

# THE PRODUCTIVE SYSTEM OF ITINERANT STOCKFARMING IN GREECE

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Pastoral nomadism has been a feature of the Greek scene since antiquity. The geomorphology of the area, climatic conditions and also the prevailing systems of agricultural production in lowland regions at any given time have all been conducive to the development and preservation over years of this productive system, chiefly of the small ruminant animals, until the present day.

Over the last decades the system has been subjected to the pressures from ever more intensive modernisation of the agricultural sector and has been influenced by the social demands and the constraints imposed on individuals in the farming community by this self-same modernising process. Adaptation to new conditions has gone hand in hand with rapid contraction of the system, despite the noteworthy economic role it purportedly has to play in the national economy, not to mention its social role in keeping alive the steadily decaying mountain districts and disadvantaged regions, which constitute a considerable proportion of the rural land area in Greece.

This period of contraction for the system has seen a decisive rejection of purely nomadic lifestyle, to the extent that today they are no longer to be found, while the number and size of the migratory herds of sheep and goats have also diminished considerably. Itinerant stockfarming is nowadays of the "trasshumant" type, which is also practised in other countries of the Mediterranean basin. Flock movements are immediately contingent on the economic and social needs of family members, which come to be centred around their permanent place of residence (Mair 1984, Psychogios and Papapetrou 1984).

Despite the decline it continues even today to represent significant branch of sheep and goat farming and of animal husbandry generally, embracing 9% of the country's total sheep and goat stock. The natural conditions are particularly favourable for the exploitation through this kind of stockfarming of tracts of mountain terrain, ill-equipped to support any other kind of farming activity. For certain regions, such as Thessaly where 30% of the migratory animal population is concentrated, the system plays a significant role in the local economy.

Itinerant stockfarming attracted the inter-

## Abstract

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 present work aims, on the one hand, to give a chronological account of the evolution of this system, on the other, to examine its socio-economic characteristics as they appear today. Our presentation of the evolutionary course of itinerant stockfarming draws extensively on the bibliographical sources and the available statistical information. For our examination of socio-economic structures we have used the findings of field research based on a representative sample of the sheep and goat flocks which winter on the plains and the lower mountain slopes of Thessaly. In analysing the data, the techniques of factor analysis and canonical correlation are used. It emerges from our inquiry that the original system evolved into what is known as transhumance stockfarming. 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.

## Résumé

*Le nomadisme pastoral en Grèce est un système d'exploitation ovine et caprine aux origines très anciennes. Tant la géomorphologie du pays que le système dominant de production dans les terres basses ont favorisé le développement du nomadisme en tant que structure socio-économique. Ce travail illustre d'un part l'évolution chronologique de ce système, et de l'autre, il examine les caractéristiques socio-économiques actuelles.*

*Quant à l'évolution chronologique nous nous sommes largement basés sur les sources bibliographiques et les données statistiques disponibles. Pour examiner les structures socio-économiques nous avons utilisé les résultats de recherches sur le terrain basées sur un échantillon représentatif de troupeau de moutons et de chèvres qui hivernent en plaine et sur les bas versants des montagnes de Thessalie. Pour analyser les données on a utilisé les techniques de l'analyse factorielle et de la corrélation canonique.*

*D'après notre enquête il résulte que le système originel a évolué en trashumance. Même s'il survit en tant que forme de base de l'exploitation animale extensive, le troupeau nomade et le type de production animale qui y est associé sont sans aucun doute en diminution à long terme. Le facteur décisif qui détermine le revenu de l'éleveur est la taille du troupeau; le rendement par tête de bétail est relativement faible et vu le capital nécessaire par chaque tête de bétail, l'élevage ne semble pas offrir un terrain favorable pour l'investissement. Il n'y a pas de corrélation évidente entre les caractéristiques individuelles de l'éleveur et le niveau d'efficacité de son exploitation.*



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est of an older generation of researchers very much as a social phenomenon and a distinctive form of organisation of the socio-economic life of the nomadic stockfarmers and their families (Karavidas 1931, Evelpidis 1944 et al). Present-day considerations are however concerned with new issues: what is the framework of socio-economic structures through which this particular productive system is articulated in its present-day operations? What are the economic characteristics of the itinerant stockfarming units, what feeding system is employed, what is the level of productivity, the extent of modernisation, the linkage with markets in present-day conditions? And how do these characteristics correlate with the social characteristics of the stockfarming families and the labour requirements of the productive units? No research has been done on these questions.

In the light of these considerations, the present study aims to give a comprehensive picture of this system on the one hand (a) through a summary presentation of the chronological evolution of the system, outlining its geographical distribution within Greece and the socio-economic conditions which have led at different times to its expansion or contraction, up to the present day, and (b) through an examination of the socioeconomic structures of the productive system in its present-day form, with a view to disclosing the conditions in which it operates and identifying its weaknesses and the problems it faces today under the pressure of the modernisation process at present under way in the primary sector.

Our presentation of its evolutionary course draws extensively on bibliographical sources and the available statistical information. For our examination of the socio-economic structures we have used the findings of field research carried out on the basis of a representative random sample of sheep and goat flocks which winter on the plains and the lower mountain slopes of Thessaly. In analysing the data we use the techniques of factor analysis and canonical correlation analysis.

