

CHAPTER 1

Transhumance in Greece

Multifunctionality as an Asset for Sustainable Development

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Introduction

Sheep and goat transhumance (SGT) describes the seasonal movement of flocks between specific summer and winter domiciles, with the key objective to take advantage of natural vegetation in highland rangelands during summer and of mild weather conditions in the lowlands during winter (Nyssen et al. 2009). Therefore, transhumance is a specific form of “pastoralism,” as it is based on grazing natural vegetation (Farinella, Nori, and Ragkos 2017), but differs from “nomadism,” because flocks perform circular predefined movements (Vallerand 2014). It is also a multifunctional production system as it produces a wide range of goods and services jointly with food (milk, meat, and dairy products, etc.).

The multifunctional character of SGT provides important contributions towards sustainable and inclusive development and provides significant ecosystem services (D’Ottavio et al. 2018). The socioeconomic role of SGT is of utmost importance for mountainous/marginal/inland areas where the economic activity is not sufficiently diversified. SGT has been the main/only economic activity for centuries, and today it is still an important source of income even in communities in which other sectors have emerged (Farinella et al. 2017). In addition, SGT protects rural livelihoods, reducing depopulation of marginal and remote areas and is in fact critical for maintaining life and productivity in the more marginal and fragile territories of the Mediterranean region. Tailored to local conditions, SGT plays a vital environmental role by enhancing biodiversity and providing ecosystem services (Varela and Robles-Cruz 2016; D’Ottavio et al. 2018). In a variety of Mediterranean settings, transhumant systems make effi-

cient use of natural resources and have shaped unique natural landscapes (Caballero et al. 2009), while also protecting genetic diversity by rearing autochthonous breeds. In addition, pastoral systems effectively mitigate climate change effects (e.g., soil carbon stock in rangelands) towards ecosystem resilience. The cultural heritage of SGT and the heterogeneity of its sociocultural contributions have characterized territories up to now: tacit knowledge concerning the functioning of local ecosystems, farm and land management; habits and customs; traditions, norms and tacit rules; processing skills. SGT in Greece, Italy, and Austria was recently included on the UNESCO list of Intangible Cultural Heritage of Humanity (UNESCO 2021).

The European Union has addressed the issues related to the multifunctionality of agricultural and livestock production systems through a broad array of policy measures. Since the accession of Greece in the European Union (EU) in 1981 the Common Agricultural Policy (CAP) has been applied, replacing all previous national agricultural policies. The CAP generally uses two types of policy tools available to all farmers in the EU, as described in Regulations and Directives, which are generally referred to as first-pillar and second-pillar policies. The former type includes all the measures that provide income support to EU farmers, either in the form of coupled subsidies to production and/or to cultivated land and animals reared or of direct payments, such as the Single Farm Payment and decoupled payments. The latter policies support rural development and provide financial incentives to farmers who wish to ameliorate their performance and competitiveness; to undertake commitments regarding their production practices; or to supply society with particular environmental and social services. These payments include agri-environmental and mountainous areas payments, financial support for investments of various types and other types of structural measures. However, it has been documented that, in Europe, pastoral systems share common challenges which are poorly addressed by the current policy framework (Ragkos and Nori 2016).

Transhumance in Greece has been examined by several authors from a rather broad range of disciplines. The available literature can be categorized into two types. The first approaches transhumance from an ethnological point of view (Nitsiakos 1995) and examines its historic evolution (Gkoltsiou 2011; Ntassiou, Doukas, and Karatassiou 2015). These studies present various aspects of the life and social structure of transhumant societies in the past, the evolution of the system under volatile historic and economic conditions, and the process of integration of nomadic and transhumant communities within the modern Greek society. A part of these studies considers the sheep and goat farming systems currently prevailing

in the country (extensive or semi-intensive sedentary systems) as the natural evolution of animal production systems (for instance Hadjigeorgiou 2011). The second type of studies examines transhumance in terms of its ecological and environmental implications (Sidiropoulou et al. 2015; Sklavou et al. 2017) or evaluates its economic performance (Galanopoulos et al. 2011; Ragkos, Siasiou, et al. 2014) and management practices (Gidarakou and Apostolopoulos 1995; Siasiou et al. 2018). Since the sector is undergoing a modernization process and is struggling to integrate to market conditions without compromising its traditional elements, the studies of the second type are actually gaining increasing attention.

