Livestock Systems in Rural Development in Disadvantaged Areas

Radical changes are taking place across Europe in the nature of support structures for agriculture and rural development. The recent Cork conference established the philosophy, at an EU level, of "integrated rural development", that may become the model for future reform of support structures, i.e. that policy structures aiming to stimulate the rural economy must recognise that agriculture plays only a part, albeit a major one in a far wider range of economic activities. This shift in emphasis, towards policies that regard environmental sustainability to be a fundamental necessity, is likely to have far-reaching effects on agricultural systems, particularly in the agriculturally less-favoured areas. These disadvantaged regions - the mountains, moorlands, wetlands and heaths and the rough pastures found in each of these landscapes - represent some 30 % of the farmed area of Europe. Livestock rearing is commonly the major agricultural sector in these areas, and it is being increasingly recognised that traditional husbandry methods have played an essential role in creating and maintaining the characteristic habitats and landscapes, that are, on the one hand, so valued by all countryside users, and on the other, so threatened by intensive agriculture practices.

Future systems must be compatible with positive environmental management, as well as returning an adequate income to farmers, a demand that is leading to an increasing number of farmers engaging in some form of processing or speciality marketing to add value to their products, possibly in co-operation with other local businesses, such as restaurants and delicatessens.

This drive to integration of rural development initiatives opens up new challenges for research. There is increasing need for collaborative, interdisciplinary work which will draw together existing knowledge and new technologies. The LSIRD network was established last year to bring together leading European researchers to share ideas, and develop new co-ordinated research programmes to address these issues. This conference is the first in Europe that will include experts in production systems, policy and economic research, and environmental management. The conference will point to new opportunities for synergy between the disciplines, and form a conceptual basis for the future development of the LSIRD network.

Livestock systems in European rural development

Identifying biological constraints acting on livestock systems in marginal areas

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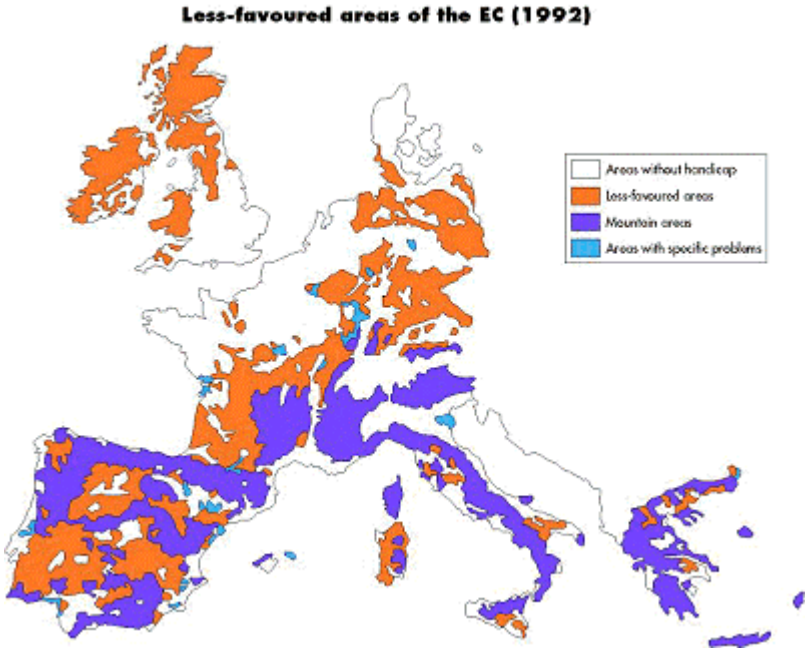
Summary

There is a huge diversity of livestock systems in marginal areas, producing milk, meat, wool and hides from a large number of breeds of cattle, sheep and goats. Those systems all, however, rely to a large extent on pasture resources to supply most of the feed. Because of the seasonality of pasture growth in marginal areas both the quantity and quality of herbage available can limit the level of nutrition to livestock. In northern Europe pasture production ceases in winter due to low temperatures, while in southern Europe high temperature and lack of rainfall limit pasture growth in summer. Variability of rainfall between years is also a major problem in Mediterranean areas. In many marginal areas soil conditions are such as to limit the supply of nutrients to plants. In winter in northern Europe and in summer in southern Europe the nutritive value of herbage available (in terms of energy and protein) is generally very low and often insufficient to provide animals with even maintenance levels of intake. Often animals have to browse shrubs, which tend to have a low digestibility and a low protein content. In addition many contain secondary plant compounds such as tannins which impair digestion. The low levels of nutrition generally limit the physiological processes of reproduction, lactation and growth, well below the potential achievable by the animals. Management systems have developed which try to overcome some of these difficulties. For example, the annual reproductive cycle in breeding animals is usually manipulated to ensure the time of maximum feed requirements coincides with maximum pasture production, and supplementary feeding can be provided to increase the level of nutrition. Nevertheless the levels of animal performance and total output from livestock systems in the marginal areas of Europe fall considerably below that of comparable systems in more favoured areas.

Introduction

There is no strict definition of marginal areas. However for the purposes of this paper it is assumed that as far as the EU is concerned, marginal areas equate roughly with those areas which have been classified as 'less favoured' by the European Commission in the Less Favoured Areas Directive (EEC, 1975). Briefly, the less favoured areas are those where there are limited possible land uses because of altitude, short growing season, steep slopes, infertile soils and low productivity. These areas are mainly suitable for livestock farming and farming is necessary to protect the countryside. The extent of Less Favoured areas in the twelve EC countries in 1992 is shown in Figure 1.



In the marginal areas there is a huge diversity of livestock systems producing milk, meat, wool and hides from a staggering number of breeds of cattle, sheep and goats. There are however several key features which many of the systems have in common which can be summarised as follows:

1. Most systems depend on pasture resources to supply the majority of feed resources.

2. Pasture production is seasonal.

3. Both the quantity and quality of herbage can limit the nutrient intake of animals.

This paper identifies the main constraints on animal performance and output from livestock systems in marginal areas. It considers the factors which constrain pasture production and quality, how the performance of animals can be limited by nutrition and how some of the limitations can be overcome.

Constraints on plant production

Temperature

Below 5oC the growth of grass species is negligible, and for practical purposes it can be assumed that the number of days that the temperature is above 6oC represents the length of the growing season. Thus in northern Europe there is little grass growth in winter, with the length of the growing season becoming shorter as latitude increases. Figure 2 shows a typical pattern of grass growth in Britain, with growth commencing in March and ending in October. Although the length of the growing season may become shorter further north, the daily rates of growth during summer can be higher because of the greater daylength during the growing season.

Temperature is also influenced by altitude. Research in northern Europe at altitudes of 150 to 680 m above sea level has shown how the annual dry matter yield of grass was decreased by 2% for each 30m rise in altitude (Hunter and Grant, 1971), although the effect did depend on the season. In spring, when temperature was limiting, yields were decreased by 5%, for each 30m rise in altitude, while in autumn the decrease was only 1.8% and in summer the highest yields often occurred at the highest or intermediate levels because of moisture deficits at lower altitudes.

Small changes in the duration of the growing season have been achieved by the breeding of grasses which initiate growth earlier in spring (Davies et al., 1989; Table 1), but the growing season has been altered by only a week or two, although even this can have significant impacts on animal performance.

Table 1. Annual lamb output from an early growing and a standard perennial ryegrass cultivar. (From Davies *et al*., 19)89

Grass variety	Lamb production (kg/ha)
Aurora (early)	493
S23 (standard)	405

Rainfall

In many marginal areas of Europe pasture growth is limited not by temperature, but by rainfall. In northern and in western Europe, rainfall tends to be relatively uniformly distributed through the year, but in Mediterranean regions, not only is annual rainfall lower, especially in the Eastern Mediterranean, but 70-80% of rainfall occurs during autumn and winter. The lack of rainfall in summer, coupled with the high temperatures which lead to a high potential rate of evapotranspiration leads to summer droughts, which results in a cessation of pasture growth in summer (Figure 3). Another common feature of Mediterranean areas is the variability of rainfall, which in turn results in large inter-annual variation in pasture dry matter production. Table 2 shows the variation in dry matter production from pasture associated with rainfall at three sites in Basilicata in Southern Italy. Over a three year period pasture production varied by 375% at Stigliano, 68% at Bella and 50% at LiFoy associated with differences in rainfall. These data also show how the variation in rainfall has a greater effect in areas where the climate is drier (Stigliano).

Table 2. Variations in annual pasture production in relation to rainfall in Basilicata in Southern Italy (From Fedele *et al*., 1988)

Site	Year	Annual Rainfall	Pasture Production (kg dry matter/ha)
Li Foy	1984	930	6200
	1985	790	5100
	1986	755	4200
Bella	1984	700	3100
	1985	750	5000
	1986	640	7000
Stigliano	1984	320	800
	1985	510	2500
	1986	640	3800

Soils

The most important soil factor affecting plant production is probably acidity, which also affects nutrient supply (Floate, 1977). In many marginal areas soils are acidic because of the combined effects of the parent material and leaching of anions due to high rainfall. Low pH can be a major cause of slow rates of decomposition of organic matter in soils and hence may limit the cycling of nutrients. Application of lime alone has resulted in pasture dry matter yield increasing from 2000 to 6000 kg dry matter per hectare.

While the application of fertilizers (nitrogen, phosphorus and potassium) in either mineral or organic form can have large effects on plant production the specific response will depend on the particular circumstances relating to soil type, climate and plant species, and may or may not provide an economic response.

In areas of high rainfall and on poorly drained soils with a high clay or silt content it may be difficult to utilize pastures in spring and autumn because of damage caused by the treading and poaching of soils by grazing animals, and the length of the grazing season may be more limited by these factors than by the duration of plant growth.

Animal intake and diet composition

The cessation of pasture growth during part of the year because of either low temperatures or lack of moisture creates an imbalance between the pattern supply of nutrients from pasture and the requirements of livestock, with the carrying capacity of the pasture being much higher during the periods of active growth. Whilst the effects of limited plant growth can be overcome in some cases by ensuring that stocking rates are sufficiently low to allow a build up of herbage for animals to eat during periods of little or no growth, the nutritive value of pasture in winter or during dry periods is usually low. Figure 4 shows the variation in organic matter digestibility of the diet selected over the year by hill sheep grazing indigenous grassland in Scotland. The organic matter digestibility of the diet drops below 0.50 in late winter because of a high proportion of dead material in the diet, and, although it rises to above 0.70 in May, June and part of July, it falls again in autumn. A similar situation occurs in Mediterranean countries, where there is a decline in organic matter digestibility and crude protein content in summer.

In many areas, the vegetation consists not only of grasses and forbs, but there can be a substantial amount of shrub species in the vegetation communities. Shrubs may be better adapted to withstand periods of drought. For example over 2 million ha of land in the Mediterranean region is covered by woody shrubs. In many regions the Kermes oak (*Quercus coccifera*) is the dominant species. It occupies 0.8 million ha in Greece (Liacos et al., 1980). Figure 5a shows the proportion of browse and grass plus forbes in the diet of goats grazing paddocks with a ground cover of 62% Kermes oak and 20% grasses and forbs. The proportion of browse in the diet declines dramatically in spring and early summer, and then increases again to over 70% by August. These changes in composition result in associated changes in the quality of the diet. The high proportion of browse is associated with low diet organic matter digestibility (OMD) for much of the year (Figure 5b), and only from March to July does OMD reach values of more than 0.50. Similarly the crude protein content is less than 100g/kg DM when the proportion of browse in the diet is high (Figure 5c). The low digestibility of browse is due to the high degree of lignification in these woody species. However many woody plants also contain high concentrations of secondary plant compounds such as tannins which reduce rumen microbial activity. The total tannin content of Kermes oak, for example, is 123-213 g/kg depending on the physiological stage. Such high levels impose severe nutritional penalties on animals consuming these plants.

As well as digestibility constraints which limit the energy supply to animals, there are often limitations on the supply of protein to the animals. A 30kg goat requires approximately 80g of crude protein per kg of dry matter intake. As shown in Figure 5c, the diet selected when grazing a Kermes oak-dominated community can supply little more than maintenance for much of the year, and is insufficient to support pregnancy or lactation.

The level of nutrition is the major determinant of animal performance. If animals are to be productive, either for meat or milk production, then the food supply must be sufficient to sustain the physiological processes of reproduction, lactation and growth as appropriate.

Reproduction

Generally the rate of reproductive performance in ruminants increases as general levels of nutrition increases. In ruminants the probability of a female being barren reduces as the level of body condition and feed intake increases and in sheep and goats, which have the ability to produce more than one offspring per litter, the probability of multiple births increases, although at high levels of body condition lambing rate decreases (Tables 3 and 4). Thus in traditional British hill sheep systems only a small proportion of ewes produce twins and lambing rates are often less than 1.0, while the same breeds might produce 1.6-1.8 lambs per ewe in lowland environments. Nutrition affects reproductive rate by influencing both the ovulation rate and incidence of embryo mortality.</P>

Table 3. Effect of body condition on lambing rate in North County Cheviot sheep (From Gunn, 1983)

Body condition score	≤2.0	2.5-3.0	≥3.0
Lambing rate	1.33	1.53	1.29

Table 4. Effects of direction of change of live-weight at mating on lambing rate in Border Leicester x Scottish Blackface ewes (From Gunn and Maxwell, 1978).

Direction of live-weight change	Losing	Maintaining	Gaining
Lambing rate	1.58	1.78	1.96

Once pregnancy is well established, sheep goats and cattle will sustain foetal growth in periods of undernourishment by mobilizing body reserves of energy (stored principally as fat) and to a lesser degree protein (Russel et al., 1968). In some cases animals can become so thin as to jeopardise their own changes of survival, especially in harsh weather conditions.

Lactation

Level of milk production, whether for human consumption or for consumption by offspring, is very sensitive to level of nutrition. However, although lower levels of nutrition result in reduced milk production to some degree, as in pregnancy, lactating animals mobilise body energy and protein to provide nutrients for milk synthesis. The degree to which this occurs depends on the genotype of the animal - females with a high genetic potential for milk yield have a greater propensity to mobilise body reserves to maintain lactation (Table 5).

Table 5. Live-weight change and milk yield in beef cows with a high (Hereford x Friesian) or low (Blue-Grey) milk yield potential (Wright, Russel and Hunter, 1986).

Genotype	Hereford x Friesian	Blue-Grey
Milk yield (kg/day)	7.0	6.2
Live-weight change (kg/day)	-1.38	-1.13

Growth

In addition to reproductive rate and lactational performance being restricted in environments where there are nutritional limitations, clearly the growth rate of young animals is affected, either by level of milk intake in suckling animals, or by the quantity and quality of solid food consumed.

Systems of production

Systems of animal production have evolved in marginal areas in ways which try to overcome some of the limitations imposed by the environment. There are two basic ways in which this can be approached, which are not mutually exclusive. The first is to choose an animal species and genotype which is adapted to the environment and the second is to manage the system in such a way as to modify the environment.

Choice of species and genotype

Smaller animal species, such as sheep and goats, have smaller mouths compared to cattle, and therefore tend to have the ability to be more selective in choosing their diet. Therefore in a plant community where the quality of the food on offer is generally low, smaller animals have an ability to select a better quality diet (Gordon and Illius, 1988). Thus sheep tend to select a diet with a higher digestibility than cattle and can achieve therefore a higher digestible organic matter or metabolisable energy intake (Hodgson and Eadie, 1986). In addition to being less selective, cattle are at a greater disadvantage than sheep when vegetation is scarce and the sward is short. Figure 6 shows how the intake of herbage, relative to the maximum achievable, declines more rapidly in cattle as sward height becomes shorter. These differences explain in part why systems of sheep and goat production tend to have

developed in the regions with the poorest quality and quantity of vegetation. In addition, because goats are predominantly browsers, they are better adapted to areas with shrub vegetation.

In addition to selecting the most appropriate species, choice of breed can be equally important. Generally smaller less productive breeds are better adapted to harsher conditions. Attempts to introduce more productive animals into animal production systems without also altering the management system have often failed because the level of nutrition has not been able to support the more productive breeds. Data from Leon Province, Spain shows how a local breed of sheep, the Churra, produces only 90 1 of milk per lactation, while a more productive breed, the Assaf, introduced from Israel, produces 150 1. However the larger and more productive Assaf based has a much lower reproductive rate in these conditions and the result is that the difference between breeds in the amount of milk produced per ewe on the farm is much less than that produced per lactation (Table 6).

Table 6. Production from Churra and Assaf ewes in Leon Province, Spain (A.R. Mantecon, unpublished data)

Breed	Churra	Assaf
Milk yield per lactation (l)	90	150
Lambs sold per ewe	0.82	0.68
Milk output per ewe on farm (l)	61	78

Modification of the environment

In addition to selecting the appropriate species and breed, management can be used to alter the environment, particularly the nutritional environment. This can be achieved by improving the quality of pasture by grazing control, application of fertilizer or even replacing natural pasture by reseeding with improved plant species. Supplementary feeding can be provided to animals at times of the year when the quantity or quality of pasture is insufficient to support the required level of performance. The ultimate change in the environment can be achieved by removing the animals from the grazing resource and either housing them or moving them to another area, as happens in transhumance systems.

An illustration of the impact of modifying the nutritional environment is provided by the introduction of what became known as the 'two-pasture system' into traditional hill sheep systems in the UK. Figure 4 shows the severe nutritional limitations to production in traditional hill sheep systems because of the low levels of pasture growth, the short growing season and the poor quality of the diet except for a few months in early summer. It was identified that the most severe limitations imposed by nutrition were a) before mating, which limited reproductive rate, b) in late pregnancy when feed requirements were high and lamb birth weight was restricted and therefore lamb mortality was high and c) during lactation when there was a high demand for milk production, which was not being met and therefore ewes were producing low milk yields, lamb growth rate was low and ewes were becoming thin which reduced ovulation rate at the next mating. The stocking rate was limited by the carrying capacity of the pasture in winter (Cunningham and Russel, 1979).

These limitations could be overcome by reseeding a proportion of the hill and using that improved pasture during lactation and before mating. Supplementary feeding was provided in late pregnancy. Figure 7 shows how there was a marked improvement in the quality of the diet under the improved system.

The consequences of increasing the level of nutrition to the sheep and of increasing the level of utilization of pasture was to increase the stock carrying capacity. In the example shown in Table 7, this resulted in an increase in the number of ewes which could be carried from 387 to 683. Individual animal performance increased, with weaning rate increasing from 0.91 to 1.10. The combined effect of increased ewe numbers and increased weaning rates led to a 246% increase in total weight of lambs weaned.

Table 7. Comparison of performance of traditional and two-pasture hill sheep systems in Scotland, UK (Armstrong, Eadie and Maxwell, 1986).

	Traditional system	Two-pasture system
Flock size	387	669
Weaning rate	0.91	111
Total weight of lambs weaned per	7900	19170

year (kg)		
Total weight of wool produced per year (kg)	870	1720

Comparison of systems

Although some of the constraints which were highlighted earlier in this paper can be overcome to a limited extent, the levels of biological performance which can be achieved from livestock systems in marginal areas tend to be considerably lower than those from comparable systems in lowland areas. Table 8 shows the performance of a sample of beef cow herds in lowland, upland and hill areas of the UK. Although reproductive rate does not vary to any great extent, upland, and especially hill farms, need to provide considerably more feed in winter, and the stocking rates are considerably lower, reflecting the longer duration of the winter feeding period and the lower rate of pasture production.

Table 8. Performance of lowland, upland and hill beef cow herds in the UK (Meat and Livestock Commission, 1994)

	Lowland	Upland	Hill
Per 100 cows mated	90	91	88
Calves born	90	92	89
Calves reared			
Calf live-weight gain(kg/day)	1.15	1.03	0.80
Concentrates fed (kg per cow + calf)	119	208	320
Silage fed (t/cow)	2.1	2.5	5.4
Stocking rate (cows/ha)	2.5	1.8	1.1

Conclusions

The problem of seasonality of pasture production in marginal areas causes major nutritional constraints on animal production systems. The effects of some of those constraints can be reduced by the appropriate choice of species and breed and by using a range of management strategies to improve the level of nutrition. There are, however, limits to the extent to which this can be done, from both an economic and environmental perspective. Compared to lowland areas, marginal areas will always be at a disadvantage. Therefore if livestock systems are to survive in these areas, ways must be found to ensure that these systems generate as much economic activity as possible.

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Economic constraints on the development of livestock production systems in disadvantaged areas

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SUMMARY

Disadvantaged areas are characterized by poorer resource quality compared to other rural areas, by remoteness and distance from the main population centres, and are mostly concentrated in hilly and mountainous areas. They experience strong depopulation trends, economic decline and deterioration of their social fabric. Although there are disadvantaged areas in many parts of the world, this paper focuses on such areas of Southern Europe. Livestock, mainly of extensive type, is one of the main economic activities and is considered as a potential development option for such areas. The purpose of this paper is to examine the economic constraints on the development of livestock production systems discussing alternative policy options in the context of reversing the trend of economic decline of disadvantaged areas. The complexity of the problem, however, requires, first, understanding the nexus of the issues, hence, the role of livestock should be considered in a wider economic and social development context, on the basis of which to derive policy conclusions. The paper identifies increasing productivity and efficiency as the main strategic objective for achieving sustainable development and for reversing the trend of decline in disadvantaged areas. Increasing productivity and efficiency of livestock systems can be achieved by increasing technology of production, mainly reducing labour requirements, reducing distance costs by improving transportation, communication and marketing channels, and by encouraging endogenous development and local initiatives in addressing issues of management of common property resources, training, and financial constraints.

1. INTRODUCTION

Disadvantaged or less favoured areas, despite strong heterogeneity and wide variation of physical resource endowments, are characterised by poorer quality of resources compared to other rural areas, by remoteness and distance from the main population centres, and are mostly concentrated in hilly and mountainous areas. Disadvantaged areas of Southern Europe although quite diverse, due to their historical, cultural and socio-economic development, share common characteristics in their social organisation, economic structure, and cultural identity that determine the observed common trends of strong depopulation, economic decline and deterioration of their social fabric. The depopulation of these areas, experienced mainly in recent decades, is the result of a rapid, but regionally uneven, economic development, the mechanisation of agriculture and the attraction of the people to the social life of the urban areas. Nevertheless, no conceptual framework is available up to now to be used for analysis and choice among policy options.

Agriculture, along with livestock, forestry, and tourism are the main employment generating activities. Agricultural production and other economic activities have been adversely affected by the depopulation of disadvantaged areas with significant land acreage been abandoned from cultivation, leading further to the abandonment of other economic activities. Extensive livestock production is sometimes considered as a potential development option. However, livestock production, as an important economic activity in such areas, cannot take advantage of such decline in cultivated land because of several economic constraints, that do not allow expansion and development. As a result, transhumance extensive livestock production systems, although maintained,

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experience, also, strong decrease in livestock numbers, moving to rather more permanent establishments close to urban centres.

During recent decades several changes have been observed in the economic and social organisation of mountainous and less favoured areas as a result of the operation of the Common Agricultural Policy (CAP) with measures supporting agriculture (Com.Dir. 268/75, 797/85, Mediterranean Integrated Programmes); further, several changes have been induced in their economic and social environment by the increase in tourism, mainly from urban dwellers who are originally from such areas, by administrative changes, by the increase in the demand for traditional livestock products, and by the development of transportation and communication infrastructure.

Certain programmes, such as the LEADER I and II, encourage the development of alternative forms of tourism (agro-tourism, eco-tourism, etc.) along with the production of traditional quality products from traditional production systems with environmentally friendly methods. Such activities promote local endogenous development in less favoured areas, by increasing their competitiveness, while maintaining their ecological resource base.

Past efforts, however, to sustain economic and social life in mountainous rural areas have been partial. What is needed is a more integrated approach to create an endogenous, sustainable development that would strengthen and diversify economic activity, encourage social cohesion while maintaining cultural identity and initiating a renewed socio-economic revival of the areas. For this reason the characterisation of the development problem of these areas is necessary, together with the identification of the economic constraints.

Production systems are always in an interaction with their economic and social environment. Such interaction is more pronounced in disadvantaged areas that experience rapid decline and important adverse changes in their economic and social organisation. A major challenge is, then, to characterise the problem and suggest policy options in the development of productive sectors that would reverse the economic decline and will generate a process of sustainable development in the disadvantaged areas.
The development of livestock production faces strong economic constraints limiting capacity to provide higher levels of income and employment to the population. There are five types of such constraints comprising factors related to: (i) labour and employment; (ii) management; (iii) grazing resources; (iv) relations with forests and the environment; (v) available infrastructure. The nexus, however, between livestock development and economic well-being of the population in the disadvantaged areas, needs to be understood in order to derive strategic and policy recommendations.

This paper starts with a detailed review of the economic constraints on livestock production in disadvantaged areas and its role in their economy and society. It continues with the conceptualisation of the development problem of the disadvantaged areas aiming to understand the interactions between livestock development and the overall economy and resource availability of the areas. After identifying labour productivity and efficiency as a major strategic objective in raising incomes and sustaining employment in disadvantaged areas, it considers alternative strategic and policy options The paper concludes with strategic and policy recommendations for livestock development in disadvantaged areas.

2. ECONOMIC CONSTRAINTS OF LIVESTOCK PRODUCTION

Livestock production systems are attracting research efforts of economists and production specialists alike because of the increasing interest on the interaction between productive systems and their economic environment. Such interaction is more pronounced in less favoured areas that experience rapid changes in their economic and social organisation. Livestock production systems in South Europe are classified in intensive, semi-intensive and extensive systems, depending on the amount of capital used in production, as well as in confined, semi-confined, peasant-static, peasant-moving, and transhumance, depending on the livestock management method used.

The confined and semi-confined livestock production systems are characterised by the operation of permanent stable structures, combining in certain cases livestock and crop production and use of produced feed resources rather than grazed communal land resources. In Southern Europe, frequently used production systems are peasant flock and herd raising, using very light housing structures further away from the home of the livestock producer, grazed in communal land resources. Livestock feeding is based on grazing with supplementary feeding during the winter months. The transhumance livestock production systems represent a more recent development of traditional nomadic systems and are characterised by seasonal movement of the herd (or flock) to mountain grazing lands in the spring and the summer. Livestock producers of this production system are almost entirely transhumance in their life-style and tradition, without any interest in crop production.

The integration of the above livestock production systems with other agricultural production in the agricultural areas of Southern Europe has attracted significant research attention within the context of wider studies of production systems in Europe. Of particular interest are the production systems of the less favoured areas in Southern Europe because of the marginalisation of such areas due to their physical (soil, climatic, etc.) and socio-economic characteristics.

Less favoured areas of Southern Europe, mountainous, remote and island areas, are experiencing strong pressures on their resource base, a rapid depopulation leading to a strong decline of their economic and social life and in many cases an increase in tourist activity. This paper attempts a characterisation of livestock production systems in the less favoured areas of Southern Europe with particular emphasis on the economic constraints facing their development and their contribution to the economic and social well-being of the population in these areas.

It is a fact that all references to productive systems in disadvantaged areas are primarily related to the extensive systems of the sheep and goat breeding, and secondly to the extensive system of the herd meat producing cow-breeding (Boyazoglou and Flamant, 1990, Hatziminaoglou et al, 1995, Apostolopoulos et al 1985, Apostolopoulos and Papadimitriou, 1990). This fact derives equally from the historical practice of these systems and from the relevant research that has been conducted on this subject by expert scientists. As disadvantaged areas are defined those areas of the Southern Europe's massifs that meet the corresponding requirements of the European Union's directives.

As to the productive systems of omnivorous animals (pigs, broilers), they fall almost exclusively in the category of the intensive breeding and so far they do not present any particular interest as systems of extensive breeding of these animals. An important economic constraint to these systems is the lack of differentiation of their products from the products of the businesslike mass production breeding, as far as their price is concerned. The extensive, small-scale aviculture, might constitute an exception, if it is combined with the servicing of agro-tourist lodgings (provisioning them with traditional and ecological products).

The main economic constraints of the extensive breeding of the ruminants in disadvantaged high land areas can be grouped into the following general factors.

Labour related factors

The man, as the main contributor to the animal production, influences restrictively the development of the mountainous regions; this happens because the profession of the sheep and goat breeder (or that of the boos breeder) never was, and still isn't particularly appealing to the people of the mountainous, rural areas and especially to the young ones (at least those still remaining). Undoubtedly, there are social reasons behind the unwillingness (or even the aversion) of the young people to follow the profession in question. The problem is not at all recent; on the contrary, it is very old but in our days it becomes more intense, regardless of the increasing unemployment among the youth, due to the continuously changing mentality in favour of urban (and less strenuous) professions. It is a fact that the labour needs in a sheep and goat unit are rather unstable during the day, but also the year, with extremely irregular working hours.

This situation worsens even more, if one takes into consideration the conditions under which all the necessary interventions are being carried out for the unobstructed operation of the unit (harsh climatic conditions, unfavourable working environment etc.). No doubt, the mechanisation of the more important phases of the productive procedure would bring about an improvement concerning the above problem and also diminution of the required human labour and freeing of man-power, so that the coexistence of cattle-breeding field and agriculture (where this is possible) might be finally achieved. Moreover, it could ease off the serious unfavourable situations that are presented at the mountainous zone, especially on the managing of large flocks, in pure sheep and goat units. This mechanisation concerns, in a great extent, the mechanic milking, providing the possibility of a simultaneous agricultural occupation and of an increase in the size of the flocks, aiming always at the improvement of the producers' family income, as well as the development of the mountainous disadvantaged and even marginal areas.

There is, also, one more constraint to the development of the extensive livestock production systems related to the great extent that the producer family is engaged with the watching and caring of the flocks or the herds. Related measurements in pure goat flocks and pure sheep flocks as well as in extensive cattle herds in the mountainous zone, showed that the engagement in cattle breeding exceeds 40% of the annual total employment. If it is taken into consideration that the milking by hand in extensive breeding goat and sheep systems, also demands 40% of the total employment (that is in these cases only 20% is sufficient for the total of the activities, except for the watching and milking), then the need for fenced pastures and also the possibility of mechanised sheep milking is obviously imperative (therefore the electricity supply in the area where the flocks are kept is also imperative). The diminution of employment time through the hedging of the flocks and the separation of the zones (see previous), as well as through the mechanical milking will free labour and will increase the flocks' size where the natural resources are sufficient, and it will also create better living conditions for the producers and their families in the mountainous zone.

Management related factors

The producers seem to have certain inability in the managing of the flocks, which are manifested by the low productivity of the most of the extensive systems of animal production units. Concerning the management level, it is pointed out that this is in general low and it is even lower in the case of larger flocks (or herds). The obvious difficulties, in this case, are related to the low level of education and training of the breeders. This acknowledgement demands the upgrading of the training level of the breeders, especially with regard to the easier management of large units, which might present a strong negotiating power during the distribution of their products, as well as a reduction on production cost as a consequence for the improvement of the productivity of the animal capital.

It is a fact that the managing ability of the breeders, is that which succeeds in exploiting the unique biological characteristics of the goat or the sheep and achieves a high productivity within the existent or improved conditions of breeding. The processing of simple, natural animal feed of the massifs to stock-farming products of high biological value (milk, meat, cheese-dairy products) through extensive systems, is a project that requires not only experience, which is paid dearly with financial sacrifices (such as losses of the animal capital), but mainly knowledge of animal husbandry and financial management, which should be based on the high administrative spirit of the producer.

The low educational status of the producers has as a result the lack of co-operative spirit in the area of the mountainous extensive systems (regardless of the aid given by the European Union to the groups of producers) along with all the adverse consequences in their full development, especially as far as the processing and trading of the products is concerned, as well as the providing of good quality and low cost productive means (particularly animal feed during the winter months).

Grazing resources related factors

It is taken for granted that in general the performance of semi-mountainous and mountainous pastures in the Southern Europe's massifs is low due to partially the climatic conditions, but mainly to the lack of a certain rationalistic system of browsing, as well as to their usual overutilisation. Furthermore, there is not a clear and permanent separation of the pastures from the forest areas, often resulting to a confrontation between the breeders and the state. Moreover, there are private areas that have been abandoned (laid off land or permanent fallow fields) because their proprietors have been urbanised years ago, which come in between the natural, community pastures disrupting the necessary unity of a big natural pasture. Therefore, there is not a legislated, clear division among agricultural, breeding and forest areas.

The above speculation together with the dive need of self-production of the animal feed by the breeders and of the protection and better utilisation of the pastures, have always been part of the specialists' concerns with the extensive systems of animal production from the World War II until today, resulting to a kind of «unwritten law» for the extensive livestock systems of ruminants (especially small ones).

This concern, along with recent research results (Apostolopoulos, Gidarakou, 1990, 1991, Kitsopanidis, 1988) indicate that assuring satisfactory pasturage and low costing supplementary feed, are in the centre of interest in order to preserve the extensive systems of animal production and the assurance of a satisfying family income from these, even under conditions of an unstable and problematic market for their products.

Relations of livestock with forest and the environment

In combination with the above, it would be an omission not to refer in particular to the relations among goat breeding and forests given that there is a large number of people who believe that these relations are especially troublesome as they consider that the breeding of goats constitutes a kind of «exterminator» for the forest. This view, which is based on the non-rationalistic use of the semi-mountainous and mountainous pastures by the goat flocks, is dissolved by the long history of the goat in the Southern Europe's massifs and the coexistence of goat breeding with the forest for millenniums, as well as by the size and the distribution of the extensive goat flocks in the semi-mountainous and mountainous zone, that can not be considered as destructive for the forest area (Apostolopoulos et al, 1985, Apostolopoulos, 1988). The overburdening of the pastures and then their overgrazing by goat flocks, might cause serious damages to the forest. But this is an extreme situation, which might not exist anyhow. The rationalistic handling of the semi-mountainous and mountainous pastures depends on the various local agents but also on the breeders themselves in order to have an important economic benefit from the production of goat milk and meat, as well as from other traditional cheese-dairy products, with the goat milk as their basic ingredient, without the damaging consequences on the natural environment. Thus, goat breeding can not accept the forest as a restrictive factor in its development, since as a traditionally productive sector in its extensive form, historically as much as macroeconomically, it has been fully justified. Its ignorant of the truth accusers should now be in a position to understand the real damaging factors to the forest.

Infrastructure related factors

The lack of basic infrastructure projects in mountainous-disadvantaged areas of the massifs seriously obstructs the development of the extensive systems of ruminants' breeding in these areas (access paths, shelters, spring exploitation and assurance of potable water through watering-troughs during the hot months, fencing, fertilisation and re-grassing of natural pastures etc.)

The insufficiency of infrastructure projects in the developing regions of these systems restrains to a great extent the seasonable providing of the necessary inputs and especially of the animal feed of the supplementary nutrition during the winter months. It is also obstructing the utilisation of the outputs and the immersion of the modern

technology, for the processing of the primary products in the production areas and the preparation of traditional cheese-dairy products, yoghurt and other dairy products of high quality, which have as their main ingredient sheep and goat milk.

At this point it should be stressed out the application of the Community programs for infrastructure projects and for the amelioration of the milk's quality and the dairy products. Accordingly, the same happens today with animals' slaughter and meat's standardisation at the production areas, with new Community regulations for the quality and with the implementation of the Community Order No. 866/90. However, the further development of infrastructure projects for the improvement of the productive conditions in the extensive systems but also of the living conditions of breeding families is of absolute necessity.

3. THE DEVELOPMENT PROBLEM OF DISADVANTAGED AREAS

Development policies proposed for disadvantaged areas vary widely, from sectoral policies favouring agriculture to the provision of infrastructure and the support of tourism activities. It is surprising, however, the lack of analysis and the ad hoc character of these suggestions, appealing to conviction rather than to reason. There are several myths perpetuated about the development problem of disadvantaged areas; hence, searching for a theoretical framework and looking for the root-cause of the problem is necessary before a policy prescription.

Myth and Reality

There are several misconceptions that are perpetuated about the development problems of disadvantaged and rural areas in general. Most of them fall under four main groups, named sometimes as development myths.

Many consider depressed demand conditions for agriculture, livestock and other resource based industries as the main cause of economic decline of the rural areas. However, the proponents of such views tend to forget that agriculture or other primary industry related incomes are usually less important than non-farm incomes and that economic growth in rural areas is not necessarily related to growth in agricultural incomes. Building on this approach, many policy makers and farm organisations emphasise the role of agriculture in rural areas in order to gain support for the protection of agricultural products. But, the net result of such policies is what has already been experienced in Europe with the main beneficiaries of support policies being the larger, more efficient farmers of the plains, leaving farmers in disadvantaged areas worse-off.

Another frequently cited proposition for rural disadvantaged areas is promoting policies that take advantage of the assumed low labour cost of unskilled labour force in such areas. Although incomes and wages in such areas are low, labour cost is not necessarily low for various reasons related to the efficiency and productivity of labour. Labour cost is measured as cost per unit of output rather than as cost per unit of input.

Last, but not least, is the proposition that attracting business activity requires the creation of economic and social infrastructure, and the provision of social services as the only solution to the development problem of the disadvantaged areas. Again, infrastructure and services, should be reminded, is not a free-good to be available on demand. Given serious budget constraints facing most governments, expenditure for the creation of infrastructure should be judiciously considered.

The development problem of disadvantaged areas

Looking for the root-cause of the development problem of disadvantaged areas, one should start by looking where the problem is observed. Although many consider that this is a problem mostly observed in Southern Europe, many areas around the world experience similar economic and social phenomena. Such areas include large parts of Scotland, Ireland, the northern parts of the Scandinavian countries, the Alpine regions of Central Europe, the mountain areas of the United States, not to mention many countries of the developing world.

One may, then consider, what is the development problem of these disadvantaged areas. Some would argue that it is a problem of agriculture. However, as already mentioned above, agricultural policies that increase agricultural protection and support may in fact lead to quite unfavourable results for the population of the disadvantaged areas, since most of the benefits of such support are accruing to large and efficient farms of the plains.

An alternative explanation claims that it is a problem of farm fragmentation that is the main cause of the lower efficiency of production. The persistence of small and fragmented landholdings is widely perceived as the most serious impediment to agricultural development in Southern Europe (Hadjimichalis, 1987). However, by reducing fragmentation in the natural environment of mountainous and hilly areas, not much can be gained in productivity and, perhaps, much can be lost in terms of resource use.

Some consider the underdevelopment of disadvantaged areas a consequence of functional - spatial interactions (see O'Cinneide and Cuddy, 1992, pp. 51-64). Many researchers focus on the spatial character of the development process in the von Thunen tradition, explaining observed differences in incomes between regions or areas. Nevertheless, such explanations lead only to typologies and cannot become operational by providing meaningful public policy recommendations.

Others consider the decline of disadvantaged areas the result of an unequal exchange in the Marxist tradition and "the pull from the urban centre sucking resources from the periphery." This approach explains the underdevelopment of the rural periphery as the result of urban-rural interaction in the well-known process of unequal exchange (see O'Cinneide and Cuddy, 1992, p. 68). Although this approach receives credit among many development economists, this model has many shortcomings in explaining the process of underdevelopment of the periphery as an inevitable phenomenon.