## Itinerant stockfarming in its chronological evolution

The roots of nomadism as a lifestyle and a socio-economic formation lies deep in history. In antiquity the relative low population density and the frequency of peaceful intervals served to limit the size of cultivated lands, leaving wide regions open for utilization as grazing areas by migratory flocks. Historical documentation testifying to the existence of nomadic stockfarming is to be met with from as early as the Homeric age. Indeed at that time stockfarming was an almost exclusively nomadic activity.

The nomadic system, with its continual

movement of herdsmen and their flocks and the absence of permanent habitation and the semi-nomadic with its seasonal migrations, predominated in almost all of ancient Greece, for example in Attica, in Boeotia, in Euboea, in Aetolo-akarnania, in Epirus and in Thessaly. From that time Thessaly has been referred to as the gathering place par excellence of the nomadic tribes inhabiting the mountainous area of central Pindus and often wintering in Western Thessaly, which the stronger family clans eventually conquered and distributed among themselves (Giolias 1989) <sup>(1)</sup>. During the Byzantine period nomadism retreated in the face of the expanding system of semi-nomadic sheep and goat farming, centred to a large degree on the extensive pastures of the great landowners, who engaged only in extensive exploitation of their lands.

During the period of Turkish occupation there developed a system of nomadic stockfarming known as that of the great "tseligata" (singular "tseligato"). The tseligata system became entrenched in the Balkan areas in the seventeenth century and continued for approximately three hundred years. A factor contributing to the flourishing of nomadism in that period was the ease of movement for herdsmen and their flocks throughout the Balkan area, as a result of unified administration under the Ottoman Empire, which then dominated the entire Balkan region.

The basis of the tseligato was a highly original system of collaboration between the individual herdsmen, the "partners", which incorporated many of the basic principles of the rural co-operative (Papageorgiou 1986). The tseligato was presided over by the tseligas, who exercised patriarchal rights over the entire group, taking charge of its economic and social organisation and representing it in its dealings with the rest of the community. According to Karavidas (1931) the tseligato was the first collectively organised productive system in the country since the Middle Ages, and the only unequivocally so.

During the nineteenth century and especially from the time of the establishment of the modern Hellenic state up until the land reform of 1922, nomadic herding developed in parallel with the expansion of big landed property. "Tsiflikia" <sup>(2)</sup> and nomadic herding were always closely interlinked, limiting the acreage of land open to cultivation and favouring the preservation of pastures (Karavidas 1931). Oriented as they were towards cereal production on the basis of three-yearly crop rotation with land being left to lie fallow, big landowners used to take measures to facilitate grazing, dividing the land under cultivation (by share-croppers) into three zones in such a way that fields sown with the same crop should adjoin one another while the third zone would be freed for grazing (Tsoumis 1936).

The raising of sheep and goats was car-

ried on in this period without any particular attempt at improving breeding techniques (as regards the quality of fodder, the genetic material and the stabling conditions). A substantial number of animals were being raised, but productivity was very low (Tzanninis and Pierrakeas 1975).

The geographical configuration of the Balkan region, with the deep corrugations of its mountainous terrain, the great height of the peaks, the frequent alternation between mountain areas and plains with a mild Mediterranean climate, the extensive coastal zones, guarantees the availability both of summer pasturage and of winter refuge, without the need for movement over very great horizontal distances. From antiquity until the present day the mountainous mass of the Pindus in the centre of mainland Greece has been the summer home for the greater part of the migratory flocks of sheep and goats. There was also a second major wintering place in the prefectures of Argolis and Corinthia, bringing together (mainly) the migratory flocks of sheep and goats which spent the summer in the mountains of the Peloponnese.

The factors which led to the migration of flocks and the flourishing of nomadism in the previous century were (a) economic: a shortage in summertime of grazing land around the winter quarters, higher productivity of flocks and prolongation of the period of lactation in the summer pastures (b) climatological: avoidance of the hot weather and the malaria prevalent in the regions where winter quarters were situated. The nomads were also usually of mountain stock and thus had a preference for the life in the high country (c) social: the predominance of big landed property which was conducive to the preservation of large expanses of uncultivated land on the plains.

At the beginning of this century nomadic herding was being carried on with the same intensity as it had been throughout the previous century. Nomadic herding suffered a fatal blow with the expropriation of the big estates (Anagnostopoulos 1929). The settlement of the landless (both locals and refugees) in Thessaly (Law of the year 1907, Stefanidis 1948) and the wave of compulsory expropriations after 1922 - dictated by the sudden increase in the rural population on the arrival of approximately 1,500,000 refugees from Asia Minor - resulted in an increase in the area of lands under cultivation and a change in the methods of cultivation themselves.

<sup>(1)</sup> Sophocles gives an accurate account of the summer mingling of flocks in the mountain districts of the country, and of their autumn departure and the journey to their winter quarters. Aristotle likewise refers to the way of life of the nomadic herdsmen, characterising the system as "live farming".

<sup>(2)</sup> The "tsiflikia" were the big estates created mainly in the last century of the Ottoman occupation and in the course of the War of National Independence, with the continuing concentration of land in the hands of capitalists, both Turks and Greeks of the diaspora.

