

Family Types on Extensive Farming Systems in Less Favoured Mountain Areas of Spain

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Abstract

Farmers' decision making is conditioned by many factors such as the socio-economic environment and the internal characteristics and situation of the family, so the different behaviour among households is explained to a great extent by their environment and the interactions between farm and family. Therefore, to study the behaviour of the farms from a global perspective, it is necessary to know the relationships between economic and social factors and the structure and situation of the family.

In this paper, the relationships between different family types and different characteristics of the farming system are analysed. This work is part of a bigger study about the viability of current farming systems and land use in less-favoured mountain areas. By means of multivariate analysis, different family types were obtained from a sample of 113 Spanish Pyrenean farms. Six groups were obtained with differences in the options for continuity of the farm, farmer age, family labour availability and degree of pluriactivity.

Farm size, spatial location, type of production, land use and economic outputs are studied in every group. A greater availability of land and larger herds are related to young farmers or elderly farmers with farm continuity assured. In this type, farms are more intensive, have more seeded grassland and more irrigated land. The best economic results are obtained by young farmers, with assured continuity and low incidence of pluriactivity.

Introduction

Farmers' decisions are influenced by different factors (McGregor et al., 1996). Changes occurring on the farm depend as much on external factors (above all the socio-economic context), as on the internal factors of the farm itself (Mauleón, 1989). Important to the latter are the characteristics and the situation of the family. Intense relationships between the farm business and the family are present in the so-called „family farms“, a concept which is nowadays clearly defined both from economic (Gasson and Errington, 1993) and social (Friedmann, 1978,1980) points of view. On these farms, the interrelations between family and farm business affect, the decision making process. This is due among other factors, to the existence of agrarian objectives and family objectives, the seasonal variations in the division of labour, the coincidence of the family home with the place of work and the relationships between succession, inheritance and retirement (Errington and Gasson, 1994).

It is difficult for researchers, assessors and politicians to understand global features, the nature of farms and indeed agriculture itself if they do not take into account the interrelationships between the family unit and the farm business (Errington and Gasson, 1994); that is to say, between economic and social factors (Gasson and Errington, 1993). To a great extent, they are these relations that explain the differences in behaviour and the different adjustments which farms make (Bryden, 1994). Therefore, knowledge of the factors that influence decisions and strategies cannot be based solely on the technical and economical aspects of the farm business (Brossier and Petit, 1977).

In the study of production systems, the concept of family-farm system is used (Osty, 1978). This concept considers the farm as an „organised whole“, and allows farmers' perceptions of objectives and situations to be considered in order to understand their needs. Generally speaking, the character and dynamics of European agriculture can only be understood in terms of „family farm economics“ and not „farms business“. Changes in the economic and social context have meant that the family becomes a unit of analysis (Brun, 1989).

From the economic point of view, the behaviour of family farms does not fit in with neo-classical theory (Etxezarreta et al., 1989). Decision making requires a hierarchy of alternative strategies which agree with the „utility“ or „satisfaction“ principle (Simon, 1959), but within these, we can observe criteria of utility, related to different family factors, which influence strategies and decisions.

To analyse the evolution of farms and understand the decision making process, one must pay attention not only to fixed factors, but also to the objectives and situations of the farmers. This allows a better understanding of their economic behaviour (Brossier and Petit, 1977), and the classical economical problems of resource allocation and production theories. It has been demonstrated that the dynamics of agricultural production units, their maintenance or disappearance and their growth or decline, are linked to the evolution of the families (number of members, characteristics, composition) (Delord and Lacombe, 1990); and that they are conditioned, to a great extent, by the structure of family farm income, in part from non-agricultural sources (Arnalte, 1989).

Farming systems and land use are also affected by the diversity of family structures and situations. The presence and importance of non-agricultural activities and income affect the diversity of farming systems, their technical characteristics and the type and form of land use (Laurent, 1991).

The livestock farms in the Spanish Central Pyrenees, which are located in a less favoured area, have conditioning factors that are linked not only to the physical environment and natural resources, but also to the socio-economic environment. The fact that they are family farms means that the family units have a more traditional character than those of farms situated in areas with more developed agriculture.