Finally, some consider it a problem of what they call "regional political ecology". This approach, put forward by Blaikie (1985), sees the problem of rural and disadvantaged areas as one where the interaction of farmers with their natural environment is seen in a political, economic, and historical context (see also Black, 1992, p. 37). This approach argues for the incorporation of environmental considerations into the theories and policies of regional growth and decline.

A tripartite ecosystem of disadvantaged areas

The ecosystem of a disadvantaged area can be considered as consisting of three parts: *population - resources - economic activity (including livestock*). Each part contributes to and yields from the system. The resources are renewable, hence the system to survive should be sustainable. The changes in the system are of economic and demographic nature, thus the system has an economic and a demographic behaviour. The system is in equilibrium when demand for incomes does not exceed the yield capacity of the resources and it should be sustainable (see Mergos, 1994, for a detailed presentation of the model).

The sustainability concept of an ecosystem is explained by Conway (1987). The system is sustainable when it can withstand stress and recover to achieve a sustainable yield level. The system that is not sustainable cannot withstand stress and moves to a lower level equilibrium, leading to economic decline and depopulation (see Mergos, 1994, Mergos, 1991).

The nature of stress that a rural ecosystem experiences originates in an increase of the population or a higher demand for yield that is not sustainable by the existing resource stock. The most common factors causing disequilibrium in rural systems is the growth of demand for food and energy in developing countries and for higher incomes in developed countries.

Population growth in the rural and disadvantaged areas of developed countries is very small, perhaps lower than the replacement level, but there is a strong demand for high incomes that puts the system under stress. The population in these areas has the desire and ambition to achieve a higher level of living, in parity with incomes in urban areas. But for this purpose, the higher level of income required cannot be supported by the resource base of

the area. The inability of the system to provide higher income levels, because of its extensive character that has developed over long periods of time, leads to disequilibrium, further inducing migration, depopulation and finally reduction in the active or usable resource stock and the productive capacity of the system.

The sustainability of the system may be secured and its decline may be arrested by making the system to withstand stress. In order to increase the capacity of the system to support increased population levels or increased demand for higher incomes and resource yields without reducing the resource stock, it is necessary to increase the productivity and efficiency of the resource use. Hence, the strategic objective should be to increase the productivity and efficiency, mainly labour productivity, of the ecosystem so that additional demand does not reduce the resource stock and does not lead to depopulation.

4. POLICY OPTIONS

Increasing productivity, mainly labour productivity, and efficiency of the ecosystem of disadvantaged areas should be at the core of every development effort in such areas. Without increasing productivity, the system cannot be sustainable and any development effort becomes futile.

The strategic approach should be translated into particular policy priorities (or intermediate objectives) that lead to the overall objective of increased productivity and efficiency. Such priorities can be:

- improving the technology of the system by promoting techniques of production that save resources and labour, by introducing additional activities by making better utilisation of resources, by attracting more trained population;
- reducing distance costs by improving transportation and communication links, attracting new, non-traditional activities;
- introducing new institutional arrangements by encouraging endogenous development, local and collective initiatives leading to better utilisation of resources, mainly common property resources, introducing innovative financing, and increasing participation and involvement of the local population.

Policy options for livestock production

Livestock production systems in disadvantaged areas are mostly of extensive type. The main economic constraints have been identified in an earlier section. The strategic objective is to increase productivity and efficiency of the system in order to contribute to the sustainability of the ecosystem and its capacity to provide higher yields and income, and to support a larger population. Increasing efficiency and productivity of the system with focus on livestock production, can be achieved by improving the technology of production, by reducing distance costs, and by introducing new institutional arrangements.

Improving the technology of production that leads to higher productivity and efficiency can be achieved by several alternative measures; by reducing labour requirements (introduction of mechanical technology, reducing herding requirements, perhaps with fencing, etc.) cost of production is reduced and, also, higher incomes for those employed in livestock production are achieved; by reducing the incidence of diseases, and at the same time improving feeding and management practices higher rates of productivity and efficiency are attained.

Better utilisation of grazing resources can be achieved by moderating the conflict between forest and agriculture. Fencing, or enforcement of property rights, for clear distinction between forest, grazing, and agricultural land can lead to a larger, uninterrupted and better utilised grazing resource.

Reducing distance costs is the second major objective for increasing the productivity and efficiency of livestock production. Distance is not measured in kilometres but in costs per unit of product transported to or from the areas. By improving transportation and communication infrastructure, costs are reduced and efficiency is

increased. In addition, improvement of transportation and communication infrastructure helps to the creation of alternative marketing channels for products or inputs, enforcing competition and improving local incomes.

The creation of low cost rural infrastructure, such as rural roads and shelters, improves the accessibility of remote areas, effectively increasing the utilisable feed resources, in particular in difficult to reach areas.

Supporting the introduction of new institutional arrangements is the third type of measures to increase productivity and efficiency of the ecosystem and in particular of livestock production. This is of particular importance for the management of common property resources, since most of the feed resources are communal or common property, managed collectively by the local society. Encouraging endogenous development or other local initiatives may be an effective way for better utilisation of government financed development schemes, for project selection and evaluation, and for forward area planning. For example, the creation of producers groups for rational management of common property resources, exchange of knowledge, self-help, training, etc., can improve the technology of the system and lead to higher levels of efficiency.

Finally, supporting innovative financing, such as micro-banking or revolving funds linked to collective action and local initiatives, provides opportunities for expansion and development by relaxing the financial constraint. Institutional measures have limited demand for capital (at least compared with alternative measures that aim to improve infrastructure), are short term in nature and when they succeed they have very high rates of return. However, they are difficult to implement and require a high level of awareness and a community spirit that is not usually present in the societies of Southern Europe.

5. CONCLUSIONS

Disadvantaged areas of Southern Europe face serious economic decline, strong depopulation trends and deterioration of their social fabric. Livestock production is one of the main economic activities of such areas and livestock development is considered an option for broader development effort and sustainability in such areas. Disadvantaged areas are characterised by poor quality of resources, at least compared to other rural areas, remoteness and distance from main population centres, and are usually in hilly and mountainous areas.

Livestock production in disadvantaged areas, is usually of extensive type, and along with forestry and agriculture are the main sources of economic activity and employment for the population. Extensive livestock production systems face several development constraints limiting their capacity to provide higher levels of income and employment to the population. There are five types of such economic constraints comprising limiting factors related to: (i) labour and employment; (ii) management; (iii) grazing resources; (iv) relations with forests and the environment; (v) available infrastructure. Therefore, the nexus between livestock development and economic well-being of the population in the disadvantaged areas needs to be understood in order to derive strategic and policy recommendations.

The role of livestock production in the economy of the disadvantaged areas is then examined with the conceptualisation of the development problem of the disadvantaged areas and with the development of a model, in the form of a tripartite ecosystem of the disadvantaged areas. The advantage of this conceptual approach is that it provides an understanding of the interactions between livestock development, the overall economy, and resource availability of the disadvantaged areas. After identifying labour productivity and efficiency as a major strategic objective in raising incomes and sustaining employment in disadvantaged areas, various alternative strategic and policy options are considered.

Increasing productivity and efficiency of the ecosystem of disadvantaged areas should be at the core of every development effort in such areas. Without increasing productivity, the system cannot be sustainable and any development effort becomes futile. The strategic approach should be translated into particular policy priorities (or intermediate objectives) that lead to the overall objective of increased productivity and efficiency. Such priorities are: improving the production technology of the system, reducing distance costs, and introducing new institutional arrangements by encouraging endogenous development actions. The most important directions of

change for increasing productivity of livestock systems are reducing labour requirements of livestock production, increasing yields, improving management of feed resources, improving product marketing and input supply channels, and strengthening endogenous -local initiatives for the management of common property resources.

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Marginalisation of agricultural land in Europe

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SUMMARY

There is no clearly agreed European definition of agricultural marginalisation and several formulations of the concept can be found in the literature. Agricultural marginalisation could be considered to be a process, driven by a combination of social, economic, political and environmental factors, by which certain areas of farmland cease to be viable under an existing land use and socio-economic structure.

Areas which are most susceptible to marginalisation are likely to be found in extensive farming regions and those where small-scale farming is prevalent. Regions dominated by extensive farming include most of Spain, large areas of southern France, parts of the UK, Ireland and Italy. They cover about 30% of the utilised agricultural areas but only around 15% of agricultural holdings. These regions account for more than half of all holdings in EUR 12 and only 15% of the utilised agricultural area. Many of the farming systems of greatest importance for nature conservation and the landscape are found in the extensive agricultural regions.

The system of compensatory payments made to farmers within the group of extensive farming regions are about a third of family farm income which was about double that of the average for all farms in EU 12. The future of these regions need to be considered alongside developments in agricultural policy since the 1992 reform of CAP.

INTRODUCTION

There is no clearly defined and commonly accepted definition of what is marginal land or marginal agriculture. Perhaps the most commonly accepted definition of a marginal agricultural situation is one which is at the margin of economic viability. Agricultural marginalisation could be considered to be a process, driven by a combination of social, economic, political and environmental factors, by which certain areas of farmland cease to be viable under an existing land use and socio-economic structure. It may consist of a combination of intensification and extensification of land used agriculturally. Marginalisation takes a variety of forms and occurs at different scales, ranging from the individual patch of land to sizeable regions. It could eventually lead to abandonment, which limits management of semi-natural areas.

Marginalisation of agriculture on European farms appears to be particularly concentrated in the less fertile and drier zones in the Mediterranean. In these regions there are large areas of agricultural land which is extensive and largely traditional in character and relatively well integrated with the natural environment. Animal production sectors including beef, sheep and dairy are of major importance to nature conservation in these areas as well, as they manage most of the areas with high nature values. They may maintain viability of extensive farming systems and subsequently to prevent abandonment of agricultural land.

The objectives of the paper are (i) to *analyse* current trends and processes of marginalisation in Europe; (ii) to *examine* methods for identifying areas within which agricultural land is marginal; and (iii) to *investigate* agricultural policies which might contribute to the mitigation of environmentally damaging effects of agricultural marginalisation and encourage viable uses of land in marginal areas.

The paper derives from a recent project by the Institute for European Environmental Policy (IEEP) in the United Kingdom and the Agricultural Economics Research Institute (LEI-DLO) in the Netherlands (Baldock et al., 1996).

CURRENT TRENDS AND PROCESSES OF MARGINALISATION

A possible definition of a marginal agricultural situation is one which is at the margin of economic viability. For example, a marginal site could be defined as one in which 'the present agricultural use yields a factor income which cannot cover the costs of the factor amounts invested in it or, given constant productivity and price trends, will cease to cover them in the next few years' (CEC, 1980).

Clearly it is not economic factors alone which make a given agricultural situation marginal. Environmental factors, geographic location, agricultural structures, social factors and policy factors need to be considered as well. This is reflected in the terminology in some languages for referring to farmland abandonment (a phenomenon commonly associated with marginalization). For example, in Germany there are terms for abandonment caused predominantly by social, structural or natural factors (see CEC, 1980):

- *Sozialbrache* refers to farmland which leaves agricultural use for social reasons, for example, agriculture near to cities which is abandoned as a result of the stronger income earning potential of employment in the city;
- *Strukturbrache* refers to marginalization caused by structural weaknesses, such as very small and/or fragmented holdings or poor infrastructure;
- *Grenzertragsbrache* refers to land which is inherently marginal due to physical conditions (soil, slope, altitude, climate, etc.).

In French there are similar terms to differentiate between various sorts of abandoned land, such as *friche social, friche technique* (the result of technological change in farming systems), etc.

Marginal situations are the result of the interaction over time of a combination of factors. Pinto-Correia and Sørensen (1995) stress that marginalization is a dynamic concept, which is related directly to the conditions at the moment of analysis and which depends on a multitude of factors, including the geographical situation and the age, financial resources and character of the farmer in question.

Thus, a plot of land which, due to its physical characteristics and poor yield potential, may be considered marginal in southern England, may be regarded as good arable land in Spain. Similarly, a farm which is abandoned by an aging farmer in southern Portugal may be converted into a highly competitive holding by a young Dutch incomer with the necessary resources.

It is important to recognize that marginal situations may exist at different geographical levels, for example:

- *Regional*: in the European context, a region may be marginal in broad physical and socio-economic terms, with predominantly unfavourable conditions and uncompetitive forms of agriculture involving low productivity and income levels, remoteness from markets, aging population, etc. The possibility of widespread marginalization in such a region may be considered high, although there may also be agricultural areas which are highly productive and competitive.
- *Local areas*: within a region, certain types of land use may become marginal as a result of changing socio-economic and technological conditions. Grazing marshes provide a good example. Such areas may exist even within generally very productive regions.
- *Farm level*: an individual farm may be uncompetitive for a variety of reasons, such as small size, fragmented land, degraded infrastructure and capital equipment, or the age of the farmer. Generally, such holdings are taken over by other farmers or land uses, depending on local conditions. In more marginal regions, total farm abandonment may occur.
- *Within a holding*, an individual plot of land may be marginal due to physical handicaps, such as poor access, steep slopes, waterlogging or distance from the main holding.

Marginalisation may be seen as a change in agricultural land from a more profitable to a less profitable one (Bethe and Bolsius, 1995). This might involve among others a change from arable cultivation to permanent grassland or from grassland to forest. A process of agricultural marginalisation with areas of farmland which cease to be viable may produce a number of different responses from farmers. For example, some may attempt to improve viability and combat marginalization, whereas others may run down or abandon agriculture altogether.

In certain circumstances, it may be possible to intensify production and to increase output per hectare, particularly when significant financial incentives are available in the form of production-oriented grants and subsidies, as was the case in most EU Member States during the 1960s and 1970s. During this period, there were many policy initiatives designed to create more economically viable farm structures, especially in areas of predominantly small-scale farming or *minifundia*, with public funding for restructuring and consolidation of holdings - generally transforming the landscape in the process. Publicly funded projects of this sort continue to be undertaken in certain southern regions of the EU, such as Galicia in Spain, often with a severe impact on the natural environment and landscape.

Where greater agricultural productivity does not appear a viable option, a gradual running down or abandonment of agriculture is more likely. However, before this situation is reached, a range of different management choices can be made by farmers with the aim of staving off marginalization and maintaining viability. Often these choices involve reducing labour intensive tasks, such as traditional hay-making, maintenance of walls, hedges, etc. The different responses of farmers will have a series of consequences for the land-use pattern, landscape and natural environment of a region. Possible responses include:

- a change from one agricultural land use to another, e.g. from crops to permanent grassland, typically involving the simplification of a mixed farming system into livestock production only;
- changes to farming systems which do not significantly alter the existing agricultural land use, e.g. reduced input use and/or stocking densities, reduced maintenance of infrastructure, etc., often known as 'extensification' in English;
- a 'contraction' of the farming system, usually involving an intensification of production on the better land and the running down or abandonment of poorer, less accessible parcels;
- restructuring of holdings as some farmers leave the land and others take it over in order to increase their farm size (often known as 'extensification' in French);
- complete farm abandonment, typically leading to natural succession and potentially to the development of scrub and woodland (sometimes referred to as wilderness);
- a change of land use out of agriculture, for example to forestry or urban building.

Within a given area, a variety of changes may take place side by side, in interaction with one another or quite separately. Marginalization often is a complex and dynamic process, proceeding at varying speeds. The outcome is not necessarily abandonment - indeed, the process can be reversed. In some cases, a significant decline in the number of farmers, accompanied by the abandoned or reversion to grazing of some parcels of land, may subsequently allow for the creation of larger and more viable holdings and hence to periods of greater stability.

At the other extreme are regions where physical conditions may be favourable for agriculture, but where a high level of economic development and increasing urbanization of the countryside results in agriculture being driven out by other land uses, such as out-of-town shopping centres and horse paddocks ('horsiculture') or, in certain situations, being replaced by specialized recreation or conservation uses such as nature reserves or country parks. Here, marginalization is driven by external pressures and urbanization rather than by agricultural decline. A slightly different phenomenon affecting farmland in urban fringe areas is a combination of 'urban nuisance' (such as vandalism) and the anticipation of urban development which can lead to neglect and abandonment of farmland. A survey of London's Green Belt in 1979, for example, found that one third of farmland there exhibited signs of idling or urban nuisance (Whitby, 1992).

The phenomenon of land abandonment and its associated problems is a common theme of research into agricultural marginalization. However, the notion of abandoned land is itself complex and often not clearly defined. For example, some commentators from regions with predominantly intensive forms of agriculture regard rough grassland and scrub managed under extensive grazing regimes as a form of semi-abandonment (for example, see CEC, 1980). There is often confusion over the term 'abandoned land', particularly when translating between languages. It is important to differentiate between situations such as spontaneous abandonment and planned withdrawal. Increasingly in Europe, farmland is withdrawn from agriculture under schemes such as set-aside (nevertheless commonly known as *abandono de tierra* or 'land abandonment' in Spain). Apparently abandoned land often is not truly abandoned, but merely temporarily out of use and awaiting a new owner or

tenant. Even totally abandoned farmland in France and the Mediterranean countries often has a legal owner, probably living in a town or city, who may one day choose to put it to some use, such as building a holiday home.

Bandarra (1994) points out that it is often very difficult to identify abandoned land. Particularly in marginal regions, such as parts of Alentejo in southern Portugal, arable land may be left fallow for many years, with only intermittent grazing during this time. Over very large areas of Iberia, farmland is largely unfenced. Consequently, land which has been abandoned by its owner may continue to be grazed by sheep and goats for many years, thus preventing natural succession to woodland.

In general terms we can define abandonment as taking place when the neglect of the main productive elements is allowed to decline beyond a point at which recuperation is practical, or economically viable. The neglect of retaining walls on terraces in semi-arid regions to the point where landslips become established is a clear example. In the case of permanent pastures, for most types of semi-natural sward it would be possible to define a species composition which is indicative of appropriate grazing pressure and more or less optimum productivity and nutritional value. In the event of insufficient grazing pressure, sward quality will tend to decline as litter accumulates and coarser and less palatable species become dominant. Ultimately, undergrazing can be expected to result in a decline in grazing value and hence abandonment, as well as in a significant loss of species diversity. Neglect and declining management may be illustrated equally by localized overgrazing, for example, by unshepherded flocks. Furthermore, the results tend to be the same, in other words, declining grazing value and ultimately abandonment.

AREAS WITHIN WHICH AGRICULTURAL LAND IS MARGINAL

So far, the available knowledge remains limited regarding the major driving forces of the occurrence of marginalisation and subsequent abandonment of agricultural land in Europe. It is mainly based on diverse small-scale case studies. A review is made here of potential statistical indicators from European databases which might represent some of the major driving forces behind the occurrence of marginalization in the European Union. A broad set of indicators was selected, divisible into five general groups:

- indicators of *biophysical conditions* for agriculture, with environmental factors such as soil quality, climatic conditions, water supply, relief, altitude. Such biophysical conditions are major determinants of land utilisation;
- indicators of *agricultural land utilization* including the trends in land utilisation as well as the price of land used agriculturally;
- indicators of *farm income* to reflect income generated from farm activities, as well as the share of direct subsidies in family farm income;
- indicators of *farm structure* to reflect the intensity of agricultural production, as well as agricultural structures and social factors of agricultural holdings;
- indicators of *rural and regional development* in order to compare viability of agriculture with the rest of the economy.

The indicators were used as a means of investigating the potential occurrence of marginalization and abandonment of agricultural land in the twelve EU countries for which data is available. A limited number of key indicators was selected in order to simplify the analysis. They were to reflect important aspects of biophysical conditions, land use, farm income and structure:

Biophysical conditions
- Share of Less Favoured Areas (LFA) in Utilized Agricultural Area (UAA) (%)

Land use
- Decrease in UAA (%)

Farm income
- Family Farm Income per Family Work Unit (FFI/FWU) (ECU)

Farm structure
- Standard Gross Margin per hectare (SGM/ha) (ECU)

- UAA per holding (ha)
- Share of farm holders of age 55 years and older (%)

Information was obtained from the Farm Structure Survey (FSS) of Eurostat, the Farm Accountancy Data Network (FADN) of the Commission of the European Communities (CEC) and the regional databank (REGIO) of Eurostat. FSS is periodically conducted to collect data on the structure of farms. FSS data refer among other things to land utilisation, livestock population, the agricultural labour force and the number of full-time and part-time farmers. FADN contains farm level data on farm structure, total output, intermediate consumption and a profit and loss account. Finally, Eurostat's data REGIO covers the principal aspects of the economic and social life of the EU, such as demography, economic accounts and employment at a regional level.

On the basis of the indicators selected, a distinction was made between five different groups of regions within the European Union. It is aimed at contributing to an investigation of the potential occurrence of marginalisation and abandonment of agricultural land in Europe.

The five groups were derived from the indicators by using a cluster analysis which was carried out to find a certain structure in a broad set of observations with various phenomena. The five regions identified can be characterized as follows:

- regions with highly productive agriculture, covering almost 40% of UAA in the EU 12 and about 20% of agricultural holdings. They cover most of the northwestern part of the EU, excluding Ireland and parts of the UK;
- regions of medium farming productivity, covering about 10% of total UAA and accounting for about 10% of all farm holdings. This group covers large areas of Germany and parts of France;
- regions dominated by extensive farming. They cover about 30% of the UAA but only around 15% of agricultural holdings and include most of Spain, large areas in southern France, parts of the UK, Ireland and Italy;
- regions where small-scale farming dominates. These regions account for more than half of all holdings in the EU 12 and only about 15% of the UAA. They cover most of Portugal, Italy and Spain;
- a small residual group where agriculture is more extensive than the average in the EU. A substantial area of land lies outside the Less Favoured Areas.

A graphical presentation of the five groups of regions distinguished is presented in Figure 1.

The cluster analysis provides two types of regions that are considered to be susceptible for marginalisation. One type which is mainly characterised by extensive agriculture (Extensive Farming Regions), the other one which mainly includes small-scale farming (Small-scale Farming Regions).

Some characteristics of these regions are provided in the following (see also Table 1 comparing quantitative figures of the five regions identified).

Table 1 Average of the indicators for the five clusters of regions

Indicator	Highly productive regions	Medium productive regions	Extensive farming regions	Small-scale farming	Other extensive regions
Key indicators used to cluster regions					
Share of LFA in UAA (%)	16	83	85	65	38
Decrease in UAA (%)	4	5	-2	-1	11
FFI/FWU (ECU)	16,200	10,300	8,700	6,500	9,500
SGM/ha (ECU)	1,730	980	430	1,660	530
UAA per holding (ha)	33	19	37	5	33
Share of farm holders of age 55 years and older (%)	46	42	51	60	43
Other indicators					
Price of land per hectare (classes)	Medium	Medium	Low	Medium	Medium
Share of direct subsidies in FFI/FWU (%)	11	17	28	12	18
Change in SGM/ha (%)	90	69	29	77	116
Share of farm holders with work time below 50% of AWU (%)	36	47	49	65	18
GDP/inh. (ECU)	15,100	12,800	10,400	9,500	9,400
Share of farm holders with other gainful activities (%)	25	36	31	29	24

Source: FADN, Eurostat; Adaptation LEI-DLO

Extensive Farming Regions

This group of regions can be characterized by Extensive Farming Regions, with low intensity of farming on a per hectare basis since the SGM/ha is less than half of the average of EU 12. The share of LFA in UAA is very high (85%). The share of direct subsidies in FFI/FWU is high (28%), more than double that of the average of EU 12. The increase over time in SGM/ha has been small.

Figure 1 Classification of regions according to the cluster analysis

The extensive nature of farming is also reflected by the observation that this group of regions cover about a third of total UAA in EU 12 and approximately 16% of all agricultural holdings. This cluster includes many relatively big farms, since farm size is more than double that of the average in EU 12. The extensive nature of agriculture is also reflected by low density of livestock population. Stocking density of grazing livestock is very low (0.6 LU per hectare of forage crops).

Small-scale Farming Regions

This cluster is characterised by Small-scale Farming Regions, with relatively small farms (an average of 5 hectare) and rather intensive farming practice. They only cover 17% of UAA in EU 12. The SGM/ha is relatively high (1,650 ECU), but FFI/FWU is low (6,500 ECU), and still substantially below GDP/inh. in that group of regions (9,500 ECU). The intensity of farming is only slightly below that in the Highly Productive Regions, although farm size is far below that in all other groups of regions. This group of regions include more than half of all agricultural holdings in EU 12, and about 40% of them belong to the farming types of permanent crops (including vineyards) The share of farm holders of 55 years and older is about 60%, which is above that in the other regions. The age distribution of farm holders is rather uneven, since about a third of all farm holders are at the age of more than 65 years. Also, only 6% of all farm holders in this cluster are younger than 35.

The assessment presented in this section is based on conditions before the reform of the Common Agricultural Policy (CAP) in 1992. Some background information on the importance of agricultural policy to viability of regions which are susceptible to marginalisation is provided in the next section.

THE ROLE OF AGRICULTURAL POLICY

The future of regions which are considered to be susceptible to marginalisation must be considered alongside developments in agricultural policy since the 1992 reform of CAP, which recognised the need for ' ... contributing to an environmentally sustainable form of agricultural production and food quality and formalizing the dual role of farmers, as food producers and guardians of the countryside (CEC, 1992: 36).

In the period before the 1992 CAP reform direct subsidies were more significant in regions with extensive farming systems than in the other group of regions in the then twelve EU countries. Direct subsidies in regions with extensive farming systems have been very important compared to the group of other regions. These subsidies include grants and subsidies which have been granted from public funds and have resulted in a specific receipt. In 1990/91 about 20% of all direct subsidies in the EUR 12 were directed towards the regions with extensive farming systems, although their share in final production was only 9% (Table 2). Direct subsidies in this group of regions on average are about a third of family farm income, corresponding to almost 3,000 ECU per holding, which was about double that of the average for all farms in EUR 12 at the time. The share of direct subsidies in FFI exceeds 50% in several regions, including Corse (France), Valle d'Aosta (Italy), Alentejo-Algarve (Portugal), Wales, Scotland and Northern Ireland (United Kingdom). Direct subsidies for drystock farms exceed 10,000 ECU in several regions of France (Midi-Pyrénées, Auvergne and Corse) and of the United Kingdom (Wales and Scotland).

The share of direct subsidies in Family Farm Income was only 8% within the group Small-scale Farming Regions (Table 2). They amounted to an average of 640 ECU per farm. Among the Small-scale Farming Regions identified this share is highest in Norte-Centro and Lisboa-Vale do Tejo (Portugal). The share of direct subsidies in FFI is only 15% on drystock farms in the Small-scale Farming Regions, compared with 70% in Extensive Farming Regions. The average for all drystock farms in the EU 12 is almost 40%.

Table 2 Direct CAP agricultural subsidies by group of regions (1990/91)

	Extensive farming regions	Small-scale farming regions	Other regions	Total
Average farm				
Total direct subsidies (mln ECU)	1,380	1,335	3,830	6,545
Direct subsidies per farm (ECU)	2,991	641	2,009	1,471
Share direct subsidies in Family Farm Income (%)	34	8	12	13
Non-LFA				
Total direct subsidies (mln ECU)	170	506	1,944	2,620
Direct subsidies per farm (ECU)	1,434	490	1,712	1,146
Share direct subsidies in Family Farm Income (%)	16	5	8	8
LFA				
Total direct subsidies (mln ECU)	1,210	829	1,886	3,925
Direct subsidies per farm (ECU)	3,529	791	2,447	1,815
Share direct subsidies in Family Farm Income (%)	40	12	22	22
of which Mountain Areas:				
Total direct subsidies (mln ECU)	346	519	366	1,231
Direct subsidies per farm (ECU)	5,364	759	1,902	1,308
Share direct subsidies in Family Farm Income (%)	43	12	17	17
of which Other LFA:				
Total direct subsidies (mln ECU)	864	310	1,520	2,694
Direct subsidies per farm (ECU)	3,103	850	2,627	2,206
Share direct subsidies in Family Farm Income (%)	39	13	24	25

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

- Less Favoured Area Scheme

The LFA scheme is oriented to allow for continuation of farming in less-favoured areas by ensuring a minimum level of population or by conserving the countryside. The LFA Directive (75/268) was the first common instrument of regional agricultural structure policy. Less Favoured Areas are areas where agriculture is hampered by permanent natural handicaps. The main objective of the LFA Directive is the continuation of farming in those regions and thereby maintaining a minimum level of population or conservation of the countryside. Three types of LFAs can be distinguished, i.e. (i) mountain areas, (ii) areas in danger of depopulation and where the conservation of the countryside is necessary, and (iii) areas affected by specific handicaps in which farming must be continued in order to conserve the countryside. Member States are authorised to give farmers direct payments in order to support farm income.

The European Agricultural Guidance and Guarantee Fund (EAGGF) expenditure on LFA compensatory payments have increased substantially during the past couple of years. Most of it take the form of headage payments per Livestock Unit (LU). However, this increase in support has been distributed very unevenly within the EU. While payments in France, Ireland and Luxembourg more than doubled, they fell in Portugal, Spain and Greece. Naturally, there are variations between years but it is clear that the system of LFA compensation payments is making only a modest contribution to the viability of holdings in several Member States including Italy where the small size of many farms has excluded them from the support sytem in the past. The LFA Scheme is only applied to part of the area in case large areas are under Objective 5a (Brouwer and Van Berkum, 1996).

Objective 5a is applied in large areas of Italy. Support to farmers is also channeled through other instruments, including Objective 1 and 5b. Although the number of holdings receiving payments is relatively high in Greece and Spain, both the level of support per LU and the average allowance per holding is low (CEC, 1995a).

The allowances which were paid to EU 12 Member States in 1994 amount to 1.38 billion ECU in total, which also includes the national contributions. The amount paid per holding ranges between less than 500 ECU (Spain and Portugal) and more than 4,000 ECU (Luxembourg). The allowance per LU is lowest (36 ECU) in Spain and highest (113 ECU) in Luxembourg (Table 3).

Table 3 The application of the LFA Directive in 1994 (EU 12)

Country	Compensatory allowances granted for LFA			Share of holdings with compensation (% of total) (ECU/LU)
	Number of holdings	Amount paid per holding (ECU)	Allowance per LU	
Belgium	6,873	1,329	86	8
Denmark	3)	3)	3)	0
Germany	231,275	2,163	93	35
Greece 1)	190,262	521	61	22
Spain	183,561	447	36	12
France 1)	139,435	2,127	70	15
Ireland	105,619	1,575	88	62
Italy 2)	39,056	689	57	1
Luxembourg	2,515	4,437	113	63
Netherlands	3,901	884	104	3
Portugal	89,510	410	54	15
United Kingdom	60,912	2,419	47	25
EU 12	1,052,919	1,310	67	13

1) Provisional data for the year 1994; 2) Not complete; 3) Not available.
Source: CEC, DG VI-F-II.1.

About one quarter of all the farms located in LFA in the EU receive compensation under the LFA Scheme. Participation rates in the southern Member States are below those in the northern Member States, primarily because about half of all LFA holdings in these countries are smaller than the minimum size for eligibility which is 3 ha (2 ha in the Italian Mezzogiorno, the French overseas departments, Greece and Spain, 1 ha in Portugal and 0.5 ha in Madeira) (Terluin et al., 1993). This is especially the case in Italy where 29% of the farms are less than 1 ha in size.

- Price support given under CAP

The distribution of the Guarantee Section expenditure has been assessed in relation to the groups of regions identified in the previous section. Total indirect subsidies to Extensive Farming Regions amounted to 2,670 million ECU. In comparison it amounted to 4,650 million ECU in Small-scale Farming Regions. Extensive Farming Regions have a 11% share of indirect subsidies, which is slightly above their share in total final production of the EU12. However, this group of regions represents some 26% of total UAA in the EU12.

Table 4 provides an assessment of the 'standard' ewe premiums after the CAP reform, based on a categorization of farms with ewes in 1990/91, including both Extensive Farming Regions and Small-scale Farming Regions. About 26 million ewes are in regions with extensive agricultural systems, mainly in large areas of Spain (Castilla-Leon, Aragon, and Castilla-La Mancha) and the United Kingdom (Wales and Scotland). About 10 million ewes are in regions with small-scale agriculture, mainly in parts of Greece (Ipiros Peloponnisos Nissi Ioniou and Sterea Ellas Nissi Egaeou Kriti) and Italy (Lazio). A very high proportion of all farms are eligible for full compensation because the number of ewes does not exceed the limits set into EU regulation. The 'standard' ewe premium in the group of regions with extensive farming systems is on average 7,400 ECU per farm. It exceeds 10,000 ECU per farm in the region of Castilla-La Mancha (Spain), as well as in parts of the United Kingdom (Wales and Scotland).

Table 4 'Standard' ewe premiums after 1992 on farms with ewes according to the new CAP regime by group of regions (1990/91)

	Extensive farming regions	Small-scale farming regions	Other farming regions	Total regions
Number of represented farms (x 1,000)	114	227	194	536
Number of ewes per farm	223	44	121	110
Normative ewe premiums per farm (CAP reform) (ECU)	7,404	1,495	3,926	3,638
Regional number of ewes (x1,000)	25,578	10,095	23,491	59,164
Regional normative ewe premiums (CAP reform) (m ECU)	848	340	762	1,949

Sources: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

The development of the market support regime for meat from sheep and goats is of particular importance in many more marginal areas where livestock grazing predominates. Prior to 1992, the number of breeding ewes was expanding rapidly in some regions including Ireland and parts of the UK and Spain. However, production was less profitable in some traditional regions and the number of breeding ewes and goats was stable or falling in parts of France and Greece. Since 1992 and the introduction of a ceiling on the number of ewes per farm eligible for the annual premium, numbers have stabilized. The European Commission expects the total number of sheep and goats to remain around its present level of approximately 98 million head and the pattern of trade between EU countries is likely to remain broadly as it is now (CEC, 1995b). The right to rear sheep and goats and claim an annual premium has itself acquired a value, and is saleable, as are milk quota in several Member States. This will provide some more marginal farms with a new asset and affect management decisions in the short and long term. Some producers may be reluctant to dispose of a potentially valuable asset and may continue to farm for longer than they otherwise would have done. Others may lease quota rights and try to keep open the option of a return to production. In general, the rate of structural change can be expected to be slower than otherwise would have occurred, although many farmers may still have an incentive to concentrate stock on better land and reduce the level of grazing on outlying areas and semi-natural vegetation where management is a priority from an environmental perspective.

CONCLUDING REMARKS

1. Marginalization on European farms takes a variety of forms and occurs at a range of different scales, from the individual patch of land no longer worth cultivating to sizeable regions. While most forms of

marginalization occur progressively over a period of time, not all result in a permanent change in land use and some are purely temporary, occurring for example on farms during a transition from one owner to another. Not only is the process of marginalization itself dynamic, but the concept has taken on different meanings in both the academic literature and the wider political world since it came into use about a decade ago.

2. Within the typology of regions developed in this paper those which are most susceptible to marginalisation can be expected to be found in the 'extensive farming' and 'small-scale farming' group. In both group off-farm activities make an important contribution to family incom.
3. Agricultural policy plays an important role in maintaining the viability of farming in regions which are susceptible for change. Direct subsidies may even exceed Family Farm Income in some Extensive Farming Regions in the European Union. This applies mainly to drystock farms in Wales, Scotland and Northern Ireland (United Kingdom), as well as in Alentejo-Algarve (France) and Corse (France).
   These regions have a limited share of the EU 12's total output. Changes in support measures may therefore have a limited impact on total production in the European Union. Their share in UAA however is substantially higher.
4. Compensatory payments per Livestock Unit under the LFA Scheme are lowest in Spain (36 ECU) and highest in Luxembourg (113 ECU). The relative dependence on subsidies of LFA farms is rather high. Direct subsidies are highest on drystock farms within LFA.

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I. General Importance of Direct Marketing in Germany

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Summary

In Germany the direct marketing and the on-farm processing showed a clear increase since the mid of the eighties. Regional focus points are South- and West Germany as well as the some regions in East Germany. The mostly offered products are eggs, potatoes and slaughter poultry from conventional farms and potatoes and vegetables from organic working farms.

In Germany the direct marketing is less popular in disadvantaged areas than in others, although especially this marketing way is frequently the recommended concept.

Regarded from the economical point of view, only for a little group of farmers, the direct marketing and the on-farm processing can be considered as a competitive alternative to the conventional agriculture with multistage marketing.

1. Focus points of direct marketing and on-farm processing

In Germany, direct marketing is far more popular than in the UK, but still has not yet reached the same importance than in France. There are not any exact data available about the number of direct marketing farms. Assuming 25,000 direct marketing farms (without the numerous farms with farm gate sale of milk, seasonable poultry or honey), in other words more than double than the data base[3] of our department has registered, this would be 4.5% of all farms (550,000 in 1995) in Germany. However, this comparison does not show the actual economic importance of direct marketing, as the part of part-time farming is much less within direct marketing farms than in the general number of farms.

The annual turnover in the direct marketing including the direct sales to large-scale consumers (catering) and retailers accounts a self estimated amount of DM 4 thousand millions and more. This would be roughly 7% of the total agricultural sales. Considering this, the direct marketing is more than a niche existence. The direct marketing in Germany is more spread over South- and West Germany than over North Germany. In East Germany as well, in some regions (around Berlin, in Saxony and Thuringia) there is a relative strong development toward direct marketing favoured by the fact that here numerous big farms - mainly co-operatives) entered especially the direct marketing of meat (WIRTHGEN/SCHEUMANN, 1995).

The high increase in direct marketing can be explained by supply and demand:

- The change in the agricultural policy since middle of the eighties (milk quota, extension, decrease of agricultural prices) has led more and more to the search for additional income by farmers. The growth rates in the direct marketing increased. Furthermore the high increase of organic farms led to an increase of direct marketers in nearly the same extend as approximately 80% of the organic farms are direct marketing farms.
- Direct marketed products have a positive image while consumers show distrust towards numerous industrial produced products. The consumer cannot comprehend the industrial way of production. Again and again new food scandals increase the distrust and make the consumer sensitive towards the purchase direct from the farm. In particular organic direct marketing farms benefit from this (WIRTHGEN, 1996, p. 6).

A survey of 200 direct marketing farms presents that in 1994/95 nearly 28% of the participated farms with all the land are situated in disadvantaged areas. (KUHNERT, WIRTHGEN, 1997). In comparison to that, in West

[3] The data base is based on addresses of direct marketing farms, which are listed in a register of direct marketing farms.

Germany there were 57% of the full-time farms situated in less favoured areas, while most of them are forage-growing farms with a high part of grassland and density of dairy cows (BMELF 1996, p. 24).
The reasons for the occurrence less than the average in disadvantaged areas are that certain activities of the direct marketing depend on locality. Economic advantaged places with buying power over the average favour the direct marketing. Places in disadvantaged areas - compared to other regions - require much higher sales effort by the establishment of direct marketing.

2. Product assortment

'One-product-enterprises' are an exception for direct marketing farms in Germany. Referring to the above quoted survey (n = 200) more than 80% of the German direct marketing farms offer additionally on-farm processed food (KUHNERT/WIRTHGEN, 1997).