The purpose of this chapter is to provide an outline of the Greek sheep and goat transhumance sector. In particular, detailed structural data of the system are presented, which demonstrate its dynamics across the country. Then, the actual operation of the system is described in detail, focusing on the particularities of SGT regarding the management of the three basic production factors (land, labor, capital). The chapter closes with a critical presentation of the main problems of the system that hinder its development and of measures to increase its dynamics and potential.

The Structure of Sheep and Goat Transhumance in Greece

In Greece there are currently two different types of transhumances with notable differences. The first involves cattle and the second, sheep and goats. Cattle transhumance is becoming increasingly popular, as it is supported heavily through the implementation of CAP Pillar I measures (Koutsou, Ragkos, and Karatassiou 2019) and has considerably lower requirements in human labor and capital. These characteristics render extensive bovine production an alluring alternative to sheep and goat transhumance, and it is thus being expanded in recent years, standing, however for no more than 6.5 percent of total cattle raised in Greece (Ragkos et al. 2013). Nevertheless, this chapter focuses on sheep and goat transhumance, which has played a significant role in socioeconomics for decades.

Compared to data from previous decades, sheep and goat transhumance has shown a decline in Greece. However, during the last thirty years the population of transhumant small ruminants has remained stable while the number of farms is decreasing, which indicates the formation of larger, viable farms. This structural evolution has been interpreted as a shrinkage of the system, and sheep and goat transhumance has been considered as a system of trivial importance. In the general context of support for the intensification of the Greek farming sector—which was further strengthened by EU CAP policies—SGT was ignored as an anachronistic

system of little market potential and unable to support the modernization of the Greek farming sector. Nevertheless, available data show that this is not the case.

Collecting data about transhumance in Greece is not an easy task for two reasons: one, the lack of cohesive statistical databases, and, two, the multiple facets of the system in Greece. Based on processed data originally retrieved from the Greek Payment Authority of CAP Aid Schemes (OPEKEPE) for the year 2011 (THALES 2015), SGT is practiced in most parts of Greece by 3,051 farms, and transhumant sheep and goats account for almost 7.5 percent of the national flock. The center of SGT is Thessaly where 805 farms (26.4 percent) rear almost 338 thousand animals (33 percent), closely followed by Central Greece with a slightly lower number of farms (787, 25.8 percent) and a significantly lower transhumant sheep and goat population (214 thousand, 20.9 percent). Peloponnese, in the southern mainland part of the country, is ranked third (19.7 percent of farms, 16.8 percent of animals), followed by Epirus in the western part, Macedonia and Thrace in the north, and the islands, including the island of Crete. Compared to statistical data quoted by Syrakis (1925), the percentage of farms spending winter in Thessaly is almost stable (28 percent in 1924) but the percentage of farms in Central Greece and Peloponnese was much lower in 1924 (10.1 percent and 13.6 percent respectively). Since the 1960s, the contribution of transhumant sheep and goats to the national flock has been reduced from 30 percent to 7.5 percent (Hatziminaoglou 2004). In the summer, almost all mountainous areas of the country are grazed, to some extent, by transhumant small ruminants. Southern parts of the country (Peloponnese and Central Greece) are home to almost 42 percent of transhumant flocks during summer accounting for 34 percent of SGT. Nonetheless, more than 26 percent of the transhumant sheep and goat population move to Macedonia during summer, especially in the western mountainous areas of Pindos.