The system of three-yearly crop rotation with one zone lying fallow abolished. The winter grazing lands diminished in size and the nomadic herdsmen were forced to limit the size of their flocks, or even to give up keeping animals (Petropoulos 1933). However this curtailment of nomadism does not seem to have had negative repercussions for Greek stockfarming as a whole, because at the same time other ways of keeping sheep and goats (the semi-nomadic, with the animals kept in enclosures, etc.) developed, techniques of animal husbandry improved and yields increased (Zolotas 1934, Vasmatzidis 1935). In 1923, i.e. before the beginning of the great shortage of winter pasture, 13,700 families were engaged in nomadic herding, with a sheep and goat population of approximately 2.5 million, of which 600 thousand wintered in Thessaly (Syrrakis 1925). The contraction of winter pastures and the social needs which were being created as a result of ongoing economic development led even the sui generis stockfarming co-operative system of the tseligata to almost total extinction in the inter-war period.

From the period immediately preceding the Second World War and moreso after the war considerable numbers of nomads purchased winter grazing land as well as cultivable land which could be used to grow plants suitable for animal feeds. This was a result of Law 1223/38 "for the settlement of stock-farmers", which was supplemented through the enactment of a special transitional provision (Article 104 in the Greek Constitution of 1952). A few years later many stockfarmers gave up the practice of summer migrations (Settas 1984). It is however somewhat surprising that as late as 1960 the migratory flocks of sheep and goats still numbered approximately two million animals (according to the figures of the National Statistical Service of Greece), which means that the system showed an amazing resilience in the years from 1922 to 1960, bearing in mind the significant contraction of winter grazing lands (to the point of disappearance in many cases), not to mention the destructions of the Second World War and the civil war that followed it.

There was a drastic reduction in the numbers of the nomadic Sarakatsani of Macedonia and Thrace (Psychogios and Papapetrou 1984), where nomadic herding almost completely disappeared. This shows clearly that absence of pastures was the decisive factor, since before the First World War in Western Thrace alone there were 100 tseligata shared among 710 families with 238,000 sheep and goats (Golemis 1934).

In the 20-year period from 1965 to 1984 the number of sheep migratory flocks fell by 27.5%, while the numbers not migrating rose 15.6%. In Thessaly the sheep population of this largest winter grazing ground for migratory sheep fell by 29.1%, and there was a 14.5% fall on the number

of non-migratory sheep also (N.S.S.G. 1965, 1984). **Figure 1** presents in diagrammatic form the evolution of the nomadic system in Greece from antiquity until the present day.

During the post-war period the purely nomadic life came to an end. From 1938 the last groups which carried on true nomadism (Sarakatsiani and the Arvanitovlachi) were obliged to register as citizens in one or other village of the mountain or plain (Psychogios and Papapetrou 1984) and the original nomadic system evolved definitively into a form of itinerant stockfarming in which the sole purpose of the migration was to ensure the availability of pasturage during the summer. In its present-day form the system resembles the semi-nomadic system of seasonal movements by herdsmen of the mountain regions as it was known in antiquity and the byzantine period. There are however distinct peculiarities in the present-day system. Apart from the fact that the itinerant stockfarming have their own permanent family home, the general economic and technological development of the country has exercised a considerable influence on their methods of operation. A slight tendency towards intensification has thus been detected. On the whole, however, the capital returns from animal breeding remain relatively slow and by and large the system remains one of extensive exploitation. The transportation of the flocks is nowadays mainly carried out by vehicle, taking less than a day, and the date of departure is no longer governed by a calendar as with the nomads of old but is decided on an ad hoc basis in accordance with weather conditions and the condition of the pasture land in the summer grazing grounds. Both the ascent and the descent of the flocks nowadays takes place in two phases. The first phase of the ascent relates to the movement of the flocks, generally in May, whereas in the second phase around mid-June the stockfarmer's family follows suit. In certain cases this movement can be something like family's summer holiday, but it may not happen at all. The first phase of the descent to the winter pastures involves the move by the family at the beginning of September, whereas the second – the movement of the flocks – may take place any time between the end of October and mid-December, varying from one district to another. The delay in bringing down the flocks that has been noted in recent years is attributable to the change in climatic conditions (information drawn from a research project of the Animal Breeding and Husbandry Laboratory of the Agricultural University of Athens, referring to the Peloponnese).

Quite a number of sheep and goat farmers (descendants of the old nomads) who move between fixed locations have acquired both residential and farm property in the areas around the winter grazing grounds (in the prefectures of Corinthia

and Boeotia and in the Thessaly region) and have put their children to work at these places while they themselves remain employed in stockfarming. The acquisition of property in lowland zones opens up new opportunities for the descendants of nomads, such that the question arises as to whether the present-day transhumant system will continue to be practised, if so for how long.

Today flock movements provides a solution to the serious problem of managing large flocks of animals during the summer months and an opportunity for utilizing mountain pastures in the general national interest. Moreover, some stockfarmers who raise sheep and goats in the same areas throughout the year may move them to other areas occasionally, depending on climatic conditions, the state of the grazing lands (in both winter and summer grounds) and their prospect of securing pasturage. In general, it seems that sheep and goat herding of a locally itinerant type will continue to exist in mountain areas, as will – for the same reasons – the completely circumstantial movements of the beef cattle herds of mountain districts of Western Thessaly, Western Macedonia and Epirus (Apostolopoulos 1986, Apostolopoulos and Papadimitriou 1990).