The most usual on-farm produced products of conventionally working farms are:
- Eggs and
- Potatoes in the same strengths, followed by
- Slaughter poultry and
- Fruits

- and of organic farms are:
- Potatoes,
- Fresh vegetables,
- Cereals (corn) and
- Fresh beef.

The strongest products contributing to the turnover of direct marketing products
- of conventional working farms are:
- Eggs (13% of the participated farms),
- Potatoes (9.6% of the farms)
- Fresh beef and
- Asparagus.

- and of the organic working farms are:
- Fresh vegetables (22% of the participated farms),
- Fresh beef (20% of the farms),
- Cheese, as well as
- Potatoes and wine.

The strong differing product assortments of the conventional and organic working farms present the various consumption habits of the consumer groups as well as the sales problem within the multistage marketing of the organic products.

Listing the direct marketing products of the on-farm processing, registered in the direct marketing data base (see footnote 1), the following four product groups should definitely be named:

1. Pork and beef,
2. Poultry,
3. Cereal products (bread, cakes, pastries, and pasta) and
4. Milk products (from cows, goats and sheep).

The first named product group (pork and beef) offered by approximately 60% of the direct marketers (including bought-in products) and therefore roughly three times more than the other product groups.
In disadvantaged areas, especially products from the product groups 1 and 4 play an important role:
- beef as well as
- dairy products from cows, goats and sheep.

Aiming the stronger support of disadvantaged areas and its agriculture, new innovative distribution and marketing ways need to be developed.

Currently there are the following obstacles:

1. Distribution ways close to the consumers such as ”case-subscription”[4], mobile sale and market supply are more cost effective for places in less favoured regions far away from the market than for places close to the market.
   The sale directly from the farm, offered by nearly all direct marketers, contributes usually too small annual turnovers in disadvantaged areas; an exception are high touristic less favoured regions.

2. Beef offer from suckler cow keeping showed a relative high increase in the last years. The direct marketing to the end consumer experiences limits for this product in several regions.

3. The German market for dairy products from on-farm processing is still developing. France, Belgium and Great Britain show much higher consumption of dairy on-farm processed products compared to Germany (WIRTHGEN et al. 1996, p. 91).

3. Economic relevance of direct marketing

The direct marketing and the on-farm processing offer a possibility of additional income for numerous farms, and create jobs for the region. The "average" direct marketing farm employs approximately one worker in the direct marketing. This person realises with direct marketing on average approximately annual turnover about DM 150,000. The ‘upper quarter’ of the questioned farms (n = 47) in Germany reaches per worker a turnover of approximately DM 200,000 with direct marketing, while the ‘lower quarter’ (n = 44) only records less than DM 60,000 (WIRTHGEN, KUHNERT, 1997).
Generally in Germany the part of the value added from the turnovers in direct marketing is on average a little higher than from the remaining agriculture. This shows that the direct marketing can be a competitive alternative to the conventional marketing way, in particular if the direct marketer works like the farms of the ‘upper quarter’.

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[4] ”Case-subscription” is a kind of sale through organic farms where the consumers weekly receive a case of different organic products home-delivered.

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Direct Marketing of Livestock Products
II. Contribution of On-Farm-Processing and Direct Marketing to Safeguard Agricultural Functions

Ralf Bokermann [1)]

Summary
In order to generate additional income for farms, the farm processing with direct marketing is one alternative. For the conditions of the less favoured areas in East Hesse, two processes of direct marketing were presented. Referring to this the direct marketing of lamb in slaughter halves can achieve profit stabilisation and ensure sales. However, a considerable income increase cannot be reached.
In contrary to that, the processing of farm cheese can generate additional income and create jobs. This is also ensured in the case of higher processing capacities with the sale of the cheese at lower prices to retailers or other farm shops. All together, the on-farm-proccessing with direct marketing can considerably contribute to the safeguard of the functions of agriculture in rural areas.

1. Safeguard of agricultural functions in disadvantaged areas

1.1 Definition of the contribution of direct marketing

The less favoured areas of Germany extend 9.4m ha or of 50.6% of the agricultural area. Most of them are peripheral and rural regions. Because of unfavourable local conditions, these regions have to cope with high competitive pressure. The objective of the national regional planning as well as of the EC-policy is to preserve the agriculture of the disadvantaged regions with their multiple functions (3, p. 123).
One possibility of preserving viable farms is the expansion of the economical base through additional lines of business, in other words through diversification. These would be especially the land tourism with several variations, take-over of services, construction of commercial branch industries a well as the on-farm-processing of primary products into food products with direct marketing. - Figure 1 presents the potential effect of the on-farm-processing with direct marketing in disadvantaged areas. The primary effect of the on-farm-processing with direct marketing is usually an increase or a stabilisation of the farm income. This leads as secondary effect to the safeguard of agricultural functions in disadvantaged areas. Especial important are the following agricultural functions: Care and preservation of the landscape, safeguard of agricultural villages as settled locations, preservation of the rural infrastructure.

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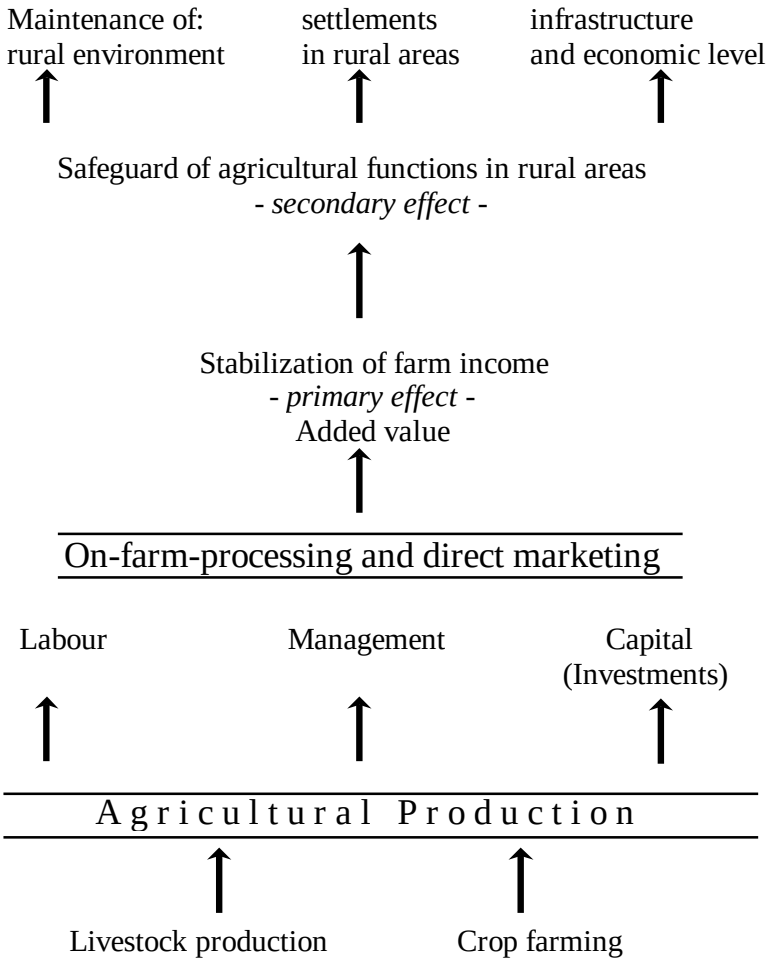

Figure 1: Effect of the on-farm-processing and direct marketing on regional functions of farms

1.2 A defined region as an example

The following deals with the economic stabilising effect through on-farm-processing with direct marketing. The economic conditions are represented by two procedures of direct marketing related to a particular region. As the livestock production in disadvantaged areas is far more important than the crop farming, it is concentrated on the processing and direct marketing of products of the livestock production.

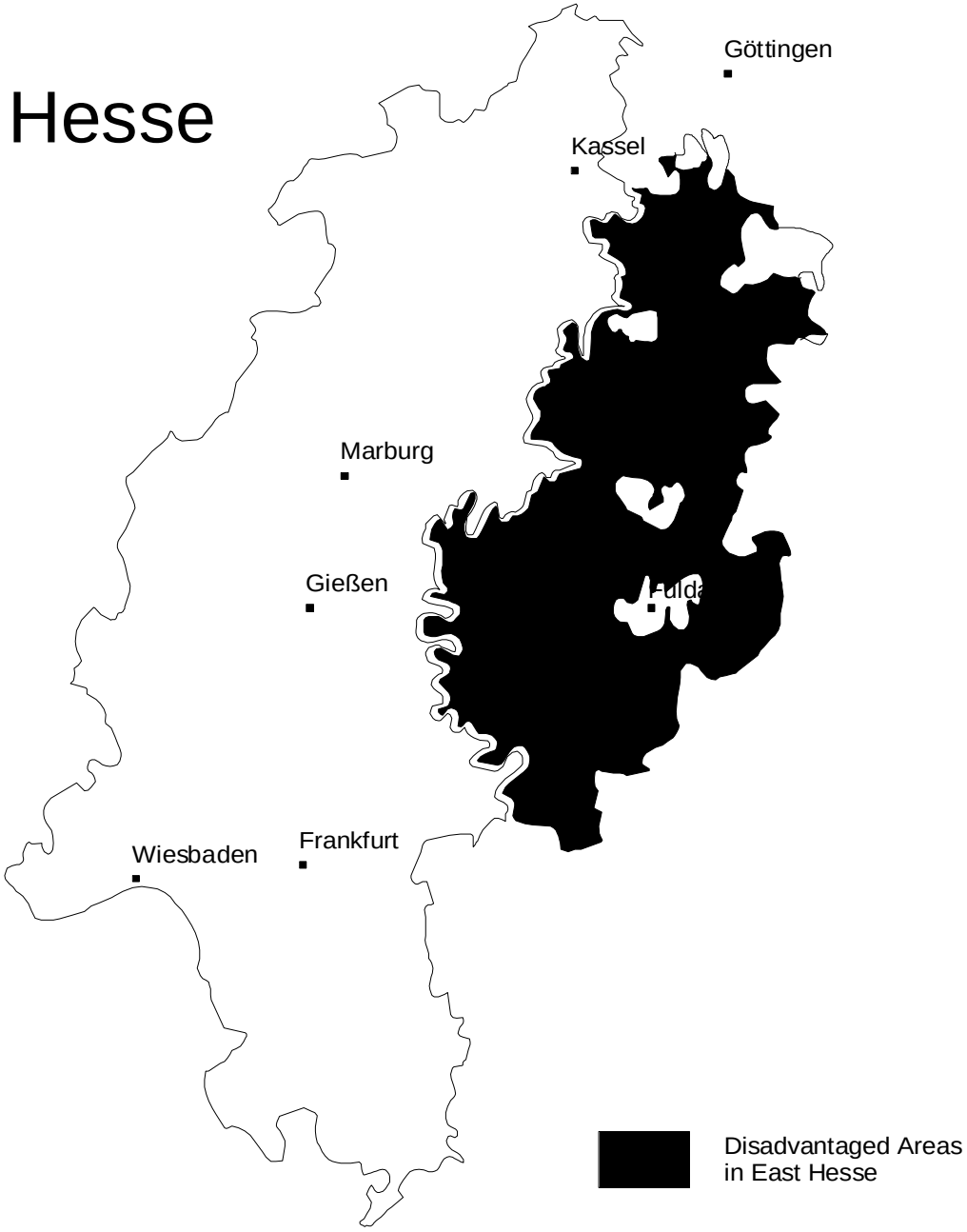

Figure 2: Situation of the disadvantaged areas in East Hesse. Source: (5)

The region serving as an example are the disadvantaged areas in East Hesse. Figure 2 shows the situation of this region in the middle of Germany. Most of the region are mountain and hill areas. A great deal of the agricultural area is taken up by hill sides. The natural conditions lead to a yield level of the cultivated area less than the average. The density of the population and the added value per inhabitant lie under the abverage of the county. Therefore, the region is listed as an ovjective 5b region of the EU structure policy (3, p. 108).

2. Direct marketing of mutton

2.1 Referring to the situation of sheep keeping

The sheep stock of the region accounts of 41 thousands sheep (6, p. 37). The importance of the sheep keeping is primarily due to ist function of ensuring the maintenance and preservation of the agrarian environment on relatively large areas. The economic situation of sheep keeping has mainly suffered from the declining prices of lamb. Without public advantage of the sheep keeping on several levels, economic sheep keeping would not be possible anymore.

At least, most of the sheep keeping farmers have partly succeeded in direct marketing of lamb straight to the consumer. In Rhoen mountains - one part of the region -, it was possible to organise direct marketing more extensive. With the objective to maintain the local sheep keeping with its several functions, a cooperative direct market mainly to large consumers (hotels, restaurants) has been achieved (9).

2.2 Organisation of a sheep keeping farm

In which extent the direct marketing can contribute to the economic stabilisation of the sheep keeping, is shown by the following example of a farm from the north of the east hessian region.

The organisation of the farm activity sheep keeping can be seen in table 1. The farm has 95.5 ha self-cultivated grassland, which is used for 350 ewes in addition to own rearing sheep. The farm sells on average 385 feeder lambs. It keeps mainly a land race sheep (Rhoen sheep), which on the one hand shows good meat quality, but on the other hand has less slaughtering weight of the feeder lamb as fattening breedings. As can be seen, the total gross margin (no. 3) is not enough to cover the part of the fix costs due to sheep keeping. A positive profit contribution can only be achieved with public subsidies and premiums (no. 4, 6).

2.3 Organisation and effect of direct marketing

The farm is marketing already 50 feeder lambs in form of slaughter halves direct to local consumers. It is planned to extend the direct sales to 200 feeder lambs step by step. In addition

Farm activities		**Capacity**		**Gross margin**	**Input of labour**
		ha	**%**	**TDEM[1)]**	**Wh[2)]**
1.	**Agricultural area, ha**	**95,50**	**100**		
1.1	**Grassland, ha**	**95,50**	**100**		
	a) Grassland - grazing	**63,50**	**67**	**- 3,8**	**267**
	b) Grassland - hay/grazing	**25,00**	**26**	**- 4,1**	**240**
	c) Grassland - ensilaging/ grazing	**7,00**	**7**	**- 1,1**	**65**
1.2	**Straw harvesting**	**(5,00)**		**- 0,6**	**23**
1.3	**Lime fertilizing**	**(24,00)**	**(25)**	**- 2,0**	
1.4	**Hay for sale**			**5,0**	
2.	**Livestock husbandry**	**Head**	**LU[3)]**		
2.1	**Breeding ewes**	**350**	**35**	**- 15,8**	**1974**
2.2	**Feeder lambs**	**385**	**19**	**42,7**	**212**

3.	**Total gross margin**		**å 54**	**20,3**	**å 2781**
4.	**Public subsidies, premiums**			**42,0**	
5.	**Proportional fixed costs**			**- 29,4**	
6.	**Profit margin/Sheep keeping**			**32,9**	
[1] Thousand Deutsche Mark. [2] Working hours/year. [3] Large animal unit.					

Table 1: Organisation and profit margin of a chosen sheep keeping farm

to private households, large consumers such as hotels and restaurants shall be targeted. The promotional approach can be the farm and its natural sheep keeping with outstanding meat quality. The sales of 200 lambs per year can be considered as realistic target. The direct marketing is organised as follows: the slaughtering is done by contract slaughtering through a butcher and the sale direct off farm. Referring to this the farm requires the investment of a dissectioning room with equipping and cool storage. At consumers' request` a dissectioning of slaughter halves is possible through a provided butcher.

The required investments, the gross margin and the profit of the direct marketing are presented in table 2. The profit of the direct marketing of DEM 6.4 thousands can increase the profit margin of the sheep keeping (table 1, no. 6) to DEM 39.3 thousands which is an increase of 19.5%. This can be considered as income stabilisation for sheep keeping, however, not as considerable extension of the income basis. The latter would need a much higher number of

Items direct marketing	**Capacity**
1. Investments, TDEM	**22,7**
- Rebuilding dissectioning room, cool storage, equipment -	
2. Direct marketed lambs, head/year	**200**
(Contract slaughtering, direct sale from farm)	
3. Input of labour, Wh/year [2]	**164**
4. Gross margin, TDEM/year	**10,1**
5. Fixed costs, TDEM/year	
5. Fixed costs of investiments [3]	**2,5**
5. Other fixed costs [4]	**1,2**
6. Profit margin, TDEM/year	**6,4**
7. Profit margin, DEM/Wh	**39,-**
[1] Thousand Deutsche Mark. [2] Working hours/year. [3] Writing off costs, repair costs, credit interest (50 % credit financing). [4] Advertising, telephone, accounting, insurance.	

Table 2: Economic data of the direct marketing of mutton in form of slaughter halves

feeder lambs directly marketed. This is hardly possible, because of rivalry of other sheep keepers and a general relative low consumption of lamb per inhabitant in Germany. An essential advantage lies in the partly dissociation from the sheep trade, which has to cope with permanent price pressure and therefore has less sales guarantee than the direct marketing.

3. Processing of farm cheese by a dairy farm

In general the direct marketing of farm cheese shows good market chances due to its specific quality. The number of farms with cheese processing is usually not very high. This is caused by the requirement of applicable knowledge for the processing, and the time factor, which is already at a medium processing capacity as high, so that the available working hours of a farm family are usually not enough.

Referring to the presented east hessian region, the dairy cows are the most important livestock husbandry. Therefore, it is examined in which extent the processing of farm cheese can support this farm activity.

3.1 Organisation of the dairy farm

The organisation of the dairy farm, for which a cheese processing shall be planned, is provided in table 3. The farm cultivates 73.95 ha. The plough land is planted with grain and rape. The grassland is extensive cultivated and used for dairies and rearing cattle. Furthermore, the farm keeps 120 fattening pigs. The profit of DEM 49,2 thousands is roughly the same as the average income of a full part farm in East Hesse (4, MB, pp. 224).

3.2 Procedure and economic contribution to the cheese processing

The current situation of the chosen farm is that, the son and heir coming back to the farm. The best possibility to create a further farm job is the milk processing.

Assuming this situation, the cheese processing is planned for three capacities: for 100 kg, 250

Farm activities		**Capacity**		**Gross margin TDEM [1)]**	**Input of labour Wh [2)]**
		ha	**%**		
1.	**Agricultural area, ha**	**73,95**	**100**		
1.1	**Grain growing**	**20,00**	**27**	**23,7**	**228**
1.2	**Straw harvesting**	**(23,40)**	**(32)**	**- 0,6**	**70**
1.3	**Rape**	**5,50**	**7**	**6,1**	**55**
1.4	**Acreage reduction programme**	**4,50**	**6**	**2,8**	**15**
1.5	**Catch crop fodder**	**(3,80)**	**(5)**	**- 1,1**	**35**
1.6	**Grassland**	**43,95**	**59**	**- 18,9**	**617**
1.7	**Lime fertilizing**	**(10,00)**	**(14)**	**- 1,5**	**7**
2.	**Livestock husbandry**	**Head**	**LU[3)]**		
2.1	**Dairies + rearing cattle**	**30**	**44**	**88,5**	**2349**
2.2	**Heifers for sale**	**7**	**14**	**8,7**	**215**
2.3	**Fattening pigs pens**	**120**	**12**	**12,8**	**371**
3.	**Total gross margin**		**å 70**	**120,5**	**å 3962**
4.	**Public subsidies [4)]**			**6,2**	
5.	**Fixed costs**			**- 77,5**	
6.	**Farm profit**			**49,2**	

[1)] Thousand Deutsche Mark. [2)] Working hours. [3)] Large animal unit. [4)] Location in less favoured area.

Table 3: Farm activities and economic data of the dairy farm with planned cheese processing

kg and 500 kg milk per day. Referring to these three variants, the most important data concerning organisation and economic contribution are provided in table 4. With a daily capacity of 100 kg and 250 kg milk, it is only possible to process a part of the amount of milk produced by 30 cows (5500 kg yield per year). The remaining bit will be given to the creamery.

With a daily capacity of 500 kg the whole amount of milk will be processed. - Until a capacity of 100 kg milk, it is usually possible, to sell the processed cheese through the own farm shop. A daily capacity of 250 kg and 500 kg milk will supposingly lead to an amount of processed cheese which need to be sold additionally through retailers or other customers. In this case, the sale through other farm shops would provide a good solution. These farms are often interested

Items of cheese processing		**Variation I**	**Variation II**	**Variation III**
1.	**Processed milk**			
1.1	**Milk per working task, kg/day**	**100 kg**	**250 kg**	**500 kg**
1.2	**Processed milk, kg/year**	**36500 kg**	**87500 kg**	**165000 kg**
2.	**Type of outlet**	**Farm shop**	**Retailer [1)]**	**Retailer[1)]**
3.	**Input of labour, Wh/year [2)]**	**2690**	**3028**	**4076**
	of it: Family-labour	**2300**	**2300**	**2300**
	Paid labour (15,-/25,-/DEM/Wh)	**390**	**728**	**1776**
4.	**Investments, TDEM [3)] (Rebuilding of rooms)**	**46,4**	**89,2**	**104,1**
5.	**Gross margin, TDEM/year**	**49,9**	**78,1**	**147,2**
6.	**Fixed costs, TDEM/year**			
6.1	**Fixed costs of investments [4)]**	**6,4**	**11,2**	**13,2**
6.2	**Other fixed costs [5)]**	**4,3**	**7,2**	**10,1**
6.3	**Labour costs**	**5,9**	**10,9**	**45,2**
6.4	**Milk analysis**	**-**	**-**	**1,8**
7.	**Profit margin, TDEM/year**	**33,3**	**48,8**	**76,9**
8.	**Profit margin, DEM/Wh (2300 family-Wh)**	**14,5**	**21,2**	**33,4**

[1)] Retailer: Direct marketing farms with farm shops. [2)] Working hours/year. [3)] Thousand Deutsche Mark. [4)] Writing off costs, repair costs, credit interest (50 % credit financing). [5)] Advertising, telephone, accounting, insurance.

Table 4: Economic data for the three variants of the cheese processing

in extending their product assortment with an attractive offer such as farm cheese. For the processing farm, the sale through other farm shops means a price shortage of 20% (for the profit margin of the marketer). The labour organisation for all three variants is planned, so that in each case 2300 working hours are provided by the family-labour. For all further required working hours other people will be employed. These will be paid like agricultural part-time workers or agricultural skilled workers depending on the work scope (no. 3). - It should be noticed that

the working hours of the processing will highly decrease by increasing daily capacity. This degression is mainly caused by the increasing labour productivity of the variants II and III. (1, pp. 189).

3.3 Investments and profitability

The setting-up of a farm cheese processing requires relative high investments beside others due to legal hygienic rules (no. 4). For building investments it is planned to rebuild existing rooms to a processing room with ripening cellar. The equipment investments include the purchase of hay drying. In order to ensure the quality of the cheese processing most of the farms have switched their feedration from silage feeding to hay feeding. This change is also planned for the planning farm. The gross margin was calculated for the following assortment of cheese: 20% of hard cheese, 25% of Gouda, 15% of Tilsiter, 25% of Camembert and 15% Limburger. The sale through the own farm shop, leads to a gross margin of DEM 136.8 per 100 kg milk, while the sale through other farm shops (with 20% price shortage) generates DEM 89.2 per 100 kg milk. Taken off the fix costs including labour costs, the economic results of the three variants differ. At a daily capacity of 100 kg milk, the profit margin of DEM 33.3 thousands will hardly reach the target income of a family-labour. Caused by the specific high working hours, the profit margin per working hour is relative small (no. 8). The variant II with a daily capacity of 250 kg generates a relative high profit for the family-labour and enables the employment of a part-time worker.

A high income, on the level of large farms, can be earned with variant III, at a daily capacity of 500 kg milk. Furthermore, this variant ensures the job for a skilled worker and achieves a higher labour productivity.

All together, the processing of farm cheese can be considered as a good possibility for farmers to increase their income and to ensure jobs in rural areas. However, it should be noticed that the, at the beginning, listed requirements for the processing of farm cheese, are only met by a part of all farms.

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On-farm processing of the products of livestock systems

B J Revell[5] & M François

SUMMARY

The paper reports on key aspects of an EU funded study into on-farm processing of milk and meat products in Belgium, France, Germany and the UK and into consumer attitudes and purchasing behaviour towards such products. The paper outlines the scale and distribution of on-farm processing of livestock products, the impact it can have on the farming business, household income and the contribution to rural employment it may make. All farms surveyed were larger than the national average in terms of utilisable agricultural area and most were in conventional agricultural production. Processing represented an important and generally growing share of household income. With the exception of the UK, labour in processing was largely from household members and averaged 0.5-1.5 full time equivalents. Between one-third and 60 percent of consumers in representative samples in each study country had purchased on-farm processed products during the previous year, although only about 10 percent of consumers were regular purchasers. The potential market for such products can be increased further given attention to strategies for pricing, promotion and distribution.. The artisanal image of such farm-processed products is fragile and may be exacerbated if direct contact is lost between producer and consumer. This poses the question and a dilemma as to whether farm-processed products can ever possess the potential for substantial market growth without the processing and distribution moving to a larger scale , and thereby jeopardising the specialist farm-produced image.

INTRODUCTION

It has long been recognised that one approach to the problem of declining farm household incomes has been diversification of activities on farm, or a re-deployment of farm household labour into off-farm activities. Such diversification has taken a myriad of forms from novel enterprises (deer and ostrich farming, angora and cashmere fibre production, fish farming), agricultural contracting services, to leisure related activities such as farm-tourism/accommodation, golf courses and shooting ranges, direct marketing of products to retailers or consumers and further processing of farm produced raw materials.. A large number of empirical studies have been made into aspects of farm diversification (Benjamin, Dalton & Wilson, Leavy, McInerney & Turner) to identify the number of holdings which had diversified and its impact on farm business/household income. Diversification aims to increase the returns to farm household labour, through shifting the resource into other activities where returns are higher than from traditional agricultural production. This may involve re-deploying the labour/management resource off-farm, or into other activities on-farm. One approach is to shift resources (or add them in the case of employment generation) into activities which add value to the existing agricultural production. One such activity is direct marketing, of which several studies have been conducted (Lagrange, Le Roy, Russell et al, Wirthgen & Maurer). However, few have focused specifically on on-farm processing with the exception of France where some seminal case studies have been conducted (GRET ed). This paper reports on the results of an EU funded study project[6] into on-farm food processing in Belgium, Germany, France and the United Kingdom. Whilst the project attempted to identify the location of on-farm processing across a wide product range, detailed enterprise studies were restricted to farms processing milk and meat products[7]. The full results of the study are available in François et al.

[5] SAC receives support from the Scottish Office Agriculture, Environment and Fisheries Department

[6] Agroalimentaire Paysan Européen CAMAR CT91-0120 . Partners conducting the study were GRET, Paris, France; Div.. Agro-Marketing, University of Ghent, Belgium; Dept. Agro-Marketing, University of Kassel (Witzenhausen), Germany; Dept. Agricultural and Rural Economics, Scottish Agricultural College, Aberdeen, UK.

[7] In Belgium the study only addressed milk processing. In Germany, processed cereal products were also included.

Processing of certain products on farm has been a traditional activity of farmers in almost all countries. The making of butter and cheese, for example, and selling directly to neighbours or in the village has been a small scale complementary activity to farming and income supplement where production has been surplus to domestic needs. But there also exist farm holdings which have separate and professional processing enterprises with specific processing investment, and which contribute a substantial proportion of farm-household and business income. Such activities have allowed the farmer to come closer to his market-place and generate added value to products the raw material prices for many of which have been under pressure through excess EU production. The questions thus posed at the outset of the research were "what were the establishments having a professional vision of processing on farm and if it was sustainable in the longer term. In this respect, it was important to understand how and where such products were positioned in the market for meat and dairy products and how they were regarded by consumers.

The objectives of the research were to:-

i. identify the population of on-farm processors, their location and product ranges manufactured

ii. examine the interaction and organisation of the farming and processing production systems

iii. establish the principle methods of marketing and distribution of on-farm processed products

iv. assess the potential demand and markets for these products.

A number of major themes, issues and specific questions arose and were explored in the study in relation to its broad objectives.

I. The Economic Importance of On-Farm Processing

- Was the activity largely found on small or large holdings?
- Does it contribute significantly to farm household income?
- Does on-farm processing generate employment, especially in less favoured rural areas?

II. The Dynamics of the Processing Enterprise, its Management and that of the Farm

- Did it have an old-traditional base or was it a dynamic new activity on holdings pro-actively adjusting to the changing economic fortunes of European agriculture?
- What were the principal problems and difficulties in establishing the on-farm processing enterprise?
- Has resource re-structuring between farming and processing activities taken place and what were the responsibilities of the farm family and employees in each?
- What was the turnover generated by processing and farming, and what were the trends?

III. The Market for and Marketing of On-Farm Processed Products

- How were the marketing and distribution activities organised for processed products and what was the relative importance of on-farm to off-farm sales?
- What were the farmer-processors' perceptions of their customers needs and wants?
- Where are farm-processed products positioned in the market-place and what are their principle competitors?

- What quality marques are used by producers to enable recognition of their products, and how do consumers perceive them?

- Are there markets for farm-processed products in each country and what are their characteristics?

- Is the market for these products growing?

- Could the market absorb more of these products?

LOCATION OF PRODUCTION AND NATIONAL SAMPLE SURVEYS

There is a great deal of uncertainty surrounding the number, location and types of on-farm processing enterprises. No contemporary national censuses of processors exist in the EU, although there are various diverse sources of information which enabled an initial picture of the population to be constructed reflecting enterprise type and location (but not size), and from which subsequent samples could be drawn[8]. The sampling procedures themselves may therefore embody potential sources of regional and business size bias, in that it was not possible to stratify according to known population characteristics.

Figures 1-3 show the location of on-farm processing by livestock product type in France, UK and Germany derived from the research. To a large extent, on-farm processing enterprise type and numbers will reflect the general farming types within particular regions, and also to some degree the proximity of local markets and demand. There are strong concentrations of milk processing in Rhone-Alpes and East Central Regions, foie-gras in the South West, pork products are more generally widespread but strongly represented in the south west and Rhone -Alps, and poultry in the Rhone Alps, South West and North West. In the United Kingdom, on-farm milk and meat processing concentrates in the South West and South East of England, with meat and game processing strongly represented in Scotland and some dairy processing specialisation in Wales and Yorkshire. In Germany, milk Baden Württemberg, Bavaria and Hesse have strong concentrations of meat processors, with milk and poultry processing also strong in Baden Württemberg.

On-farm processing is not a dominant activity amongst all diversification opportunities being realised by farmers. McInerney and Turner estimated that 41 percent of UK full time farms were diversified. This study estimated that only 1.6 percent of all farms in the UK were involved in on-farm processing (Revell and Dunn), although Colman et al estimated around 7.5 percent were involved in either processing or direct marketing. In Germany, the estimated proportion of farms on-farm processing was 1.9 percent.

In total, detailed surveys of on-farm processing businesses were made of 220 farms in Germany, 287 in Belgium, 536 in France and 106 in the United Kingdom (Great Britain).

THE PROCESSED PRODUCT RANGE

The nature and definition of on-farm processing is complex. In broad terms, a state change from the application of a transforming process was necessary. It was also recognised that the farmer would control the management of the processing and marketing activities, even if he had employees to conduct them on his behalf, and he must utilise his own raw materials, although not exclusively. Thus the concept of a farm-processed food would exclude simple washing, packing and selling. However, pasteurising and bottling milk was considered a simple processing operation. Clearly culturing of milk products is a more advanced process. For meat, especially large ruminants, slaughtering generally would legally be required to be conducted off-farm in a licensed abattoir. However,

[8] In the UK, a Register of businesses handling food is held by municipal Environmental Health Authorities, and there are various farmhouse producer groups and Commercial trade Directories of processors. In Belgium, a register is held at the National Office for Milk. In Germany, some data are held by veterinary and hygiene authorities. In France, some data were available from the 1988 Census of Agriculture.

provided the farmer then received back the carcase for further cutting for fresh meat sales, or for further processing, this would not compromise the definition of a farm processed product.

The range of products made by on-farm processors differs in emphasis between countries. Table 1 summarises the key features.

TABLE 1
Principal processed product ranges by country

	Germany	Belgium	France	UK
Milk	Hard and semi-soft cheese fromage frais yoghurt quark butter	Hard, semi soft, soft and fresh cheeses butter yoghurt ice-cream	Fresh bottled milk Hard and soft cheeses AOC Small cheeses fromage frais/blanc butter	Bulk and bottled/cartoned milk Hard cheeses Yoghurt Ice cream
Meat	Sausages Beef and pork fresh meat ducks, geese, chickens and turkeys sated, smoked and dried meat	n.a.	Foie Gras Roasting poultry Patés, terrines venison dried and smoked meats	Fresh meat cuts: pork and venison sausages, pies and patés smoked meats fresh and processed poultry meat.

In Belgium the most holdings produce butter, followed by bottled and pasteurised milk. In Flanders, where urbanisation is stronger, other products such as cheese tarts, fromage blanc and yoghurt are made. In the UK

In the UK the product range is very varied and wide. It includes hard farmhouse cheeses, soft/cream cheeses, ice cream, cream and bottled milk. Although largely from cows milk, goats milk and ewes milk products can also be found. In the meat sector, fresh meat cuts are sold (especially turkey-meat), as well as other products such as charcuterie, farmed venison and game birds such as pheasant and quail, and smoked meats. France is similar in many respects to the UK, with the notable exception of the highly specialised and world reknown foie-gras production. Many of the French cheeses have Appellation d'Origine Controlé status. There are also products which adapt to changing needs of consumers such as small apéritif goat's cheeses, cheeses in pastry crusts, cheese-tarts, meat terrines and conserves. Generally, meat and dairy processors in the UK and France tend to specialise in either one or other product type.

In contrast, in Germany, the processed product range is broader than that the normal farming enterprise mix. Some 80 percent of farmer processors produced meat products, 33 percent poultry, 23 percent milk and 35 percent bread. In the meat sector, fresh meat cuts ,sausages and salted, dried and smoked meat products dominate. Dairy products are typified by hard cheeses, Gouda-type cheeses and semi-soft cheeses, together with fromage frais and yoghurt.

THE ECONOMIC SIGNIFICANCE OF ON FARM PROCESSING

In general, farms involved in processing tend to be larger than average (Table 2).

TABLE 2
Average utilisable area of farms processing milk, meat and cereals and numbers in less favoured areas

	Germany	Belgium	France	UK
Average area of all holdings (ha)	17.7	15.8	28.2	67.9
Average Area of Processors surveyed (ha)	44	37	50	104
Percent of farms in LFA	47	<1	59	27

Of the farms surveyed, a large proportion in France and Germany were within the less favoured areas, whereas only about one quarter of UK farms were virtually none of the Belgian processors.

In fact, the necessary volume of raw material supply, together with investment and financing requirements means that on-farm processing cannot simply be a marginal complement to mainstream farming activities, but requires substantial entrepreneurial ability and an asset base to match. This perhaps runs counter to the traditional concept of a small scale or peasant farmer adding value or processing his production. Most of the processors surveyed were owner-occupiers of the farm holdings or tenants, and the processing enterprise either sole-trader or partnership, with company status more common in the UK. Some 85-95 percent of production was conventional, as opposed to organic, in the UK, France and Belgium.

In terms of the importance of on-farm processing to the farm household income, the enterprises on the surveyed farms contributed a significant share to household revenues in all countries concerned (Table 3).

TABLE 3
Sources of total farm household income(%)

Income Source	Germany	Belgium	France	UK	
				Milk	Meat
Processing	32	28	60	56	37
Oth. alt. enterprises	4	}	1	1	8
Farming	51	}72	32	28	36
Off-farm jobs	13	}	7	15	19

However, whereas in Belgium and Germany, the activities were largely complementary to farming, in France and the UK (especially for milk processing), the processing enterprise was a major specialisation contributing over 50 percent of household income.

It is difficult to generalise about the impact of on-farm processing on rural development and the local economy. Some insights can be gained from examining the employment in such enterprises.[9] Table 4 presents estimates of full time equivalent labour inputs (employees and farm household) into processing and marketing.

[9] Although assessing what might have happened to the farm business and employment in the absence of processing is problematic without prolonged monitoring of businesses.

TABLE 4
Average employment in on-farm processing and marketing in full time equivalents (FTE's)

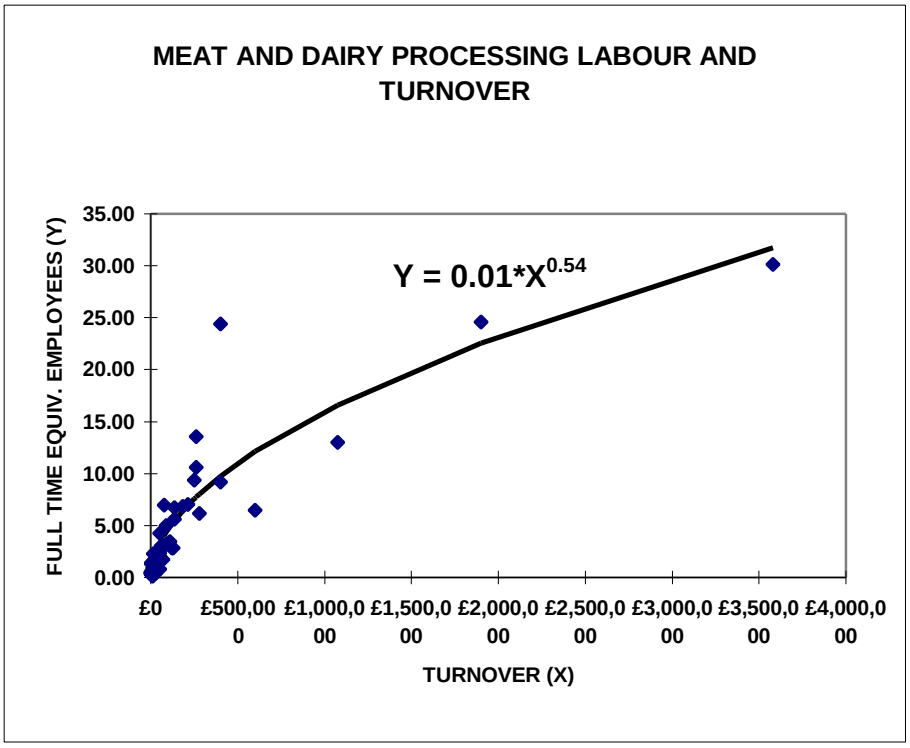
	Germany[a]	Belgium	France	UK
Labour FTE's	1.4	0.6	1.1	6.6

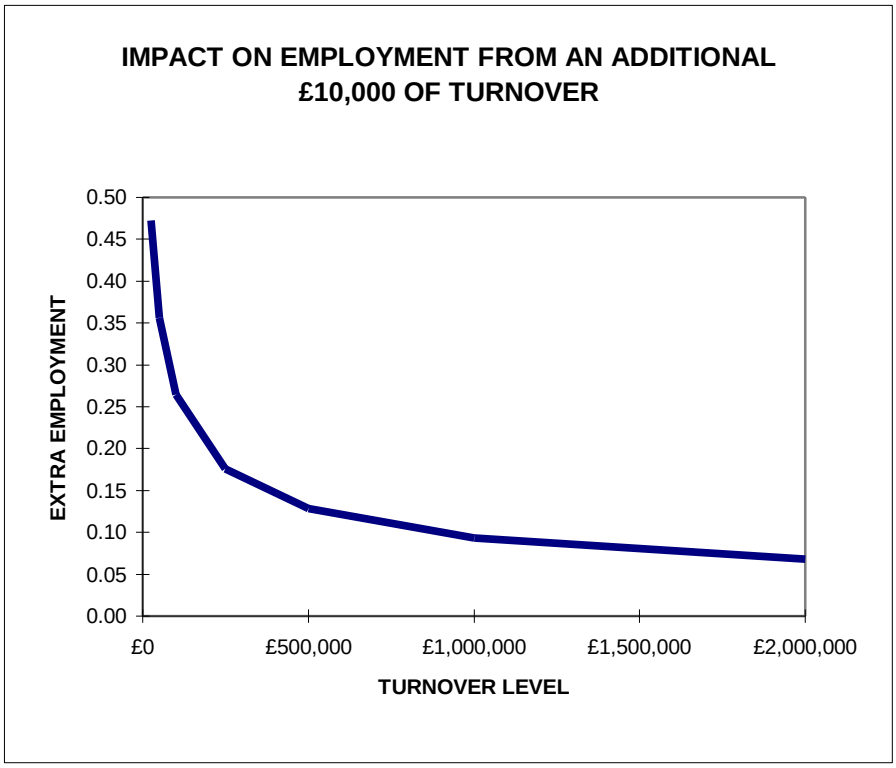
[a] Processing only

In Belgium, labour use was little more than on a part-time basis whilst in France and Germany processing and marketing provided employment for about 1 -1.5 full time equivalent persons. In the UK, there was a great deal of variation in employment, and the average level of labour use was much higher than in the other study countries, with 6 FTE's. However, there were some very large enterprises in the UK sample and the employment distribution is highly skewed. Between 40 and 50 percent of the UK processing businesses employed no additional permanent staff, and between 30 and 40 percent of the businesses employed between 1 and 4 employees.