The average size of transhumant farms as well as the importance of sheep and goats vary across regions. The average farm size is 335.5 sheep and goats, with smaller flocks prevailing in southern mainland regions (with average sizes of 272.3 and 286.5 animals in Central Greece and Peloponnese respectively), and relatively larger flocks in the northern parts: 419.8 animals per farm in Thessaly, 387.0 animals per farm in Macedonia, 333.9 animals per farm in Thrace. Sheep farms prevail in the central regions of the country yet the importance of goat farming is escalating. In Peloponnese, goat farms correspond to about 28 percent of the total—as they are well adapted to the rocky pastures of its southern part—while in Crete the percentage of mixed farms is very important (41 percent). In Macedonia the majority of farms are mixed or rear goats exclusively. The

size of the average goat farm is significantly higher than the average sheep farm, both at the country level (403.3 animals versus 280.2) and at the regional level, with the exception of Crete.

Considering the distances of movements SGT flocks, “trasterminance” is the prevailing type (56.6 percent of all sheep and goat mobilities), which is also the case in Italy, as pointed out by Pardini and Nori (2011). Movements of up to 100 km are more common for the central/west part of the country and Peloponnese. Remote movements of over 100 km flocks—which usually exceed the conventional boundaries of Regional Units or Region—are the most typical in the eastern part of Thessaly and also very common in EtoIoakarnania in the western part of Central Greece. Very remote movements exceeding 200 km and up to 350 km are also common to the central part of the country, of which the most interesting are those of flocks whose winter domiciles are in the capital district of Attica, around the urban web of Athens.

In the last decades, movements with trucks are the established means, especially in cases of movement over 100 km, but even for shorter distances; only short local movements are still performed on foot throughout the country. According to a survey of a sample of 551 transhumant farms, 27 percent of them moved on foot, 65 percent used trucks and 8 percent used both means (Lagka et al. 2015). Changing lifestyles and integration to the market economy with intensification trends are some of the reasons behind this shift. With truck movements, farmers achieve considerable time savings and higher milk production, but renting trucks is sometimes costly, especially under reduced liquidity and low revenues when product prices are low (Ragkos, Karatasiou et al. 2016). For this reason, in the last decade a “return” to movements on foot has been seen, reviving old transhumance routes (for road distances over 100 km), especially when returning to winter domiciles, where the downhill road and the fact that the animals are not milked make the movement easier, quicker, and more comfortable.

SGT in Greece in general is predominantly for milk production (dairy ewes). According to the results of a technical and economic analysis on a sample of sheep and goat transhumant farms in the region of Thessaly (Ragkos, Siasiou et al. 2014), milk was by far the most important product of transhumant flocks (56.4 percent), with an average milk yield of 96 kg/ewe(dam)/year. Siasiou, Galanopoulos, and Laga (2020) reported 97.45 kg/ewe(dam)/year for the whole country based on a sample of 551 farms, which is substantially lower than for other production systems. For instance, milk production in intensive farms rearing Chios-breed sheep was 226 kg/ewe/year (Theodoridis et al. 2012) and 218.6 kg/ewe/year in semi-extensive sheep farms in northeastern Greece (Ragkos, Koutsou,

and Manousidis 2016). For goat farms, Gelasakis et al. (2017) reported an annual yield of 207 ± 115.3 kg/goat/year in mainland Greece. Meat was also an important source of income (28.3 percent) while on-farm transformation of milk (cheese production) was of low importance for the overall income of the average farm (4.9 percent) because this activity is restricted to only a few farms. The farm income was supplemented through subsidies (10.4 percent).

Aspects of Management of Transhumant Flocks in Greece: Modernization and Tradition

SGT has not remained unaffected by the general trend for intensification in the Greek livestock sector (Ragkos, Koutsou et al. 2016; Karanikolas and Martinos 2012). The sector has developed a dualistic pattern, being (semi-)intensive in winter and (semi-)extensive in summer, with more use of concentrates for animal nutrition and modern buildings and machinery. This intensification has not altered, however, its predominantly traditional character. This can be seen in more detail based on previous research (Ragkos, Siasiou et al. 2014; Lagka et al. 2014; Siasiou et al. 2014; Galanopoulos et al. 2011; Loukovitis et al. 2016). The management practices of transhumant farms have been evolving through time and continue to adapt to technological advances. Indeed, SGT typically incorporates traditional elements appropriately adapted to today, along with practices that can be characterized as innovative.