The general features that define the cattle systems in this area allow us to consider them as traditional systems, although to very different extents (Olaizola et al., 1995 and 1996; Manrique et al., 1997). Characteristic sheep systems are still transhumant, although there are small non-transhumant farms and mixed cattle-sheep farms (Olaizola et al., 1995; Manrique et al., 1996; Lopez Pueyo, 1997)

In this paper, the relationships between different family types and various features of the farming systems are analysed. This paper is part of a wider study of the options for viability of mountain livestock systems in the Spanish Central Pyrenees.

Methodology

The data was obtained via interviews with 113 livestock farmers (1991-92) located in the Pyrenean valleys of Broto, Benasque and Baliera-Barravés (Community of Aragón, Spain). From the sample, 55 farms were considered cattle farms, 35 were sheep farms, and the rest were mixed cattle-sheep farms with both activities in different proportions.

Several characteristics were considered: the age of the farmer, presence of pensioners on the farm, presence of children and continuity of the farm, pluriactivity of farmers or other family members, family members who work on the farm and marital status. Seven variables were selected that were divided into classes representative of the distribution of the sample (Table 1). The variables were analysed by Multiple Correspondence Analysis (MCA) and Cluster Analysis to classify the farms. Six groups or family profiles were obtained. In each profile, we analysed characteristics such as farm size, type of production, spatial location, land use and economic results.

Table 1. Variables used in the Multiple Correspondence Analysis

	Classes		Classes
Age of farmer	$\geq 22 \leq 35$	Number of Pensioners	0
	$> 36 \leq 55$		≥ 1
	> 56		
Farm continuity	- without successor	Farmer Pluriactivity	- No pluriactivity
	- uncertain		- Main non-agricultural activities
	- assured		- Secondary-non agricultural activities
Partner pluriactivity	- No pluriactivity	Other family members Pluriactivity	- No pluriactivity
	- Other on-farm activities		- Other on-farm activities
	- Other off-farm activities		- Other off-farm activities
Number of family workers	≤ 1		
	$> 1 \leq 2$		
	> 2		

Results and Discussion

Differentiation of family profiles

The first three factors obtained from the MCA explained 38% of the total inertia. The first factor (15% of the inertia) identified older farmers (55-67 years old) whose farms do not have continuity assured or continuity is uncertain. Generally, only one member of the family works on the farm and the owner does not have any activities outside the farm.

The second factor explained 12% of the inertia and identified farmers of an intermediate age (36-55 years old), whose partners or other members of the family are involved in tourism activities on the farm. At the same time, these farms do not have assured continuity.

The third factor (11% of the inertia) identified farms whose continuity is not guaranteed and in which the number of family members working in the farm may be one (the farmer) or more than two. There are other family members who work outside the farm, at least two people who receive pensions and the partner does not have non-agricultural activities.

The co-ordinates of the farms to the first three factors of the MCA were used in the Cluster Analysis. Six groups of farms that correspond to six family profiles were obtained (Table 2).

PROFILE 1 *Young farmers with high labour availability.* This group is made up of thirty farms whose owners have an average age of 32. They are single or have small children so continuity seems to be guaranteed. They have an average of three people working in the farm and they have old people who receive pensions. Regarding pluriactivity of farmers, only six of the farms have part-time farmers, and apart from two of the farms, the partner does not normally work outside the farm. Pluriactivity amongst other family members is greater, with 30% of them (9 farms) receiving income from outside the farm.

PROFILE 2 *Young farmers with other family labour and non-agricultural activities.* This group is characterised by young farmers, though somewhat older than the previous group (average age = 38). Continuity is guaranteed, except in two cases in which it is uncertain, as the farmers are single and somewhat older. Regarding pluriactivity, on only three of the farms does the owner have a main activity outside the farm. In four cases, the partner is involved in tourism activities on the farm and in two of these cases there are other family members also involved. Like the previous group, the average number of family members who work on the farm is three, the average being the highest of the groups.