FIG 4

UK ON-FARM PROCESSING EMPLOYMENT AND BUSINESS TURNOVER



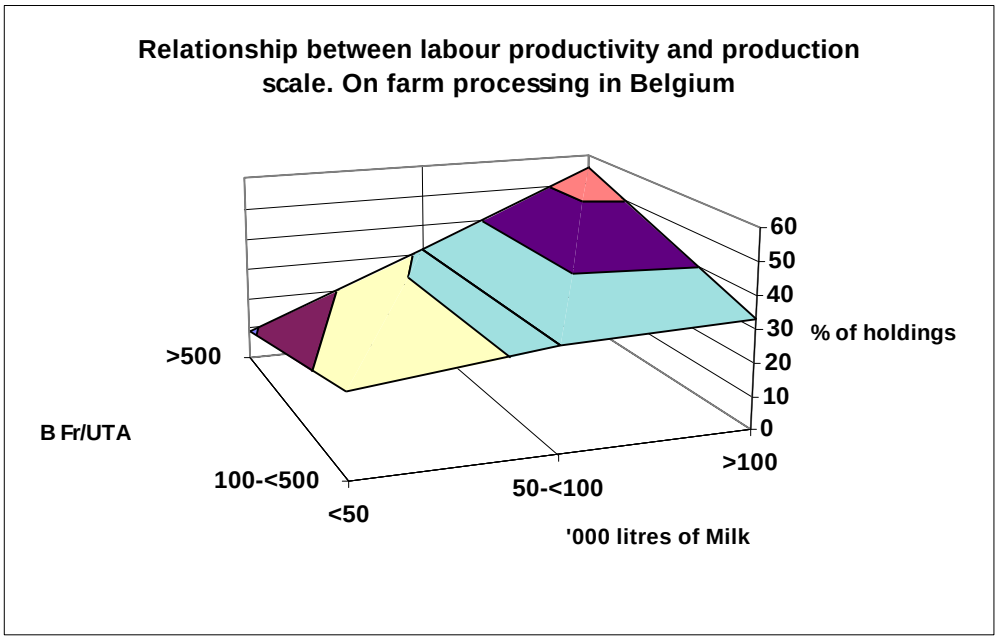


There is a clear relationship between size of on-farm processing enterprise and the number of employees. Figure 4 illustrates that there is a positive relationship between processing turnover and employment in UK farm-processing enterprises. But, the analysis also clearly reveals labour-capital substitution as the enterprise grows in size and implies size economies in processing and increasing labour productivity at higher volumes of production. A comparable analysis of Belgian dairy processing activity (Figure 5) shows that for any given level of labour productivity[10], a larger percentage of the holdings will be in the bigger size group in terms of volume of milk processed. Figure 4 shows too that businesses which expand beyond a certain threshold will require increasingly large increments in turnover for every additional employee taken on. The biggest employment effects (either in terms of labour retention or use of spare family labour or hiring new employees) are likely to be in the business start-up and early expansion phases[11] to a medium size enterprise). However, that is not to say that large on-farming processing businesses will not contribute to rural employment, because clearly they do and employ more people than smaller ones. They may be more stable and less vulnerable to collapse than smaller enterprises. But for the marginal unit of public investment, the employment effect may be bigger assisting a small business than a large one in the on-farm processing sector.

[10] Measured as value added per full time labour equivalent

[11] In the initial phases of business start up, additional labour employed/used frequently comprises of a family member. In France, non-family employees are only likely to be hired when the business requires more than 2 FTEs

Figure 5



THE DYNAMICS OF ON-FARM PROCESSING ENTERPRISES

In the UK and Germany, the creation of the livestock product processing enterprises were relatively new[12] whereas in Belgium most surveyed had been set up before 1984. In France, there was a mixture of new and established businesses. The primary motivations for initiating such enterprises in all countries were to maintain farm household income, to add value to the raw materials and personal interest. All businesses experienced difficulties at start up. The principal reasons given in most countries were:-

- To find market/sales outlets
- To find finance for the enterprise
- To obtain hygiene and sanitary approval

In all 4 countries, food processing is strictly controlled by the authorities, in order to ensure consumer safety. This posed major problems for producers starting up in France, Germany and the UK. A further difficulty was the variation which some producers perceived in the way in which regulations were interpreted and applied in different countries, although it was difficult to gather precise evidence about this in the survey. It was clear that much of the on-farm processing activity was initiated through producer interest and hence was in many cases a *production-led* rather than a *market-led* activity. A primary initial difficulty farmers experienced was to find outlets for their products. All processors felt the need for some further training in food processing technology, marketing and business law. Technology training is particularly necessary as the enterprise moves up from a small-scale activity level, and there are complementary demands for improvements to marketing expertise as the volumes available for sale increase.

The size and evolution of the on farm processors' turnover largely reflected the different sizes of agricultural enterprises. Table 5 presents the average turnover for each country. Processing businesses were smallest in Belgium, bigger in Germany and France, and very large in the UK[13], where some of the UK dairy processors have attained a quasi-industrial scale of production.

[12] Less than 10 years old at the time of the survey

[13] However, as with farm size, the distribution of UK sales turnover figures is highly skewed, and the high mean turnover in the UK reflects the presence of some very large dairy and meat processors in the sample. Fifty five percent of UK milk processors had a turnover of less than 65,000 ecu, and 75 percent were below 200,000 ecu.

TABLE 5
Average turnover (sales revenue) from on-farm processing in 1992

	Germany	Belgium	France	UK
Average processing turnover	23,000 ecu	14,200 ecu	63,732 ecu	125,425 ecu(meat) 710,720 ecu (milk)

Turnover for the majority of on-farm processors in all countries except Belgium was increasing whilst that from basic agricultural production was largely stagnating or in decline (Table 6).

The figures thus suggest that processing, once started, tends to assume an increasing importance in the farm household activities, and that resources and income shift away from agricultural activity to processing. This is also a feature of many farms which diversify. A corollary of the diversification is that agricultural production tends to become less intensive and more extensive, thereby proffering the possibility of environmental gains where intensity of production is lowered (Dalton, Appleton et al).

TABLE 6
Evolution of Income Sources

	Germany	Belgium	France	UK
Income from Agriculture	Incr.(14%) Stagnat.(38%) Falling(38%)		Incr.(13%) Stagnat.(57%) Falling(30%)	Incr.(12%) Stagnat.(41%) Falling(47%)
Income from Processing	Incr.(65%) Stagnat.(5%) Falling(30%)	Incr.(33%) Stagnat.(27%) Falling(40%)	Incr.(57%) Stagnat.(38%) Falling(38%)	Incr.(52%) Stagnat.(34%) Falling(13%)

Although many farm businesses start by processing only their own raw material, as the enterprise expands, it may become necessary to augment the basic raw material with that purchased from surrounding farms. In the UK and France about 42 percent of meat and dairy processors surveyed drew some raw material supplies from other farms. In Belgium and Germany self-supply rates were higher, with 32 and 34 percent of surveyed processors respectively buying in supplies.

MARKETING ISSUES RELATING TO FARM-PROCESSED FOODS

Many producers had highlighted the difficulties of locating markets for their produce at the outset of their processing enterprise. The difficulties of developing a market when there are initially limited volumes of produce to sell, will frequently restrict selling activity to within the locality of the farm.
Table 7 illustrates the dominance of local sales in all countries except the UK, although even French processors must sell almost one-third of their output outside the immediate locality in order to survive..

Nearly 40 percent of meat processors had a turnover of less than 32,000 ecu and nearly 80 percent less than 130,000 ecu.

TABLE 7
Proportion of sales turnover derived from local sales

	Germany	Belgium	France	UK
% of turnover	85%	80%	68%	30%
	30 km radius	10 km radius	30 km radius	30 km radius

Generally, the main distribution channels correspond closely to the size of the processing enterprise and the geographical location of its customers (Table 8). UK farm processors, like industrial food manufacturers, mainly use wholesalers and supermarkets for distributing and retailing their products, especially in the milk sector. On-farm sales only contributes a small share of their total turnover. In part this also reflects the increasing concentration of retail distribution in the hands of the supermarket multiples in the UK. However, the use of wholesalers and supermarket outlets enables the producer-processor to tap into markets far beyond his immediate locale. Processed meat products are also sold direct to the hotel and catering trades. In complete contrast, Belgian farm-processors are highly concentrated in the immediate vicinity of the farm.

In France and Germany, the main distribution channels are on-farm sales and at local fairs and markets. This trend is most marked in Germany, where 70-85 percent of sales value passes through these channels, as compared with 50-75 percent of French products. Other marketing channels are also used (delicatessens, specialist grocers, co-operative farm shops etc.) according to the type of product and availability of outlets.

TABLE 8
Main distribution channels by percentage of estimated total turnover

	Germany		Belgium	France		UK	
	Milk	**Meat**	**Milk**	**Milk**	**Meat**	**Milk**	**Meat**
Farm	57%	76%	53%-76%	23%	40-50%	4%	9%
Home Delivery		6%	8%-27%			11%	
Market	18%	8%		28%	15-25%		
Delicatessen	7%						
Retail shop				9%			18%
Wholesaler				9%		30%	30%
Supermarket						44%	16%
Hotels Restaur.							17%

The principle factors contributing to the successful sale of the products were universally identified by all producers as "*word of mouth*" and "*being a good salesman*". The use of food-trade press articles, advertising, market research and having a good distribution network were particularly important in the UK with its bigger enterprises.

All farm-processors felt that the primary factors motivating consumers to buy their products were:-

- Taste
- Confidence in the producer
- Traditional and Artisanal Quality
- Healthiness and safety of the products.

In France, quality and tradition were rated as paramount. In Germany taste was most significant. In Belgium organic and regional image were most important whilst in the UK, confidence in the producer was the dominant

consideration. The future of the processing enterprises rested on a number of key considerations. Quality and uniqueness of product were key elements dominant, together with the need for local and regional demand. Personal interest and the motivation of the producer-processor was also essential.

Clearly the future success and viability of on-farm processing depends on both the marketing skills of the producers, the quality, image and healthiness of their products competition from other products and consumer perceptions and demand. The position of farm-processed foods in the market-place is somewhat fragile. Table 9 shows the principle competitors for such products as perceived by farmer processors.

TABLE 9
Market position and competing products. Percent of processors mentioning.

	Germany	Belgium	France	UK
Other farm processed products	35%	11%	40%	51%
Industrial food products	28%	31%	39%	28%
Branded Food Products with Farmhouse Image	23%	23%	55%	41%
Organic Products	19%	1%	6%	6%
Butchers/dairymen's products	19%		12%	23%

In the UK and France the most strong competition was perceived from other farm-processed products and to a lesser extent comparable industrially processed foods. However, branded food products with a farmhouse image were seen as strong competitors, and this to some extent reflects the increased penetration of UK and French farm-processed products into the supermarketing and wholesaling sectors. The greater local emphasis and niche marketing of Belgian and German produce means that such branded farmhouse products are seen as less of a threat. However, unless the on-farm processing activity is to remain small scale with a local market, it will be important to protect and promote the authenticity of farm-processed foods in order to stem such competition. The creation of specific quality marques for authenticity of farm-origin (perhaps allied with geographic/regional origin (AOC) certification) might help in this respect.

In terms of the overall market penetration of farm-processed products, Table 10 reveals that some 40-60 percent of consumers in France, Germany and Belgium had bought a farm-processed product on some occasion. The level of penetration in the UK was somewhat lower. However, only some 6-10 percent of consumers were regular purchasers, and 10-17 percent were occasional buyers.

Almost half of the consumers of farm-processed products did not envisage increasing their purchases, either because it was too complicated to get more, because they were perceived as relatively expensive (except in the UK), because they were given them as gifts or because what they usually bought was already sufficient. On the other hand, almost another half of consumers hoped to increase their purchases if pricing, distribution and product availability were improved.

TABLE 10
Market penetration and purchase frequency of farm-processed products; (percent of consumers)

	Germany	Belgium	France	UK
Have purchased[a]	43.5%	53.6%	59.65	35.2%
Regular purchase[b]	10.7%	9.3%	11.6%	6.4%
Occasional Purchase[c]	11.7%	12.2%	17.0%	10.0%

[a] On one occasion in the past year
[b] at least one in the last month
[c] several times a year

As the national demographic profiles of the buyers of farm-processed products were quite different, any targeting of particular market segments would need to be closely allied to the socio-demographic characteristics of the country concerned. In other words, there may not be universal solutions for improving market penetration and sustaining market growth, although it is likely to be in urban areas and more removed from the immediate locale on which much of the growth in Germany, Belgium and to a lesser extent in France was hitherto based.

CONCLUSIONS

In France, Germany and the UK, and to a lesser extent in Belgium, on farm processing is a response by farmers to changing economic conditions of agriculture. Such activities have contributed to sustaining employment where they have been created, although the employment effects depend very much on scale of output and turnover.

Processing enterprises in some countries contribute over half of the household income on those farms actively involved, and despite the fact that it was not possible to estimate profitability of processing as opposed to turnover/revenue, presumably such enterprises were profitable as many had had survived for some 8-10 years. The majority of producers in all countries except Belgium were relatively confident of the future viability of their businesses, despite changing regulations and hygiene controls. Business success depended on quality of product, healthiness and uniqueness together with an appropriate distribution network for the product. While the largely small-scale German and Belgian farm-processors focused essentially on local markets and on-farm sales, those in the UK at the other extreme were involved in more sophisticated levels of supply chain management into large-scale distribution. Product ranges and marketing must therefore be tailored to the appropriate market conditions, although it seems likely that if on-farm processing is to grow, it will ultimately have to face the changing nature of retailing and its concentration into supermarkets and hypermarkets unless it is to remain of marginal interest and significance. This sits ill with the image of an artisanal product, and industrially produced products with similar farmhouse images are perceived as a threat to future development. Development of certification and certificates of origin and authenticity may therefore assist in underpinning and promoting the image of these products and afford a measure of protection from similar industrial products.

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Contribution of rural tourism to the market for livestock products in LFAs in Germany [*]

Gerold Rahmann [**]

1 Introduction

Compared to the world market, the production of animal products like meat, milk and wool has a low competitiveness and comparative cost advantage in the European Union (EU). The protection of the common market and subsidized products was the way to keep animal husbandry in the marginal areas (LFAs) of the EU. With the GATT negotiations and the reformed Common Agricultural Policy (CAP) this closed European market will be opened to the world market. This will lead to high competition with other countries and between the regions resulting in large structural changes in agriculture in the community.

Rural tourism plays an important role in the local economy of many LFAs. The consumption behaviour of tourists while on holiday is different to their behaviour at home. While on holiday, adventure buying is more important than cheaper buying when at home. Tourists are often willing to buy extraordinarities (e.g. souvenirs) or pay more for products with local identity. This is even the case of food eaten while on holiday. A „good holiday" for many rural tourists includes a „good" breakfast, lunch or/and dinner in a restaurant or hotel with rural atmosphere, hospitality and traditional or tasty food of the region. Nowadays, many restaurants offer a menu with special emphasis on the origin of the meat. As with the BSE-crisis, this has became an important marketing strategy of many butchers and restaurants.

Besides the „direct products" from animals sold in LFAs to rural tourists, the marketing of „indirect products" has become of more interest in the last decade. Touristic enterprises have identified the cultural landscape and the „intact world" as an attitude for tourists to their chosen holiday location. These expectations of rural tourists have received more attention in public relations of the region. Beauty landscape, rural lifestyle and farming adventure holidays are advertised by tourist agencies. Actually, the German rural tourism is performed as „*competition of the regions*", every region tries to attract tourists with its local identity.

This paper will show in the example of the Biosphere Reserve Rhön (BR Rhön) the potential and problems of marketing animal products to rural tourists in LFAs. The paper is divided into marketing of „direct goods" like meat and wool and „indirect goods" like recreation on farm, participating in rural lifestyle and landscape management in the BR Rhön.[14]

2 The development of sheep keeping in Germany: the problem of low competitiveness of livestock products in LFAs and changed marketing structures

The development of sheep keeping for wool production in the last century has shown that changed world markets can destroy a specialized animal production in a very short time. For example, in Germany there were about 30 mio. head of sheep in the year 1860 due to the excellent prices for wool (terms of trade between wool and meat 1850: 1:17). With the improvement of transport (steam ship, railways), the enormously increased flocks of sheep overseas (e.g. New Zealand, Australia, South Africa, USA) and the inventions of synthetic fibre and the cotton deseeding machine, the numbers of sheep in Germany decreased to 5 mio. head within 30 years. The price for wool fell rapidly (terms of trade between wool and meat 1880: 1:1). The wool production in Germany lost its

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[14] A share cost project of the EU (DG VI, FAIR) is analysing the impact of tourism to ecologically friendly and socially acceptable animal husbandry (EQULFA). The German partner (Dept. of International Animal Husbandry; University of Kassel) is carrying out the research in the BR Rhön.

comparative advantage to other countries and sheep were nearly all abandoned. Nowadays, there are about 2,4 mio sheep in Germany for meat production. The shearing of the wool is more expensive than the value of the sheared wool (terms of trade wool and meat 1996: 1:0,20) (RAHMANN, 1997).

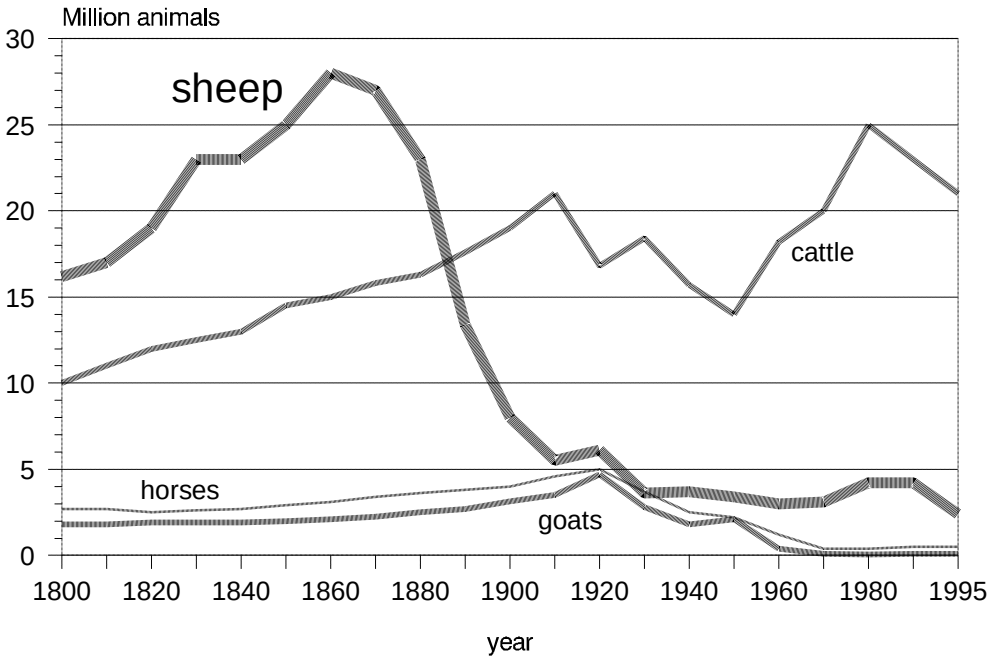

Figure 1: The development of animal keeping in Germany in the last 200 years.

Source: RAHMANN, 1997

Mutton/lamb has a low competitiveness to beef or pork and to mutton/lamb producers overseas. For example, New Zealand sheep traders can offer a kg lamb for about 6,00 DM in a German supermarket, while German lamb of this quality has to be sold at a minimum of 9,00 DM to beat the costs. The only thing sheep traders from overseas cannot offer is meat with local identity (e.g. meat from Rhön sheep produced in the Rhön).

Without governmental support and new marketing strategies, the production of milk, meat and wool would decrease and eventually be nearly abandoned in disadvantaged areas. The actual governmental support to farmers in the frame of GATT and the reformed CAP based on 2078/92 and 2091/92, gives an income transfer to the farmers. These regulations are not any more product-orientated but production-orientated: the subsidies are not given for a kg of milk, meat or grain, it is given for extensive farming, eco-farming, landscape management. Actually 50 to 70 per cent of the earning in sheep keeping comes from subsidies. Nevertheless, the income of sheep keepers is one of the lowest in farming in Germany, particularly in LFAs. Additional improvements of marketing the products are necessary to have an economically successful enterprise. Rural tourists are an excellent group of well-paying consumers in LFAs.

3 The Biosphere Reserve Rhön

The BR Rhön is a hilly LFA in Germany with a harsh change in agricultural structure during the last few decades. The BR Rhön was established in 1991 as the 12th biosphere reserve (BR) in Germany. It is situated in the middle of the country in a triangle of Bavaria, Hesse and Thuringia and comprises about 166.674 hectares (Table 1) (GREBE/BAUERNSCHMITT, 1995). In terms of flora, fauna and geology, the Rhön is one of the most remarkable low-range mountain areas in Germany (Figure 1). Apart from the numerous precious woodlands and vast areas of meadow land, the Rhön is characterised by extensive hill-top clearings in the upper reaches. These

originated during the clearance period in the Middle Ages. Reforestation has been inhibited to date through natural grazing by native breeds of cattle and sheep (old domestic breed is the Rhön sheep).[15]

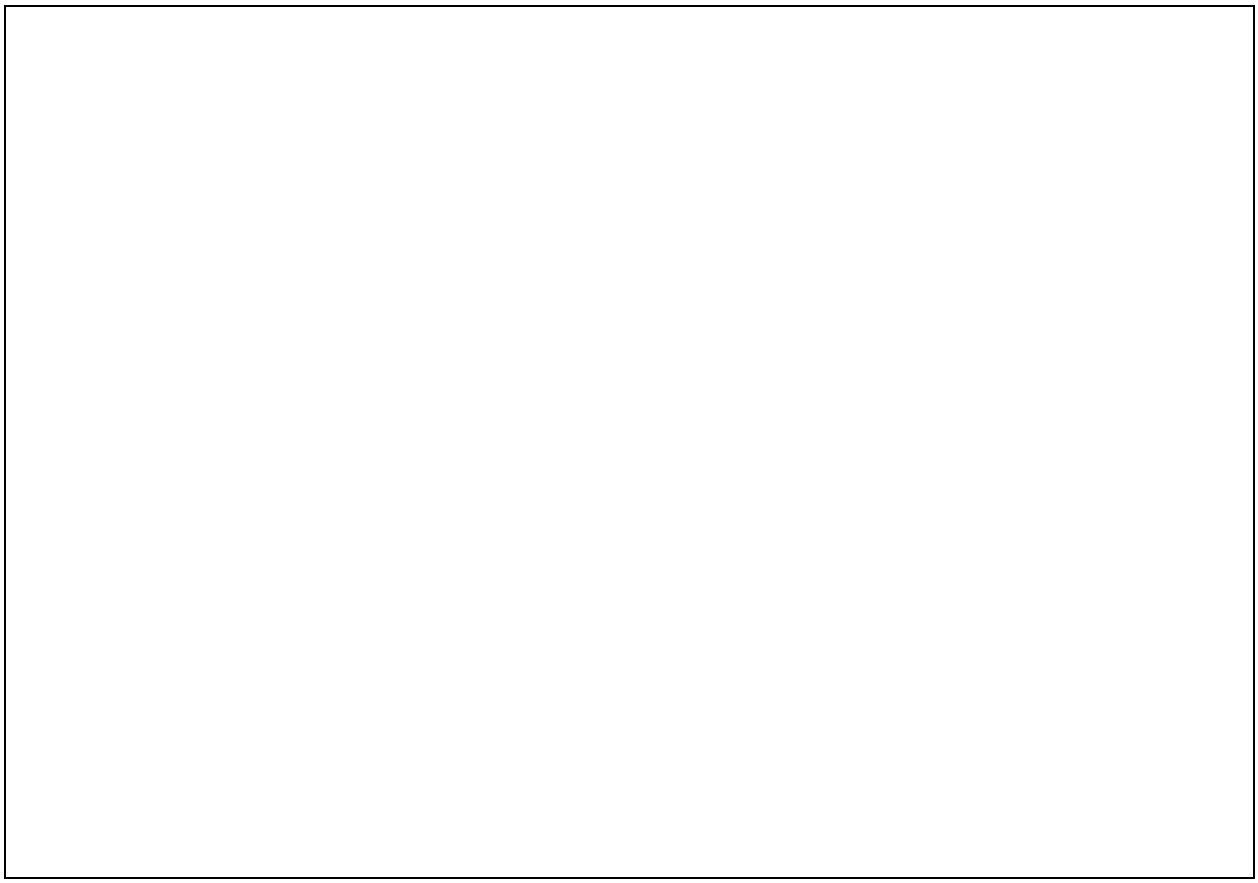

Figure 1: The Biosphere Reserve Rhön

Source: GREBE/BAUERNSCHMITT, 1995

There are great differences between Thuringia and Hesse/Bavaria. In Thuringia, part of the former GDR, one farm, agricultural co-operatives, manages 2.000 to 5.000 ha. In Bavaria the average farm size (full-time farmer) is 50 ha, for all farmers (sideline farmers and full time farmers) only 9 ha per farm. Sideline farming is very important in the Rhön, particularly in Hesse and Bavaria (in the Bavarian part of the Rhön there are about 2.700 farms: 2350 sideline farmers and 350 full time farmers; in the Hessian part of the Rhön: 2.550 farms: 1.870 sideline farmers and 680 full time farmers; in Thuringia: 13 farms as LPG-followers; no sideline farming, many hobby farmers (<3 ha)) (GREBE/BAUERNSCHMITT, 1995).

Table 1: Biosphere Reserve Rhön in brief

Geographical Location:	**Area (including extensions):**
Situated at the point where the three Federal States	Total: 184.939 ha

[15] A short description of the agriculture in the BR Rhön: Land use by farmers has created the landscapes in the Rhön (actually 54% of the total area is farm land), particularly by extensive animal husbandry like sheep herding or extensive meadow use systems (e.g. hay production). The structural changes during the last decades has led to conditions by which this created landscape cannot be preserved by actual dominant land use systems (e.g. intensive meadow and pasture use, abundance of farming). Without extensive land use systems, the character of the Rhön will be lost.

of Thuringia, Hesse and Bavaria meet. **Type of Landscape** (above sea level)**:** Rhön foot hills (up to 500 m) Northern Rhön clearings (up to 830 m) Black Mountains in South (up to 840 m) Geba in East (up to 750 m) Plateau (up to 950 m) **Plant Families:** Sparse meadows, bristle grass meadows with arnica, silver thistle, Turk's cap lily, golden oat grass meadow, lime grass meadow, water meadows with globe flowers and high-lying moors. **Animals and Birds:** Black grouse, capercaillie, common snipe, dipper, king-fisher, black stork, wild cat.	of which: 72.802 ha in Bavaria, 63.564ha in Hesse and 48.573 ha in Thuringia. **Population Density:** 110.000 people (including the extensions); 65 i/sq.km, distributed in villages between 100 and 5000 inhabitants. **Area Utilisation:** Forest: 68.000 ha (41%) Meadow Land: 50.000 ha (30%) Arable Land: 36.000 ha (22%) Settlements, roads etc.: 12.000 ha (7%) **Zoning:** Core zone: 4.199 ha (3%) Cult./Develop. Zone: 67.483 ha (37%) Transition zone: 107.557 ha (58%)

Source: POPP, 1995

With 1,5 mio. overnight stays per year (1991: GREBE/BAUERNSCHMITT, 1995), tourism is one of the most important branches in the economy of the BR Rhön. 300.000 rural tourists stay for one day, 100.000 for rehabilitation and over 1.100.000 for holiday. The average time of staying is roughly 4,3 days and the daily expenditure of day-tourists is about 29 DM and for holiday tourist about 65 DM (FUTOUR, 1996). The expectations to the Rhön as a holiday area are mainly orientated to the nature and active recreation (hiking, biking etc.).
The cultural landscape gives the Rhön the tourist perception of „a land of open spaces". With the declaration of the BR Rhön the Rhön sheep was chosen as an emblem of this cultural landscape as a publicity effect for tourism. Free publicity for the BR Rhön has been given by the local Hessian radio station taking the Rhön sheep „Manfred" as their mascot.

One hundred years ago the Rhön sheep, excellently adapted to the harsh conditions in the hilly areas of Germany, could be found nearly everywhere. The number of more than 200.000 head of this breed declined rapidly during this century (KOLB, 1996). In the '50s there were only 300 herd book-registered head of sheep. The breed has nearly become extinct. In the '60s, the number increased a little to 1.000 head but the breed was still endangered. Nearly all of them were kept outside the Rhön by hobby keepers. In 1987, the BUND (a Germany-wide nature conservation association) bought a herd of 200 sheep to re-introduce them into the Rhön to maintain endangered cultural landscape with an endangered domestic animal (POPP, 1993). In 1996, the number of Rhön sheep in the Rhön had already increased to a number of 2.000 head.

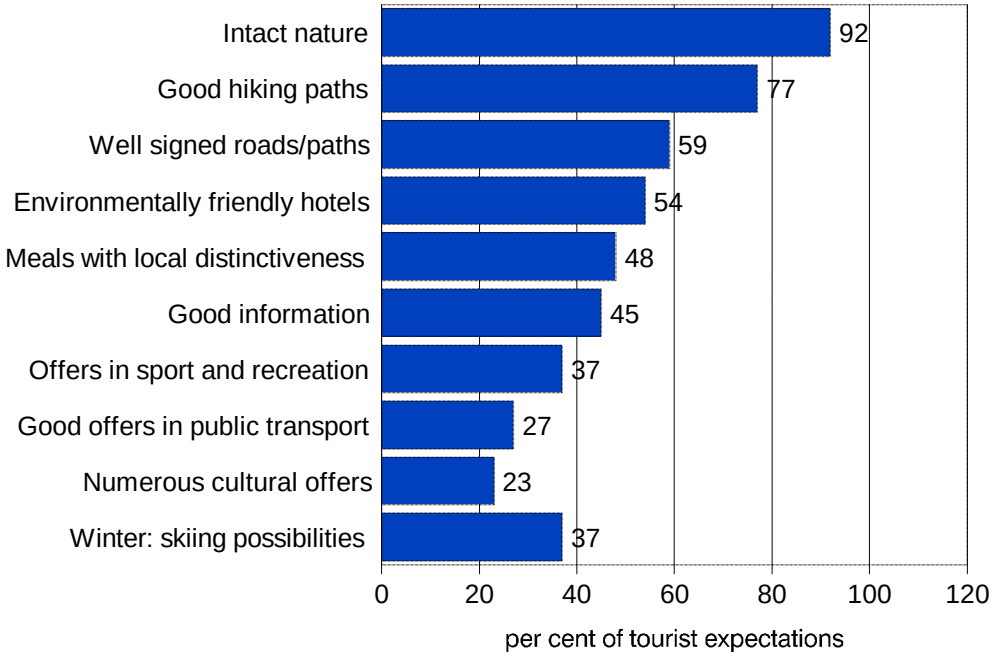

Figure 3: Expectations of tourists to the holiday area „BR Rhön“

Source: FUTOUR, 1996

4 Marketing of „direct goods“ from sheep to rural tourists in the BR Rhön

„Direct goods“ are defined as material goods which can be quantified and qualified. In animal keeping, these goods are milk, meat, eggs and wool (even processed). Sheep produce meat and wool as direct goods. Meat can be sold in kg and classified in the EUROP-system (alive or slaughtered), wool in kg and classified in in µm, colour or dirtyness.

The definition of high quality food has been changed by the German consumer during the last 10 to 20 years. Besides the official classification (EUROP) and measurable quality (low fat, colesterine) many consumers have recognized with increasing attentiveness the origin of the product and the way of production. These expectations have been fulfilled by an increased number of animal keepers. They advertise their products with ecological and local distinctiveness (like trade marks). One of the best markets for these products are the rural tourists.

4.1 Meat

German culture has a special attitude to the meat of sheep. At home, lamb is less prefered than pork or beef., while in many regions it is declared as a delicatess or speciality, particularly in LFAs with a important history in sheep keeping (*Lüneburger Heide, Rhön, Deichgebiete*). Many regions have created a label to promote their lamb to the consumer. These effects stretch from national advertising (*Fleisch aus deutschen Landen*) to state level (*Thüringer Lamm*), regional level (*Rhönschaffleisch aus der Rhön*) and local levels (*Seifertser Hirtenpfanne*). The regional and the local level especially are important for marketing to rural tourists.

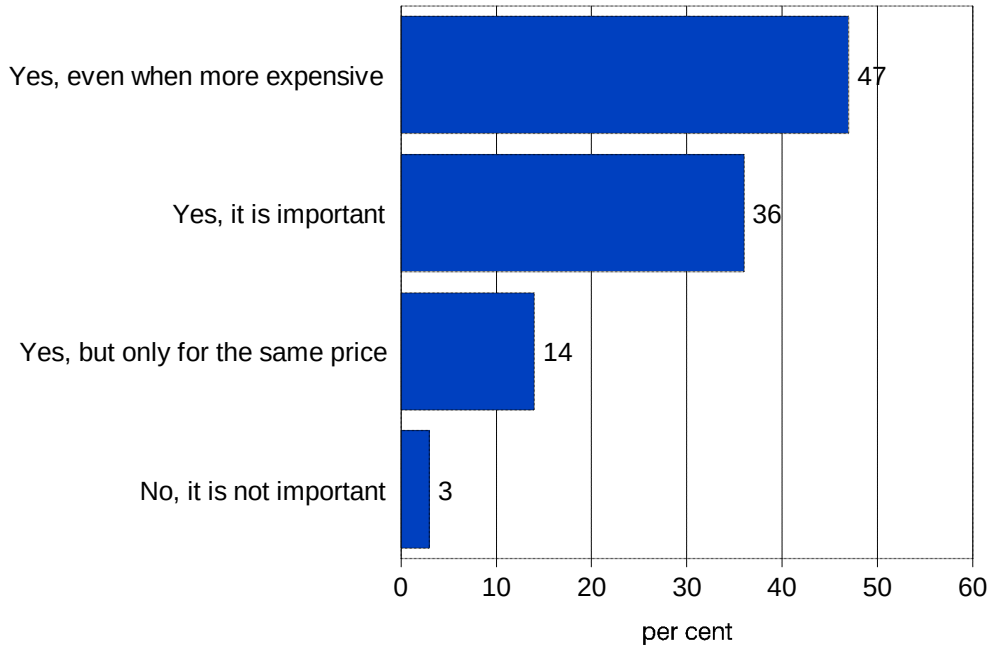

Figure 4: In the tourists' opinion while on holiday the dishes should be with local distinctiveness

Source: FUTOUR, 1996

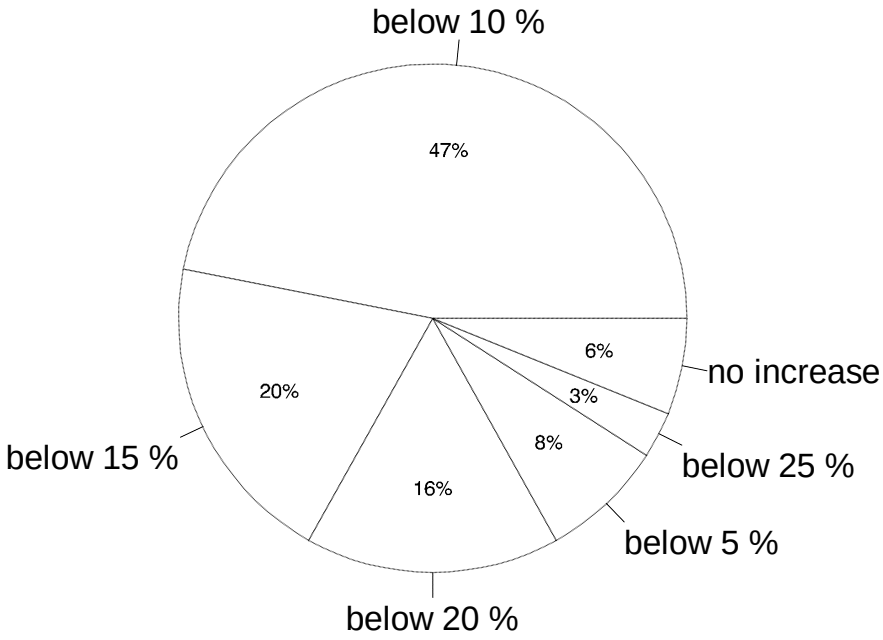

Figure 5: How much more would the tourists pay for dishes with local distinctiveness

Source: FUTOUR, 1996

Lamb can be offered successfully to these tourists at a high price level (Figure 5). Some restaurants in *Bad Neustadt*, a town in the *Rhön*, offer specialities of the Rhön lamb, the typical and endangered breed of the region. They co-operate with the German Railway Company (*Deutsche Bundesbahn*) (HESS, 1996). On special days extra chartered trains carry tourists to *Bad Neustadt* for lunch. Restaurants buy the Röhn lamb for 13,50 DM per kg carcass weight. Compared to the wholesaler price of 6,40 DM (free slaughterhouse, Aug. 1996; ZMP, 1996) this is double of the price.