Depending on soil and climatic conditions as well as local habits, management practices of transhumant farms vary across the country. In the northern and central areas (Macedonia, Thrace, Thessaly, Epirus, and Central Greece), the movement to the mountains starts in May and the flocks remain there for four to five months, returning to the lowlands usually by the end of October. In southern areas—parts of Central Greece and Northern Peloponnese as well as on Aegean islands—the stay in the mountains can be longer (from late April until mid-November), while in southern Peloponnese and Crete the weather conditions in the mountains are milder and flocks may graze there up to eight to nine months every year. An important characteristic of SGT in Greece is that in most cases the family moves along with the flock in the highlands when the distance between the lowlands and the highlands is not small.

The lives of transhumant farmers are intertwined with the needs of their flocks. The production period starts with the birth season of sheep in November. By that time, flocks in northern Greece are already in the lowlands, while in southern Greece it is not uncommon that births take place

in the highlands. The weaning period lasts about forty-five days so that lambs are sold to markets before Christmas, in order to profit from higher meat prices. The birth season of goats and of ewes at first lambing takes place by the end of February or early March, to meet the high demand for meat during the Easter period.

On Christmas—or soon after—the milking season begins. Typically, animals are milked twice and—more rarely—three times a day. The milking period usually lasts for six to seven months—most commonly until late July—which means that animals are milked regularly during their stay in the mountains for about two months. Regarding nutrition, animals graze and/or are fed indoors, depending on weather conditions. In northern and central parts of the country, animals are kept indoors almost exclusively from November until March, and only by early spring do animals start to graze in natural or cropped pastures. In southern parts animals may graze throughout the year, depending however on weather conditions and the availability of rangelands. In the highlands, animals are fed exclusively in natural rangelands freely throughout the day or under the supervision of shepherds, if predators are present. The period from August to the beginning of October is the most relaxed for transhumant farmers, as they do not milk or feed the animals, until they start their return to lowland communities.

Sheep and goat transhumance in Greece exhibit important particularities which discern it from other—either extensive or intensive—production systems. These stem from the specific use of available resources (land, labor, and capital) and are outlined in what follows.

The Role of Land in SGT

Sheep and goat transhumance is highly dependent on land management compared to other livestock production systems, especially compared to intensive ones. This is due to the use of rangelands in both winter and summer domiciles, but also to the cultivation of land for the production of fodder and concentrates.

Rangeland management and the allocation of land constitute issues of high importance to the survival of transhumance. Until the early decades of the twentieth century, transhumant farmers were organized in specific collective actions named *tseligata* (singular, *tseligato*) within which transhumant families cooperated in rearing their animals and managing common resources (Karavidas 1931; Koutsou et al. 2019). Within *tseligata* farmers fully understood the value of natural resources as common goods and developed a practical land management system based on empirical observation and knowledge of vegetation and weather conditions. Based

on these they assessed the grazing capacity of the areas they used, and each farmer grazed his animals in a specific place each year.

The individualization of transhumant farmers in the second half of the twentieth century combined with socioeconomic and political developments and a general trend of modernization and intensification brought about competition in rangeland use. Nowadays, livestock farmers are faced with a bureaucratic system of rangeland allocation, which increases uncertainty and—in some cases—is the cause of social conflicts in rural areas (Koutsou et al. 2019). In particular, rangelands are actually allocated to livestock farmers based on a rough estimation of grazing capacity by paying a small premium per animal. In other cases, some areas are allocated to farmers based on an auction process. In addition, the development of the road network, the expansion of cropland and the encroachment in mountain paths due to under-grazing have reduced accessibility to mountain terrains. Although there are local variations of this system across the country, this system has reduced the importance of traditional ecological knowledge, which resulted in environmental degradation in some areas (Ragkos, Koutsou et al. 2020) and brought uncertainties and sometimes conflicts among farmers and other land users (Koutsou et al. 2019).

