thessaly is located in central Greece and consists of the regional units of Karditsa, Magnisia, Larisa and Trikala, which occupy an area of 263,799 ha, 236,019 ha, 538,560 ha and 338,612 ha respectively (islands not included) (Fig. 1). About 50% of the region are lowland areas, most of which are located in the central part of Thessaly and constitute the Thessalian plain (Christakis, 2013).

In the present research, land use/cover maps were produced for 1990 and 2018 using the corresponding Corine Land Cover inventory (EEA, 2012). The lowland areas in each prefecture ($\leq 200\text{m}$ altitude) were isolated with the help of a 3D Digital Terrestrial Model (NASA, 2009). A zone of radius of 1,000m from the mountain foothills was created with the 'buffer' command of ArcMap 10.1 (ESRI, 2011) which was removed in order for the survey to include exclusively villages located in lowland areas and not adjacent to mountains. The following categories were selected and isolated from the Corine Land Cover maps: 231-pastures and 321-natural grasslands (Bossard et al., 2000). Finally, additional data for the research were obtained from the aerial photographs of 1945 (National Land Registry and Mapping SA, 2018).



Figure 1. Study area: Regional units of Karditsa, Magnisia, Larisa and Trikala.

III - Results and discussion

The analysis of the land use/cover map of Corine Land Cover for 1990 and 2018 showed that in the lowlands of Thessaly there is a characteristic zone with grasslands around the villages (Fig. 2), in contrast to the rest of Greece where this phenomenon is observed to a limited extent.

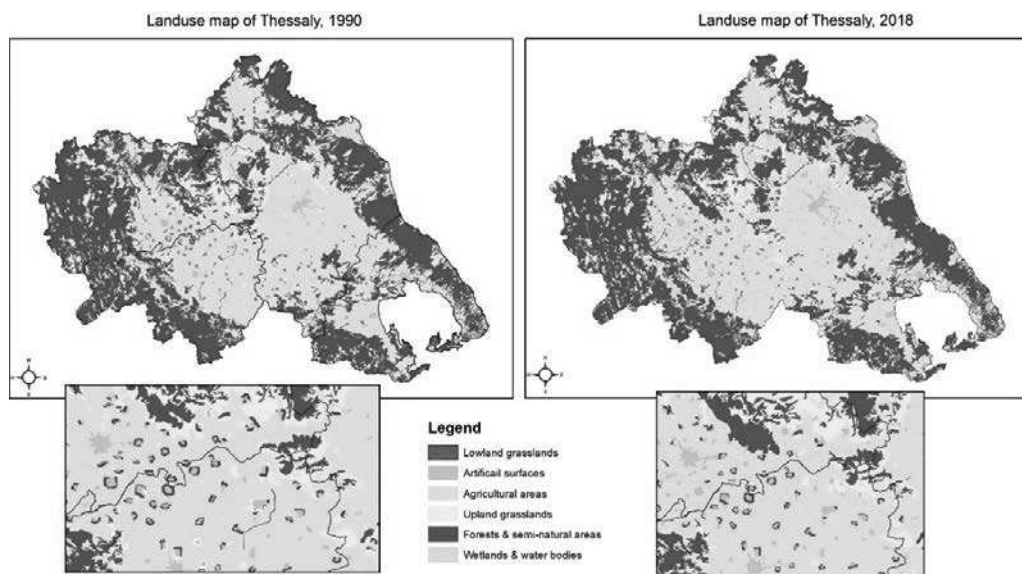


Figure 2. Land use maps of Thessaly, Greece for 1990 and 2018 (EEA, 2012).

In Western Thessaly (regional units of Trikala and Karditsa) these areas occupied 5616.9 ha in 1990 and in Eastern Thessaly (regional units of Larisa and Magnisia) only 2190.2 ha. In 2018 they appear decreased by 42.1% and 54.1% respectively (Fig. 3).