Besides the individual co-operation between farmers and touristic suppliers, marketing co-operation on regional level tries to promote local products. In such a co-operative farmers, restaurants, touristic offices and individual persons gathered to do joint marketing of a special product, for example Rhön sheep. The marketing is based on special characteristics of the sheep (endangered), special purposes (landscape management) or the way of keeping (eco-farming, traditional farming). The co-operative organises the marketing, restaurants offer specialities of this particular sheep.

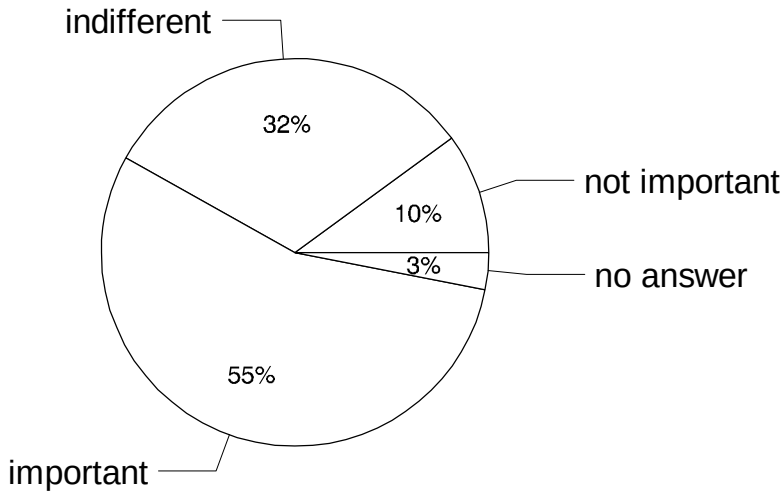

Figure 6: Information in the menu concerning the typical regional dishes is important for Rhön tourists (1995)

Source: FUTOUR, 1996

One example is the marketing association *„Aus der Rhön für die Rhön"* which wants to promote the Rhön sheep. With the establishment of the BR Rhön in the year 1991 this breed has become label for the area. New marketing strategies have had to be established. In 1992, a restaurant and the LEADER supported organisation *„Natur- und Lebensraum Rhön e.V."* organized a meeting of several restaurants from the Rhön. About 25 restaurants attended the meeting but could not be convinced to participate in a special marketing offensive for the Rhön sheep. By 1993, the marketing of the Rhön sheep had become successful and other restaurants joined the group. The marketing co-operation *„Aus der Rhön für die Rhön"* was established and local products were sold in 18 restaurants in the Rhön. In 1994, a second marketing co-operation was established with 60 restaurants („RHÖNER CHARME"). The marketing strategy was slightly different. Rhön lamb is bought by these restaurants at an excellent price (13 to 20 DM per kg) and even the dishes with this meat are sold 200 to 300 per cent more than using ordinary lamb.

These are only two examples of co-operation between local producers and local touristic restaurants/hotels in the case of the BR Rhön. The marketing of meat as a speciality/delicatess with local identity to rural tourists is

dependent on restaurants. Compared to souvenirs or other durable goods, this meat has to be consumed in the area (restaurants) while on holiday. Apart from sausages, no tourist would buy expensive meat to consume at home. Meat with local identity can only be sold as a speciality to rural tourists. This needs co-operation between animal keepers and tourist orientated restaurants/hotels: *„The restaurants have in the marketing of regional products a key and multiplicator function, which is only successful and economically sustainable with good quality and ingenious marketing of the product (*KRENZER, *1996)"*. The consumption of meat with local identity makes the meal an adventure for the tourists. For them, this is a form of participation in the local environment. This shows that the consumption of lamb with local identity is more than the taste. It is the whole atmosphere and the ambiente in which it is consumed. Only if the atmosphere is as it was expected by the tourists, will they be convinced that they had a good meal for a good price. Besides hospitality, this atmosphere can be attained by special emphases like explanations of the products. The information of the origin and the history of the products, the way of production and the preparation is necessary to get a product with local identity (KEMPF/KRENZER, 1993). The saying of „*protection by consumption*" was created.

4.2 Wool

Actually, the wool production in Germany is not profitable. The price for shearing a sheep costs as much as the value of the sheared wool.[16] Nowadays, wool is a secondary (couple) product in sheep keeping. German wool is, with the breakdown of the German wool marketing company (Deutsche Wollverwertung GmbH) in 1996, not competitive on the world market and under heavy constraints.

Rural tourism can be used to have some profits even in wool production. In the BR Rhön (*Rhön Plüsch* aus Kaltensundheim/Thuringia) the wool of the Rhön sheep is used to make sheep toys for children and souvenirs for tourists. They cost between 15,- and 50,- DM and the income from wool per sheep can be doubled, despite only a small part of the wool being used. Of course, this is a limited market. It is, however, creating jobs and a marginal contribution to sheep keeping in a LFA. Even wool clothes manufacturers use the BR Rhön for marketing: e.g. neckties, shirts and socks made from Rhön sheep wool are sold at a high price to tourists in the Rhön. There are some other examples of marketing wool to tourists (e.g. sheep skins, wool paper) but the market is very limited. The selling of wool as insulating material in house construction (roof) could be a future market for wool and has actually been proven.

5 Marketing of „indirect goods" from sheep to rural tourists in LFAs in Germany

„Indirect goods" are defined as non-material goods produced by animal husbandry. The consumption of these goods is done by viewing (taking in the beauty and the function of animals: on pastures, in stables, while working, in parks), touching (animal stroking by children: lambs, calves, chicks), using (horse riding, traction, guarding) or a „good feeling" (creation of cultural rural landscape, nature protection, animal welfare). Landscape creation and animal husbandry itself are goods which are „consumed" by non-farmers, the society and - of course - tourists. Many LFAs in Germany are attractive for Germans to visit for a day-trip or weekend, often for special seasons. The „beauty" landscape and „healthy" environment, quiet accommodation and hospitality are the main reason for visiting the area. Families with young children coming from cities enjoy a day-trip or a weekend for recreation in a rural environment.

Animals play an important role in the attraction of many rural area to the tourists' attitudes. Landscape and villages become alive with animals on real farms with tractors, dogs, cats, horses and rural tradition. It creates the ideal picture of an intact world. The expectations of the rural tourist are being given more attention by public relations in these regions. Beauty landscape, rural lifestyle and farming adventure holidays are advertised by the tourist agencies.

For farmers, it is difficult to market these „indirect products", which are a side-product of their farming. Only if it is provided on farm e.g. „holiday on farm", „domestic animal parks" or „riding farms", does the farmer have

[16] The average quantity of wool per sheep ist about 4 kg. The farmer gets between 0.70 and 1,50 DM per kg of wool, the shearing costs between 2,50 and 5,50 DM/sheep (DVL, 1995).

direct connection to the tourist and his expenditures. Not all farms, however, are willing to change to touristic acitvities, they want to be farmers. A way of participating in the expenditures of the tourists is the „maintainance of cultural landscape“ for tourists attraction.[17]

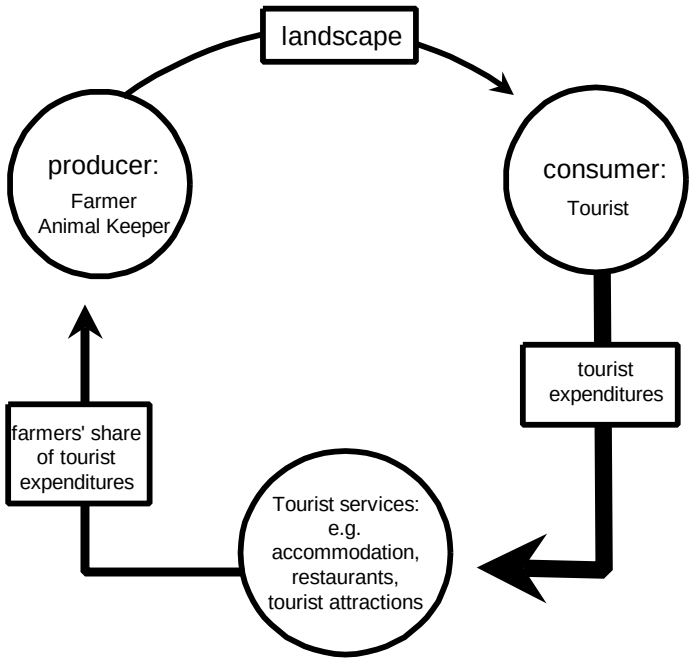

Figure 7: Model of farmers' participation to touristic spending in attractive rural environments

Source: RAHMANN/ALBERT, 1996

Landscape management with animals is only often understood in the way of protection of endangered man-made biotope. It is, however, much more:

- Conservation of protected anthropo-zoogenic biotopes
- Conservation of rural culture and history *in situ*
- Advancement of village life and farmers
- Sustainable production of healthy food
- Protection of ressources (genetic, soil, water)
- Promotion of innovative and advanced animal husbandry systems
- **Promotion of rural (eco-)tourism**

Animal keepers in the BR Rhön get between 300 and 700 DM per ha and year, when they keep their animals on endangered biotopes like bristle grass meadows or sparse pastures. In the BR Rhön these preserved biotopes are not only important for nature protection but also provide most attractive landscapes for tourists. For example, the Rhön sheep keeper in Ginolfs with about 800 sheep maintain 250 ha pasture in the nature protection reserve „Lange Rhön“, which is about 63% of the total grassland (400 ha or 0,5 ha per ewe). Two thirds are pasture and grazed by sheep, one third is meadow for hay production. He received 250 DM per ha and year for this landscape management, which is about 62.500 DM per year in total or about 80 DM per ewe and year. This is important additional income in the sheep keeping, payed by the governmental nature protection offices and base on nature protection and tourist expectations (KOLB, 1996).

[17] In Switzerland, some villages in the Alps finance a farmer to stay with his animals, the tourists in the villages expect this and without this support there would be no farmers any more.

Besides the income from landscape management, sheep keeping in the nature protection areas is an attraction for the numerous tourists visiting this beauty landscape. This sheep keeper is attending this demand. He keeps flocks in the traditional way with traditional clothes, a shepherd dog and all the symbols tourists expect from shepherds. The marketing of this indirect product (entertaining the tourist) is done by advertising on television, on posters and in many books on the Rhön. This has been done so well that he becomes the „trade mark" for the tourist place BR Rhön. Schools and nurseries come by bus to let the children enjoy lambs in springtime (stroking them), tourists' groups take pictures of him and his flock, the tourist agencies market him as an attraction. This shepherd is getting 100 DM per hour for this. The income by this activity is not very high but is complementary to his sheep keeping (HESS, 1996).

6 Conclusion

Rural tourism is a source, where local animal husbandry can find a market without competition to other areas and countries. This market however, has to be explored before it can be exploited. At first, there is a need to know tourists' expectations and consumption behaviour. Secondly, the fulfillment of these expectations is necessary. In detail it can mean changing farming management, the way of production, the marketing of products. One of the main restrictions and the reluctance of farmers to participate in rural tourism is the low experience in marketing to these special clients or they have no access to them. Co-operation with tourist agencies, hotels, restaurants for marketing are necessary. Besides this, it has to be accepted that rural tourism in Germany depends on the regional and rural charm, the hospitality of the people and beauty of the landscape. This has to be maintained by all who are interested in having a part of the income from touristic spending.

The example of an individual sheep keeper in the Rhön shows the survival as a sheep keeper not only depends on the political frame conditions, but also on good advertising and marketing strategies. Sheep keeping can be an excellent enterprise even in competition to the world market. The case of Rhön sheep keeping in the BR Rhön shows the potential of rural tourism for rural development, particularly in marketing of animal products in LFAs. The sheep keeper, the landscape, the nature, the endangered old domestic breed, Rhön sheep, and the restaurants have all gained by the joint promotion of the Rhön sheep to rural tourists:

- the sheep are financed by a nature protection association,
- the meat is sold to the marketing association „*Aus der Rhön für die Rhön*" and the restaurants in Bad Neustadt,
- part of the wool is sold for toys to the tourists. It brings a better income than the rest of the wool,
- the landscape mangement is a good paid measure of grazing and
- the activity as tourist attraction the BR Rhön gives extra income.

In 1996, the Rhön flock of sheep in Ginolfs had grown to 800 and in the Rhön to 2.000 ewes. Despite the large increase in nine years and the high price per kg, the demand is still higher than the supply. It was a successful strategy to promote an animal product with local distinctiveness for a high price to rural tourists.
There are many such examples throughout Germany. Examples like this show new functions and strategies for animal husbandry. Local distinctiveness and co-operation with tourist agencies, restaurants, nature protection offices and associations are a possible way of successful marketing of animal husbandry in LFAs, when the area is attractive for rural tourism. Fantasy can be an advantage in sheep keeping. It was shown that sheep have not to be cheap in marketing. There is competitive sheep production even in LFAs and possible EU markets are open.

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Animal fibres - Adding value through producer co-operation

S.M. Andrews

SUMMARY

The Europe Union has a long history of fibre production; but it is only over recent years that efforts have been made to develop production operations for such fibres as cashmere, angora mohair, alpaca, llama and fine wool. The term ***adding value*** *can be applied to any process in which the product is brought closer to the consumer. This is demonstrated in the fibre industries of France, Denmark and the UK in both tangible forms, (such as processing/knitting), and intangible forms, (such as transportation to the market-place and farm retailing). Through co-operative ventures, the performance of such activities permit the grower to exploit economies of scale and to effectively widen their net margins. However there are additional - often non-counted - costs that need to be brought into the equation, such as additional labour. If these factors were fully costed the additional margins may appear less attractive. Although collaborative activities permit such fibre opportunities to evolve in an otherwise economically non-viable environment, there is little evidence to suggest that European growers are able to fairly compete with the rest of the fine fibre producing nations to satisfy the market. It can be concluded that there is still a need for a closer identification of the market place, in order to design, produce and locate the right product types to exploit niche market opportunities.*

INTRODUCTION

It is widely accepted that the majority of the UK agricultural community are engaged in some field of diversification. Motives for change differ markedly from profit maximisation to supply chain and management control. Many new channels of diversification have evolved over the past fifteen years - amongst which are alternative animal fibre enterprises.

The term diversification has been used and misused by most sectors of the agribusiness communities. It has been referred to, in its broadest sense as any business which generates additional income to the farm from activity outside *the range of conventional crop and livestock enterprises*, (Ilbery 1991), and more concisely to *those enterprises taking place on predominantly agricultural - proprietal land which (a) are not based on the primary production of food and fibre and (b) fall outside the price support mechanism of the Common Agricultural Policy*, (Slee 1986)

In order to pursue such an activity, which carries with it numerous risks, (Haines 1987), there is a requirement for careful planning in order to ensure such risks are minimised. These risks have been to some degree assessed by Ansoff (1988), who considered the opportunities in the market place according to two differentials: the market itself and the product. Altering these differentials creates different windows of opportunity, of which diversification - in its truest form - is perceived to be of highest risk, (see fig 1).

FIGURE ONE : Opportunities in the marketplace

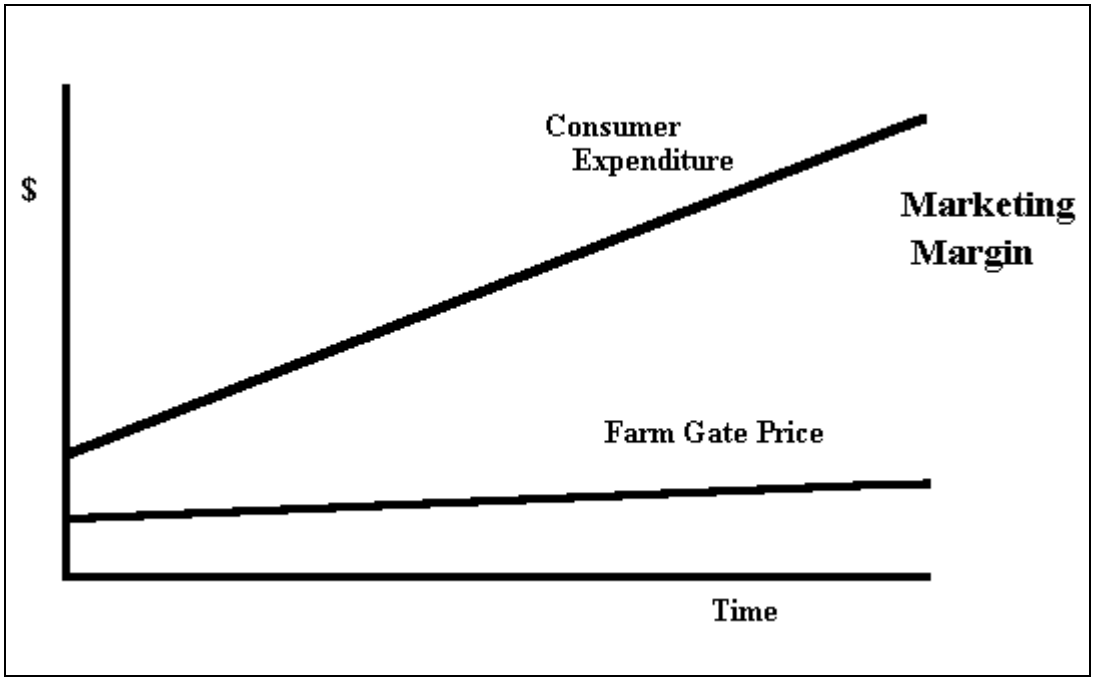
	Current Markets	**New Markets**
Current Products	*Market Penetration*	*Market Development*
New Products	*Product Development*	*Diversification*

Source: adapted from H.I.Ansoff (1988)

In a recent national survey of farm shop owners in the UK 146 respondents were asked to identify the key motives for setting up such an enterprise, (Andrews 1996). The majority of responses inferred that income generation was the principle factor. However, other responses included family employment, better utilisation of farm resources, challenge and fun. This begins to identify the multifactorial driving force behind diversification.

Many European producers have expressed concern regarding the discrepancy between the price the consumer pays for the product and the farm gate price - this is frequently referred to as the ***marketing margin***. What is clear to see from Fig 2. is that this discrepancy has grown over time. This has been accounted for in a number of ways - for example - it is recognised that the consumer demands a greater choice in food purchase, that a greater proportion of the 'food bill' is for processed products, and that most Europeans are prepared to travel to a supermarket, (that would usually employ a sophisticated logistics system), to physically purchase the food. All of these activities add value to the food - bringing it closer to the consumer. In doing so, any of these activities effectively incur a cost which justifies the increasing marketing margin.

FIGURE TWO: The Marketing Margin



Source: adapted from R.L.Kohls (1990)

If the producer were able to add value to the product - be that tangible, (such as processing/knitting), or intangible, (such as transportation to the market-place), then their share of the margin will increase. This is the primary motive of the UK farm shop owner. However is this the case for all diversification activities and more specifically for the fibre industries?

Through a series of market oriented models, one can attempt to identify future opportunities for present and potential contributors to the European fibre pool, whilst highlighting areas of current strength and weakness. The importance of market focus and marketing planning in the fibre sector has been highlighted on many occasions, (Gallico 1994 and Watkins 1995).

THE CURRENT POTENTIAL FOR EUROPEAN FIBRES

There are many areas within the Europe Union with a long history of fibre production; but it is only over recent years that efforts have been made to develop production operations for such fibres as cashmere, angora mohair, alpaca, llama and fine wool. Many of these projects have been exclusive to a particular region or state, and few have since attempted to develop strategic and commercial alliances between such groups.

FIGURE THREE: The Management Of Fibre Production In Europe

	France	Denmark	UK
Angora mohair goat	Mohair society 50t fibre produced Asecaum & France Mohair government support sale: farm shops	Mohair society 8t fibre produced Dansk Naturfiber employ state support sale: farm shops	Mohair society 50t fibre produced British Mohair Marketing no gov't support sale: processors
Cashmere goat	only a little produced localised sale	only a few animals	SCPA society <1t fibre produced Cashmere Breeders EU funding sale by members
Camelid (lama)	only a little produced localised sale	only a little produced localised sale 20 society members	2 societies 4000 animals >200 owners little fibre sold

Source: S.M. Andrews (1997)

The current relationships between interested parties, related to the European fibre producing groups, can be illustrated by examining the behaviour of three animal groups in the three main fibre producing European states: Denmark, France and the UK., (see fig 3). All three groups are represented in the three named states to a greater or lesser degree. The typical characteristics of the stronger groups would appear to be the employment of a high profile breed society and the collaboration of members to improve the *marketability* of the product

By controlling the supply chain, it is possible to avoid transfer of title regarding product ownership and, under such circumstances, the marketing margin remains with the producer, (or *grower* as many prefer to be called). Through co-operation, scale economies can be achieved permitting growers to effectively replace the roles of the intermediaries. Due to relatively low world prices, many European fibre enterprises are unable to generate sufficient margins from production alone. Through co-operative, value-added diversification, the total margin to the producer may be increased thus economically justifying the enterprise, (assuming market demand exists).

This final assumption holds the key to a successful venture. Even with state/EU support, breed societies and added value processing through co-operatives, a lack of market focus and consumer orientation will still limit the scope of any project. This is demonstrated in the French mohair and the Scottish cashmere ventures, both of which currently appear to be experiencing decline in membership and total output.

By contrast the Danish mohair producers appear to be exploiting new market opportunities and have been experiencing a growth in adopting growers. The key reasons for the success of this relatively new enterprise are the motivation and co-operation of a few individuals, who have demonstrated a determination and genuine faith in their new product. The fibre is being processed by a producer controlled initiative: Dansk Naturfiber (DNF). Current trends indicate that the national demand for Danish grown mohair products have completely outstripped supply.

Growers have received the benefit of state support; but this has had to be funded by the breeders themselves through the angora breed association. Together, the Mohair Society, the Danish Agricultural Advisory Centre and DNF have developed a simple, yet sophisticated, method of production and supply to the consumer, that is both cost effective and provides a viable return to the grower - subsidy free.

In its simplest form, the grower provides the fleece to the DNF fibre pool. It is then graded, cleaned and processed in bulk to form nearly two tonnes of yarn and woven products. The cost of this process is funded by the grower on a per kg basis, identified from a model developed at the Advisory Centre. The fibre is then returned to the grower as either blankets, socks or spun yarn, according to the needs of the grower.

It is then the responsibility of the grower to identify a consumer for the product. Since the development of the project, over 25 exclusive farm shops have evolved in a variety of forms serving a number of different types of consumer from the local knitter to the German tourist looking for the most exclusive of knitwear.

With the aid of a design group, a number of products exclusive to the DNF group are available, or if the consumers so wish, they can purchase the yarn and the design, and knit the garment themselves. It is the careful implementation of designs - of a clearly defined Scandinavian origin - that is seen to add value to a totally regional production and processing initiative.

The target consumer is the tourist - both Danes and Germans - who expect to pay more for a locally produced and designed quality garment. In this way, the Danish growers have identified a truly diversified window of opportunity for their garments - both in terms of new product/design development and in terms of niche market development.

The scheme of payment and production is also sufficiently flexible to suit a variety of production interests. The pricing structure permits growers to buy back more fibre from the DNF fibre pool than they produced. Therefore, by means of a simple pricing mechanism, a grower can opt to do no more than send his fibre to the pool and await the purchase from another grower. In return he will receive up to four times the world market price for his fibre. Alternatively a grower may elect to purchase more fibre from the pool that was supplied in order to satisfy the grower's retail needs.

THE FUTURE POTENTIAL FOR EUROPEAN FIBRES

In order to appropriately analyse the market opportunities for value-added fibre growers, a *SWOT analysis* is employed - demonstrating the internal environmental strengths and weakness of fibre growers and the external opportunities and threats facing the future European fibre producing industries. A general view of key factors within the fibre growing sectors are highlighted in the following broad analysis, (Dibb 1994):

Strengths

- Clearly, any factor which increases the margins of the producers is a strength. Co-operation to exploit economies of scale have, (in the case of UK mohair), lifted growers from a point of net enterprise loss to a point of modest profit.
- The small size of the individual sectors permit greater flexibility to changing consumer opportunities.
- The employment of niche, quality designs to compliment a quality product may well position the grower to exploit a regional competitive advantage.
- The greatest observed social strength of the majority of all European fibre growers is the dedicated, positive mental attitude towards the product, its origin and its quality. however, this sheer determination often deflects attention away from the consumer whilst maintaining a driving focus on the product.

Weaknesses

These can best be described through five observations -

- Sectors are product not market driven
- Most growers have limited and insufficient access to market information
- Horizontal communication between growers is often limited
- The size of many sectors is too small to maximise scale economies
- There is insufficient state/private support for the European grower

Opportunities

- Greater co-operation within breed groups will increase efficiencies whilst scope also exists for new links and stronger links between different breed groups / member states.
- There may be many new opportunities to develop niche positions. Some are currently being tested in the UK.
- A strong communicating body with a quality product needs to be aligned with strong design development
- A stronger focus on the consumer market trends will provide new market-driven opportunities

Threats

- The greatest threat are the larger fibre producing countries with a long history of quality fibre production. Any increase in supply from the EU, may well evoke a competitive response from such third countries.
- Production and processing sectors are shifting - for example - the Chinese are limiting the supply of Cashmere onto the World market to encourage a stronger focus on home processing. This may shift the processing centre from Northern Europe and thus create potential trade barriers for European producers.
- The consumer is a dynamic concept - changing consumer tastes have led to a cyclical pattern of supply and demand in the fibre trade which can destabilise European production.

CONCLUSION

Today, through resilience, entrepreneurism and faith in a quality value-added product with unique characteristics, the Danish mohair growers are experiencing a steady growth in their industry, contrasting the economic climate of the UK and French mohair sectors. This demonstrates the importance of leadership and communication of initiatives to all parties. It is essential for the survival of any small group, that there is a clearly planned, designed, executed and focused marketing plan - that is adopted and employed by all parties.

Given the relatively small size of the European sectors in comparison to the larger fibre producing nations such as South Africa (mohair), China (cashmere), and South America (lama fibre), the greater opportunity may be exploited through strong European integration of value-added, co-operative programmes. However, this must be cautiously pursued so as not to diminish the regional specialisms that have successfully evolved in certain niche areas.

It can be concluded that there is yet still a need for a closer identification of the market place, in order to design and produce the right type of product, to the right location at the right price, to meet the wants and needs of the target consumer. Furthermore there is a need for stronger co-operation in order to truly exploit the economic opportunities of added value diversification.

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Location of optimal areas for the development of an alternative livestock species: the cashmere goat

Kate Corcoran, Barry Dent, Julian Smith & Pablo Lara

SUMMARY

Optimal areas of location for the development of livestock enterprises within the European Union can be identified based on a classification methodology using ranking and weighting of physical, climatic and socio-economic characteristics for areas being evaluated. Two less Favoured Areas (LFA) in hill and upland situations in Andalucia in Spain and Scotland were classified sub-regionally in order to identify optimal areas for the location and development of cashmere goat production.

ARC/INFO Geographical Information System (GIS) facilitated the ranking and ordering of spatially variable characteristics and was an integral part of the overall enterprise location 'decision support system'. The technique of spatial overlay allowed areas coincident for optimal characteristics to be identified and mapped in sequence to produce a final map of optimal areas. The order of coverage overlay (thematic layers of information) was significant with areas where characteristics were judged to be most limiting, eliminated first. The order of coverage overlay was as follows:- LFA status (Sub-group 'Areas at Risk of Depopulation') overlaid with areas satisfying altitude > 400 ms. Areas satisfying both these criteria were then overlaid with climatic maps and resultant areas classified as optimal, sub-optimal or unsuitable. Administrative areas corresponding with the second overlay were identified and scored based on a number of socio-economic criteria to give a final map with a five category optimality range. The spatial units used in the analysis were the 'comarcas' in Spain and the 'region' in Scotland. Socio-economic factors considered in the administrative scoring process were: presence and level of sheep and goat subsidy; land area (SAU); goat and sheep population; milk and meat goat population; goat and sheep slaughter numbers; number and size of farms and population density.
The process was robust in firstly identifying areas of suitability and secondly in providing a methodology which could take account of changing levels in one or more characteristics.

INTRODUCTION

Structural adjustment is now firmly a feature of EU farming and a both rural and farm diversification promoted widely through EU policy. The policy context of the post Structural Funds reform period since 1988, has been: firstly to move away from production centred support instruments which, for the livestock sector has seen a high proportion of previous support decoupled from output, though this has been in part replaced by headage payments. A second post-reform measure seeks to provide the means for a wider integrated rural development policy through support measures targeted at designated Objective Areas, with Objectives 1 and 5B relating directly to disadvantaged 'Less Favoured Areas' (LFA)s. For agriculture in these areas this has resulted in funds being made available for diversification of farm enterprises where enterprise options to provide viable farm-family income are limited and where average incomes in LFAs are currently 50-70% of those achieved in non-LFA areas (Commission of the European Communities, 1993). The impact of farm diversification to supplement farm income has been disappointing and uptake low. While current policy seeks to encourage diversification, a more integrated approach of extension support, enterprise economic assessment and initial targeting of areas with a high probability of success is necessary if more diversification is to occupy a permanent place on farms. Policy makers need information or rules upon which to base decisions on improving the uptake of alternative enterprises. This study concentrated on developing a methodology for identification target optimal areas for the alternative ruminant, the cashmere goat. The production fibre and meat from cashmere goats represents a potentially sound extensive diversification option (Milne, 1993; Corcoran, 1994). Optimal locations are likely to be for those areas which provide most favourable conditions when the interaction of physical, climatic and socio-economic characteristics are evaluated. The hypothesis presented here is that 'if the optimal occurrence of characteristics are spatially located and ranked, based on the scoring and weighting of relevant factors, then areas which are 'most favourable' for a particular enterprise can be positively identified and ranked.

Geographical Information Systems (GIS) provide effective tools for this type of reasoned land evaluation processes through the development of decision rule structures and predictive modeling (Eastman, 1993). Siddiqui, Everett and Vieux, (1996) used a GIS spatial analytical hierarchy process (AHP) to take into account regulatory restrictions, area attributes and site assessment criteria provided by experts and/or users, for a preliminary landfill site assessment in Cleveland County, Oklahoma. In the present study, AHP ranking methodology using choice heuristics and selection rules, was used to locate ideal areas for the development of cashmere goat enterprises. These were Andalucia, Spain and Scotland, UK.

SPATIAL DECISION SUPPORT

Decision rules typically contain procedures for combining criteria into a single composite index together with a statement of how alternatives are to be compared using this index. They are structured in the context of a specific objective. The nature of that objective serves to guide the development of the structure used in a particular decision rule and the relative weighting given to criteria used are in turn guided by expert opinion. In the analysis of spatial or thematic information, decisions on the selection and ranking of features within each thematic layer and the order in which these layers of information are overlaid is critical for the results generated. For spatial overlay using Boolean criteria (/constraints), suitability solutions usually lie in the union or intersection of conditions. In order to evaluate areas of suitability for cashmere goats in Andalucia, the following spatial overlay sequence was used to select areas of coincident and consistent high suitability: areas of favourable LFA status/ risk of depopulation, Objective 1 or 5B status, altitude and climate (favouring goat systems). Superimposed on these areas were administrative areas (*comarcas*) each carrying an index of suitability based on criterion scores and weightings of those factors considered to be essential in the evaluation process. As factors were continuous, (less to more important) a weighted linear combination in which weightings were applied to factors, followed by a summation of results yielded the suitability scores (Eastman, 1993).

i.e. S = w ix i where s = suitability
wi = weight of factor I
xi - criterion score of factor I

Scales upon which criteria scores were based were subjectively standardised. The development of weights was based on a pairwise ranking process developed by Satay (1977) using AHP where the weights sum to one. Weights are derived from the comparison of the relative importance of the two criteria involved in determining suitability for the stated objective (Table 1). On a 9 point continuous scale, a value is given for the relative importance of paired factors laid out in a matrix such that a high priority rating is given a high score for the factor row (e.g. 7), whereas a low relative rating for the factor row would be given an inverse score of 1/7 (Figure 1).

1/9	1/7	1/5	1/3	1	3	5	7	9
Extremely	very Less	strongly important	moderately	equally	moderately	strongly More	very important	Extremely

Figure 1: The continuous Rating Scale

For Andalucia, the suitability score index was calculated using the single objective 'areas which offer best potential for a cashmere enterprise at the current time for each relevant

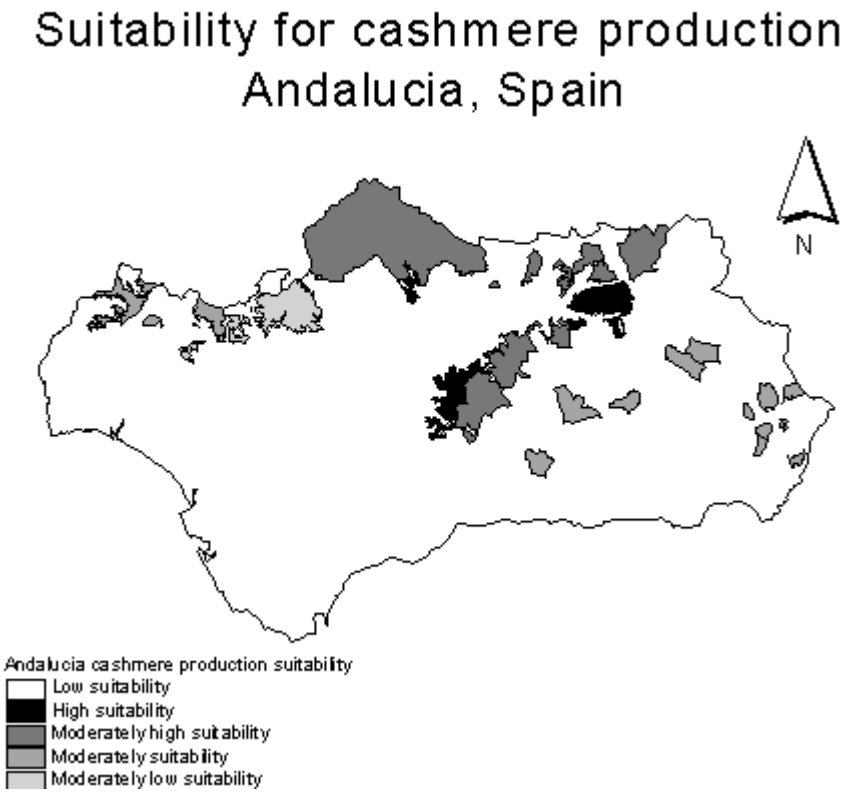
Finally the procedure sums the weights within each column, divides each co-efficient by the sum and then averages over all columns to produce a *best fit* approximation set of weights. This procedure achieves a good

approximation with Satay's (1977) *best fit*, produced by computing the principal eigenvector of the pairwise comparison matrix (Table 2).
Suitability maps were produced for both areas in ARCVIEW following the union of spatial and weighted attribute data. Spatial polygon data coverages were digitised using ARC/INFO ADS at a scale of 1:1,000,000. At this scale discrete farm polygons are lost and mapped output reflects potential at a low resolution. The overlay procedure followed to compile the 'optimal location' map is given in the APPENDIX.

RESULTS

The coverage overlay order in the UNION process and the ITEMS chosen for reselection influenced the polygons satisfying the selection criteria and the spatial distribution of selected polygons on the final suitability map. The inclusion of 'Mountainous Areas' within the LFA selection would have taken in additional tracts in Huelva, Cordoba, Jaen, Granada, Almeria and the northern part of Malaga. However the addition of the constraint of areas with an altitude greater than 400 metres was felt to allow the 'theme' of depopulation to be modeled at altitudes where hill farms exist. The climate ranges selected were: 'cold and hot steppe' and 'temperate warm and hot summer', these having to occur in areas above 400 metres. No upper constraining limit of altitude was included in the evaluation process although this constraint is valid and would have eliminated further areas from the final suitability map.

An evaluation of land areas suitable for cashmere goat enterprises in Andalucia., was carried out at the University of Cordoba in 1996. This produced a high degree of consistency with areas identified and provided validation of the AHP methodology (Lara, 1996). This ground-truthing was essential when the weighting and ranking of factors was carried out outside Andalucia.
Map 1



HtmlResImg

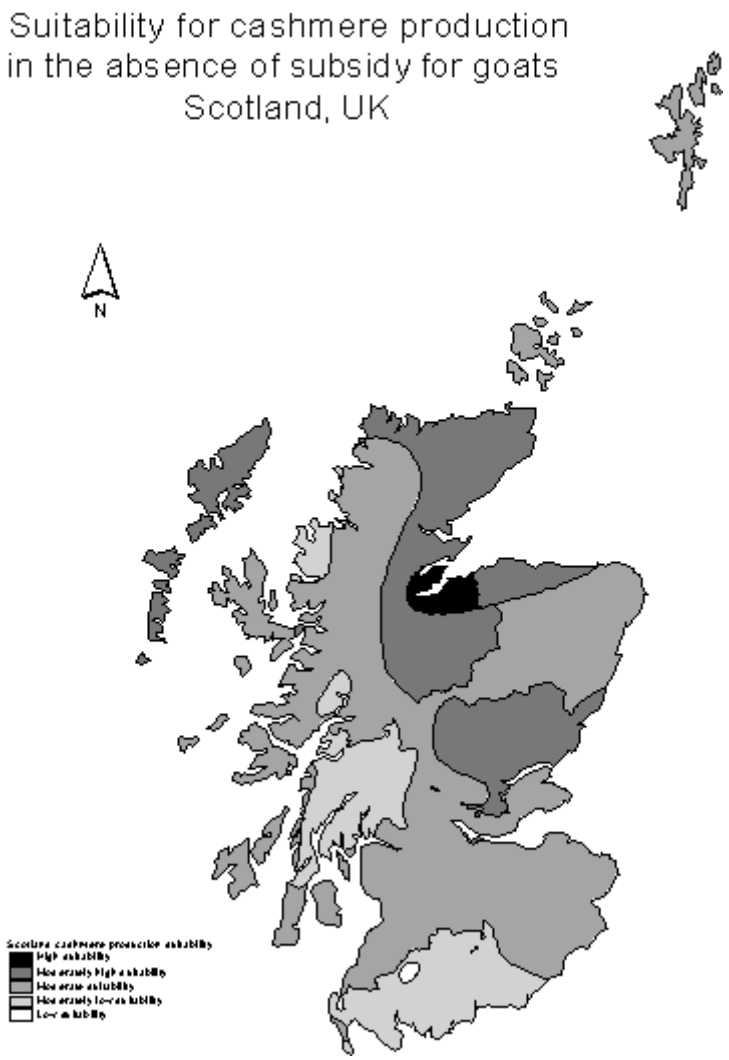
Map 1, includes areas in the following comarcas: Alhama, Alto Almazora, Anavalo Occidental, Bajo Almazora, Baza, Campina Alta, Campina del Norte, Campina del Sur, Campo Tabernas, El Condado, Guadix, Huescar, Iznalloz, La Loma, La Sierra, La Sierra Norte, Pedroches, Penibetica, Sierra, Sierra Cazorla and Sierra Morena. The factor 'common grazing' not relevant in Andalucia, would serve to modify index scores in Northern Spain.