Transhumant flocks are also dependent on the production of feedstuff (forage and concentrates) for winter. Although they have the option to buy feedstuff from markets, many prefer to cultivate land for animal feed, in order to reduce costs. It is not unusual to own land in the lowland but also to rent it either for the cultivation of feed or for grazing crops. In general, the cultivation of land by transhumant farmers follows the pattern of other sheep systems in Greece—that is, it is an activity of secondary importance, with less intensive use of purchased inputs compared to crop farmers and seldom is part of the production sold in markets.

The Role of Labor in SGT

Labor is a factor of crucial importance for livestock farms, while for pastoral production systems it is necessary for the expansion of farms, and its lack could lead to abandonment not only of the sector but also of whole rural areas (Nori 2017b). Nowadays, the debate over labor in the primary sector is part of the broader debate on the role of skilled or unskilled labor in the development process around the world. Transhumance differs from conventional intensive or semi-intensive livestock systems because it is in direct contact with nature. The production process is not automated/industrialized, as it is, for example, in intensive dairy farming, and therefore requires workers with specific practical skills, experience, and appropriate training, willing to adopt a way of life that is intertwined with

nature and the productive cycle of animals. Labor in a transhumant farm represents multiple challenges: manual milking, sometimes under harsh conditions; surveillance of livestock in pasture to prevent predator attacks; protection against extreme weather conditions; treatment of diseases; repairing farm machinery and/or makeshift buildings and equipment, etc. These are combined with increased requirements for managerial work for the effective management of capital and decision-making for production and product sales as well as bureaucratic procedures (Ragkos and Nori 2016; Ragkos, Koutsou et al. 2018). A modern-day transhumant farmer in Greece is expected to combine the special “wealth” of traditional ecological knowledge inherited from his predecessors with knowledge of technological innovations, livestock science, and farm economic management.

Transhumant farms have traditionally been run by family members (Loukopoulos 1930) and this is also the case nowadays. Most Greek transhumant farms meet all six conditions set by Gasson and Errington (1993) defining the “farm family business,” which constitutes the backbone of the European Model of Agriculture (Vermersch 2001). The family works on the farm either exclusively or occasionally, much like in the past (written testimonies by Loukopoulos [1930] and Syrakis [1925]) but also with notable differences which are described in the remainder of this section.

The allocation of tasks among family members generally maintains the basic principles (by gender and age) of previous decades. A male family member (usually the husband) is the head of the farm and is also involved in feeding, milking, animal health, and crop production as well as in economic management, decision-making, communication, and product sales. Women work in a supporting role—e.g., in milking or during birth season and weaning—and they are usually the ones producing cheese. Other family members have auxiliary roles; these include children who are away for studies but return home for summer and holidays, as well as grandparents. Another form of labor division is pluri-activity, through the horizontal or vertical development of parallel activities within the family farm. In areas where such activities are available—often taking advantage of financial opportunities of the CAP—farms expand to crop production for market (e.g., olive and citrus fruits in Crete and the Southern Peloponnese), tourism and household artisanal production (cheese/dairy products). In this form, the family members who are put in charge stop working on the livestock enterprise but still remain within the family business.

The problem of farm succession has made the pattern of labor organization in transhumant farms more complex. Throughout the Mediterranean, young family members tend to leave the family farm, for studies or seeking employment in other sectors, as working in the sector is generally not appealing due to its harsh requirements (Ligda et al. 2012; Nori 2017b).

This way, farms are deprived of an input of crucial importance, but, more importantly, they are also left with no successor (Farinella et al. 2017). The lack of labor has hindered the development of the Greek primary sector in general (Karanikolas and Martinos 2012; Kasimis and Papadopoulos 2005). In previous decades, the lack of family labor—for example, because of family member migration—led to a decline in the primary sector in general, as there were no alternative sources of hired labor, because the social perception of working in another farm was demeaning (Loukopoulos 1930).

The shrinking pattern of livestock production until the 1980s was reverted when—starting from the 1990s—cheap hired labor started to be extensively offered by migrants, mainly Albanians, who came to the country in large numbers—a phenomenon also recorded in Italy (Nori 2017a; Farinella et al. 2017).