Table 2. Characteristics of the family profiles

	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
No. of farms	30	15	17	9	18	24
Farmer age (average)	32	38	54	58	47	42
Farm Continuity	With successor or young single farmer		High % of farmers with successor	With successor but farm continuity uncertain	Without successor	With young children
No. of pensions (average)	1.0	1.3	0.3	0.3	0.9	0.6
No. of family workers (average)	3.1	2.9	2.3	1.9	1.5	2.0
Farmer pluriactivity	Low	Medium	Medium	No pluriactivity	High	No pluriactivity
Partner pluriactivity	Low	Medium	No pluriactivity	Low	Low	High
Other family members pluriactivity	High	Medium	Medium	Medium	High	No pluriactivity

PROFILE 3 *Elderly farmers, no pension and farm continuity assured.* This is a group of 17 farms whose owners' average age is 54. Here, there are no older people receiving pensions. Continuity is guaranteed in 70% of the farms and in only 5 cases the farmers are elderly single men or married men without children. The importance of pluriactivity to the owners and to other family members is similar to the average of the sample. The owner works full time outside the farm in three farms only, while on another four farms other family members work outside the farm.

PROFILE 4 *Elderly farmers with farm continuity uncertain.* There are nine farms with the average farmer age higher than the previous group (average age = 58). In this group, two family members work on the farm. The continuity of the farms is uncertain despite there being descendants, since in 67% (6 farms) the children do not live on the farm or work in activities outside it. The incidence of pluriactivity of the owner or his partner is nil in this group, while in three farms there are other family members who work outside the farm.

PROFILE 5 *Farms with uncertain continuity and pluriactivity.* This group is characterised by farmers without successors, so farm continuity is uncertain. The average age of farmers is 48 and they are mainly single. On these farms, there are elderly people who receive one pension on average. Owner pluriactivity outside the farm is very high (33%, 6 farms). The incidence of pluriactivity by other members of the family is also important, as it is present in 33% of the farms. The least number of family members work on the farm within this group.

PROFILE 6 *Active farms with non-agricultural activities by partners.* This group is made up of 24 farms whose owners are middle aged (average = 42), and who have descendants in all cases. Therefore, continuity is not in question. At the same time, this group is the one in which pluriactivity by partners is most important (15 farms), the majority of activities being

outside the farm. In 50% of the cases there are elderly people who receive a pension. On average, two members of the family are involved in agricultural activities.

Family Profiles and Farm Sizes

From the distribution of farms by surface area, we can observe that certain sizes have a greater importance in some of the profiles (Table 3). Larger farms (>100ha) (8% of the sample) represent 26% of the farms of Profile 2 and 10% of Profile 1. Furthermore, 23% of this latter group and 21% of the Profile 6 (active farms with non-agricultural activities by partners) are between 50 and 100ha, whilst for the sample as a whole this only makes up 16%. In contrast to this, in Profile 5 (uncertain continuity) and Profile 3 (elderly farmers without pensioners) 88% and 95% of the farms are less than 50ha respectively. These results point to the fact that large or medium sized farms belong to family types with young owners, great availability of family labour and the existence of succession. The owners work on the farm, though their partners and other family members may have other activities. On the other hand, we see that smaller farms belong to farmers who are middle aged or elderly, without succession and with little labour resource. Pluriactivity can be carried out frequently. These results coincide with those obtained by Houdard (1977), which pointed out the increase of Arable Land (AL) on farms with high labour available and descendants, and the decrease on those without succession.

Regarding herd size, we can also observe the greater importance of the largest farms (>100 Livestock Units (LU)) in the first three profiles (more than 20% in all cases). They represent 27% of the group of young farmers, with other family labour and non-agricultural activities (Profile 2). However, in the case of farms with continuity uncertain (Profile 5), 83% of the farms have less than 50 LU. In the group of active farms with non-agricultural activities by partners (Profile 6), there is a predominance of intermediate herd sizes ($25 < \text{LU} \leq 50$), since they make up 54% of the group.