Map 2 indicates areas where goats might targeted under the present 'no subsidy' regime in Scotland. In the absence of subsidy paid on goats, LFA 'specialist sheep' was taken as a proxy of land use suitability for fibre goat systems. Precipitation was then overlaid on this 'composite' coverage with the rainfall range divided into six suitability categories falling between 500 and 3000 mm. Areas with a rainfall above 1500 mm were considered least suitable with those between 500 - 1000 mm suitable on a sliding scale. This product coverage was then overlaid with the administrative regional boundaries which carried the suitability index score for attribute agricultural data. The area with highest 'suitability' lies in the north around Inverness where rainfall is lowest at 500 mm per annum. Moving to the next suitable zone - 'fair to moderate suitability', more extensive tracts of Highland Region, upland Tayside and the southern part of Grampian Region were selected. These areas have a low to moderate rainfall with high levels of extensive sheep systems. Areas in the west in Highland Region, Argyll, Strathclyde and Ayrshire and in the north east in Grampian Region, Fife, Central Region Lothian and borders have 'moderate to poor' suitability ranking. This rank reflects a combination of factors which scored low for goat production in these areas: high rainfall, poor access to grazing or the presence of a high level of non-LFA farms made up by arable, intensive livestock, or mixed farm types for example.

Map 3 shows areas of suitability within Scotland if subsidy were extended to goats in line with levels applied in southern European countries i.e. at 90% of sheep subsidy. LFA areas carrying Highland and Island Enterprise attracts highest subsidy and scored highly. Map 3 reflects the a situation where higher scoring, extensive

specialist sheep target areas, frequently to fall within areas of higher rainfall, which carry a lower ranking. This gives an end-picture of higher suitability in northern highland areas, becoming marginally less suitable moving south through Argyll. Grampian, Central Region Tayside, Strathclyde, Dumfries and Galloway and eastwards through the Borders region to carry a 'moderate' suitability rank. The areas of Fife, East Lothian and Berwickshire have a 'least' suitability allocation being the principal cereal growing areas of Scotland. Other areas to the west in Ayrshire also carry a low suitability rank due to a high concentration of dairying in the locality.

Map 2



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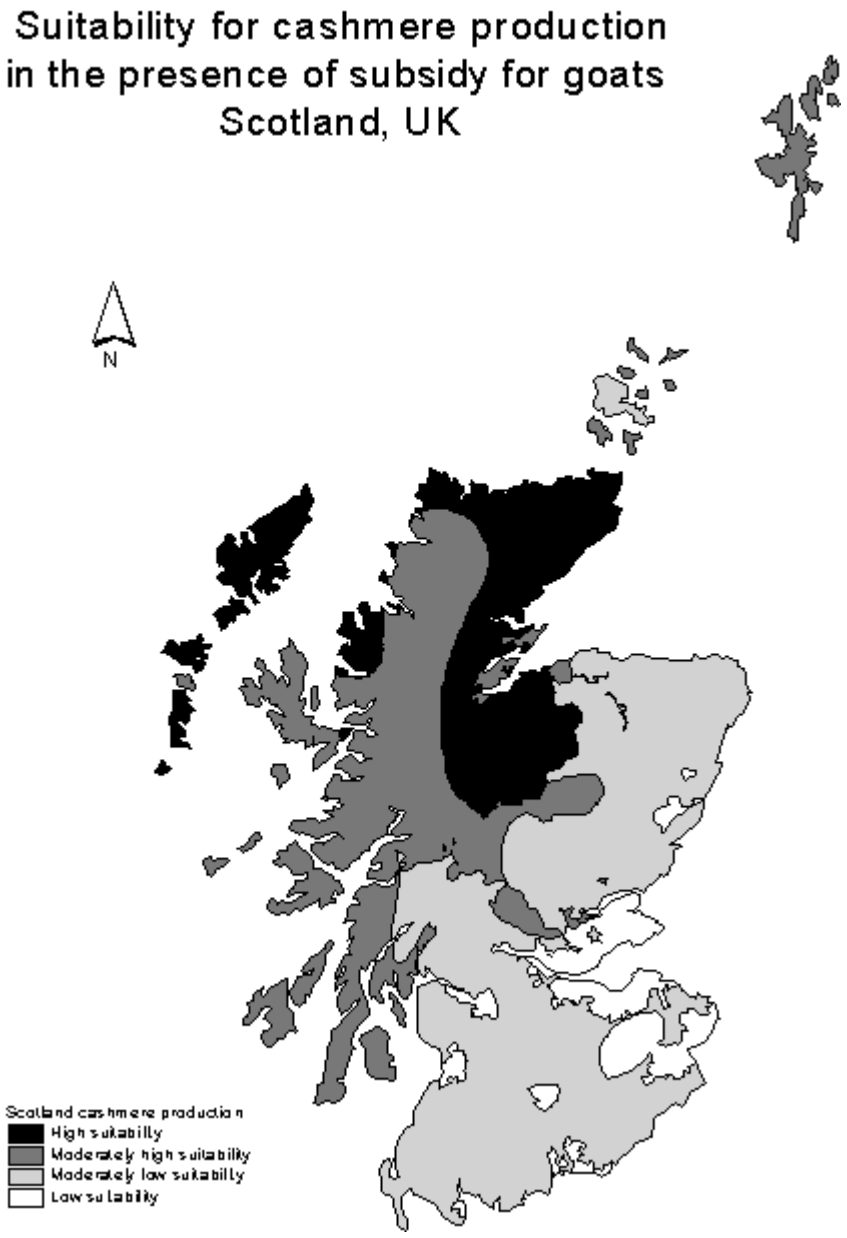
The Islands region varies in suitability ranking: Orkney, being lowland in type has a fair suitability based on lower levels of existing sheep production, while the opposite situation exists in the north in Shetland. The Western Isles have a high suitability rank due the high score given to common grazing in this area. The availability of common grazing and high sheep density offset the high negative rainfall score and small holding size which could reduce the suitability scoring. For Scotland expert opinion has suggested that areas with higher precipitation should be allocated lower scores at the pairwise ranking matrix stage.

Map 3



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DISCUSSION

The process of spatial overlay and analytical hierarchy process for indexing factors in the attribute evaluation was robust, firstly in identifying areas of suitability and secondly in providing a methodology which could take account of changing levels in one or more characteristics by rerunning the overlay process and/or recalculating the *best fit* set of weights. If the location of the optimal occurrence of characteristics can be scored in this way and areas which are deemed 'most favourable' for a particular enterprise identified, it follows that the process could

evaluate between competing enterprises for allocation of land resources for example. Optimal location could also be alternatively given as area where profit can be maximised from an enterprise; also fibre production and carcass weight or the farm-family labour resource could be used most efficiently.

The methodology proved successful in identifying areas of suitability in Andalucia based on validation from within the area. The procedure is transferable in that local weighting and ranking of key factors which affect or influence area selection can be carried out for a range of livestock location exercises across Europe. Validation in Scotland was not possible at the current time due to the low goat population and number of goat enterprises.

CONCLUSIONS

Processes for evaluating information which helps decision makers and practitioners choose between alternatives are vital, if benefits derived from public monies are to maximised and unsuccessful schemes minimised. This study shows that initial target areas can be identified based on expert evaluation of current knowledge.

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THE ROLE OF LIVESTOCK IN HABITAT MANAGEMENT

J.A. Milne and K. Osoro[1]

Introduction

Many of the ecosystems found in disadvantaged areas of Europe are managed through the presence of large herbivores, mainly domestic ruminants. The impacts of domestic ruminants fall directly on the vegetation and soils but they also influence birds, mammals and invertebrates and affect landscape value and water quality. Grazing impacts can be found at the level of the individual plant, the patch, the plant community and the landscape (Senft *et al*., 1987; see Figure 1). They are a function of the density of individual ruminant species, even when expressed on a livestock unit basis, their foraging behaviour, ie where animals graze, and their ingestive behaviour, ie what animals choose from a particular grazing site. The combination of these effects result in the major impacts of vegetation offtake, trampling damage and excretal return which have in addition a strong between-season and between-year temporal basis and, particularly, an important spatial dimension. These need to be understood if the role of livestock in habitat management is to be quantified.

Impacts of grazing biodiversity at the field scale

Defoliation of a single plant can influence plant species composition by reducing the ability of the plant grazed to compete with other plants. Species vary in the ability to withstand grazing depending, inter alia, upon the position of their apical meristem. Trees are less resistant to grazing than shrubs or forbs with grasses being the most resistant. Within each of these vegetation types, there are differences between species with, for example, annual forbs being less resistant to defoliation than perennials and tussock grasses less resistant than tillering grasses. Preference by grazing animals is also important; a plant which is highly preferred and with a low resistance to defoliation is likely to be unable to compete. This combination does not occur frequently in grazed plant communities and hence is one reason why rapid shifts in species in a plant community, which has been grazed for some time, do not occur.

Between the patch and community scale Grime (1979) postulated a now widely accepted bell-shaped relationship between plant species diversity and standing plant biomass or grazing pressure (see Figure 2). High and low grazing pressures produce few plant species whilst intermediate grazing intensities lead to maximum species diversity. In temperate areas of Europe the grazing pressures which maximise grass growth and animal output per hectare, and give acceptable levels of individual animal performance, require sward heights of 4 cm and 8 cm for sheep and cattle respectively (Hodgson, 1990). Such sward heights, especially the 4 cm sward heights, are equivalent to high grazing pressures in Figure 2. In a long term study at 3 sites Marriott *et al*. (1997) conducted an experiment whereby sheep grazed swards at 4 or 8 cm for a period of 6 years and where impacts of fertiliser had also been removed. The grazing intensity on the 8 cm sward was reduced by between 40 and 70% compared with a sward maintained at 4 cm. Over 6 years little appreciable change in species diversity occurred. It was only when grazing was removed altogether that rapid change occurred. At the field scale large changes in plant diversity are unlikely to occur by simply lowering stocking density. Indeed there are some circumstances where a general reduction in grazing pressure can actually reduce species diversity. Smith *et al*. (1996) showed that the further that the grazing management moved away from a system of hay-making and specific high grazing pressures in the autumn and spring, the greater was the reduction in plant species diversity.

Grazing pressures which create maximum plant species diversity in grassland are also likely to lead to increases in the general species diversity of invertebrates, particularly of the phytophages and predators, although there will be a reduced diversity of soil decomposers, scavengers and parasitic insects because there is less dung produced and less animals (Curry, 1994). As for plant species diversity it is likely to be a combination of different management strategies involving, for example, grazing by different species at different intensities and at different times of the year that will maximise diversity (Dennis *et al*., 1995). For small mammals and birds within small territories a combination of grazed areas, often suitable for the provision of food, and ungrazed areas for shelter and nesting are often required to maintain high levels of diversity.

Milne and Fisher (1994) modelled the effect of increasing the patchiness of pastures, as represented by the proportion of tall grass in a sward, on individual animal performance. From Figure 3 it can be seen that, once patchiness of tall grasses reached proportionally about 0.40 of the sward, appreciable losses in individual animal performance occurred. It can thus be concluded that the types of grazing management systems that are required to maximise individual animal performance, and also output per unit area, are unlikely to maximise biodiversity. Specific management systems already exist which provide high levels of diversity in disadvantaged areas but the design of further grazing systems to achieve that objective is unlikely to be met by simply reducing stock numbers and hence grazing pressure.

Impacts of grazing on biodiersity at the lansdcape scale

At the landscape scale the foraging behaviour of farmed ruminants becomes important in determining which plant communities are grazed and in what seasons they are grazed. A commonly used paradigm is that animals distribute themselves about a resource in relation to the digestibile energy intake that they can derive from each of the components of the resource. Different species also have different abilities to harvest vegetation. For example, sheep graze closer to the ground and are more selective in their grazing than cattle while cattle and goats are more able to harvest tussocky grasses than sheep and goats often select a more fibrous diet than sheep. This is illustrated in Figure 4 where at high biomasses sheep and cattle eat predominantly the same diet but at low biomasses cattle eat more of the less preferred species. Another example of the difference between species in grazing behaviour is illustrated well in an experiment conducted in the north of Spain where sheep and goats grazed the same initial vegetation mix of shrubs and herbaceous species for a period of three years. As can be seen from Figure 5, after three years, goat grazing had reduced the proportion of shrubs relative to that of sheep grazing because of the different dietary preferences of the two species with the goats favouring a more shrub-based diet. The temporal basis of the pattern of species grazing also had an effect. Hence different animal species can have different spatial and temporal grazing patterns in relation to their stocking intensity and therefore can have different impacts on the vegetation. This has significance in relation to the balance between the density of different grazers and habitat management to achieve natural heritage objectives.

Impacts of grazing on the vegetation at a landscape scale in terms of changing a plant community type are generally relatively slow. Depending upon the grazing pressure, they can take from 10 to 50 years to occur. Such change is not necessarily linear but is usally gradual and the rapid state transitions that occur in non-temperate ecosystems do not often occur. Figure 6 illustrates the changes from one vegetation type to another for the Cairngorms area of Scotland, UK between 1947 and 1988 using aerial photographic interpretation and analysis by Hester *et al*. (1996). It shows that the largest change has been from heath, pine woodland and grassland communities into plantation forestry, which is not through the impact of grazing, but that there are also small changes from heath into grasses associated with grazing.

These changes can be encapsulated into simple predictive models based on experimental evidence and expert knowledge. In Figure 7 predictions of the length of time and the stocking rate of sheep needed to move from one community to another are described for some plant community types in the U.K. These depend upon soil properties and the plant community being grazed. Considerable research effort is currently being expended on developing more quantitative models, particularly in order to describe more adequately the structural changes that take place within a community as it changes from one community to another. This is of particular importance to habitat management to meet nature conservation objectives. It is also important in predicting the effects of reduced grazing pressure on plant community change as this is becoming a major issue in parts of Northern Spain, Italy, Southern France and Greece where reductions in grazing pressure are causing a change from pasture land to scrub and woodland resulting in an elevated fire risk.

It is unlikely that the impact of the density of large herbivores at the landscape scale will influence invertebrate populations because the geographical scale that is important to them is at the scale of the patch or the field. The impacts of large herbivore densities on bird and mammal populations can be various. The balance between grassland, scrub and woodland can be important for a whole range of species in providing appropriate feeding and nesting sites. Reduced domestic livestock numbers will reduce on the one hand the amount of prey and carrion from domestic animals but on the other hand will increase the number of wild prey because of the changed structure of the vegetation and may also provide improved habitats by virtue of increased cover. An

example of this is the reduced livestock numbers and associated management by man of them in North Spain and the increase in woodland providing the opportunity for wolves to show considerable increases in numbers (Zorita and Osoro, 1995).

Conclusions

It has been demonstrated in this paper that farmed ruminants play an important role in habitat management to influence biodiversity objectives. This is not to underestimate the need to understand better the habitat requirements of particular taxa or species, particularly those which have a rarity value, to augment the general understanding of the impacts of ruminants. The particular role for farm livestock in habitat management will depend upon the ecosystem found in the different regions of Europe but the application of the general principles outlined in this paper, combined with appropriate site-specific knowledge, can lead to the development of grazing strategies for different farmed species to meet nature conservation and environmental needs. These strategies do not necessarily conflict with animal production objectives and the maintenance of rural human populations.

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Extensive pasture systems in Germany - Realising the value of environmental sustainability"

Rainer Luick

Summary

The current diversity of farming systems and landscapes found throughout Europe reflects a long evolutionary history. Today, as a result of various economic and social pressures, a point has been reached where it must be decided if many of the more vulnerable, extensively-used of these regions, often tose with European ecological importance and cultural tradition, are to disappear within the next generation. The study presented in this paper intends to give a brief overview of the status of low intensity farming systems in Germany focusing on regions which are related to pastoralism with sheep and/or cattle. As case studies the Black Forest and the Swabian Jura in the Federal State of Baden-Württemberg are presented. Both regions can be considered as less favoured areas (LFA´s), but of high ecological value. For these regions details of the current agricultural situation, developments to be expected in the years to come, policy measures needed to preserve the cultural and ecological richness of the regions, and options for land-use-systems are discussed in relation to one another.

1. Introduction

Germany is probably not the first place that comes to mind when talking about low intensity farming systems in Europe. The actual appearance of grasslands (meadows, as well as pastures) in most regions in Germany is characterised by intensive agriculture. In marginal areas the mowing and grazing of grassland is increasingly being abandoned, whereas where suitable conditions exist the use of grasslands is ever more intensified.

Large parts of the central European grasslands undoubtedly are the result of cultural-historical processes. From Neolithic times until recently, the pasturing of livestock (since the Middle Ages primarily cattle and sheep) had a substantial impact on the development of different types of grassland. Thus, many meadows with high ecological diversity have their origin in the common grazing practices which existed in Germany for hundreds of years up until the middle of the last century.

The historical types of pasture cannot, however, be compared with modern pasture systems. Previously, pastures extended over vast areas and, because of their low productivity, the density of livestock was very low. Due to poor management the pastures were certainly rich in structures. On the other hand the economic forces for a maximal exploitation of all natural resources were accompanied by overuse and devastation of the landscape. Pastures of this origin would nowadays be characterised as extensive. According to site conditions, the manner of-, and the intensity of grazing, specific plants for pastures and plant-communities were formed. Considering the agricultural history of present ecologically highly-valued extensive grassland it should be stressed that their appearance is mainly the result of the withdrawal of agricultural activities.

Because of the change of agriculture into systems of more intensive productivity, or because of abandonment of agriculture in regions disadvantaged for intensive agriculture, extensive grassland areas have seen a dramatic decline. Figure 1 gives an impression of the locations in Germany where land-use systems with considerable areas of extensive pastures are still be found. The best known areas include the alpine pastures, common grazing in the southern part of the Black Forest, the downs of the Swabian and Franconian Jura, pastures in the Central-German-Hilland-Range (i.e. Eifel, Vogelsberg and Rhön), heaths in Northern Germany (i.e. Lüneburger Heath), lowland pastures along the Elbe-river and flooded saltmarshes along the coast-line of the North and Baltic Seas. It should be remembered, however, that even in these regions extensive-pastures are usually only found on a small scale. It is only as a result of the remoteness and harsh environmental conditions and strong traditional values in these areas that low intensity farming systems have survived and with them some rare adapted livestock breeds.

There are, in fact, regions which correlate very precisely with the distribution of indigenous and endangered livestock species such as the Hinterwald (Black Forest)-cattle, the Red-Vogelsberg-cattle or the "Schnucke" of the Lüneburger-Heath (Tables 1 and 2). But it has to be pointed out that the rare breeds of today do not have many

features in common with their ancestors of the last century. As an example, in the first half of the 19th century the weight of a "decent" cow of a local breed in the Franconian Jura (Baden-Württemberg) was about 150 to 200 kg with a annual milk yield of not more than 1.000 kg (Flad 1987). In comparison, the present breeding aim for the Black Forest Hinterwald-Cattle, which is the lightest and smallest central European cattle breed, is about 400 to 450 kg (Brodauf 1995).

One of the most important aspects in the actual discussion of endangering factors and concepts for conservation of extensive pastures is the question of how agricultural systems can be maintained in regions less favoured for agriculture and how they can be integrated into local cycles of processing and consumption. As examples of how agricultural-policy impacts areas less favoured for agriculture, but of high ecological value, historical processes and current situations are presented for the Black Forest and the Swabian Jura in the Federal State of Baden-Württemberg.

The history of agriculture and agricultural practices in Germany have been widely influenced by the past pattern of farm inheritance. Generally in the northern and eastern parts of Germany are found large holdings as a result of an inheritance systems where the property was not divided but rather passed on to the eldest son. In central and southern Germany, in contrast, farms were often split between all offspring resulting in small holdings with small and scattered field sizes.

In the western part of the Swabian Jura today are found communities where the average size of a field is about 0,2 hectares and the property of a farmer owning 10 hectares may be located in more than 40 separate places. As an example Figure 2 shows a small section of the territory of the village of Hossingen/Zollernalb-District (Zeeb 1996). This pattern is a result of laws of succession when within a few centuries the succession led to extremely fragmented farms with field sizes sometimes as small as the width of a towel. This resulted in non-viable small-scale farms and impoverished rural communities. Historical documents say that the hay yield of a meadow could be carried away with one wheel-barrow.

2. Change of landscape in the Black Forest

Until the middle of the last century, as in most other areas, agriculture in the Black Forest was characterised by subsistence farming. When nowadays we think fondly of those "ecological good-old-days" we are surprised to recognise that historical land-use systems were anything but sustainable. In contrast to modern approaches of what is sustainable agriculture, subsistence farming such as in the Black Forest was often accompanied by an over-exploitation of natural resources and the degradation of soils (Ottnad 1981, Ott 1981, Borcherdt et al. 1985).
By the end of the 18th century, approximately 80 per cent of woodlands in the Black Forest had been lost. The reasons had been overuse, excessive grazing of forests and shifting cultivation systems, with devastating consequences for soil quality, which became common practice from the Middle Ages onwards. A reminder of that era is the so-called "communal pasture area" in the southern Black Forest, which nowadays is a unique example in Germany of a low intensity farming system. It is also the breeding area of the Black Forest cattle, a small and hardy breed which is indigenous to the southern Black Forest. Although vast areas of extensive grasslands have been lost over the past hundred years (due to reforestation and natural succession), the communal pastures still comprise an area of about 10,000 hectares. However, it should be remembered that this historical agricultural system was far from sustainable, and it is only in modern times that the land has been used in a more environmentally sensitive way. Nowadays, the central and northern Black Forest is mainly woodland and in many cases only small strips of cultivated land remain in the valleys (Eggers, 1957; Brückner, 1981; Schwabe-Braun, 1980; Kersting, 1991).
In response to the depleted state of woodlands at the end of the eighteenth century, reforestation programmes were initiated at the beginning of the nineteenth century. However, it is the large scale plantations of recent decades which have had the largest impact on landscape. In general, since 1950, the amount of wooded land has increased by 20 per cent throughout the Black Forest. The current distribution of woodlands in the Black Forest is about 70 per cent in the southern-, 80 per cent in the central-, and about 90 per cent in the northern-part (calculated from official data sources).

In 1968, Sicco L. Mansholt, the former EEC vice-president, made the following statement (Homburger 1981):

"In the year 2000 agriculture in the Black Forest region will have disappeared. Because of disadvantageous conditions for agriculture there will be no further possibilities to compete with other EEC regions where food can be produced cheaper with lower input of labour, techniques and energy. It is envisaged that the Black Forest will develop to an entirely wooded area".
If the political opinion of that time had prevailed, the Black Forest as a cultivated region would have disappeared by now. However, the strategy set by the EC for the future development of the Black Forest precipitated regional protest in the late 1960s and led to the establishment of the Black Forest Programme (Ministerium für Ernährung, Landwirtschaft und Umwelt Baden-Württemberg, 1973; Homburger, 1981). However, although many initiatives have been taken since this time, the future of the region is still more-or-less heading in the direction foreseen by this vision.

The following figures, compiled from various data sources, will briefly show the dramatic decline of agriculture in the Black Forest region within the last 20 years. Although the Black Forest can be easily defined geographically, the political borders are rather complicated because it falls within the boundaries of more than one administrative district. Agricultural statistics are usually only available for entire districts or provincial administrative districts. Therefore, accurate data referring only to the Black Forest area is hard to obtain. For this reason, the data shown refers to the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) which comprises the southern and most of the central part of the Black Forest. Because the region covered also includes some areas of greater agricultural potential (the Rhine valley and the Lake of Constance area) some of the developments in the Black Forest may in fact be even worse. The data used was kindly provided by the: Amt für Landwirtschaft, Landschaftsentwicklung und Bodenschutz Emmendingen Hochburg; Regierungspräsidium Freiburg; Statistisches Landesamt Baden-Württemberg and Staatliches Forstamt Waldkirch.

Figure 3 depicts the decline in the number of part-time and full-time farmers, which have been almost halved in the last twenty years. Of even greater importance, because it threatens the basic economic structure of the region, is the dramatic number of closures of dairy farms (Figure 4). Despite the effects of intensification there has been a loss of about 80,000 dairy cows since 1974 (Figure 5).

On the other hand, it can be observed that due to the availability of premiums, and because farms giving up dairy farming have turned to meat production in their closing years, the number of suckler cows has increased considerably over the last few years (Figure 6). When the data from Figure 5 and 6 are combined, a total loss of at least 60,000 ruminants can be calculated. Based on an average stocking density of about 1 livestock unit (LU) per hectare (the growth and climatic conditions of the Black Forest support 0.5 to 0.7 LU per hectare, equivalent to one ruminant per 1.4 to 2.0 hectares), this can also be expressed as a loss of approximately 60,000 hectares of meadows and pasture in the Provincial District of Freiburg over the same period of time.

A look at the landscape shows that the changes are visible. There are examples of communities in the Black Forest where the wooded area doubled in the last 40 years (Figure 7). Because most of the reforestation takes place in ecologically valuable locations, locally threatened biotopes such as grassland communities with high biodiversity have disappeared entirely. Figure 8 shows the loss of agricultural land to reforestation in a valley in the central Black Forest since the beginning of this century. It shows that only small stripes of cultivated land are left on the valley floor.

One development of great concern (in terms of future impacts) is the level of training for the agricultural sector in the area (Figure 9). Because of the pessimistic outlook for farming, it is understandable that agriculture is not regarded as secure employment. In 1994, there were only 26 trainee farmers (in their first year) in the Provincial Administrative District of Freiburg in comparison to the 250 trainees per year needed to secure the future of about 8,000 full-time farms (current status) in the area. We are already at the point where traditional skills and knowledge are being lost. In practice, information and training are given mainly by means of crash courses of 200 hours duration which aim simply to fulfil the national eligibility requirements for subsidies. This low standard of education combined with the complex demands of modern agriculture gives reason to believe that Sicco L. Mansholt´s vision will be realised.

To summarise the agricultural and ecological situation in the Black Forest, some specific issues are now briefly discussed:

1. Landscape changes due to farm closures have already been dramatic and will continue at an increasing rate. The vision of a "dark forest" is already a reality in the northern part of the Black Forest. There is evidence (so far at least for local examples) that the change of landscape has resulted in a corresponding decline in the numbers of tourists.

2. Dairy farms are caught in a vicious circle. The constraints of the Black Forest dairy complex are as followed: Falling milk prices cause a decline in dairy farming. The combination of fewer dairy farms and increasing collection costs results in milk companies suspending their services in remote parts of the Black Forest. If the remaining dairy farms want to stay in business, they are hindered by EU regulations governing the manufacture and marketing of pure, natural products.

3. One initiative to challenge the agricultural market is the use of premium labels. There are labels on a national, federal, regional and even communal level for various products and quality standards. As the labelling of agricultural products has spiralled, concerns have developed that the use of labels is being abused and that they may give consumers misleading impressions. For example, the label Black Forest Ham implies pig rearing under environmentally sensitive conditions in a region where consumers perhaps once spent their holidays. In reality, since there are few pig keeping farms left in the Black Forest, approximately 90 per cent of the pigs are fattened in pig units as far away as the Netherlands, Denmark and Poland.

4. One crucial problem is the fact that a variety of programmes exist to support extensive agricultural production but here are no initiatives to promote the marketing of the resulting products. A number of measures have been implemented under agri-environment Regulation 2078/92, for example the MEKA programme (Marktentlastungs- und Kulturlandschaftsausgleich) in the Federal State of Baden-Württemberg. MEKA and the suckler cow premium scheme (SCP) may have ecologically positive effects on nature and environment. However, there are also less successful initiatives which focus on extensive pasture systems in the Black Forest. One example is the special premiums available to farmers for rearing rare livestock breeds such as Black Forest cattle, a breed which is especially well-adapted to hard mountainous conditions. The measures aim to encourage the use of grassland in a way that preserves is ecological richness. However when selling meat from rare breeds on the normal market, which is subject to the conditions of the EU meat classification system, farmers receive only low prices, although the meat is considered to be of high quality.

In the current competitive meat market, classifications do not mirror the ecological and physiological value of products and the livestock friendly rearing methods, resulting in farmers going unrewarded for their efforts. Direct marketing is a potential solution to this dilemma, but a multitude of obstacles constrain private small-scale marketing initiatives. As local/regional products do not fit into EU market schemes, their production is of little relevance to, or is even prohibited by EU regulations. For this reason it is difficult and sometimes impossible for farmers to establish local cycles for processing and marketing genuine products. The explanation often given to the public for the inflexible regulations is the attainment of necessary hygiene standards, but there is reason to assume that monopolistic enterprises will become increasingly profitable at the expense of small farms. At the moment, customers are more likely to find Angus beef from Argentina on the menu of Black Forest restaurants than a regional product. It is hard for Black Forest farmers to accept this phenomenon when they are reliant for up to 80 per cent of their revenue on subsidies for low intensity farming, the environmentally sensitive products from which are apparently neither financially valued nor socially esteemed.

5. Farmers find the implementation of EU and national agricultural programmes by the relevant authorities both confusing and burdensome. A 1993 survey showed that farmers have to deal with 58 programmes for infrastructure support, subsidies, premiums etc., (Aldinger et al. 1993), and the details of some of these measures change annually. For this reason, it is already common practice for farmers to employ consultants to help them through the jungle of agricultural bureaucracy.

6. A regional problem, but nevertheless one with ecological impact, is the lack of cattle in the southern part of the Black Forest. Because there are too few livestock to graze the common grassland, special premiums encourage cattle from neighbouring regions to be brought into the area. However, most of the "visiting livestock" are Friesian-Holstein and Simmental cattle. These breeds are heavier and graze and behave differently from the light,

indigenous Black Forest cattle which can lead to negative effects on the soil and vegetation of the pastures. In addition, the decline of infrastructure and the disappearance of hay-meadows for winter fodder are accelerated due to the withdrawal of regional agriculture.

3. Sheep keeping on the Swabian Jura

A well known area in Germany for sheep keeping is the Swabian Jura in the Federal State of Baden-Württemberg. The Swabian Jura, and with it the Franconian Jura, are the only regions in central Europe where a unique form of a transhumance system had developed in the past. However, in contrast to Mediterranean types of transhumance as for example in Extremadura (Spain) or in Provence (France), the Swabian/Franconian one can not be traced back to Neolithic times. Although since the Middle Ages sheep keeping was always of importance for personal and local supply, a proper type of transhumance only developed as late as at the end of the 18th century. Hornberger (1959) lists the various reasons as follows:

As the result of a royal monopoly in Spain for the export of merino sheep and because of political reasons, for a long time it was not possible to introduce them into the numerous kingdoms, dukedoms, counties etc., which comprised Germany until Napoleonic times. Despite of the fact that various well adapted local breeds of sheep existed most of them had the disadvantage of not having a good wool for high quality products and not having the constitution endure long marches. However, in the second half of the 18th century there was political interest to improve/to establish a weaving industry in the dukedom of Württemberg. Eventually, through good contacts it was possible to gain allowance for the introduction of some Merino rams and ewes from Spain. An interesting historical document tells of the journey of Württemberg shepherds in 1786 to southern France and onto Spain to where they were sent to buy the desired sheep. The description of their travel talks about struggles with thieves and wild animals, about losses of sheep and how the Württemberg Merino sheep-breeding programme was set up by crossing pure merinos with local breeds (Volz 1845). A few years later the first flocks took off from the Swabian Jura. Because of the harsh climatic conditions and because of poor and dry soils it was not possible to feed large numbers of sheep from autumn to spring in the Jura mountains. Thus, traditionally the Swabian transhumance worked in the following way: From late spring until autumn the shepherds grazed extended downland areas in the Jura mountains. Depending on weather conditions they sometimes started their marches to lowland regions as far away as several hundreds kilometres as early as in late summer. Typical areas where the Jura flocks spent the winter times were the valleys of the Rhine and Danube and the Lake of Constance basin (Figure 10).

This transhumance system flourished for less than a hundred years, as a rapid decline in the demand for wool occurred in the second half of the 19th century. The reasons had been the substitution of wool by cotton and cheaper wool which was imported from New Zealand and Australia. Today, transhumance in the Swabian Jura exists only on a very small scale. In the heydays of sheep keeping, in the first half of the 19th century, in the dukedom of Württemberg alone the number of sheep in the grazing season during summer was about 600.000 to 800.000 head (Hornberger 1959). At present in the entire area of the Federal State of Württemberg (which is more than twice the size of the previous dukedom of Württemberg) only about 256.000 sheep are counted (Beinlich 1995). Estimations calculate that today during summer just 100.000 sheep graze on the Swabian Jura (Beinlich 1995).

Modern sheep keeping is confronted with many obstacles. The following list briefly discusses the most severe aspects:

1. Until recent times the most important product of all sheep-keeping systems in Germany, matter which breed was kept, was wool. Today, wool has no economic importance at all. Generally the shearing costs are higher than the revenues generated by selling the wool.

2. The revenue from sheep keeping is firstly earned by selling the meat of lambs and secondly comes from subsidies which are derived from several sources (e.g., ewe premium scheme, MEKA-payment scheme). When allocating the total income from sheep keeping it can be shown that wages that can be achieved are only as high as the subsidies. Or in other words the meat prices that can be obtained on the normal market are just enough to compensate for the production costs.

3. The survival of sheep keeping can only be seen in the production of high quality and high priced meat lambs. This point has to be attributed to all sheep keeping areas in Germany. In comparison with the past manner of sheep keeping, when the wool was of major importance, this needs a complete change to the production system. For the large flocks of previous times it was important to have "something" to eat throughout the year. The poor diet that grew on the downs of the Jura mountains was enough for the maintenance of the livestock. The growth rate of the lambs was, of course, very limited. In contrast, a modern and profitable working shepherd cannot make a living (only) on high nature value of the downlands since the production of marketable lambs also requires grazing of better quality. This leads to a limiting point of modern sheep keeping which is the difficulty of finding necessary good grazing for low costs.

Even in the realm of extensive grassland there still is a wide spread of interests. This means that in practice the interests of the shepherds are often challenged by suckler cow farms (due to special premiums suckler cows can be more rewarding than sheep), by farmers producing hay (due to a high level of support hay meadows can be more profitable than the rents of a shepherd), and by afforestation (the better the ground the higher the afforestation premiums are).

4. In the first half of the 19th century hundreds of thousands of hectares of extensive grasslands were grazed by large numbers of sheep. This led of course to overuse and resulted in ecologically depleted areas. Today, on the other hand, there is evidence that extensive grazing with sheep (sites of chalk grassland communities) occur only on about 7.400 hectares in the Swabian Jura (Beinlich 1995). There are various reasons which can account for this development, although the dramatic decline of sheep numbers is of greatest importance. An often neglected issue, but of great concern, is the philosophical discussion of what are subjects and techniques of nature conservation and what is sustainable agriculture. For some decades nature conservation interests have highlighted the ecological richness of chalk grassland communities. Until present, however, it has not been easy to match the interests of conservationists with the demands of a shepherd. Thus, in western parts of the Swabian Jura a situation is faced where up to 90 % of the remaining downs are not grazed by sheep anymore, but rather are artificially managed by means of mowing the swath and disposing of the biomass (Beinlich & Klein 1995). Furthermore the sites with downland are very scattered and are usually quite small. A survey of 1.000 sites showed that most of the plots are smaller than 10 hectares and that most of these are isolated with long distances in between (Figure 11). This is a crucial point when new concepts for grazing would be established (Beinlich & Plachter 1995, according to Meluf 1982).
5. The south-western German transhumance relied upon rules and privileges for the wandering shepherds. As in Provence or in Extremadura there existed a system of special drover roads. Today, the disappearance of such drover roads and the fragmentation of the landscapes by all sorts of transport networks are reasons that make transhumance almost impossible. Modern traffic and sheep flocks crossing highways do not go well together. In addition, if a shepherd finally makes his journey from the Swabian Jura to the valleys of the Rhine or Danube he has to cope with the fact that his traditional winter grazing lands have been totally transferred into intensive maize and/or cereal fields.
6. In the historical times of the flourishing transhumance a flock of 100 ewes was enough to make a reasonable living from. Today, a shepherd has to have at least 700 to 800 ewes, which are just enough to make a poor living with.
7. From a nature conservation point of view shepherding by transhumance evokes sentimental feelings: "living in harmony with nature". But one has to be aware that shepherds at all times have been more the "social outcasts" than a profession with social esteem. Living without any familiar privacy for the most time of the year and under circumstances which can be even worse than primitive is anything but a desirable perspective. It is little wonder that almost nobody wishes to live as a transhumance shepherd anymore.

4. Why support agriculture in the less favoured areas of Germany and what are the future perspectives?

The reasons why agriculture is needed in the Black Forest or on the Swabian Jura are comparable to most other regions in Europe which, under the prevailing conditions, are considered not to be competitive in the European market. They simply cannot compete with the present market schemes for as long as prices do not account for the negative environmental impacts of most agricultural systems.

- Agriculture and viable rural communities in the Black Forest and on the Swabian Jura are necessary because they result in:
- the preservation of landscapes with cultural values having long traditions;
- the production of high quality food;
- the rearing of rare livestock species;
- an economic basis for tourism;
- the provision of recreation areas for urban populations;
- a basis for the maintenance of infrastructure for settlements (schools, medical care etc.)

These points should make it clear to decision-makers that agriculture is necessary for many reasons, of which food production is only one. Food production in regions like the Black Forest or the Swabian Jura is, of course labour intensive and therefore expensive, but in contrast to many other regions farming may be considered sustainable.

An aspect which is usually badly neglected in rural development concepts is that of missing sensibility. A scenic landscape as a product of agricultural activities is highly estimated by visitors as well as by entrepreneurs of the tourist sector. But this sensitivity for agricultural landscapes does not exist when the habits of consumption and the food sources of these same visitors are investigated. Rössler (1997) unveiled interactions of tourism and the benefits for agriculture in the central part of the Swabian Jura: In 44 restaurants in the Lauter-valley (the Lauter-valley and the surrounding area is one of the regions in the Swabian Jura with the richest chalk grassland sites) the consumption rate of lamb is only about 1,2 % of the total meat (= 1,505 kg). Further more, significant parts of this small amount (because it can be bought cheaper from catering services) comes from abroad. What is lacking in the first place is an awareness of the interdependence between the performance of landscape, ecological richness, low intensive farming systems and consumption behaviours. Rössler (1997) calculated that if the consumption of lamb in the Lauter-valley restaurants would increase from 1 % to 25 % this would mean that about 1.506 ewes more could be kept and, accordingly, 628 hectares of downland could be managed/preserved in a natural way. To achieve this aim needs a change in consciousness of the people, a change in the mentality of the restaurant owners, it needs creative cooks with recipes that consist not only of lamb chops, shepherds with marketing competence, and probably the most important point, it needs intelligent moderators/programmes to merge these various interests.

A low public awareness and missing concepts which integrate the interests of farming, nature conservation, landscape development, regional crafts, tourism and forestry, are probably the most crucial points that have to be addressed when talking about policy issues of LFA´s and failures of existing integrative rural development models. At the moment all the disciplines mentioned like each to experiment with their own ideas and administrative structures. However, they are often not conducive to co-operation between interests. There are already numerous and sophisticated landscape development concepts which have been developed in the Black Forest and in the Swabian Jura (e.g. Auctor, 1991; Landsiedlung Baden-Württemberg GmbH, 1992 a; b; c; d & e, Beinlich et al. 1995, Hampicke & Tampe 1995), but these approaches often lack cross-compliance and advice to facilitate practical implementation.