## Investigation of the present-day structure of itinerant stockfarming system

### Methodology

#### *Research material*

For our investigation of the present-day structure of this production system, a representative stratified random sample of forty-five flocks was chosen from among the migratory flocks of sheep and goats, which winter on the plains and lower mountain slopes of the department of Thessaly. This sample, which comprised 13,500 sheep and goats, is equivalent to 3.5% of the total migratory sheep and goat population of the country and approximately 5.3% of the total number in the department.

The geographical department of Thessaly was chosen as site for the conduct of the study because it is a representative sheep-farming district and may be considered in its entirety as a traditional wintering place par excellence for migratory herdsmen in Greece.

As regards the composition of the flocks in the sample, the sheep is the typical producing animal, whereas goats constitute only five to ten percent of the animal population.

The socio-economic data was gathered by means of a questionnaire, which comprised the chief means of gathering information about the flocks over two productive periods. At the same time a record was drawn up to note the necessary data for

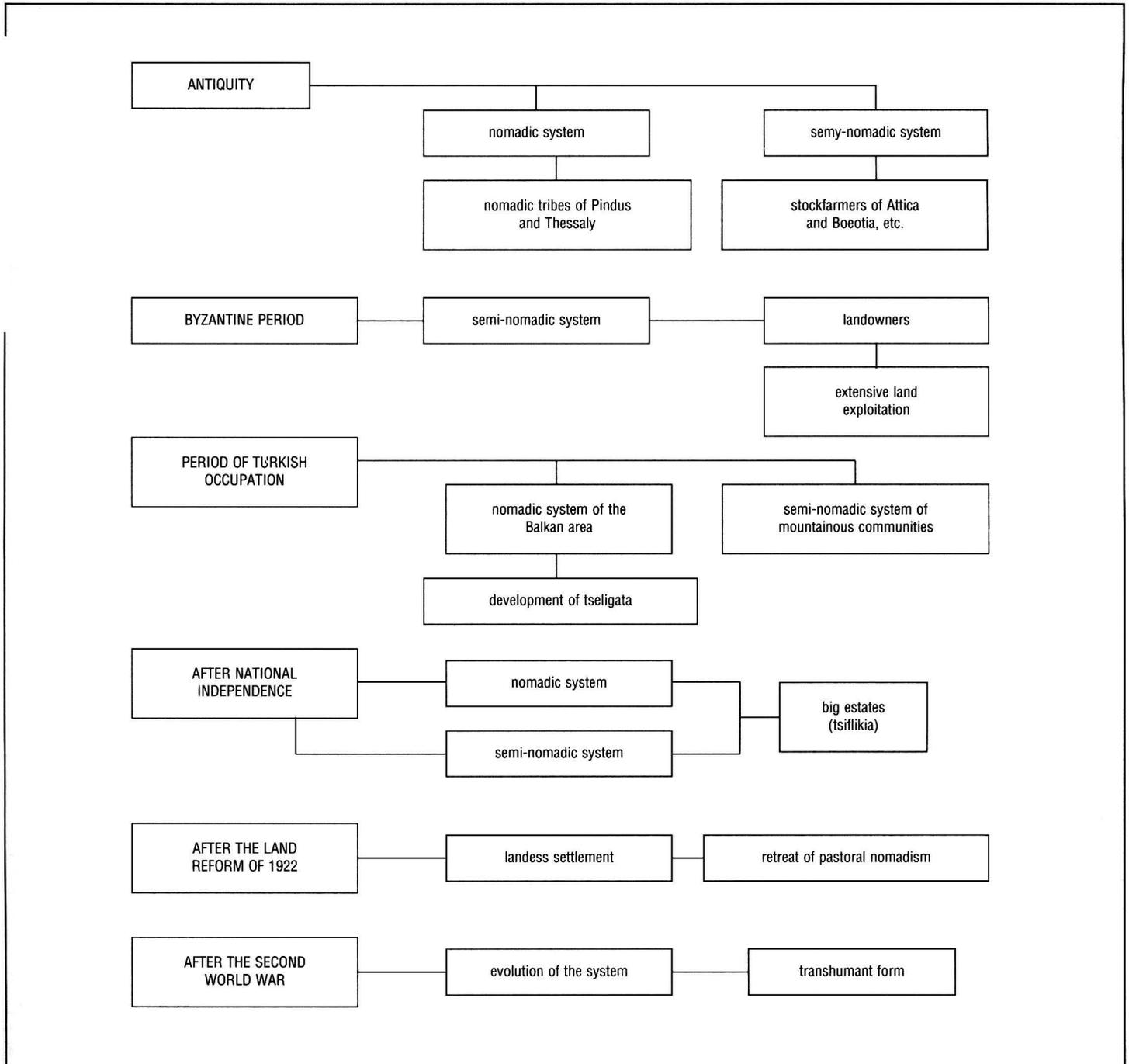


Figure 1 - Evolution of pastoral nomadism in Greece.

those elements which change through time.

For the purpose of the study sixteen variables were specified (table 1), of which eleven represent structural characteristics of the migratory flocks and five indicate their economic characteristics.

#### Methods of statistical analysis

For the analysis of the data use was made of the methods of factor analysis and canonical correlation analysis.