We can observe a similar pattern in herd and farm sizes. The largest farms correlate with young or elderly owners who have succession and are involved, to some extent, in other activities. In all cases the family labour force is high. On the other hand, a small number of LU and ha of land correlates with farmers without succession, who are middle aged, with low labour resource and pluriactivity carried out by the owners. Kazakopoulos et al. (1996) pointed out that on sheep farms, the largest flocks and areas belonged to farms with succession. On the other hand, Mauleon (1989) associated a larger cattle herd size to the presence of a son on the farm and with the farmer age and labour dedication to the farm. If the farmer is young, the size of the farm is related to labour dedication, although this cannot only be explained in terms of the existence of part-time activities (Gasson, 1968).

Table 3. Farm size, type of production and economic outputs in the farms studied and in the family profiles (% of farms)

Variables	Classes	Total farms	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
Arable Land (ha)	≤20	37.0	36.6	26.7	41.2	44.0	33.0	42.0
	>20≤50	38.9	30.0	26.7	47.0	33.0	61.0	37.5
	>50≤100	15.9	23.3	20.0	6.0	22.0	0.0	21.0
	>100	7.9	10.0	26.7	6.0	0.0	5.5	0.0
Total Livestock Units	≤25	18.6	13.0	13.0	18.0	33.0	44.4	4.2
	>25≤50	37.2	36.7	33.0	29.0	11.0	39.0	54.0
	>50≤100	27.4	30.0	27.0	29.0	55.0	11.0	25.0
Transhumant Inputs (%)	>100	16.8	20.0	27.0	23.5	0.0	5.5	17.0
	≤20	82.3	80.0	67.0	82.4	78.0	94.4	87.5
	>20≤50	12.4	16.0	20.0	12.0	11.0	5.5	8.3
Total Output (%)	> 50	5.3	33.0	13.0	6.0	11.0	0.0	42.0
	≤20	49.0	46.0	33.0	29.4	66.7	50.0	71.0
	>20≤60	16.0	23.0	13.3	23.5	0.0	11.0	8.3
Total Gross Margin*	>60≤90	8.0	6.7	20.0	11.8	0.0	11.0	0.0
	>90	27.4	23.3	33.0	35.3	33.3	27.7	27.4
	≤2	43.4	33.0	40.0	53.0	44.0	66.6	33.0
Margin*	>2≤4	37.2	43.0	26.0	29.0	44.0	33.3	42.0
	>4≤6	13.3	13.0	26.0	11.8	0.0	0.0	21.0
	>6	6.2	10.0	6.0	6.0	11.0	0.0	2.0

*000.000 pts.
(1 EURO=168 pts.)

Family Profiles and Land Use

The study of land use in different profiles highlights the fact that there are no appreciable differences in the availability of natural pastures (Table 4). However, regarding the importance of rough grassland, it can be seen that in Profile 3 (farms with elderly owners and farm continuity assured) 23% of the farms have more than 80% rough grassland. At the same time, groups 2 and 5 also have a large number of farms with a high proportion of rough pastures (40% and 28% of the farms are situated in the 50-80% class respectively). However, for active farms with partners involved in non-agricultural activities (Profile 6), 54% have an intermediate level of rough grassland (20-50%).

Taking all the farms as a whole, cultivated pastures have little importance, although within certain family profiles their importance is higher. In Profile 1, 13% of farms have more than 20% of their area allotted to cultivated pastures, the figure being only 8% for the whole sample. In Profile 2 (young farmers with other family labour and non-agricultural activities), and in Profile 6 (active farms with non-agricultural activities by partners) farms with a medium-high percentage of cultivated pastures (10-20%) are more frequent. Similarly, irrigated land has little importance in the sample. However, there are a greater number of farms with more than 30% of irrigated land in Profiles 1 and 6.

Regarding the use of land, we observe that the use of rough grassland seems to be related to an intermediate or high level of pluriactivity, but not with other family characteristics. However, the importance of cultivated pastures and irrigated areas, which must be observed as indicators of intensification in the productive process, tend to be related to families with high labour potential and with succession or small children, i.e. farms with dynamic features. On these farms, there is usually little pluriactivity by farmers. Mauleon (1989) associated the level of dedication to the farm, specifically the lower frequency of part-time farming, with a greater intensification in terms of LU/ha. Kazakopoulos et al. (1996) pointed out the relationship between existence of succession and irrigation.