Albrecht (1996) investigated interactions between communal policy, local/regional agriculture, tourism/gastronomy and the appearance of landscape in the Western Lake of Constance area in the Federal State of Baden-Württemberg. As one aspect tourist publicity was analysed for 25 communities. It was noted how often certain features had been used. The following categories were distinguished: 1. landscape, flora and fauna, nature conservation aspects; 2: community, architecture, historical sites; 3. gastronomy; 4: sport (events/activities), 5. culture (events/activities). Figure 12 presents the results: As was almost expected the most important attributes to attract tourists were the categories 1 and 2. Additionally, in a questionnaire, mayors and/or people responsible in their community for the tourist sector were interviewed. One question was designed to assess the average input of local or regional products in the local restaurants (excluding beverages). Figure 13 shows the results. The estimations given suggested that up to 80 % of the food input derives from local/regional sources. However, only one interview partner was near to the real situation, which is that the average percentage ranges from 0 % to a

maximum of 5 %. These figures are once more a hint at the discrepancy between perception and true reality in the discussion of rural development policy.

What action is needed to ensure that (extensive) farming in high nature value regions such as the Black Forest or the Swabian Jura can be maintained for the future? First of all there is the fundamental question of whether those regions disadvantaged for agricultural productivity in terms of morphology, soils and climate should be maintained as a cultivated area under the premises of current and future (EU) agricultural policy. As landscapes have ever evolved from a conservationist point of view, it will sometimes be hard to accept that, because of demographic and social change, future farming systems will be different from now. In the same way, the composition of landscape and biotopes will change.

It is probably going the wrong way to give further support to dairy farms at high altitudes in Black Forest and encourage them to increase their cattle numbers yearly, and to then pump the resulting milk into the European milk reservoir. It might also be a wrong approach to only think of preserving the downs of the Swabian Jura by transhumance.

As the current saleable products of greatest economic interest coming out of landscapes rich in extensive grassland are meat and milk, we firstly have to think of producing high quality meat and dairy products. To make this possible, money has to be spent on appropriate initiatives rather than the current system of short term solutions which are merely prolonging the end of the present systems.

A model with a promising perspective is the large-scale extensive pasture system utilising cattle kept as suckler cows which can be handled by the few remaining farmers expected in LFA´s. There are already positive examples in the southern part of the Black Forest, in the western Swabian Jura region and in the Western Lake of Constance area (Luick 1996). Experience shows that with extensive pasture systems, most of the desired ecological aims can be preserved and can even be improved. Furthermore, if the frame condition are appropriate (e.g. good marketing concept, large connected field-sizes) extensive pasture systems can be managed in a profitable way. However, to implement those systems agricultural policy has to be changed. Improved infrastructure is needed, for instance new local slaughter- and cool-houses which will enable guaranteed product quality and transparent production and processing. This is in contrast to the EU idea for further regional specialisation. Another prospect could be the production of pure, natural cheese which could be manufactured by farmers or in small, local co-operatives. Surveys show that regional cheese varieties could yield good prices. At the moment, only a few cheese-making dairies exist in the Black Forest and on the Swabian Jura because of the stringent regulations for hygiene and product labelling as already discussed. Some producers are currently operating illegally but few are prepared to take such risks.

Finally, there is one dominant factor contributing to the pessimistic outlook for farming in the Black Forest. This is the unreliability of EU-agricultural policy. We should expect that our policy makers show interest in long term developments to make regional, low intensity farming possible and to take care of the generation-oriented decisions which are necessary in agriculture.

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Table 1: Rare cattle breeds in Germany .(Frahm 1990, Sambraus 1994).

Breed	**Origin/Distribution**	**Weight of cows (kg)**	**Milk yield per year (kg)**	**Cows in herd book**	**Population size**
Hinterwald	Southern Black Forest/Baden-Württemberg	400 - 450	3.000 - 4.000	662 (1992)	2.500
Vorderwald	Central Black Forest/Baden-Württemberg	550 - 600	5.601	5745 (1992)	40.000
Glan-Donnersberg	Eifel, Hundsrück/Rheinland-Pfalz	600 - 700	4.000		130 (1993)
Limpurger	Hohenlohe/Baden-Württemberg	600 - 650	4.314	70 (1993)	150
Murnau-Werdenfelser	Alpine region/Bavaria	500 - 600	3.800	114 (1992)	600
Pinzgauer	Alpine region/Bavaria	600	3.666	327 (1992)	1.500
Vogelsberg	Vogelsberg/Hessen	600	4.000 - 5.000		300
Angler	Angeln/Schleswig-Holstein	650	5.900	12.360 (19992)	30.000

Table 2: Rare sheep breeds in Germany (Woike & Zimmermann 1992, Sambraus 1994, Dittrich 1995).

Breed	**Origin**
Bentheimer Landschaf	Netherlands and Emsland/Niedersachsen
Bergschaf	Northern Italy, Austria and Bavaria
Coburger Fuchsschaf	Franconia/Bavaria, Hohenlohe and Swabian Jura/Baden-Württemberg
Leineschaf	Eastern Niedersachsen
Graue Gehörnte Heidschnucke	Lüneburger Heath/Niedersachsen
Weiße Gehörnte Heidschnucke	Weser-Ems-Region/Niedersachsen
Weiße Hornlose Heidschnucke(Moorschnucke)	Bogs and Heaths in Niedersachsen
Rhönschaf	Rhön Mountains/Hessen, Bavaria, Niedersachsen
Rauhwolliges Pommersches Landschaf	previous "Ostpreussen and Schlesien", Mecklenburg, Pommern
Skudde	North- and North-eastern Europe

Table 1: Rare cattle breeds in Germany (Frahm 1990, Sambraus 1994).
Table 2: Rare sheep breeds in Germany (Woike & Zimmermann 1992, Sambraus 1994, Dittrich 1995).

Figure 1: Landscapes in Germany where ecologically high-value areas related to extensive cattle and/or sheep keeping systems can still be found: (1) salt-marches along the North Sea and along estuaries, (2) salt-marshes of

the Baltic Sea and the Bodden-region, (3) marshlands along the lower and upper Elbe-valley, (4) Lüneburger Heath, (5) Weserbergland-mountains, (6) Eastern Münsterland-area, (7) slopes of the Oder valley, (8) Eastern Harz-mountains and foreland region, (9) Shell-limestone landscapes in Thüringen, (10) Rhön-mountains, (11) Vogelsberg-mountains, (12) Westerwald-area, (13) Eifel-mountains, (14) Franconian Jura, (15) Swabian Jura, (16) Northern Black Forest and Kraichgau-region, (17) Central Black Forest, (18) Southern Black Forest, (19) Vorderer Bayerischer Wald-region, (20) German Alps and foreland-region.

Figure 2: Fragmented field sizes as small as 0,2 hectares are still common in south-western Germany. Section of the territory of the village of Hossingen/Zollernalb-District (Zeeb 1996).

Figure 3: Decline of full-time and part-time farms in the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) from 1974 to 1994.

Figure 4: Decline of dairy farms in the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) from 1974 to 1994.

Figure 5: Decline of dairy cows in the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) from 1964 to 1994. This graph shows that the decline of dairy farming can be traced back for a longer period of time. It has, however, accelerated in later years.

Figure 6: Increase of suckling cows in the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) from 1974 to 1994.

Figure 7: Increase of wooded area and decline of agricultural land in three communities (A, B, C) in the Central Black Forest/District of Emmendingen.

Figure 8: Decline of area for agriculture (mainly grassland) and increase of forests (hatched areas; mainly spruce plantations) in the central Black Forest since 1900.

Figure 9: Decline of trainees in agriculture in the Provincial Administrative District of Freiburg (Regierungsbezirk Freiburg) from 1939 to 1994 (250 trainees per year would be the minimum required to secure the future of 8,000 full-time farms (approximately the current status) in the region.

Figure 10: In the second half of the 18th century a unique form of Central European transhumance developed in the Swabian Jura. Typically the flocks spent the summer on the downs of Swabian Jura and then in autumn they took off to over-winter in the valleys of Rhine and Danube, or in the Lake of Constance Basin.

Figure 11: A survey of 1.000 sites with chalk grassland communities (down) showed that most of the plots are smaller than 10 hectares and most of them are isolated with long distances in between. This is a crucial point when new concepts for grazing shall be established (Beinlich & Plachter 1995, according to MELUF 1982).

Figure 12: Notations of attractions used in tourist publicity of 25 communities in the Western Lake of Constance region in the Federal State of Baden-Württemberg (Albrecht 1996): 1. landscape, flora and fauna, nature conservation aspects; 2: community, architecture, historical sites; 3. gastronomy; 4: sport (events/activities), 5. culture (events/activities).

Figure 13: Assessment of mayors and /or persons responsible for the tourist sector in 13 communities in the Western Lake of Constance region in the Federal State of Baden-Württemberg about the average input of local/regional food in the restaurants within their communities (Albrecht 1996).

The support to livestock producton in less-favoured areas under the Common Agricultural Policy of the European Union

Eduardo Díez Patier & Daniel Trueba Herranz

1. **Background**

The Community agricultural structures and rural development policy, in general, and the attention paid to less-favoured agricultural areas, in particular, are two subjects the responsible authorities for the Common Agricultural Policy (CAP), throughout its history, cannot really be pleased about.It can even be said that one of the reasons for the classical CAP crisis has been the difference in speed that, since the beginning, the EAGGF-Guarantee Section and the EAGGF-Guidance Section, as well as their corresponding action frameworks, markets and structures, have kept. It must not be forgotten that at the Stresa Conference a resource distribution of 2/3 for markets and 1/3 for structures was agreed though it was never observed. Till the modification of the Structural Funds in 1988, the distribution was 95% for the EAGGF-Guarantee Section and 5% for the EAGGF-Guidance Section, approximately.Not only was it a matter of different speeds. The requirement of national cofinancing for structural and territorial measures, but not for market measures, has meant a curb to agricultural holding modernization in those Member States having greater economic difficulties which, besides, are, in general, those with the largest number of less-favoured agricultural areas.Therefore, less-efficient agricultural holdings had larger difficulties to get into the path leading to structural improvements, although they were taken into account in the income policy when fixing the minimum guaranteed prices, either influencing their increase or avoiding their reduction. That implied a stimulus for the production increase in the most efficient agricultural holdings which, without the need for following market signals, gave rise to surpluses of costly financing.In short, the CAP was, at first, subordinated to the market policy, leaving structural subjects in the hands of national policies and reserving for the Community just the cofinancing of particular projects.

2. **Development**

The adoption of the first real structural measures coincides with the emergence of agricultural and livestock products surpluses. It followed the Mansholt Memorandum of 1968 as well as its corresponding Plan which was never applied in an integral, coherent way. It was the three socio-structural Directive-package approved in 1972 on the modernization of farms, cessation of farming and guidance and occupational training of farmers (Directives 72/159, 72/160 and 72/165).However, it will not be till 1975 that the approval of rules of territorial scope took place. Directive 75/268, on mountain and hill farming and farming in certain less-favoured areas established detailed rules for the application of paragraph 2, point 2, Article 39 of the Treaty of Rome on structural and natural inequalities of the different agricultural regions and in fact it is the first Community rule which allows differentiated treatments according to natural conditions. Besides, it does so trough direct aids to farmers'incomes by Compensatory Payments (CP).This first package of rules was completed, in 1977 and 1978, through Regulations on common measures to improve the conditions under which agricultural products are processed and marketed and on aids to agricultural producer groups and associations thereof (Regulations 355/77 and 1360/78, respectively).A second generation of socio-structural provisions appeared in the late eighties, and on the one hand coincided with the serious crisis of the market policy which would give rise to the 1992 CAP Reform and, on the other, with the modification of the Structural Funds and the new regional policy in the Community resulting from the European Single Act.The Directive on modernization of farms was totally amended, turning into a Regulation on improving the efficiency of agricultural structures (Regulation 797/1985); the first environmental measures along with certain integral and regional schemes (Mediterranean Integrated Programmes, less-favoured areas schemes) were adopted; likewise, accompanying measures concerning the agrobudgetary stabilisers prereform (set aside, reconversion and extensification, advanced cessation, programme of agricultural income aids etc) were approved. But, to the purpose of this paper, it is specially interested to underline the new orientation of the Structural Funds which are designed around five great objectives (in fact six, since the fifth one is divided into two), three of which have territorial nature and two of those three are

specifically rural and agricultural. Such Funds are applied through Operational Schemes of a territorial basis to the purpose of the distribution key of financial resources as well as to the purpose of the range of possibilities to be developed and financed. The overlap of horizontal measures (improvement of structures) and those of territorial nature is generally solved through both more flexible conditions in less-favoured areas and a larger percentage of Community financing.The asumption by the EAGGF-Guarantee Section of some kind of structural action or reference to less-favoured areas would not appear till Commissioner Mac Sharry's procedures for "support to the rural world", in 1990 and 1991, to favour small farmers or those located in less-favoured areas. The 1992 CAP Reform will also finance its acompanying measures (afforestation, advanced cessation and environmental measures) through the EAGGF-Guarantee Section, although they have direct repercussion on specific territorial bases or on livestock production.

3. **Identification of less-favoured areas**

As a result of the above mentioned, the first question arising is the identification of less-favoured areas in the Community legislation. To that end it can be considered:a) **Mountain, and less-favoured areas**, in the sense of Directive 75/268. They are regions (made up of municipality groupings, NUTS IV) with considerable problems to maintain the population or to preserve the natural environment. There are several groups:- Mountain areas with problems regarding altitude or slope gradient, which means considerable difficulties for the development of farming (paragraph 3, Article 3 of the Directive). - Areas with risk of depopulation, little productivity of the land and low population density or even a trend to population regression (paragraph 3, Article 3 of the Directive).- Other areas having specific limitations, that Member States can apply for up to a maximum 4% of the Useful Arable Land (UAA), if need be to maintain farming on (paragraph 5, Article 3 of the Directive).b) **Objective 1 Areas**, in the sense of Regulation 2052/88, in which the aim is the development and structural adjustment of the less developed areas. The regions are defined in terms of NUTS II, when Gross National Product (GNP) per capita is below 75% of the Community average, expressed in the three-year average. Such a parameter can be obviated for the overperipheric territories of France, Spain and Portugal, in Northern Ireland as well as in the New Landers of the Federal Republic of Germany, (and also for the new objective 6 created for Sweden and Finland as a consequence of the last enlargement). Exceptionally, other adjoining territories can be included in some regions where the level is lower than NUTS II and have problems related to the GNP.c) **Objective 5b Areas**, in the sense of Regulation 2052/88, in which the aim is the promotion of rural development, making easier both the development and the structural adjustment of the rural areas. Such areas are not included in Objective 1, although they face, at municipality level (NUTS IV), agricultural unemployment problems, low agricultural income level, low population density, or other problems derived from the agricultural holding structure, ageing of the agricultural population, pressure on the environment and the rural space or specific location.

4. **Aids to livestock production**

4.1. **Compensatory payments**In Directive 75/268 a Compensatory Payment (CP) for livestock head (also for area unit) is established to be granted, in mountain and less-favoured areas, to agricultural holding owners on active who commit themselves to stay in the farm at least five years and have a minimum area of four hectares (three hectares when it comes to Southern areas of the Community).The aid is granted for the equivalent to Large Animal Unit (LAU) of cattle, sheep, goats and horses. Dairy cows are only taken into consideration when milk production is an important component in the farm production, and it is restricted to 20 units when it refers to less-favoured areas included in paragraphs 4 and 5, Article 3 of the Directive. In any case, the CP is subject to the disposal of a territorial base equivalent to a 1,4 LAU/Ha density.The amount of the aid cannot be lower than 20,3 ECU/LAU or higher than 150 ECU/LAU, or, in exceptional cases, higher that 180 ECU/LAU. Within this range, Member States can both adjust the amount of the CP, theoretically, taking into account the seriousness of the permanent natural limitations affecting farming, and establish complementary or restrictive conditions, in particular when it comes to using practices compatible with both environmental protection and natural space preservation.The maximum eligible amount at the expense of the EAGGF-Guidance Section is limited to the equivalent to 120 LAU per agricultural holding and, besides, from 60 LAU on per holding, the maximum eligible

amount per LAU is cut down to 50% of the maximum amount of the CP provided for in general.The Community cofinancing of the CP varies between 25% and 75%. As a rule 25% is applied; certain areas provided for in paragraph 3, Article 26 of Regulation 797/85 have the right to obtain 50%, and mountain and less-favoured areas, which besides are in Objective 1 areas, are entitled to obtain 70%.Some comments can be made on this aid and they would be related to the core of the matter which will be treated further ahead. The "diversity" of the Community agriculture, that of its less-favoured areas together with that of the characteristics of natural difficulties it has to face is, by all means, important. In any case, it may not be so important as to justify a range from 20,3 to 180 ECU por LAU which could affect the conditions of competence provided for in Articles 92 y 93 of the Treaty. But the debate diversity versus competence is inserted in that of "financial solidarity": the demand of a minimum 30% of national cofinancing involves, in some Member States, a real curb to establish a CP level next to the maximum authorized limits, whereas other Member States enjoying more financial resources can be more generous regarding this matter. This way, the CP level is set up depending no so much on the specific difficulties of the less-favoured areas but on the Member States resource availability.

4.2 **Sheep supplementary premium**It is the most important measure of those included in "support to the rural world" introduced by Commissioner Mac Sharry. As it is well known, the basic element of the Common Organization of the Market (COM) in sheep is a production premium based on the difference throughout the year between the market price and the institutional base price. This difference is later transformed into a premium per ewe and goat head. Ewes which are not milked, and produce "heavy" lambs, get the whole premium, whereas both ewes which are milked, and produce "light" lambs, and goats get 80% of the premium. At present, the right to the premium is subject to the individual quota scheme regime, based on the premium received in the reference year 1991.The suplementary premium is granted to sheep and goats located in the less-favoured areas envisaged in Directive 75/268, and its present amount is 6.641 ECU per head for ewes producing "heavy" lambs and 4.586 ECU for ewes producing "light" lambs and goats, and it is wholly paid by the EAGGF-Guarantee Section. As a reference, it can be pointed out that the amount of the general premium for 1995 has been 24.82 ECU for ewes which produce "heavy" lambs and 19.857 ECU for ewes which produce "light" lambs and for goats. From the EAGGF-Guarantee Section budget, for 1995 financial year, 423.1 million ECU were paid as supplementary premium while payments for the general premium reached 1,781.9 million ECU.The financial solidarity (there is no cofinancing) of the EAGGF-Guarantee Section makes every farmer get the specific premium if he is entitled to it for being in less-favoured areas. Another conclusion of the analysis of the amount paid, is that in most of the producing countries, sheep holdings are located in these less-favoured areas (such as in Greece, Spain, France, Portugal, Ireland and Austria). There is no risk of competence distortion since, besides, the premium is the same for every producer.

4.3 **Suckler cow supplementary premium**In the COM in beef as a consequece of the CAP reform, a suckler cow premium relatively important, of 144.9 ECU/suckler cow (which is not milked), is granted provided that a minimum livestock number is respected (2 LAU/Ha in 1996) and within an individual quota scheme of the premium rights. Additionally, there is an extensification premium to be referred to further ahead.Besides, Member States are authorized to grant an additional premium up to 30.19 ECU/cow, of which 24.15 ECU/cow are financed by EAGGF-Guarantee Section in Objective 1 areas.Such an approach tries to avoid the appearance of competence problems in each Member State, but it does so by dint of the financial solidarity principle characteristic of the EAGGF-Guarantee Section, since the supplementary premiums for suckler cows which are not in Objective 1 areas must be financed by national budgets, as it happens when it comes to paying the possible excess up to 30.19 ECU/cow of those in Objective 1 areas. In practice, only Member States with a high percentage of suckler cows in Objective 1 areas are interested in applying this supplementary premium and obviously they will probably do it only to the limit of 24.15 ECU/cow of the Community financing.

4.4. **Other aids in the COM framework**

a) In the COM in beef, the suckler cow premium and the young animal special premium both have an extensification complement when the density factor is lower than 1.4LAU/Ha. For 1996, the amount of such an extensification premium is 36.23 ECU/LAU. As a reference, the ordinary premium for suckler cow is 144.90 ECU/cow and the special young animal premium is 108.70 ECU/head. Even recently the Council of Ministers of the E.U. has approved a second level of the extensification premium for livestock numbers under 1 LAU/Ha. The total extensification premium amount in the financial year 1995 of the EAGGF-Guarantee Section was 438.1

million ECU. These extensification premiums are not specifically linked to less-favoured areas recognised by the Community, as defined in previous points in this paper, but undoubtedly such areas generally fulfil the ideal conditions for extensive livestock and that is why they are those which most benefit from these aids. For example, in Spain and in Greece the extensification premiums represent about 20% of the whole set of the beef sector premiums, whereas for the Community as a whole such a figure is 10% (data from EAGGF-Guidance Section, 1995 financial year).

b) Regarding aids subject to individual quota schemes (special sheep premium and special suckler cow premium) the Community regulation allows Member States to define certain sensitive areas from which quota transfer to other areas is not permitted. Needles to say that such a restriction is provided to protect less-favoured areas producers, but due to the way the authorization has been introduced Member States have difficulties in using it owing to matters of interference with the general quota market and, probably, to domestic policy problems.

c) Till the CAP reform and the establishement of the individual quota scheme for the payment of the sheep sector premium, there used to be a limit of 500 heads per farm, and from that limit on producers were paid 50% of the premium, though in respect of less-favoured areas such a limit was 1000 heads for herd. Taking into account the individual quota scheme and to avoid artificial division of herds, such limits were removed after the 1992 reform and along whith the evidence of an action to favour livestock in less-favoured areas.d) Among the acompanying measures of the CAP reform, that of environmental nature (Regulation 2078/92) could have been a good support to livestock in less-favoured areas. Nevertheless, the fact that, although such measures are financed by the EAGGF-Guarantee Section, a national confinancing is requested (and even though in Objective 1 areas such national cofinancing is 25% versus 50% in other areas), once again makes more difficult its implementation by countries with scarce resources. As an example, Germany, Finland and France together catch in between 60% and 65% of the resources spent by the EAGGF-Guarantee Section, even though their Objective 1 areas represent just 20% of the total.Besides, it is likely that in the conception and development of this Regulation, environmental criteria of Northern countries have been imposed, and such countries are far from aridity, drought and desertification problems the less-favoured areas in Southern countries have to face. To confirm all this it can be pointed out that to have access to the aids envisaged in this Regulation regarding livestock activity a **reduction** in the livestock number per hectare is required -Article 2.c-, whereas in many less-favoured areas there is plenty of forage area, although not very productive, and the problem is **to keep** both the herd and the economic activity.

4.5. **Aids to improve the efficiency of farms and Operational Programmes**In general, aids to improve agricultural and livestock holdings are regulated by Regulation 2328/91, on improving the efficiency of the agricultural structures. Such aids are part of Objective 5a of the Structural Funds, although they also have a territorial distribution to the purpose of the partition of the Funds as a whole. The main characteristics of such an aid scheme are as follows:- The holder must practise farming as the main activity, with some flexibility and the holding must have an income per agricultural labour unit under 120% of a reference income of the correponding region. Granting of aids to producers associations is foreseen with some limitations.- The farmer professional training must be documented. He must commit himself to keeping a minimum record of the holding accounts and it is necessary to submit an Improvement Plan where objectives to be reached and measures to be taken to his purpose must be described.- Livestock productions have several limitations (milk, beef cattle, pig meat, eggs and poultry) which, in general, can only made more flexible when taking into consideration both environmental matters and animal welfare, but bearing in mind the limitation of the production potential.- There are ceilings established for investments to be made, referred to the holding as a whole and to the agricultural labour unit it bears.- The aids, in subsidy form, are limited to 20% (and 35% for buildings) in general, but both in mountain and less-favoured areas envisaged in Directive 75/268 such figures raise up to 30% y 45%.- The Community cofinancing of EAGGF-Guidance Section varies between 25% and 50%, in general and between 50% and 75% in Objective 1 areas and, in the latter, the Community cofinancing can exceptionally reach 80% in countries benefiting from the Cohesion Fund (Spain, Portugal, Greece and Ireland) and 85% in overperipheric regions and in Greek peripheric islands. This financing scheme also applies to the Operational Programmes of the Objective 1 and 5b regions of the Structural Funds.Regulation 2328/91 contitutes, besides, the criteria and detailed rules for Articles 92 and 93 of the Treaty regarding national aids to agricultural holdings. Under particular conditions national aids to agricultural holdings are strictly forbidden and, in other cases, the amount of such aids is

limited.All which has been stated in the previous paragraph has meant, besides, a curb to the possibility for Member States to include, in the Operational Programmes of Objective 1 and 5b areas real specific plans for livestock development in less-favoured areas, which should be adapted to the problems and needs of each region although the latter do not meet the general rules of Regulation 2328/91.This way, the Operational Programmes in Objective 1 and 5b areas, contrary to the initial approach, do not constitute an appropriate reference framework for private investments in agricultural and livestock productive sectors and they are limited to cofinance national or local administration actions.It is true that in the Operational Programmes several collective actions (genetic, health, hygenic-sanitary conditions of production improvements) for herd development in less-favoured areas have place, but they are just secondary measures regarding the main goal which is to make livestock holdings viable.In short, and bearing in mind the experience of some Southern Community Member States which have considerable problems concerning livestock development in less-favoured areas, it can be stated that the Community Support Framework is not an adequate answer to the existing problems.

5. **Considerations for the future**

In January, 1995, Italy submitted a memorandum on mountain and hill agriculture which gave rise to several debates within the Council which proved the existence of a real problem as well as the inadequacy of the present measures to solve it. Due to the reservations of some Member States along with that of the Commission, no steps ahead could be taken. Such Member States were worried about both the budgetary repercussions and the competence distortion problems which could derive from some of the aids Italy asked for.Nevertheless, the outcome of the Cork Conference recently held (November, 1996) on rural development is still more worrying. It is so, not only because no specific reference to less-favoured areas was made on the Final Declaration, but because most of the ideas envisaged in it (diversity, subsidiarity, diversification, cofinancing, reduction in the importance of the market policy and so on) could have counterproductive effects on the agricultural and livestock development in less-favoured areas.In the Community agriculture as a whole, and in particular in less-favoured areas, there will be neither farmers nor rural world to be developed if there is not an adequate agricultural activity considered in its most economic, dinamic, competitive sense.Such an activity will undoubtedly need certain aids to compete on open markets, and the former could be more or less directly granted or as compensation for the occupation and maintenance of the territory as well as to make easier both habitability and development in the rural world. But, it must be stressed that the priority is to maintain and ensure an agricultural and livestock production activity with economic and market foundations.

On the other hand, it is also certain that the granting of certain specific aids in less-favoured areas could bring about risks of competence distorsion, but it is considered there are other alternatives to maintain agricultural and livestock activity if the problem is approched from the Cohesion spirit set up in the Treatry after Maastricht and, as stated in Article 130 B, such spirit must be the reference when it comes to approaching and developing all the Community policies, including the CAP.From this Cohesion prospect, an approach to the problem solution about agricultural and livestock development in less-favoured areas could be as follows:

a) Compensatory Payments should be unified at an adequate intermediate level, enlarging the maximum eligible and being totally financed by the EAGGF. This will perhaps require a revision of the present definition of areas.

b) A Community reserve of quotas for less-favoured areas should be available (milk, premium to ewes, premium to suckler cows) and granted to farmers (individuals o enterprises) who settled or enlarged their activity in such areas. It goes without saying that such reserve quotas could not be transferred to an area different from that they had been allocated to.

c) Regarding aids to investments in agricultural holdings located in less-favoured areas, most of the specific restrictions imposed on the livestock activity should be removed and lots of other general requirements (full-time farmers, maximum limit of investment, etc) should be made more flexible or even removed.

d) "Rural world support" measures should be kept and encouraged, and the allocation of certain aids to the less-favoured areas within the COM framework, being financed by the EAGGF-Guarantee Section, should proceed.

e) Diversification and support activities (rural tourism, payments for environmental measures, provision of services, etc) and in general everything known as sustainable rural development must obviously be kept and encouraged as a complement to the agriculture and livestock activity although it is sure that such measures would be pointless if a minimum, adequate market-guided production activity of a dynamic and competitive nature is not kept.

Beef farming in the GB LFA - the response of farmers to the 1992 CAP reform measures and the implications for meeting world trade obligations.

Professor M. Winter, **J.A. Rutherford & Dr P Gaskell**

1. Introduction

Upland heather (*Calluna vulgaris*) is one of the most important and distinctive habitats in north-western Europe, with a considerable proportion of its distribution in Great Britain (Thompson *et al* 1995). It is important for its distinctive plant communities and associated animal species, particularly birds, as well as from a landscape and amenity perspective. Economically, heather is significant because it is so essential to grouse populations, grouse being an important game bird. However, much heather has been lost or degraded as a result of both afforestation and heavy grazing, especially at the grass/heather interface. The grazing problems are exacerbated by winter feeding on old heather, poor burning, decline caused the heather beetle, and competition from bracken (Johnson & Merrell 1994). There was a net loss of 20% of heather moorland in England and Wales between 1947 and 1980 with heavy grazing by sheep accounting for 67% of the total change in moorland cover (English Nature 1996). There is now considerable policy concern to ensure the maintenance or improvement of existing heather communities and, even, to re-establish heather moorland. There is also concern about grass moors where course species, such as *Molinia* and *Nardus*, are spreading at the expense of finer grass species and a diverse ground flora.

The replacement of cattle by sheep is of particular significance here, for sheep are more selective grazers than cattle and less likely to graze the course grasses that compete with heather. Thus, Rushton and Bryne (1990), found that an increase in ewe numbers of 40% between 1979 and 1989 was associated with a 40% reduction in the area of heather in situations where heather had accounted for more than 50% of the ground cover. Heather moorland (and grass moors too) are maintained by a combination of appropriate grazing, burning and trampling. In these ways, control of the coarse grasses and the bracken that compete with heather and the finer grasses is promoted. Hitherto, much of the discussion of heather decline has focused on sheep stocking rates and has rather neglected the significance of cattle. But there is an increasing consensus that cattle have a pivotal role in grazing and trampling course grasses and trampling bracken. As sheep have replaced cattle in the uplands so the problems have increased. .

Vegetation change is not the only issue of importance. Cattle, especially the traditional and distinctive hill breeds (such as Welsh Black, Highland and Galloway), play an important role in the cultural landscape of British upland areas (Evans and Yarwood 1995). From the perspective of cultural aesthetics the uplands would be a poorer place without them.

The decline of cattle in the uplands has been a consequence of a combination of factors to do with the economics of cattle and sheep production over a couple of decades and more recently, the operation of sheep and suckler cow quota rules. The crisis in the beef sector and in beef consumption brought about by BSE has only served to exacerbate existing problems.

This paper examines data on the current state of beef farming in the uplands of Britain and considers the prospects for policy changes and the implications of these for upland beef farming. Clearly what is happening in the beef sector provides only part of the story and further work is, additionally, exploring the sheep sector. Thus this paper should be seen as an interim account of some of the key current agricultural production and policy trends.

2. Background data from the CAP reform project

The research on which this paper is based forms part of a larger three year project to investigate the impact of the 1992 reforms of the Common Agricultural Policy (CAP) on the GB countryside[18]. The research involved a continuous desk study and interviews with 558 farmers and 17 crofters. The sample frame was constructed from data provided by the Ministry of Agriculture Fisheries and Food (MAFF) and Welsh Office Agriculture Department (WOAD) for England and Wales, and the Scottish Office Agriculture, Environment and Food Department (SOAEFD)[19]. The purpose of the sample was to provide an illustrative selection of farms, stratified to represent farms across the farming sectors and geographical areas (Table 1). A sample of 588 holdings was stratified according to *geographical location* (England; Scotland and Wales); *farm type* (Cereals; General Cropping; Dairy; Cattle and sheep (LFA); Cattle and sheep (lowland); and Mixed farming) and *size of holding* (20-99.9 ha, 100-299.9 ha, and 300+ha). *It is important to note that the stratification over-represented farms with larger areas of land at the expense of smaller farms. In the analysis presented here no attempt has been made to weight the data to take this into account, but this is being done for the final project report.* The data presented here draw on an interim project report on the beef sector (Gaskell and Winter 1996).

Table 1. Stratification of sample by farm type, farm size and country.

	England	**Wales**	**Scotland**	**Total**
Dairy	**48**	**30**	**30**	**108**
Small	16	10	10	36
Medium	16	10	10	36
Large	16	10	10	36
Cattle & Sheep (LFA)	**48**	**30**	**30**	**108**
Small	16	10	10	36
Medium	16	10	10	36
Large	16	10	10	36
Cattle & Sheep (lowland)	**48**	**30**	**30**	**108**
Small	16	10	10	36
Medium	16	10	10	36
Large	16	10	10	36
Cereals	**48**	**0**	**50**	**78**
Small	16		17	26
Medium	16		17	26
Large	16		17	26
Cropping	**48**	**0**	**50**	**78**
Small	16		17	26
Medium	16		17	26
Large	16		17	26
Mixed	**48**	**30**	**30**	**108**
Small	16	10	10	36
Medium	16	10	10	36
Large	16	10	10	36
TOTAL	**288**	**120**	**180**	**588**

[18]Funded by the Countryside Commission, the Countryside Council for Wales, the Department of the Environment and Scottish Natural Heritage and undertaken by the Countryside and Community Research Unit, Cheltenham and Gloucester College of Higher Education.

[19]Hereafter refrrred to as "the agriculture departments".

The purpose of the farm survey was to provide in-depth information on farm decision making and management in order to identify and to explain changes in agricultural activity which affected land management. The farm survey was carried out during 1995/96. The sample was not designed to be representative of farms with beef enterprises. However, it is representative of the farm types most influenced by the CAP reforms of 1992. Two thirds (389) of the interview survey possessed a beef enterprise and 125 of these were located in the LFAs (Table 2). The location of the LFAs in GB is shown in Figure 1.

Table 2. The frequency of beef enterprises in the sample

Country	Farms with beef	Total farms	% of farms with beef	% of LFA farms with beef	% of non-LFA with beef
England	173	285	60.7	93.5	76.1
Scotland	124	163	76.1	65.5	92.3
Wales	92	110	83.6	77.7	93.1
GB Total	389	558	69.7	81.4	84.8

The geographical distribution of the beef farms in the sample is shown in Figure 2.

Figures 1 and 2 here.

3. Beef production systems in Britain

Grazing livestock in Britain fall into three main categories: dairy; sheep; and beef. Dairy farming in Britain is a highly specialised sector utilising specialist breeds (Friesians or Holsteins) rather than traditional dual purpose breeds, and is no longer common within the LFAs except in parts of west Wales. Beef, seldom the main enterprise on a farm, is associated with a wide range of other enterprises depending on location. On lowland farms, a beef enterprise would typically be used either to exploit arable by-products in intensive or semi-intensive systems, or for more extensive production from grass or a forage crop used as a break crop in an arable rotation.

In upland or mountainous areas (LFAs), sheep are the dominant farm enterprise, found virtually on all farms. Where beef cattle are also farmed, their grazing is likely to be confined to both open and enclosed land in valleys or lower slopes, although in some English LFAs, such as Dartmoor, they are to be found on the same range of land as sheep. The secondary role of beef enterprises on most farms (Table 3) is important in assessing reactions to, and impacts of, changes in beef policy.

Table 3 The contribution of the beef enterprise to total agricultural turnover

% of turnover	England	Scotland	Wales	Total farms	% of all farms
<25	7	4	10	21	16.8
25 to 50	25	14	16	55	44.0
50 to 75	15	12	11	38	30.4
75 to 100	2	8	1	11	8.8
Total farms	49	38	38	125	100.0

Because beef systems are so often linked to other enterprises, they are designed to suit a particular farm's circumstances. But at the risk of generalisation, most systems fall into one of four main systems:

Suckler Systems: Beef breeding systems made up of breeding cattle and calves. Calves are usually weaned at 6-9 months and either sold, usually to lowland farms, or retained for further finishing. Suckler herds can be sub-divided into hill and upland systems or lowland systems depending on the premia they attract and the type of grassland on which they are grazed. In this paper they are distinguished as **LFA suckler and non-LFA suckler**.

Extensive rearing and finishing systems: Beef animals reared for slaughter which at some stage in their lives graze outdoors but may be housed at certain times.

Intensive rearing and finishing systems: Beef animals reared for slaughter and housed for their entire lives.

Two thirds (66.5%) of all survey farms with a beef enterprise had a suckler herd and just over half of these herds were situated in the LFA. Table 4 shows the distribution of the major beef systems, revealing the relative rarity of intensive systems.

Table 4 Distribution of major beef systems by country

Beef system	England	Scotland	Wales	GB Total	% Total
1 LFA Suckler	49	38	38	125	36.5
2 Non-LFA Suckler	49	33	21	103	30.0
3 Extensive Beef	46	25	23	94	27.4
4 Intensive Beef	9	9	3	21	6.1
Total	153	105	85	343	100.0

The distribution of beef systems varies according to farm type. Extensive beef rearing systems are more dispersed than suckler systems; dairy farms accounted for almost 32% of extensive beef followed by 23% on mixed farms, 23% on cereal and cropping farms and 16% on non-LFA livestock farms. Intensive beef had a strong association with dairy and cropping farms, 33.3% and 28.6% respectively, followed by cereal farms which accounted for 14.3% of intensive beef enterprises.

The size of farms with LFA suckler systems varied considerably. The average size of farm was 378.8 ha. with a range from only 20.2 ha. to 5,050.3 ha. However, this large degree of variation was in part due to the sampling frame employed. As was expected sheep enterprises were normally run in association with the suckler herd (Table 5).

Table 5. Enterprises found in conjunction with LFA suckler herds

Enterprise	Total farms	% of all farms
Arable	35	28.0
Dairy	11	8.8
Sheep	116	92.8
Horticulture	0	0
Pigs and poultry	4	3.2
Other	5	4.0

The beef enterprise usually made a significant contribution to the agricultural turnover of the LFA farm. On 43.2% of the farms the beef enterprise made up at least half the agricultural turnover. The average farm had a suckler herd of 40 cows with a range of 3 to 344 cows. Single suckling was virtually universal with only 4 farms (3.3%) practising multiple suckling. The majority of suckler herds calved in the spring (61.0%). The average number of cattle sold in 1994/95 was 72.3, with over half of the farms (54.0%) selling 50 cattle or less and 30% selling over 100. Most of the farmers sold their cattle at 12 months or under (66.4%), a further 20.8% produced strong stores or 18 month beef.

The average forage area was 361.2 ha. ranging from 10.1 ha to 4,469.8 ha. Most farmers (113) had quota for the Suckler Cow Premium (SCP) and 94 claimed the Beef Special Premium (BSP).