Actually, Albanian workers are employed throughout the country; Bulgarians and Romanians work mainly in the north; Pakistanis and Indians are mostly found in central and southern Greece. These individuals, in many cases, had previous experience with livestock farming in their countries of origin and their employment costs were low (Nori and Ragkos 2017; Ragkos and Nori 2018), so they quickly became employed on livestock farms. Transhumant farms, however, resort to hired labor only when necessary, in fact the analysis of data from Thessaly (Ragkos, Siasiou et al. 2014) showed that about 27 percent of labor requirements were covered by hired workers. These people work all year round or are only recruited during peak periods and are engaged in simpler but harsher and more time-consuming tasks such as grazing, cleaning, and feeding and also in milking. The remuneration of hired workers includes their salary and benefits in kind, such as housing, food, and clothing.

The Role of Capital in SGT

Sheep and goat transhumance, as practiced today, has incorporated a higher level of capital use compared to the past. To some extent, capital has now substituted the other two factors of production (land and labor), especially in winter domiciles. On the other hand, this trend is not excessive, and the system maintains a traditional extensive character with less dependence on capital compared to semi-intensive or intensive systems (see for instance Theodoridis et al. 2012, 2013). CAP funding has played an important role in this process, providing the opportunity to modernize their equipment at relatively low financial costs.

Fixed capital is used in the form of buildings, machinery, and livestock. Buildings in the winter domiciles are usually stable and not always make-

shift, made of a variety of materials (wood, stone, bricks, or concrete). Their values vary significantly depending on materials and size as well as the region, as in northern and central Greece more stable and functional facilities are required to deal with low temperatures, humidity, and snow. In summer domiciles, buildings are usually makeshift and traditional, with materials that are part of the landscape and natural environment, while in some areas there are municipal/community buildings for flocks (sheds or fences). The machinery of transhumant farms is relatively limited. It definitely includes feeders and watering cans (metal or wooden), a milk cooler for preserving fresh milk until it is collected by the dairy industry, and a farmer truck for the transport of inputs and products. In many cases the farm has a hammer mill (for preparation of mixtures of concentrates), a tractor, and more rarely, a truck. Portable milking machines that can be transported between winter and summer domiciles are becoming increasingly popular, however farmers who are experienced in milking by hand are sometimes reluctant to switch to machine milking (Lagka et al. 2014). If the farm cultivates feedstuff, it has, in most cases, the necessary tractor accessories (ripper, cultivator, disc harrow, fertilizer distributor, tank) and, less frequently, sowing and harvesting machines as well as mowers.

A significant number of transhumant farms rear local breeds of sheep and goats—either purebred or crossbreeds. These breeds are characterized by low yields compared to imported ones, but their milk usually has high quality characteristics (Ragkos, Koutouzidou et al. 2017). In addition, they are well adapted to grazing under the adverse conditions of mountainous areas, while they are resistant to illnesses and have low nutritional requirements (Ragkos, Koutouzidou et al. 2019). Particular examples are the Kalaritiki breed in Epirus, the Anogia breed in Crete, the Karystos breed in Evia, and the Vlachiko breed in Western Macedonia.

The use of variable capital mainly relates to liquidity for the purchase of consumables and affects managerial choices of farmers (e.g., use of purchased or on-farm production of feedstuff). The most significant variable capital expense concerns the purchase or cultivation of feedstuff which is very important especially in winter. With the exception of some islands, where animals graze freely all year long and are kept for meat, this expenditure stands for at least 35–40 percent of the total expenses of transhumant sheep and goat farms, especially in the Northern part where winter is harsher and longer (Ragkos, Siasiou et al. 2014). Thus, the five-month stay in the mountain pastures leads to significant cost savings. For flocks that spend winters in the lowlands of Thessaly, grazing in mountain rangelands substantially reduces feeding costs by 47 percent to 58 percent compared to intensive production (Ragkos, Siasiou et al. 2014). Such savings are even greater in Peloponnese and the islands, where feedstuff cul-

tivation is limited and therefore the prices of basic feedstuff (corn, clover, cereals) are significantly higher. As mentioned above, on-farm feed production is more common in the north and contributes to further savings.