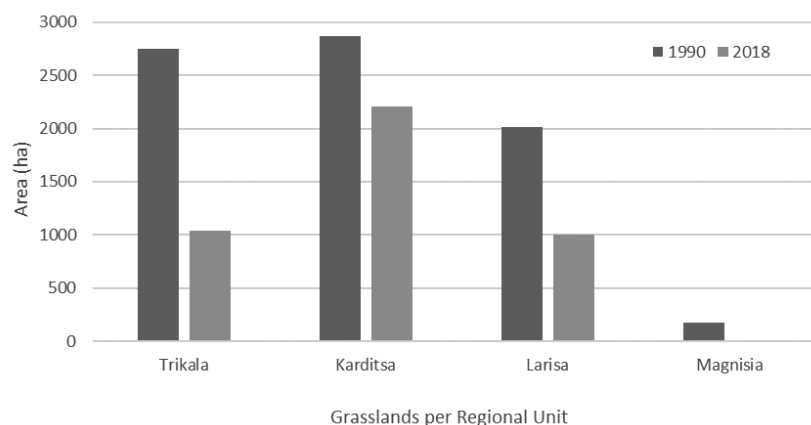


Figure 3. Land use changes between 1990 and 2018 in the regional units of Karditsa, Magnisia, Larisa and Trikala, Greece.

These grasslands occur in between the villages and the extensive agricultural crops and their width ranges from about 150m to 1,000m (Fig. 4a). They were communal and resulted from the need to provide for the animals during winter in the past. The villagers used their most fertile fields for this purpose because they were close to the villages and they usually had plenty of running water and safe places to keep their animals. These areas remained unchanged until today because in 1955 (article 197 of the Agricultural Code and Law 3194/1955) they were granted to the nearest Municipalities and Communities for the common use of their habitants and any use other than grazing was strictly prohibited (Chiotis, 1997).



Figure 4. The village Megala Kalyvia in the prefecture of Trikala: a) community grasslands around the village nowadays (Google Earth Pro, 39°29.869'N, 21°47.275'E, 2014) and b) traces from the livestock facilities around the village in 1945 (National Land Registry and Mapping SA, 2018).

For many years, these grasslands were the main source of cheap and valuable feed for animals in the lowland areas of Thessaly. According to Chiotis (1997), the necessary facilities for animal husbandry were the hut for shepherd, the storehouse for feeds, the shed, the watering cans and the milking pen for animals. These structures were not permanent and were dismantled as soon

as the grazing period ended. However, as they were constructed in the same places each time, they left their mark on the ground (Fig. 4b). Construction materials were abundant in the surrounding area: willow and wicker rods, wood, thorns and tree branches (Chiotis, 1997).

The greater presence of these community grasslands in Western Thessaly seems to be due to a combination of factors. They were used not only from the permanent population, but also by transhumants during the winter (Dasiou, 2014). The need for grazing areas was such that transhumants also rented large, uncultivated areas from the local landowners (Nasioka, 2012). The strong presence of animal husbandry in the area is reflected in the maps of the Austro-Hungarian Army of 1914 (Eötvös Loránd University, 2009). Toponyms such as Vlahinaköj (Vlach village), Longos (shrubland area), Megala Kalivia (big huts), Nomi (property), indicate the systematic use of certain areas for livestock activities.

On the contrary, in Eastern Thessaly, most of the transhumants spent the winter at the foothills, where the conditions were ideal for sheep and goats (protection from winds and low temperatures, fertile grasslands, existence of water sources (Dasiou, 2014), leaving the extensive plains, with the most scattered villages, exclusively for agricultural exploitation (Gourgioti, 1983). The existence of Lake Karla, which was dried up in 1962, played an important role, occupying a large part of the eastern plain (20000 ha). The surrounding villages were more connected with the diverse economy of the lake, mainly with fishing (Goutis, 2013; Dodouras et al., 2014). In 1907 refugees from eastern Rumelia were added to the population composition of Thessaly (indigenous permanent residents and nomads) and from 1921 to 1923 refugees from Pontus and Mikra Asia settled mainly in eastern and southern Thessaly (Oikonomou, 2007; Patronis, 2015). They were given land which they used almost exclusively for agricultural exploitation.