Factor analysis was used in the investigation and interpretation of the casual relationships linking together all the variables

in the model. The method of principal factoring was applied with iterations and the varimax rotation in order to facilitate recognition of factors.

In an attempt to detect the existence and to determine the extent of the interrelationships between theoretically relevant sets of variables the method of canonical correlation analysis was applied. The sets of variables, whose correlations were investigated, were:

(a) the set of variables of structural characteristics ( $X_1...X_{11}$ ) and the set of variables of economic characteristics ( $X_{12}...X_{16}$ ) (b) the set of variables related

to farmers ( $X_4...X_8$ ) and the set of variables of economic characteristics ( $X_{12}...X_{16}$ ).

The computations were carried out on the basis of the SPSS (1975) program, which was developed by Jae-On Kim for factor analysis and P. W. Warwick for canonical correlation analysis.

#### Results

##### Factor analysis

The factor loadings, the communalities and the parts of total and common variance accounted for by the factors extracted are

**Table 1** *Varimax rotated factor matrix.*

Variables	Designation	Fact f <sub>1</sub>	Fact f <sub>2</sub>	Fact f <sub>3</sub>	Fact f <sub>4</sub>	Fact f <sub>5</sub>	Fact f <sub>6</sub>	Com. h <sup>2</sup>	
X <sub>1</sub>	Flock size	Number of head	,950	-0,88	-0,87	0,74	,160	,028	,950
X <sub>2</sub>	Agricultural land	Stremmas (0,1 ha)	,246	,753	-,158	,068	-,288	,127	,757
X <sub>3</sub>	Own-produced feed	O:No, Yes	,039	,665	-,111	-,004	,291	,060	,545
X <sub>4</sub>	Age of stockfarmer	No. of years	-,176	,008	-,017	-0,06	-,471	-,621	,639
X <sub>5</sub>	Education level	No. of years of schooling	,078	,161	,050	,015	,022	,795	,668
X <sub>6</sub>	Family size	No. of members	,478	,070	,144	-,019	,710	,161	,785
X <sub>7</sub>	Labour input (total)	No. of 8-hr working days	,688	,010	-,154	,116	,466	-,020	,728
X <sub>8</sub>	Hired labour	% of total labour time	,521	,077	-,574	,106	-,141	-,014	,638
X <sub>9</sub>	Fixed capital	Value in 000s of drachmas	,752	,120	,177	-,013	,085	,147	,640
X <sub>10</sub>	Use of concentrates	O:No, Yes	-,096	-,431	-,059	,141	-,120	,390	,384
X <sub>11</sub>	Privately-owned pastures	O:No, Yes	-,264	,859	-,047	,068	-,068	,066	,824
X <sub>12</sub>	Output per productive animal	Gross income in drachmas	,148	-,049	,712	,173	-,166	-,055	,591
X <sub>13</sub>	Own consumption	Product value in drachmas	,718	,013	,286	,012	,098	,061	,611
X <sub>14</sub>	Domestic cheese-making	% of total milk production	,233	-,155	,594	,039	,223	,114	,496
X <sub>15</sub>	Expenses per productive animal	In drachmas	,080	,023	,192	,973	,017	,069	,995
X <sub>16</sub>	Incombe from stockfarming	In 000s of drachmas	,689	-,106	,392	-,491	,023	,016	,881
	% participation in common variance		38,0	20,1	13,4	11,0	10,6	6,9	
	Cumul. particip. in common variance		38,0	58,1	71,5	82,5	93,1	100,0	
	% participatuin in total variance		26,4	14,0	9,3	7,6	7,4	4,8	
	Cumul. particip. in total variance		26,4	40,4	49,7	57,3	64,7	69,5	

presented in **table 1**. Six common factors explain the structural intercorrelations among the original variables. Together these factors account for 69.5% of the total variance. The communalities range from 0,384 to 0,995. For the purpose of interpretation only those factors greater than 0,400 were considered significant. The factors identified on the basis of the variables on which they had high loadings are: *flock size, feeding system, productivity of animal capital, money expenses, family situation and social characteristics of stockfarmer.*

*Flock size* is the most significant variable, with 38% participation in the common variance. As emerges from the structure of this factor, flock size is decisive in determining the income level of the stockfarmer,

independently of the productivity of the animal capital, which appears to be unrelated to income. The maintenance of large flocks presupposes an increased workload for members of the stockfarmer's family or the resort to outsiders' wage labour (chiefly for shepherding). The labour requirements entailed by large flocks are the chief factor encouraging correspondingly large families. A relatively high level of own consumption of produce is typical of an itinerant stockfarming holding and the level of own consumption increases with both the size of holding and the number of members in the stockfarmer's family.

From the structures of the *feeding system* factor it emerges that agricultural land, as is natural, means private pasturage and own production of feeding stuffs, almost

exclusively roughages. The application of this feeding system to the extent that it is prevalent in the itinerant stockfarming, naturally results in reduced usage of concentrates and provides evidence of the relative extensiveness of the system.