Challenges for Greek Sheep and Goat Transhumance

The specificities of SGT in Greece render the system vulnerable to numerous socioeconomic and policy-related problems. The lack of clear recognition of its multiple roles combined with the lack of a specific policy framework adapted to its particularities bring about exogenous challenges, while the balance of the system between modernization and tradition brings endogenous issues that need to be tackled. Some of these problems are common to extensive livestock systems across Europe while others are more severe in the Greek setting.

Problems in Land Uses

Problems in land use, as discussed earlier in the chapter, is perhaps the most important problem of the Greek transhumance sector, as farmers do not have easy and unobstructed access to rangelands both in the lowlands and in the highlands. In order to mitigate the negative effects of the current system of rangeland allocation, Integrated Rangeland Management Plans (IGMPs) are expected to be delivered in the following years. IGMPs will be based on a precise estimation of grazing capacities of rangeland “parcels” which will be allocated to livestock farmers for a considerable time period—and they will then be entitled to undertake all necessary activities to prevent degradation (Ragkos and Koutsou 2021).

Apart from the issue of rangeland uses, there are conflicts relating to the unclear ownership of some areas. This is the result of the lack of an integrated land registry—which is still under preparation. “Forest maps” were recently delivered with an aim to discern forest areas from other land uses, but still they have not been finalized. In addition, competition from alternative land uses (intensive agriculture and livestock in the lowlands, such as Peloponnese and Central Macedonia; tourism on islands and coastal areas; sustainable energy systems; expansion of habitats of predators) limits the possibilities of the operation of the system in certain parts of the country.

Problems Related to Infrastructure

The access to the specific mountain rangelands where animals graze from the highland communities where farmers live with their families during

the summer is sometimes difficult, as they are not accessible with farmers' cars due to the poor quality of forest roads. The provincial road network connecting highland communities with main roads are also in need of repairs and upgrades to enhance accessibility. Public infrastructure for livestock is not always appropriate (e.g., makeshift barns and watering stations, huts for shepherds) or lacks maintenance. Furthermore, many mountain communities lack basic health and education infrastructure as well as entertainment and culture opportunities, despite the incentives provided by rural development policies.

Problems Due to Economic Performance

Transhumant sheep and goat farmers are faced with particularly high input prices, which have been increasing for decades (Karanikolas and Martinos 2012; Ragkos, Koutsou et al. 2016). These changes occur at a time when product prices (milk and meat) show significant decreases, especially during the past few years—a trend which is no different for pastoral farmers across Southern Europe. Although this is a problem of the Greek livestock sector as a whole, there is more pressure for sheep and goat transhumance because they often do not profit from the added value of their quality products, but are treated with the same pricing policy as intensive farms (Ragkos, Koutsou et al. 2020). Alternative marketing options are limited, thus leaving significant margins for marketing improvement through certification or the design of new products (Ragkos, Theodoridis, and Arsenos 2019). In addition, low liquidity is a major operational problem, as the system has developed a stronger dependence on capital compared to previous decades, especially in the lowlands, where animals are kept indoors during winter.

Problems Related to Human Capital

There are still significant issues relating to the aging transhumant populations that hinder the development of transhumance in Greece, following the general trend in the Greek and European farming sectors (see for instance Koutsou, Ragkos, and Botsiou 2015). In addition, due to a relatively low level of education among the farmers, there is an inability to cope with regular financial and bureaucratic management procedures. This is a problem of the Greek livestock sector in general, as the lack of modern educational programs corresponding to the actual problems and aspirations of farmers decreases opportunities for innovation and market integration. This issue is even more important for extensive livestock farmers—including transhumant—whose specific practices and exposure to natural

constraints increases their need for training and information regarding particular practical issues.