The agrarian reform (Law 1702/1917) that was implemented with the arrival of the refugees in 1922 (Patronis, 2015), with the aim of expropriating the land and distributing it to the farmers, marked the beginning of the abandonment of transhumance, as it resulted in the reduction of winter grasslands (Tsakanika and Ispikoudis, 2004). Nowadays, the overall form of livestock activity has changed and stable livestock farming is predominant. Grazing time has decreased due to increased use of complementary feeds (Mitka, 2009) resulting to the gradual homogenization of the landscape and the loss of its biodiversity.

IV - Conclusions

The intense development of animal husbandry in Western Thessaly, contrast to the more extensive development of agriculture in Eastern Thessaly in the past, led to the creation of a characteristic mosaic of land uses. Understanding the operation of pastoral communities is directly related to grassland management and can promote the integration of historical background in land use planning. In Greece, a relatively small effort has been made for an integrated development approach. However, interventions in pastoral landscapes require rational management of all natural resources in order to develop policies that contribute to their conservation and the development of the local economy.

References

- Basupi L.V., Quinn C. and Dougill A.J., 2017.** Historical perspectives on pastoralism and land tenure transformation in Ngamiland, Botswana: What are the policy and institutional lessons? In: *Pastoralism 7* (1): pp. 24.
- Bossard M., Feranec J. and Otahel J., 2000.** Corine land cover technical guide. European Environmental Agency, Copenhagen. 105 p.
- Bunce R., Pérez-Soba M., Jongman R., Gómez Sal A., Herzog F. and Austad I., 2004.** *Transhumance and biodiversity in European mountains*. Alterra Green World Research, Wageningen UR.
- Chatzimichali A., 2007.** *Sarakatsanoi*. Vol I. 381 p.
- Chiotis N., 1997.** *Megala Kalyvia*. Our place and the world. Cultural Organization of the Community of Megala Kalyvia, Trikala. 335 p.
- Christakis C., 2013.** Multifunctional landscape: the case of the plain of Thessaly. Department Planning and Regional Development. University of Thessaly, Volos. 89 p.
- Dasiou K.D., 2014.** Application of GIS in recording and studying historical transport networks: the case of South-Western Macedonia. Faculty of Engineering, Aristotle University of Thessaloniki. 430 p.
- Dodouras S., Lyratzaki E. and Papagiannis T., 2014.** Walking Guide of Carla Lake. Mediterranean Institute for Nature and Man (Med-INA), Athens, 239 p.
- EEA, 2012.** CORINE Land Cover 2012 [WWW Document]. URL <http://land.copernicus.eu/pan-european/corine-landcover/clc-2012/view>
- Eötvös Loránd University, 2009.** 3rd Military Mapping Survey of Austria-Hungary. Eötvös University, Department of Cartography and Geoinformatics.
- ESRI., 2011.** ArcMap™ 10.1. Environmental Systems Resource Institute, Redlands, California
- Farina A., 1998.** *Principles and methods in Landscape Ecology*. Chapman & Hall, 223 p.
- Ganatsou E., Rapti D. and Ispikoudis I., 2008.** Contribution of nomadic livestock husbandry on the creation of alpine and sub-alpine formations 'NATURA 2000' areas. pp. 221-226. Range science and protected areas (Mantzanas K. and Papanastasis V., eds). Proceedings of the 6th Hellenic Range and Pasture Conference. Leonidio, Arcadia, October 2-4, 2008. Hellenic Range and Pasture Society, no 14.
- Gourgioti E., 1983.** Sarakatsani animal breeders/farmers in the area of Larisa. *Sarakatsanoi*. A Greek nomadic livestock population, 49-61 p.
- Goutis D., 2013.** Optimization of a combined aquifer-reservoir model of Lake Carla in relation to water demand. School of Engineering, Department of Civil Engineering. University of Thessaly, Volos, 210 p.
- Ispikoudis I., Sioliou M. and Papanastasis V., 2004.** Transhumance in Greece: past, present and future prospects. In: Bunce, R., Pérez-Soba, M., Jongman, R., Gómez Sal, A., Herzog, F., Austad, I. (Eds.), *Transhumance and Biodiversity in European Mountains*. IALE publication Wageningen, pp. 211-229.
- Kakouros P., 2008.** Spatio-temporal change of pastoral land uses and their effects on the landscape. School of Forestry and Natural Environment, Aristotle University of Thessaloniki, 131 p.
- Katsaros N., 2009.** *The Sarakatsanika Tseligata of Vermio and life in their flocks*. Association Sarakatsanoi of Imathia 'Oi Stavraetoi', Alexandria, Imathia, 431 p.
- Laga V., Ragkos A., Skapetas V., Mitsopoulos I., Kiritsi S., Abas Z., Mazaraki K. and Bambidis V., 2012.** Current trends in the transhumant sheep and goat sector in Greece. In: *Options Méditerranéennes Series* 102: 473-476 p.
- Leffler A.J., Leonard E.D., James J.J. and Monaco T.A., 2014.** Invasion is Contingent on Species Assemblage and Invasive Species Identity in Experimental Rehabilitation Plots. In: *Rangeland Ecol. Manage* 67: 657-666 p.
- Manolopoulos I., 2003.** Rangeland and development of the mountain areas of the West Thessaly, 61-68 p. Range science and development of mountainous regions (Platis P. and Papachristou T., eds). Proceedings of the 3rd Hellenic Range and Pasture Conference. Karpenisi, 4-6 November 2002. Hellenic Range and Pasture Society, no 10.
- Mitka A., 2009.** Study of the diachronic landscape evolution of Kopatsaraika villages of the prefecture of Grevena with the use of geographical information systems (G.I.S.). School of Forestry and Natural Environment, Aristotle University of Thessaloniki, 125 p.
- NASA, 2009.** Aster Global Digital Elevation Model. Land Processes Distributed Active Archive Center (LP DAAC), U.S. Geological Survey (USGS) Center for Earth Resources Observation and Science (EROS). National Aeronautics and Space Administration.
- Nasioka, F.P., 2012.** Management of common resources: A case study of the institution of tseligata. Department of Economics, University of Thessaly, 111 p.
- National Land Registry and Mapping SA, 2018.** <http://gis.ktimanet.gr/wms/ktbasemap/default.aspx> [June 2021]