From the third factor, *productivity of animal capital*, it emerges that in the event of increased productivity of the animal capital, stockfarmers make a significant quantity of the milk into cheese (production of feta cheese). Cheese making as a cottage industry is a basic feature of the system and is closely related to the prolongation of the period of lactation that comes from securing adequate summer pasturage. It is characteristic that the stockfarming income variable does not contribute to any significant extent to the struc-

ture of this factor, thus confirming the previous finding that flock size is the decisive income determinant. The productivity of the animal capital is relatively low in itinerant stockfarming when compared to the figures typical for other forms of sheep and goat keeping, such that it has no great effect on stockfarmer income. Similar results emerge from a scrutiny of the statistical data on the chronological evolution of milk production levels in relation to the corresponding productive animal population. The high negative loading for the stockfarmer income variable in the factor identified as money expenses leads to the conclusion that in the system of itinerant stockfarming investments made (in circulation capital) on productive animals do not pay. From the structure of the *family situation* factor it emerges that the younger heads of holdings are the ones with the largest families. This fact is very expressive of the particular way of functioning of itinerant stockfarming holdings in Greece. The families of itinerant stockfarmers are for the most part "joint families", that is to say that they consist of the members of the nuclear family of the couple, who make an essential contribution to the maintenance of the flock. The father is usually the shepherd, while the son is more likely to be a farmer, until such time as some member of the younger generation moves into the production process and brings about a rotation in the positions of previous members of the stockfarmer holding. The factor identified as *stockfarmer's social characteristics* is the least significant in interpreting the fluctuations of the different variables. It is in any case characteristic that none of the other structural variable (apart from that denoting "use of concentrates" contribute any significant loading to the factor. It turns out accordingly that the individual-social characteristics of the stockfarmer are unrelated to the efficiency of his holding.

#### Canonical correlation analysis

(a). The canonical correlation of the set of structural characteristics with the set of economic characteristics of the stockfarmer holdings yielded a pair of canonical factors with a significant canonical correlation coefficient (0,991 where  $p \leq 0,001$ , table 2). The canonical factors which constitute the pair and present the structure of relations between the initial sets of variables are identified as *size of holding and economic result of holding*. The variables "flock size", "fixed capital", "family situation" and "labour time" represent a high loading in the structure of the first canonical factor, and the variables "stockfarming income", "own consumption" and "domestic cheese making" in that of the second.

From the canonical correlation it emerges that flock size determines the economic yield of the holding. Large flocks are associated with extended families and with

**Table 2 Results of canonical correlation analysis of variables for structural characteristics and economic characteristics.**

Structural characteristics			Economic characteristics		
	variables	canonical variate loadings		variables	canonical variate loadings
X <sub>1</sub>	Flock size	-,903	X <sub>12</sub>	Out per productive animal	-,158
X <sub>2</sub>	Agricultural land	-,049	X <sub>13</sub>	Own consumption	-,784
X <sub>3</sub>	Own-produced feed	,022	X <sub>14</sub>	Domestic cheese-making	-,492
X <sub>4</sub>	Age of stockfarmer	,376	X <sub>15</sub>	Expenses per productive animal	-,185
X <sub>5</sub>	Educational level	-,185	X <sub>16</sub>	Income from stockfarming	-,708
X <sub>6</sub>	Family size	-,644			
X <sub>7</sub>	Labour time (total)	-,749			
X <sub>8</sub>	Hired labour	-,199			
X <sub>9</sub>	Fixed capital	-,804			
X <sub>10</sub>	Use of concentrates	-,027			
X <sub>11</sub>	Privately-owned pasture	,328			
	Interpreted variation	,253		Interpreted variation	,284
	Redundancy measure	,215		Redundancy measure	,241

Eigenvalue = ,849, Canonical correlation coefficient = ,991, Wilks'  $\Lambda$  = ,071,  $X^2$  = 93,660, d.f. = 55, level of significance = ,001

**Table 3 Results of canonical correlation analysis of stockfarmer and employment variables with those for economic characteristics.**

Producer and employment variables			Variables for canonical characteristics		
	variables	canonical variate loadings		variables	canonical variate loadings
X <sub>4</sub>	Age of stockfarmer	,478	X <sub>12</sub>	Out per productive animal	,066
X <sub>5</sub>	Educational level	-,237	X <sub>13</sub>	Own-produced feed	-,712
X <sub>6</sub>	Family size	-,804	X <sub>14</sub>	Domestic cheese-making	-,337
X <sub>7</sub>	Labour time (total)	-,968	X <sub>15</sub>	Expenses per productive animal	-,209
X <sub>8</sub>	Hired labour	-,362	X <sub>16</sub>	Income from stockfarming	-,575
	Interpreted variation	,400		Interpreted variation	,200
	Redundancy measure	,224		Redundancy measure	,112

Eigenvalue = ,555, Canonical correlation coefficient = ,748, Wilks'  $\Lambda$  = ,304,  $X^2$  = 45,785, d.f. = 25, level of significance = ,007

the need for greater personal involvement of the stockfarmer in the work of the enterprise.

The productivity of the yield-bearing animals does not evidence any significant coefficient of participation in the structure of the canonical factor, so indicating that it does not correlate with flock size, a fact which anyway emerged from the factor analysis.

Nevertheless, the figure for the redundancy measure is very low in both sets. For this reason, although the two canonical factors which were identified above very satisfactorily show up the structure of relations between the two sets of variables, familiarity with the process of formation of the characteristics of one set provides no adequate basis for predictions concerning the formation of the characteristics of the other.