Table 4. Land use in the farms studied and in the family profiles (% of farms)

Variables	Classes	Total farms	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
Natural Pastures %	≤30	27.2	33.0	47.0	23.0	22.0	28.0	12.0
	>30≤50	24.6	23.0	20.0	47.0	0.0	22.0	25.0
	>50≤75	30.0	23.0	27.0	18.0	44.0	28.0	46.0
Forage Area	>75	17.7	20.0	7.0	12.0	33.0	22.2	17.0
Rough Grassland %	≤20	31.8	33.0	20.0	18.0	67.0	39.0	29.0
	>20≤50	38.0	40.0	40.0	29.0	22.0	28.0	54.0
	>50≤80	22.0	20.0	40.0	29.0	0.0	28.0	12.5
Forage Area	>80	8.0	7.0	0.0	23.5	11.0	5.5	4.2
Cultivated Pastures %	0	54.0	47.0	47.0	65.0	67.0	50.0	58.0
	>0≤10	24.6	23.0	20.0	23.5	22.0	28.0	17.0
	>10≤20	30.0	17.0	27.0	6.0	11.0	11.0	20.0
Forage Area	> 20	17.7	13.0	6.6	6.0	0.0	11.0	4.0
Irrigated %	0	44.0	30.0	60.0	59.0	44.0	50.0	37.5
	>0≤30	32.0	40.0	20.0	23.0	33.0	38.0	30.0
	>30≤50	19.5	26.0	13.0	18.0	11.0	11.0	25.0
Forage Area	>50	4.4	3.0	7.0	0.0	11.0	0.0	8.3

Family Profiles, Spatial Location of the Farms and Type of Production

When we analyse the relationships between family profiles and spatial location of the farms, a greater presence of certain groups in specific valleys can be observed. The Profile 6 (dynamic farms with partners involved in non-agricultural activities) are fundamentally in the Broto and Benasque valleys (Table 5). At the same time, in Profile 2 (young farmers with other family labour and non-agricultural activities) 53% of the farms are situated in the Baliera valley, while the farms studied in this valley make up 33.6% of the sample. For Profile 3 (elderly farmers, no pension and farm continuity assured) there are no farms in the Broto valley. Profiles 1 and 5 (young farmers with high labour availability and farms with continuity uncertain respectively) are present in all valleys. This would indicate the existence of family typologies across all the mountain areas studied.

From the point of view of the type of production, both specialized cattle farms (Cattle Output/ Total Output >80%) and sheep farms (Lamb Output/ Total Output >90%) are distributed across all the profiles. Nevertheless, in Profile 6 (active farms with non-agricultural activities by partners) 71% are cattle farms, whereas the figure is only 49% for the total sample. On the other hand, sheep farms are more frequent in Profiles 2 and 3.

There are also profiles that do not contain mixed farms, i.e. Profile 4 (elderly farmers with farm uncertain continuity). In other family groups, such as Profiles 1 and 3, mixed farms (Lamb Output/ Total Output =20-60%) are more important (23% of the group, 16% of the whole sample). Equally, in Profile 2 mixed farms with a higher proportion of sheep (Lamb Output/ Total Output =60-90%) are 20% of the group (8% for the sample as a whole).

Regarding transhumance of sheep and using as indicator Transhumant Inputs/ Total Inputs, it can be observed that the farms with greater importance of transhumance (Transhumant Inputs/ Total Inputs >50%) are located across all profiles, except in the group of farms without assured continuity. In Profile 2 (young farmers with other family labour and non-agricultural activities) there are more transhumant farms. The inputs of transhumance account for more than 20% of the total inputs in 33% of the farms, whilst the figure for the sample as a whole is 18%.