A specific issue relating to the human factor is the lack of collective actions. This lack can be traced not only among transhumant farmers but also across the majority of Greek farms. This indicates the limited social capital, a common characteristic of the Greek countryside during the last decades (Koutsou, Partalidou, and Ragkos 2014). Actually, there is one Association of Transhumant Farmers in Epirus (Western Greece), which does not undertake commercial functions. Otherwise, transhumant farmers participate mainly in Agricultural Cooperatives and Associations of Livestock Farmers involving mainly sedentary or semi-intensive farmers. This lack constitutes one of the reasons why transhumant farmers find difficulties in solving problems which are particular to the sector or even contrast with the pursuits of sedentary and/or intensive farmers.

Problems Related to Bureaucracy and Lack of Recognition and Information

There are several problems reported by transhumant farmers related to the level of complexity of control and administration requirements at the central level. These requirements are often generic and transhumant farmers are expected to follow the same requirements as sedentary and intensive farmers. These issues sometimes impact the timely payment of CAP financial support. In this regulatory context and without a clear positioning in markets, transhumant farmers struggle to consolidate their identities. Actually, the system lacks recognition not only concerning its multiple contributions to society but also regarding its mere existence (Ragkos, Theodoridis, and Arsenos 2019)

Conclusions and Policy Implications

Drawing on the above presentation of SGT in Greece, it is evident that the system is an important source of employment and income, and it also has important potential for the future. In order to support its survival and assist its transition towards a more sustainable pattern, three types of recommendations can be made.

The first type includes general measures and actions to favor transhumance alongside with other pastoral systems in Greece and in the EU. The effect of these policies has been beneficial to Greek farms in general, as they boosted their viability (Karanikolas and Martinos 2012) but failed to address particular problems of transhumance and/or pastoral

systems. There are already examples of measures which have benefited transhumant farms—as outlined in the introduction to this chapter. The new framework of CAP 2021–27 provides, however, opportunities for novel approaches for extensive (based on grazing) livestock production, including a more targeted implementation of Pillar II measures. A deeper and more coordinated support towards pluri-activity in pastoral households would increase and stabilize their sources of income, like the example of Crete and other islands. Given the important environmental role of pastoral systems a highly relevant example involves the introduction of certification schemes (eco-schemes) in the form of a “grass-fed” certification (Lampkin et al. 2020). In addition, the example of “Payments for Ecosystem Services” which has already been applied in other countries of the European Union could induce a more straightforward connection of CAP payments with the provision of benefits that society appreciates. It should also be stressed that considerable funds could be allocated to the development of targeted training and information programs for pastoralists. In other Mediterranean countries there are examples of relevant structures providing training and support to pastoralists (for instance in Spain), while in Greece there is still much room for improvement in this domain.

The second type of intervention is more specific to transhumance and involves market-based measures and actions to be undertaken. Measures of this sort could involve the development of marketing channels for transhumance-specific products, which will take advantage of the high quality of its products. Actually, most dairies and industries do not collaborate exclusively with transhumant farmers and do not produce transhumance-specific dairy products. This means that this premium quality milk which is produced during the summer period when flocks graze the rich vegetation in the highlands (Zdragas et al. 2015; Ioannidou et al. 2019) is paid the same prices as conventional. In addition, dairies and industries pay farmers mainly according to their volume of production and not according to the quality characteristics of their milk (Roustemis 2012). As described by Ragkos et al. (2019), transhumance-specific products could increase returns for farmers under specific conditions, while the effects of premium pricing of such products were found to be important for the economic performance of the system (Ragkos, Koutsou et al. 2020).

Finally, a third type of intervention is specific to SGT and involves the development of a policy toolkit which will accommodate its multi-functional roles and will transform these characteristics to opportunities to increase competitiveness and approach new markets. SGT in Greece requires an enabling environment to permit the system to flourish and live up to its true potential. In this domain, the diversity of new schemes

proposed in the new CAP could provide additional certification opportunities for transhumance-specific products, as existing schemes have not been proven particularly successful for the case of transhumance, nor are they able to integrate the whole range of its multifunctional roles (Ragkos et al. 2019). Furthermore, an asset of importance for SGT is the development of old transhumance routes, not only for use by flocks but also as an attraction for alternative tourism (Ragkos, Karatasiou et al. 2016; Ntassiou and Doukas 2019).

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