(b). The correlation of the set of individual and social characteristics of the stockfarmer and of his occupation with the set of economic characteristics of the respective holding (table 3) yielded a pair of canonical factors with a significant correlation coefficient (0,748 where  $p \leq 0,05$ ). Nevertheless the degree of overlapping between the sets, particularly the set of economic characteristics (0,112) was exceptionally low, so that it cannot be said that the formation of the individual characteristics of the stockfarmer and his occupation can account, partially, or to a satisfactory degree, for the formation of the economic characteristics of his holding. The individual characteristics of the stockfarmer, and particularly his education, do not seem to have any relation with the economic success or otherwise of his holding, since even in the previous elaboration of the structure of the first factor it did not contribute any significant loading, and in the present elaboration also the first canonical factor is in no way identifiable of the labour time and family situation. Similar findings concerning the individual and social characteristics of itinerant stockfarmers and the operational efficiency of the stockfarmer holding were derived from factor analysis.

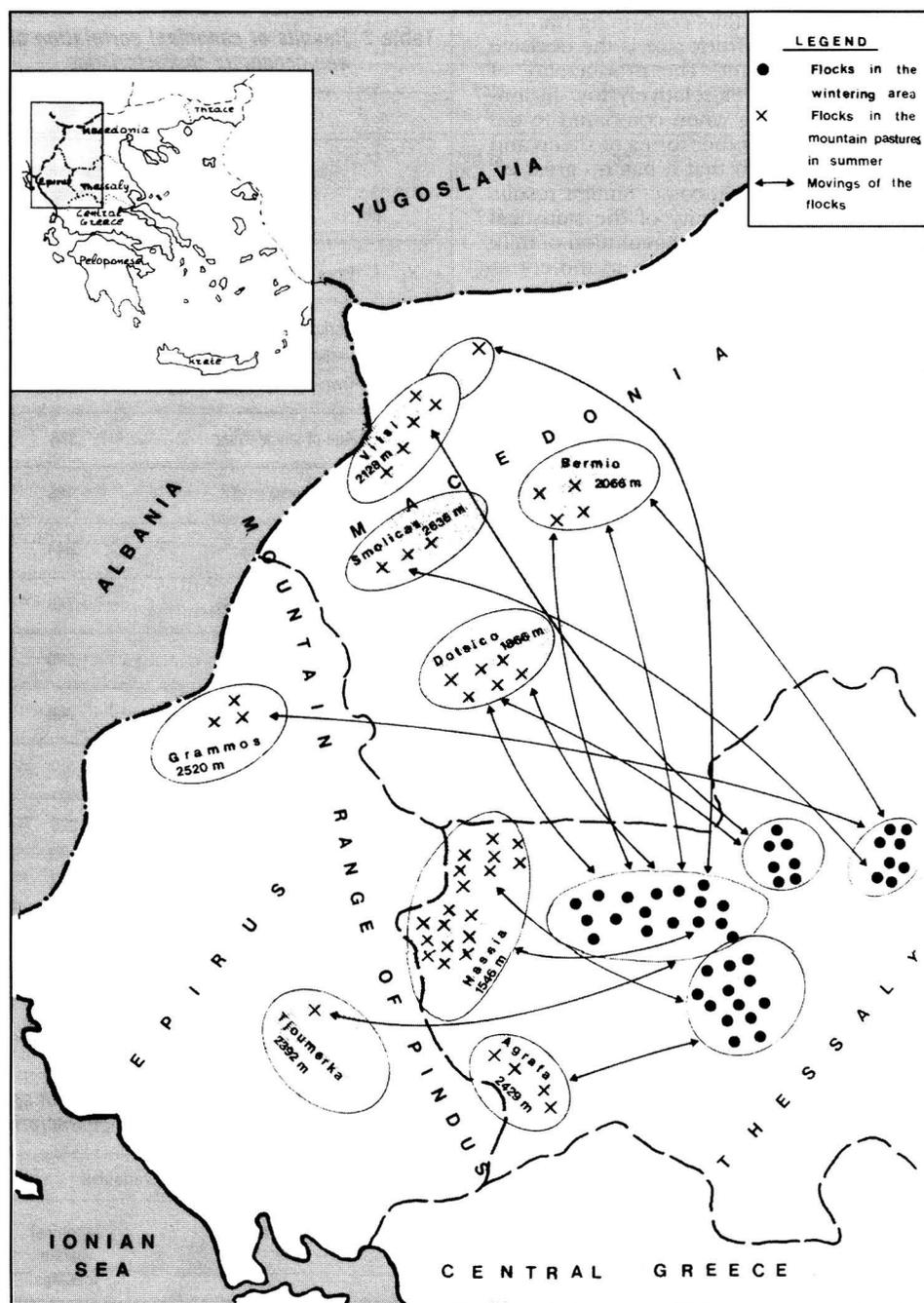


Figure 2 - The movings of the migratory flocks.

### Conclusions

From a summary account of the evolution of the itinerant stockfarming emerge that itinerant stockfarming, as a system of raising animals and as a way of life, exhibits remarkable endurance and stability through the ages. Until the middle of the twentieth century it was carried out more or less in the same primitive way as it had been in antiquity, preserving the basic characteristics of "live under canvas", of migration of the family together with the flocks, of almost total lack of involvement with cultivation of the land and of retention of an extensive system of farming generally.