Table 5. Spatial location of the farms studied and in the family profiles (% of farms)

	Total farms	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
Valley of Broto	23.0	30.0	0.3	0.0	11.1	27.8	37.5
Valley of Benasque	43.4	30.0	33.3	53.0	55.5	44.4	54.2
Valley of Baliera Barravés	33.6	40.0	53.0	47.0	33.3	27.8	8.3

These results do not allow us to clearly establish the relationship between the type of family and the orientation of production: cattle, sheep or mixed. The presence of specialized cattle and sheep farms is observed in very different family types, but without farmer pluriactivity as a common feature (Profiles 4 and 6). This seems to contradict the results of Liffra (1983) and Laurent (1991) in which farmers' pluriactivity and different sources of income lead to a

reduction in diversification of production. Profile 3 and mainly Profile 2 (high availability of family labour, succession assured, little or intermediate pluriactivity), have the highest proportion of sheep farms or sheep oriented farms. The existence of successors seems to be a distinctive characteristic but the results have not corroborated with the results of Houdard (1977) or Sánchez Fernández (1990), who pointed out that the lack of succession, few family members and part-time farming lead to the abandonment of milk production.

Family Profiles and Economic Results

Using Gross Margin (GM) as an indicator of the economic results, we can observe that farms of Profile 5 obtain lower GM. In this group, where continuity is uncertain, 66% of the farms obtain less than 2 million pesetas⁴⁹ (pts.) of GM, the rest obtaining between 2 and 4 million pts. At the same time, in Profile 4 (elderly farmers with uncertain continuity) 88% of the farms obtain less than 4 million pts.

On the other hand, in Profiles 1, 2 and 6 (young owners, family labour available, succession assured) there is a greater presence of farms with higher incomes. In Profile 1, 10% of the farms obtained more than 6 million pts. of GM. In Profile 6 (partners involved in pluriactivity) and Profile 2 (certain presence of other activities) the farms with a high Gross Margin (4-6 million pts.) are relatively frequent (21% and 26% respectively). These three types of families have common factors such as the young age of the farmer; the existence of succession and the high labour potential, which seems to lead to better agricultural incomes. On these farms, we have to consider that better incomes are required due to the lack of pluriactivity. Nevertheless, we should not forget the well-known relationship between size of the farm and economic results.

Conclusions

The age of farmers and the possibilities of continuity of the farms are the socio-economical variables that most differentiate the groups of farms in the survey. Profile 4 and especially profile 5 (16 and 8% of farms studied respectively) have the most uncertain future, and are distributed in the three valleys considered. The hypothetical abandonment of these farms, taking into consideration the consequences observed in similar areas, could produce the loss of natural pastures, used exclusively by local livestock. Nevertheless, the permanence of livestock farming activities seems to be assured in all valleys. This is because the group of farms managed by young people with high availability of family labour (26% of farms) is also distributed across all valleys. Nevertheless, the group of dynamic farms with high pluriactivity by partners is only observed in valleys with developed economic sectors, especially the tourism sector (Broto and Benasque valleys). With reference to farming systems, larger farms with a high number of hectares and animals, are more associated with family profiles in which farm continuity is guaranteed. The reverse is seen on smaller farms. Therefore, the existing relationship between higher gross margins and larger size of farms determines that the best economic results are obtained by families with young farmers and high availability of labour. There is a great diversity in terms of land use. The presence of rough pastures is higher on farms with other economic activities and on farms with non-assured continuity. On the contrary, higher intensification in cultivated pastures is related to young farmers with good availability of labour. It can be said that these farms will allow the

⁴⁹ 1 EURO=168 pts.

conservation of the traditional valley bottom landscape. Farms with non-assured continuity can be seen in both cattle, sheep and mixed systems, while young farmers with high labour availability and assured continuity are more frequent in mixed systems. This points to a relationship between diversification and dynamism of the farms. The transhumance of sheep, a traditional system becoming less important, has disappeared in farms with non-assured continuity. This system is more frequent among farms with high-labour availability and younger farmers. This could guarantee the maintenance of transhumance as a system in the future. Nevertheless, it has to be considered that this high availability of labour is often due to the presence of elderly people.

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