- Oikonomou K., 2007.** *Larisa and the History of Thessaly*. Vol D', 510 p.
- Papanastasis V. and Ispikoudis I., 2012.** *Rangeland Ecology*. Giakouidi editions, 325 p.
- Patronis B., 2015.** *Το Αγροτικό Ζήτημα II - Η Μεγάλη Γαιοκτησία: Η περίπτωση των τσιφλικιών στη Θεσσαλία, 1881-1923*. Ελληνική οικονομική ιστορία. Εκδόσεις Κάλλιπος.
- PCAGGCA, 2011.** Payment and Control Agency for Guidance and Guarantee Community Aid. Registry of farms and farmers. Ministry of Rural Development and Food, Athens, Greece.
- Sidiropoulou A., Karatassiou M., Galidaki G. and Sklavou P., 2015.** Landscape pattern changes in response to transhumance abandonment on mountain Vermio (North Greece). In: *Sustainability 7*: 15652-15673 p.
- Tsakanika V. and Ispikoudis I., 2004.** Transhumance as main economical activity of the Vlachs of N. Pindus, 589-595 p. Rangelands of lowlands and semi-mountainous areas: means of rural development (Platis P., et al, eds). Proceedings of the 4th Hellenic Range and Pasture Conference. Volos, 10-12 November 2004. Hellenic Range and Pasture Society, no 12.