Through all the periodic alternations between nomadic and semi-nomadic forms of animal husbandry or even their metamorphosis into more static varieties under the influence of whatever socio-economic conditions happened to prevail in the region at different times, these two basic forms were the characteristic method for keeping animals, and they remained in operation until recently. During one period where the system was particularly thriving (from the seventeenth century to the beginning of the twentieth) the economic and social organisation of life under the tseligata for the first time included principles analogous to those of the rural

co-operative movement, without however this leading to any internal differentiations within the stockfarming system as regards its chief characteristics. Under the influence of the economic and technical evolution of the last decades the pure form of nomadic life passed from the scene and the hole system developed into a kind of stockfarming which incorporated more and more agricultural activity, disconnected the movements of the family from those of the flocks and abolished those peculiarities which distinguished the life of the itinerant stockfarmer from that of the settler engaged in the more static forms of farming and stock-

farming.

In its present-day form, judging from the features which have been the object of study, the factor which appears to exercise the determining influence on income levels of itinerant stockfarmers is the size of their flocks. Productivity is relatively low (is lower than in the static system) and plays no significant role in the determination of income levels. The low productivity of the animal capital is attributable to the extensivity of the system (lands available for satisfaction of the animals' feeding requirements are largely confined to common pastures in both winter quarters and mountain districts) and the genetic standards of the animal capital, which are not conducive to high levels of productivity but are instead characterised by the type of rugged constitution appropriate for the performance of long-distance migrations. This explains why the yield on retained capital per productive head of livestock does not seem particularly high. Retention of large flocks naturally presupposes long working hours. Given the impossibility here of substitution of mechanical for biological energy, at least to the degree to which such substitution may occur in other productive systems, this greater demand for labour constitutes an inherent weakness of the system in question and a substantial impediment to the reproduction of holdings centred on itinerant stockfarming.

The greater size of the families engaged in this type of production and the relative youth of the household heads is an intimation of the existence of "joint families". Moreover empirical observation corroborates the view that although the heads of these households are indeed younger, the stockfarming side of their operations (minding of flocks, etc.) is for the most part carried out by members of the older generation of the extended family, while younger family members occupy themselves with the plant production side of the holding, which to a considerable extent has coexisted with itinerant stockfarming throughout the evolution the system has undergone over the last two or three decades.

The organisation of these working relationships today functions as a mechanism for effecting the transition to static stockfarming or even to purely plant-based production. An analogous development, deriving from different conditions (distribution of lands to property less producers and contraction of winter pastures) occurred in the country approximately seventy years ago, with significant repercussions on the system.

It is also characteristic of the system that pasturage reserves, in the form, for example, of self-produced and unprocessed stock feed from privately-owned, and for the most part natural pasture lands, should be secured on a self-provisioning basis. This self-provisioning of course reduces production costs, but is depended on the

size of the farm holding, and also on the grazing potential of the common pasture lands, given that this common land is the chief source of pasturage for the flocks. The research findings indicate that stockfarming units on the smaller farm holdings, and enjoying only limited access to common pasture lands, during the winter months are more heavily burdened with the purchase of ready-made stockfeeds. Although the use of these feeds could be construed as an element of modernisation in the provisioning system for the animals and simultaneously as a sign of adaptation of the overall productive system to new conditions, it does not appear to correlate with any increase in either income or animal productivity, clearly because it represents the simplest form of substitute pasturage and nothing more.

Domestic cheese-making is yet another basic element in itinerant stockfarming, linked to the prolongation of the lactation during the summer months due to greater availability of pasturage on the mountain grazing lands. Carried out in the summer encampments, the cottage industry in question evokes images of infrastructures inadequate for the promotion of traditional cheese products on the big urban markets, as a result of insufficient development of collective forms of management of these products.

The need for unimpeded access to common pasture lands in mountain districts is inseparably linked to the resolution of many and varied ownership questions in these mountain areas and with the division of the mountain zone into forests, farmland and grazing districts. Utilisation of the Community Support Structure for investment in pasturage resource development in mountain areas, through production, storage and provision of animal feed and above all through improvement of infrastructures in mountain pasturelands (completion of infrastructure-related projects) could greatly assist in the productive exploitation of these lands.

One point that emerges from the research findings is that fixed capital expenditure (for animals and installations) is a basic element in the production costs of livestock holdings.

The fundamental inadequacies in the stabling facilities examined in the study operated very much to the detriment of the health of the animals and thus to their productivity.

It also emerges that the individual social characteristics of the stockfarmers are not linked to the economic characteristics of their holdings and, as indicated by the results of canonical correlation analysis, the configuration of the former characteristics provides no satisfactory explanation for the latter. Similar findings emerge from a broader study of sheepbreeding (Apostolopoulos and Gidarakou 1991). Although the subject requires further investigation, this study does record the functioning of the system through a common framework

of stockfarmer behaviour.

To what extent this represents an indication of the indifference of young stockfarmers to the introduction of potentially income-generating innovations (and thus a danger sign warning of further contraction and even of future abandonment of the system), or is a product of the organisation of labour relations within the livestock holding, or even an indication of the influence of external economic factors (such as the degree of dependence on the market, the relationship to plant production, the role of subsidies, which have a leveling and homogenising influence on the entrepreneurial behaviour of both young and older producers) are undoubtedly issues which have yet to be clarified.

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