4. The role and objectives of the countryside agencies

An understanding of the agri-environmental objectives of the agencies who commissioned the research on which this report is based is necessary in order to appreciate how beef farming in Britain is evaluated from an environmental perspective. To summarise, the agencies:

- give a high priority to encouraging the identification and adoption of techniques which lead to the sustainable use of natural resources;
- have a remit that extends to protecting and enhancing the environment with natural and human aspects increasingly seen as integral parts of the same system;
- have an interest in the human environment that includes aesthetic, amenity/recreation, historic, cultural and socio-economic considerations;
- have a statutory obligation to advise government about the appropriateness of policy reform options;
- recognise that agriculture has a significant effect on their ability to achieve these aims.

It is a fundamental requirement, recognised by the agencies, that any farming system must be economically viable in order to support the people who are directly dependent on it for their livelihoods and to deliver wider social and environmental benefits. The commercial viability of most beef farmers in Europe depends on both the market returns for their products and public support via the Common Agricultural Policy. Many of the social and environmental benefits that are associated with agricultural activity are beyond the reach of market mechanisms. For example, an attractive rural environment may well be the result of traditional farming systems but is not of direct economic value to the farmers who produce and maintain that environment. However, such a landscape may be of considerable aesthetic and cultural value to society as a whole or may contribute to the social fabric of the area because of the economic value that arises from indirect activity such as tourism. The valuation of farming systems in economic, social and environmental terms and the justification of continued public support of

agricultural activity is therefore a complex task. And as society's values concerning food security, food safety, farming ethics, animal welfare, cultural heritage and the natural environment are rapidly changing, that evaluation and justification is requiring policy makers to take a much wider interpretation of the meaning of farming and the countryside.

In general terms it is with reference to environmental sustainability that the management, and the effects of policy on the management, of beef cattle in Britain are judged by the agencies that commissioned this research. While it is recognised that this is only a partial view it is hoped that it will be helpful in enabling a more integrated approach to this area of rural policy. In summary the agencies' understanding of environmentally sustainable agriculture entails conformity to environmental objectives in the areas of: wildlife and habitat protection; resource use and protection; landscape; social, cultural and historic heritage; recreation, amenity and health.

With regard to beef production, and the policies that influence it, the broad environmental objectives of the agencies can be summarised as:

- to secure adequate grazing where it is needed and where it is more beneficial for cattle to be present than absent;
- to avoid the natural carrying capacity of the land and any high value vegetation;
- to maintain and rebuild the natural fabric of the countryside (eg hedges, walls, ditches, rough areas, trees, natural river channels, flood lands, heaths, woodland, historic landscapes and species rich grassland;
- to maintain at the whole farm level integrated mixed management units (ie beef with other enterprises);
- to support extensification, whereby heavy use of inputs is reduced significantly;
- to discourage the adoption of systems that involve the use of intensive indoor units, especially in sensitive landscapes;
- to maintain and rebuild the elements of the cultural heritage of the countryside.

5. The 1992 CAP Reforms

In 1992 the European Commission, under the leadership of Commissioner Ray MacSharry, introduced a major reform of the CAP. The objective of these proposed reforms was essentially to restore the ability to control farm support expenditure. Throughout the 1980s production of several major commodities, notably cereals, beef and dairy products, rose dramatically and led to an escalating costs of market intervention, storage and subsidised export of surpluses. The MacSharry plan was to shift the basis of the CAP away from price support and towards direct payments that were less production distorting. At the same time the negotiation of the GATT Uruguay round demonstrated that in the future Europe's agricultural policies would need to be compatible with global trade obligations. Up to December 1995 the European Commission argued that the 1992 MacSharry reforms were indeed compatible with the GATT Agriculture agreement (Buckwell 1996).

The key measures relevant to the UK undertaken in the beef sector were as follows:

- Intervention prices cut by 15% over 3 years from 1993/94.
- Ceilings progressively introduced on intervention purchases from 1993/94 to 1997/98.
- The beef special premium (BSP) increased from 1993/94, with the number of eligible animals constrained by regional ceilings, limited to a maximum of 90 male head of cattle per producer.

- The suckler cow premium (SCP) increased in 1993/94 subject to individual producer quotas.
- An extensification premium introduced from 1993/94.

The support of the beef sector under the reformed CAP was designed to:

- offset the loss of income resulting in the cut in the intervention price through the BSP and the SCP.
- establish market equilibrium throughout the year (deseasonalisation premium), not applicable in GB.
- encourage extensification.
- reduce beef production from dairy herds (calf disposal scheme or, alternatively, intervention arrangements for lightweight carcasses).

The detailed rules of the various measures are not considered here apart from the use of livestock units and forage area to determine stocking density criteria for eligibility to certain premia and the eligibility for the Extensification Premium. This is because these measures have a direct bearing in assessing how effective the reforms have been from an environmental perspective of promoting a more extensive and environmentally sustainable beef sector.

Eligibility for both the BSP and the SCP is now conditional on meeting certain stocking density rules, expressed as a number of livestock units (LUs) per hectare. Eligibility for the extensification premia is also based on the stocking density criteria. The limit for 1993 was 3.5 LUs, progressively reduced to 2.0 LUs in 1996. The calculation of stocking densities is complex and requires a submission to the agriculture departments providing, *inter alia*, detailed data on the forage areas and livestock numbers on the holding. The following factors have to be taken into consideration in the calculation of stocking rates:

i. Livestock units
- dairy cows (1.0 LU)
- breeding ewes on which sheep premium is claimed (0.15 LU)
- male cattle, under two years of age, on which BSP is claimed (0.6 LU)
- male cattle, aged over two years, on which BSP is claimed (1.0 LU)
- suckler cows on which SCP is claimed (including in-calf replacement heifers) (1.0 LU)

ii. Forage area
- This is the area of the holding available throughout the calendar year for feeding or grazing livestock excluding, buildings, woods, ponds, paths, areas used for crops benefiting from community aid, areas used for permanent crops or horticultural crops and areas of land set-aside.

iii. Extensification Premium
- Where a farmer has a stocking density of less than 1.4 LUs per hectare of forage area, then a supplement is payable in addition to the BSP and/or the SCP.

It is very important to note that the stocking density rules only apply to the categories of livestock specified above rather than to the actual number of animals on the farm. Farmers may also keep animals for which no claim for premium is made or other animals which are ineligible for premia, such as non-breeding female beef stock, calves under six months of age, lambs or alternative categories of livestock such as deer. It is also significant that the definition of forage area could include areas of arable on which aid under the Arable Area Payment Scheme is not claimed.

This reliance on 'paper' animals and forage area, rather than actual stock and forage areas on the farm, to calculate stocking densities, raises the possibility of claims rather than stock numbers being adjusted in order to qualify for the Extensification Premium and in ensuring claims observe the stocking density limits. As will be seen the existence of a 'paper' farm has been a significant factor in determining the environmental value of the beef regime reforms in Britain.

6. The impact of the 1992 CAP reforms on LFA suckler systems and management

The survey on which this paper is based provides information on how the four main beef systems operating in Britain were modified in response to the 1992 reforms. However, for this paper we focus chiefly on the changes observed in LFA suckler systems, although reference is made to data from the other systems where this is relevant.

Changes in management since 1992

Three quarters of farms (76.0%) had not changed their area since 1991/92. However, 22 holdings (17.6%) had increased and 8 (6.4%) reduced in size. The contribution of the beef enterprise to agricultural turnover had not changed on half of the farms and where there had been a change the direction of change was equally divided between increased and decreased importance. Despite the introduction of quotas, average herd size increased from 55.9 in 1991/92 to 59.6 in 1994/95. Just over a third of farmers (34.7%) had expanded their herd while only 11.3% had reduced numbers. The general pattern with regard to management of herds and stock rearing and fattening policy was little changed. Just three farmers had changed their feeding system and three changed the system of stock housing.

With regard to sales, 32% had increased sales by 10 animals or more and only 19.4% had reduced the number of cattle sold, reflecting the trend in changed breeding herd size, although there was little change in the age of stock sold.

Regarding SCP and BSP claims, the majority had made no change, but a significant minority had increased claims (Table 6).

Table 6 Changes in SCP and BSP claims between 1991/92 and 1994/5 (% of farms)

Nature of change	SCP	BSP (10 months)	BSP (22 months)
Increase	16	31	22
No change	75	61	69
Decrease	9	8	9

Very few farmers with suckler herds had altered herd management as a result of the reforms. In contrast however over one third had increased the scale of production from their beef enterprise. The introduction of quotas on SCP does not seem to have frozen production patterns in either the uplands or the lowlands of Britain. However, farmers with LFA suckler herds were less likely to have reduced the size of their enterprise, while lowland suckler herds showed a considerable degree of dynamism since the 1992 reforms with only 38.8% reporting no change in herd size compared to 54% in the LFAs. This indicates that farmers in the LFA enjoy far less flexibility in their farming operations in the face of pressure for change (Table 7).

Table 7. Changes in the suckler herd 1991/92 and 1994/95 (% of farms)

Change in herd	LFA Suckler	Non-LFA Suckler

Increase	34.7	36.9
No change	54.0	38.8
Decrease	11.3	24.3

The impact of the stocking density regulations (see summary Table 8)

The majority of farmers reported that their stock numbers had been unaffected by the stocking density regulations implemented as part of the 1992 reforms. Only 10 farmers (8.0%) said that the management of their enterprise had significantly changed as a result of the new regulations, and most farmers had accommodated the change by careful management of stocking density, in some instances by increasing the forage area available. Two farmers had responded by adjusting the balance between premia and non-premia livestock by reducing claims for BSP, so effectively removing stock from the calculation of the stocking density. Only two farmers said that the introduction of the stocking density regulations had resulted in an overall reduction of stocking density on their farm.

When farmers were asked how they would respond to the introduction of the lower stocking density (2.0 LSUs/ha.) in 1996, 86% said they would not have to change their management practices. Only 17 farmers (13.6%) said they would need to make changes. Four said they would acquire additional forage area, while seven farmers would reduce the number of premium claims, the remaining six had not decided how they would respond.

The response to the extensification premium

Surprisingly perhaps, given the above observations on stocking levels and the policy objective of reducing stocking levels, the Extensification Premium was claimed by 90.6% of farmers. Of those claiming, just 20.8% had made adjustments to their official stocking density to qualify, the most frequent response being to purchase or rent additional forage area. None of the farmers said they had reduced the overall number of livestock on the farm in order to qualify for Extensification Premia. Only two farmers were planning a reduction in their stocking density to qualify for the Extensification Premium in the future.

Comparing the response to the stocking density regulations and the Extensification Premium in other beef systems we find that in *non-LFA suckler herds* there had been a modest increase in average herd size, from 72.0 in 1991/92 to 73.2 in 1994/95. Almost all (94.2%) of farmers said they were unaffected by the stocking density regulations. In only two cases had there been an overall reduction in stocking density. The lower 1996 stocking density limit would affect 26.2% of farmers, with only 7.8% planning to reduce livestock numbers. The Extensification Premium was claimed by 64.3% of farmers, with 17.5% having made adjustments to 'paper' stocking density to qualify and only two farmers reducing actual stock numbers. In *extensive beef finishing* systems the average number of cattle sold per annum during the period between 1991/92 and 1994/95 increased from 80.6 to 87 head. Only 9.6% of farmers said their livestock management had been directly affected by the stocking density regulations, with only two farmers saying it had resulted in an overall reduction in actual stocking density. The main response was to alter the `paper' stocking density by changing the balance between premia and non-premia eligible livestock. Over half of the farmers (51.2%) claimed the Extensification Premium. Of these, 15 had made management changes to qualify, usually by acquiring additional forage area, only three farmers had actually reduced the number of livestock on which they claimed premia.

In contrast to the other systems, *intensive beef systems* showed a fall in the average number of cattle sold between 1991/92 to 1994/95, from 135.5 to 118.0. Nonetheless, all but one farmer claimed to be unaffected by the stocking density regulations, although seven said that future livestock management would be affected by the introduction of the lower 1996 limits. Even in intensive systems, 38.1% of farmers claimed the Extensification Premium and only one farmer had made management changes to become eligible. None of the farmers who had a stocking density above the extensification limit said they would attempt to de-stock in order to qualify for payments in the future.

Table 8. Response to stocking density requirements and Extensification Premium across the beef systems (% of farmers)

Beef system	***Farmers making an overall reduction in stocking density***	***Farms affected by the 1996 stocking density regulations***	***Farmers claiming Extensification premium***
1 LFA Suckler	1.6	13.6	90.6
2 Non-LFA Suckler	1.9	26.2	64.3
3 Extensive Beef	2.1	17.2	51.2
4 Intensive Beef	0.0	33.3	38.1

7. Pressures for further CAP reform

Since 1992, when the last major reform of the CAP was concluded there have been a number of significant developments that have once again opened the debate over the need for further reform of the CAP. These arguments were summarised by the European Commission's Strategies paper published in December 1995 (see Tracy 1995). In common with other commentators (Buckwell 1996) this paper cites three major forces for further reform of the CAP:

- Expansion of the EU to include the central and eastern European states;
- Environmental;
- implications of the GATT/WTO.

In the beef sector the compatibility of the 1992 CAP reforms and the requirements of GATT have been in doubt for some time. A report considering the implications of the GATT agreement on the English Countryside (BER 1995) concluded that "it seems likely that the Community may have to make further adjustments to the beef regime in order to bring supply and demand into better balance", and a further report commissioned by the countryside agencies analysed the impact of the GATT agreement on market balance (Entec 1996). This report suggested that, in order to meet its GATT obligations in the beef sector, the EU would need to reduce subsidised exports of beef to 817,000 tonnes by the year 2000, a reduction of more than 30 per cent on the 1993 level. To test if this obligation was achievable a forecast of the beef market balance to 2000 was prepared (Table 9).

Table 9. Projected EU beef market balance ('000 tonnes)

	1993	1995	1997	1999	2001
Production	7713	7813	8150	7900	7640
Imports	583	583	583	583	583
Demand	7692	7200	7240	7200	7150
Exports	1450	1119	998	877	817
Stocks	200	13	983	1854	2446

Source: Entec 1996: 48.

The production trend was based on the European beef herd stabilising at 10.5 million head, a 10% decline in the dairy herd and a 1% annual rise in carcass weights. The production forecast was very close to similar exercises conducted by the National Farmers Union and MAFF. The projection also assumed a continuing decline in consumption, which at the time was in conflict with official EU projections. The debate over whether the EU

could meet its GATT agreement obligations hinged on the beef consumption trend in the EU. A modest decline in consumption, in line with the long term trend, would lead to stocks of beef in excess of 2 million tonnes by 2001. The BER report concluded that "there is a high probability of a policy crisis in the beef sector towards the end of the century".

In the event, the crisis came even sooner than anticipated. On the 20th March 1996 the UK government announced that there was the possibility that a new form of Creutzfeldt-Jacob disease could possibly be linked to the occurrence of BSE in the UK herd. The effect of this announcement on beef consumption in Europe is well reported, EU per capita consumption has fallen from 23kg in 1988 to 18kg in 1996 (Agra Europe No 171, October 11th). As demand for beef crashed across Europe cattle prices went into free-fall and the future for beef producers was highly uncertain. The EU responded with a set of emergency measures that included additional aid for beef produces and the introduction of intervention buying to take unwanted beef off the European market. From a short term perspective, the measures can be seen as successful, beef prices were stabilised, although still well below pre-20 March 96 levels, and consumption levels of beef in the EU, which slumped by 30-40% in the immediate aftermath of the crisis in March/April recovered to just 10-15% below early March levels by October 1996. However, it is difficult to envisage consumption making a full recovery in the short to medium term and European beef intervention stocks have risen from almost zero at the start of 1996 to 440,000 tonnes by the end of the year (source Meat and Livestock Commission).

The response of beef farms in Britain to the crisis is difficult to forecast. The survey on which this report is based was not designed to examine the implications of BSE and almost half of the interviews took place before the government announcements of March 20th (Table 10). It was therefore possible to get an indication of some of the likely responses to the BSE crisis by comparing the answers given to these questions by farmers interviewed before and after March the 20th. However, it must be stressed that the majority of farmers interviewed after the crisis broke were visited within four weeks of March 20th which gave them little time to consider the implications of the crisis for their farms. While the majority of beef farmers (65%) could not say with confidence what would happen to their farm businesses in the next three years, a sufficient number were able to discuss their plans to make a detailed analysis worthwhile. The most obvious conclusion to draw is that farmers with LFA suckler herds have few alternative options to consider other than reducing beef herds and increasing their sheep production, notwithstanding the limitations imposed by ewe quotas. This could have negative consequences for the management of the countryside as the problem of overgrazing in the uplands has been linked to the same trend of declining cattle numbers in favour of sheep.

Table 10. Date of farm survey by beef production system

Beef system	% of interviews undertaken before 20.3.96	% of interviews undertaken after 20.3.96
LFA Suckler	36	64
Non LFA Suckler	48	52
Extensive Beef	49	51
Intensive Beef	55	45

8. Conclusions

The beef enterprise is an important component of the agricultural turnover on LFA farms with suckler herds. Despite the introduction of quotas, stocking density limits and Extensification Premia average herd size and cattle sales were increasing until the impact of BSE. The majority of farmers were unaffected by stocking density regulations and on only two farms had these led to an overall reduction in stocking density on the farm. The great majority of farmers (86.4%) would not have to change their management practice even with the introduction of lower stocking density limits in 1996. The Extensification Premium was claimed by almost all

farmers and while 20.8% had made adjustments to their `paper' stocking density to qualify, none had reduced the overall number of livestock on the farm in order to qualify for the Extensification Premium.

It is widely accepted that prior to 1992, developments in the CAP had been inimical to the natural environment. Sadly, it is clear that the 1992 reforms in the beef sector have failed to live up to expectations that they might provide a turning point in reversing these trends in the uplands and elsewhere. The reasons for this are twofold. First, the 1992 CAP measures are insufficiently focused on environmental improvement. Apparent elements of conditionality are, in practice, exceedingly week. Secondly, market developments have altered and continue to alter the course of the reforms. This last point is of considerable significance not only in explaining the operation of the reforms in the last four years, but also in bringing home to policy makers and others that the CAP is not the only engine of change in agriculture. Farm management decisions are driven by both policy signals and market signals.

Aggregate responses to market and policy signals are based on individual responses by business men and women motivated by a range of factors to do with the trajectories of their own businesses and of the families within which those businesses are socially and economically embedded. Consequently the precise relationship between countryside change and policy change is highly complex and it is important to recognise that particular trends may be the consequence of a combination of factors.

Future policy reforms must recognise the complex and inter-related factors influencing farmer behaviour if policies are to be designed which will make positive impacts on the natural environment. This is likely to mean a combination of measures designed to capture the potential for protecting natural resources, increasing biodiversity, enhancing landscape character and encouraging public enjoyment of the countryside, in a range of contrasting farm systems and individual farm circumstances. Giver the decline in beef consumption and the obvious need to reduce beef production, there is little doubt that beef cattle numbers will continue to decline in the uplands. This makes it all the more important that policies should be environmentally targeted. It is important that beef cattle should continue to be located, or re-introduced, on key sites where nature conservation or landscape protection demands their attention. Reforms to the beef regime that would encourage slower-growing cattle of traditional breeds should also be explored. At the same time attention should be given to adjusting the sheep regime in certain ways. For example, older wether sheep graze much less selectively than ewes and young lambs. They might replace the valuable role of cattle in certain circumstances but are unlikely to be economically viable as long as sheep payments are tied to ewes and subject to quotas.

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Necessity for Integration of Agricultural, Regional and Environmental Policy for Disadvantaged Rural Areas

S. Bauer & S. Mickan

Summary

This paper deals with the various policy instruments applied in rural areas. These manifold policy instruments are, however, not integrated and harmonised. This leads to conflicts and counteracting effects and low efficiency as well as to limited success for the development of rural areas.
The concept of sustainability offers a comprehensive approach to integrate environmental, economic and social needs of the society as a whole as well as of the disadvantaged rural areas. From the environmental point of view, it is important to consider the main negative and positive effects of agriculture and the various production techniques applied. As argued elsewhere, a comprehensive policy should include taxes for environmentally dangerous inputs and production techniques on the one hand and subsidies for positive environmental effects on the other hand.
Also regional policy should be re-arranged in relation to the basic needs. A new policy should include general financial compensations according to generally accepted social criteria as well as interregional compensation payments for inter-regionally occurring environmental spill over, such as positive and negative external effects. Also following the principles of a federal policy system, a reform is needed concerning the responsibilities of the financial and political decision-making process at the various political levels. At the local or regional level, the real problems are best known. Therefore, decisions on regional development strategies should be made at these lower levels, e. g. investments in local infrastructure, subsidies for direct marketing and processing, subsides for investments outside agriculture or for the creation of tourism facilities. This requires a re-arrangement of decision-making and financial responsibilities from the EU to the local and regional levels.

1. Introduction

This paper basically deals with the conditions of agriculture in rural areas, agriculture's environmental effects and the policy instruments that are already applied and those that should be applied in these areas.
As rural areas are not homogenous, it has to be asked why some of them are more and others are less advantaged and how the resulting problems could be overcome. Of course, there are not only internal or natural factors affecting the areas' situations. Instead, the agricultural sector's local people can take actions by themselves to influence their situation at least partly. Additionally, rural areas are affected by the various policy instruments applied by numerous decision-making institutions at the different political levels.
To understand the importance of an integrated agricultural, regional and environmental policy, especially for disadvantaged rural areas, it is necessary not only to pay attention to the factors affecting the regional conditions but also to take into account the various effects of the agricultural sector on its environment. Only when taking together all kinds of effects, it is possible to determine the socially optimal level of agricultural activity. Especially the concept of sustainability reflects the necessity of political integration as it is occupied with environmental, economic and social aspects at the same time.
When the current situation is analysed the present policy applications can be examined critically and suggestions for an improved integrated policy can be made.

2. Agriculture in Rural Areas

2.1. Diversity of Locational Factors and Conditions in Rural Regions and Disadvantaged Areas

The rural areas differ in several aspects such as their natural and prevailing economic conditions, their geographical locations, farm structures, conditions of infrastructure, externalities as well as political constraints.[20] It is quite obvious and well known that the natural conditions of the regions like soil quality, climate, landscape etc. determine the possible and also profitable agricultural activities. But even if natural conditions are favourable, as can be observed in several areas of north and east Germany, agricultural and general economic activity can decrease. This is particularly true when the region under consideration lacks alternative employment opportunities outside the agricultural sector. In such a situation one has to expect further migration pressure from disadvantaged regions, resulting in an additional decline of overall conditions. Similar arguments can be applied when farmers lack proper direct marketing possibilities or a competitive access to their input and output markets. In these cases they are restrained to perform their agricultural activities in an optimal way. Thus the incentive to stop their farming and possibly to migrate to other sectors and/or regions increases, leading to the decline in regional conditions mentioned above. This shows the influence and importance of the overall economic situation on agricultural development in rural areas.

Especially in connection with these economic factors the geographical location of an area is of importance. In general, peripheral areas are likely to be disadvantaged in relation to rather centrally located regions, as the former often experience the economic shortcomings just mentioned. Whereas the pressure for in-migration and manifold uses of the land increases in the latter, especially when they are located closely to agglomerations. Therefore, already existing differences between regions can even increase over time, worsening the relative situation of already disadvantaged areas.

Another reason for regional differences is the existence of varying farm structures and sizes. This can be seen very clearly when comparing the agricultural sector in west and east Germany. Different production techniques and machinery are employed depending on their applicability, thus leading to different cost and return functions as well as to miscellaneous environmental effects as will be explained in chapter 3 of this paper.

Regarding the prevailing conditions of the infrastructure, differences between regions can be observed in basically every country. Again, it is often the peripheral areas that are disfavoured by infrastructure as they are confronted with far distances of transportation for agricultural inputs and outputs. Also the quality of some infrastructures might be worse than in more advantaged or more central regions, e.g. when education facilities are very limited. It is even possible that disadvantaged areas lack some infrastructure facilities which are taken as guaranteed in other parts of the country, such as modern communication technologies. In addition, the various areas experience all different kinds of positive and negative externalities of which they benefit respectively suffer or which they pass on by themselves to other areas. These externalities can be due to e.g. environmental effects or touristic attractions such as a particular landscape.

As will be shown later, the different political levels of decision-making as well as the various decision-making institutions are not integrated yet. This again results in a large diversity of regional conditions.

2.2. Main Driving Factors for Structural Change and Relative Decline of the Agricultural Sector

Apart from the factors that lead to a diversity in rural conditions, there are also a couple of factors which are important for the structural economic change in the long run. In general, in industrialised countries a continuous increase in agricultural production can be observed with a decreasing potential of factors of production and a

[20] Weinschenk,G., Henrichsmeyer,W., 1966, "Zur Theorie und Ermittlung des räumlichen Gleichgewichts der landwirtschaftlichen Produktion", in: *Berichte über Landwirtschaft*, Vol.44, S.201-242.

growing productivity. Especially during the 1960s human labour was increasingly substituted by capital and other non-human inputs. This was mainly due to the favourable relations of agricultural prices and the migration of labour to other sectors of the economy. Later, during the 1970s and 1980s, the structural change of the agricultural sector stated for the 1960s, was slowed down as the situation on the labour market declined in most European countries, resulting in a nowadays unfavourable agricultural structure[21]. However, the development of agriculture is characterised by an increasing mechanisation using newly invented technology and an intensified production.

As the relation between wages and interest rates rose over time, mechanisation and the use of capital intensive production techniques were encouraged as well as the invention of new technologies. This also applies to the biological progress and other automation processes. All these activities aim at rising labour productivity. As the agricultural output was expanding continuously over time and thus the supply of agricultural products while the demand increase for these goods was much lower, the supply surplus was growing as well. According to Engel's law, which states that the demand for food stuff declines relatively to overall demand when per capita income rises, this development could have been expected. Therefore, the relative decline of the agricultural sector in terms of GDP could have been anticipated.

Finally, the continuous specialisation of the individual farms is another main driving force for the structural change within this sector. This is due to the changes just mentioned, such as the increasing wage-interest-relation and technological inventions. Also it has become more important to acquire and use special farming and business knowledge for securing the economic success of one's farming activities. The danger not to be economically successful anymore becomes apparent when the development of the sectors' incomes are considered. As the nominal income of the agricultural sector stagnates its real income declines, which in turn results in a widening difference between agricultural and non-agricultural incomes and thus raises the pressure on agriculture's income. Further, as long as agricultural product prices are determined basically by the market it is important to farmers to grow and produce many different kinds of farm products to balance the income risk. Now, such a necessity to diversify the farm's activities does not exist since prices for most agricultural products are stabilised by EU policy. Thus the price risk is not as immanent as it used to be. Part of this specialisation is the externalisation of particular activities from the farming sector to specialised input and processing businesses. Besides this specialisation at the farms' level a geographical concentration of specialised farms can be observed as they often exploit similar comparative advantages a region offers.

Since the agricultural sector experiences quite some pressures as a consequence of all these driving factors, it is rather evident that especially the disadvantaged areas as they were characterised above have to struggle to get through this process of structural change.

2.3. Alternative and Additional Activities of the Farming Sector

The above mentioned pressures for structural changes generally and for disadvantaged areas specifically, require adjustments of the farmers to the new conditions. So to say, it has to be searched for possibilities to reduce the negative effects of the structural change on agriculture in particular and on rural areas in general.

Traditionally the farm size was increased to realise the required income for sustaining the family's life. This was done either by an extended use of land, possibly even putting marginal or ecologically valuable land under cultivation or by intensifying land use respectively increasing stocking rates. But certainly there are limits to such an 'adjustment'. First, usually the most productive land is already under cultivation, so all additional land cultivated will be less productive. Therefore, the land constraint becomes effective at the latest when planting, harvesting and other marginal costs start to exceed the respective product prices of the land under question. Second, the demand for land increases not only in the agricultural but also in the economy's other sectors while

[21] See Schrader, H., 1984, "Tendenzen und Probleme des betrieblichen und regionalen Strukturwandels", in: *Agrarspectrum*, Bd.7 (Agrarstruktur im Wandel), p.46-77.

the supply of land is fixed. Third, especially when ecologically valuable land such as moors, primary forests and wetlands are used by agriculture, large damage of the nature is very likely to occur. Once such areas are transferred from their original state to farm uses, they can never again be restored or replaced appropriately. Forth, by increasing the intensity of the land use, ecological damage is likely to be caused as the arable land or the pastures could be overused. Because of the restrictions in total land availability, individual farm growth by the means of additional land can only be achieved when other farms give up their farming activities. This is typical for the structural change of agriculture based on family farms. Particularly in rural areas, this simultaneous process of growth and giving up of farming depends very much on the labour market situation outside agriculture. As already indicated, in many countries it has been observed, that the process of structural change has slowed down with increasing unemployment problems. Correspondingly to these limits the adjustments of farm sizes mentioned are no generally suitable measure, thus other forms of adjustment have to be taken.

The second rather traditional form of adjustment is that of multiple job-holdings by farmers. Many farms are managed only part time so that the farmer can spend the rest of his labour hours working outside agriculture. Or sometimes some family members work on the farm while the others take jobs in another economic sector. All these kinds of multiple job-holdings make it possible for farmers to earn some steady and 'secure' income besides their farm income which depends on harvests and product prices and thus is less secure. But again, these adjustments are no unrestricted solution to diminishing agricultural returns, as can be observed looking at the prevailing difficult labour market situation.

Anyhow, there are further adjustment measures conceivable. As consumers become more and more aware of healthy nutrition, some farmers introduce ways of organic farming practices for which product prices are higher relatively to 'normally' produced agricultural goods. Especially to advertise particular product qualities farmers can increase their marketing activities. Besides these farming activities there are also possibilities to engage in environmental or local service actions, such as the maintenance of the landscape or the production of renewable resources as there is e.g. energy. Since the potentiality for raising funds for such activities is very limited in most regions and countries, the chances to earn some additional income in such a way are also quite restricted and thus no general solution.

For other farms it can be profitable to engage in tourist activities such as 'holidays on a farm' or ecology and nature oriented tours of the region. Further, they might be able to produce agricultural side products and special commodities like medicinal plants, bee honey etc. Finally, they can occupy themselves in private services and handicraft businesses depending on individual interests and talents.

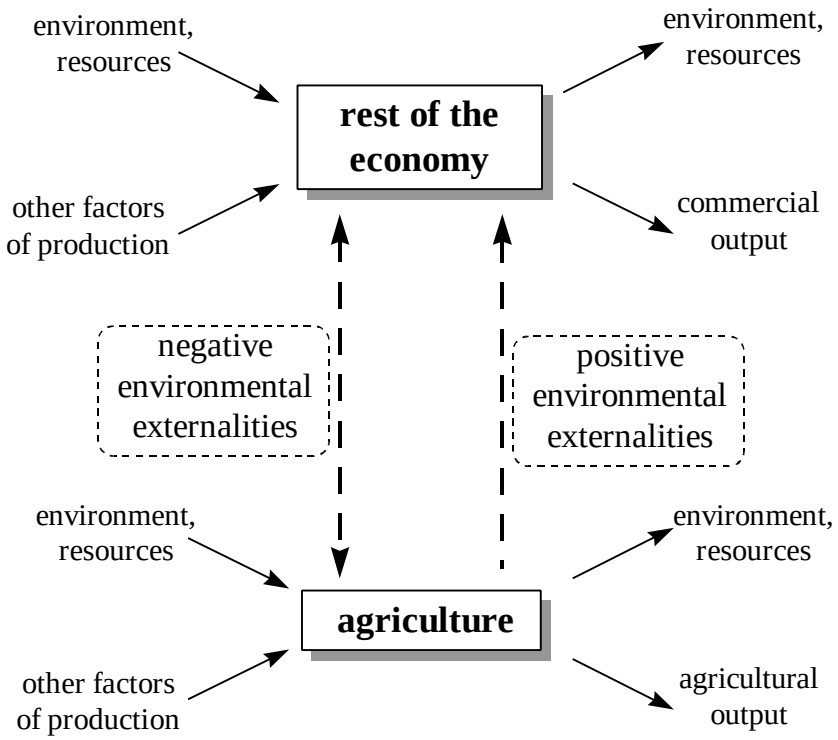
As all these different examples for conceivable additional income sources reveal, they can never be generalised. Instead, these activities can only be applied in dependence of the farms' and/or regions' conditions, e.g. not every farm and region would be in a situation to attract tourists, such as those located in no special landscape but near significant industrial settlements with immanent negative externalities.

3. Environmental Effects of Agriculture

3.1. A Synoptic View

As a starting point for a more detailed analysis of agriculture's externalities, the relationships between this sector and the rest of the economy in terms of environmental interdependencies should be described. In general, these interdependencies can be clarified with the help of figure 1.

Figure 1: Environmental effects of agriculture and the rest of the economy



As can be seen, both agriculture and the rest of the economy use natural resources and the environment as well as other factors of production for their production processes as inputs. Both generate some output in form of goods and side effects, such as the effects on the environment. Effects on natural resources exist in so far as they are 'consumed' by the production process and thus their stock diminishes in the case of exhaustible resources whereas the stock of renewable resources is not endangered as long as the rate of harvest does not exceed the rate of growth permanently. Regarding the environment, the negative externalities of the rest of the economy, especially those of industry, affect the agricultural sector strongly. This is due to the fact that agriculture is distinctly connected with the environment, since it depends on the use of the environment. To get hold of these problems, this sector will have to draw up its requests for the rest of the economy with respect to environmental standards, compensations etc. However, agriculture also causes negative environmental effects which can influence the rest of the economy, e.g. degradation of water quality due to an overuse of fertiliser though the water is needed for other uses in good quality as well. But in addition, agriculture also provides positive environmental effects, when e.g. preserving the landscape and the variety of species. This can result in positive outcomes on rural tourism and the research sector for instance.

These interdependencies already indicate the necessity for an integrated policy for means of the environment and disadvantaged areas, as these regions might at least in some cases suffer particularly badly of negative environmental effects of the overall economy. Anyhow, the importance of such an integration will become even more evident when the externalities of the agricultural sector are itemised and the significance of the concept of sustainability is made clear.

3.2. Negative Environmental Effects of Agriculture

The negative environmental effects of the agricultural sector basically can be put down to the technological, economical and political conditions under which this sector has to operate. In the case of negative external effects, the consumer e.g. of water suffers nitrate etc. which is accumulated in the water due to fertiliser use. Then the farmer is the cause of the damage, but he has not got to pay for it as the market mechanism does not consider such externalities. Further, there are no property rights concerning ground water, air and noise. Hence, nobody has to pay for negative externalities he causes nor does anybody get paid for positive externalities he induces. The typical agricultural effects on the environment can be characterised as in the following.

- Especially during the 1960s and 1970s many **measures of land clearing** were applied. As a result, ecologically valuable land got lost and the natural landscape was changed. This development was very much due to the relatively high price level of agricultural products, which again let to high property prices. Thus, formerly uncultivated land was put under agricultural use as even less productive land became profitable. Even though already cultivated areas are set aside at present, those environmentally valuable areas that were lost during these land clearing measures cannot be restored appropriately.
- As already mentioned in chapter 2.2., agricultural production was **intensified** by means of an expanded use of factors of production. This was mainly caused by a favourable change of the ratio between input and output prices, resulting in a high level of inputs used and the development of new technologies. This development has caused many problems, particularly from an ecological point of view, as residues of fertilisers etc. arose in the ground, soil, water, air and even in food commodities. Furthermore, as another result a decrease in the variety of species could be observed, leading to not reversible environmental damage.
- Also the increasing **specialisation** of farm's activities and the rising **regional concentration** mentioned above induce quite some negative environmental externalities, such as high levels of animal waste, soil erosion, a less diversified crop rotation and a changing landscape. Further, it is very likely that the use of fertilisers and pesticides is increased, and that more animal medicines are used than in a more diversified agricultural system. These problems become the more serious the higher the concentration of similarly specialised farms in a region, as the landscape becomes more uniform and thus leads to a diminishing variety of species when the natural variety of landscape elements disappears.
- Finally, the increasing level of mechanisation and use of more and more modern agricultural technology is not without environmentally important effects. Concerning crop production, mechanisation is associated with soil deformation, rising farm sizes, larger farming plots and faster operation times of planting, fertilising and harvesting. At least partially, this is accompanied by massive problems for flora and fauna, as e.g. there are less protection and withdrawal possibilities for animals. The technological progress in animal production has resulted in larger livestock which in turn has negative consequences as overstocking and manure problems occur.

3.3. Positive Ecological Effects of Agriculture

In general, it can be said that agriculture traditionally has to produce in harmony with the environment, as the environment is the main factor of agricultural production. In the past, agricultural activities have led to an increasing variety of flora and fauna as well as it has given cause to the rise of new ecological subsystems such as heaths, pastures etc.

Though today's agriculture can induce negative externalities when specialisation, mechanisation and the other factors mentioned are applied too strongly, it can also bring about several positive ecological effects, especially when it keeps producing in harmony with the nature. One important task of agriculture in terms of such effects is the production of oxygen and the clearing of the air. That way, agriculture also serves the protection of the climate. Others are the preservation of soil fertility and stability as well as the conservation of good ground water quality and a sufficient supply of ground water. By implementing hedges etc. on farming plots, the variation of the landscape can even be increased affecting biodiversity positively.

As can be seen by the points listed in the last two chapters, agriculture can have both, positive and negative effects on the same elements of the environment. Whether agriculture affects the environment in one way or the other, depends very much on the way in which agricultural activities are carried out. However, positive externalities of agriculture are usually neither considered by the market mechanism nor by agricultural policy. Instead, they are taken as a matter of course by the society. Often they are regarded as side products of agricultural activities that arise automatically and which are not rare and can thus be used as free goods. The market leads to an insufficient supply of public goods, because these goods can be consumed without payment and also because the producers are not paid. Therefore, it is not amazing that the supply of such goods by the agricultural sector has decreased substantially during the last decade, especially when the structural and technological changes occured. Instead, this decline is sometimes taken as a negative externality for which the farmers shall pay by internalising these effects.

3.4. Private and Social Optimality of Traditional and Modern Agriculture

It is quite often argued that the transition from profit oriented to some ecologically oriented agriculture should be made. But such postulates do not accomplish such transformation as long as the way this can be achieved is not made explicit. Considering the limited success of Christian religions' attempts to change the peoples' attitudes and behaviour for more than 2000 years, it seems that this change will not come about simply because of moral appeals. In addition, environmental problems seem to become more and more serious year by year. Nevertheless, organic farmers are as profit oriented as conservatively producing farmers though they generate more ecological output respectively less negative environmental effects. The difference between these two kinds of farmers is, that they work with different techniques and produce miscellaneous goods' qualities. Also the former have to be profit oriented, otherwise they would not be able to earn sufficient income and provide social security for their families. The profit oriented behaviour of these farms in combination with their way of production aims at a long run survival and at realising sustainability. Therefore, it can be concluded that individual profit maximisation behaviour should be accepted as the basic rule for policy concepts. It has to be analysed whether private and social optima diverge and how it is possible to overcome the difference.

Figure 2: Private and Social Optima of Traditional and Modern Agriculture

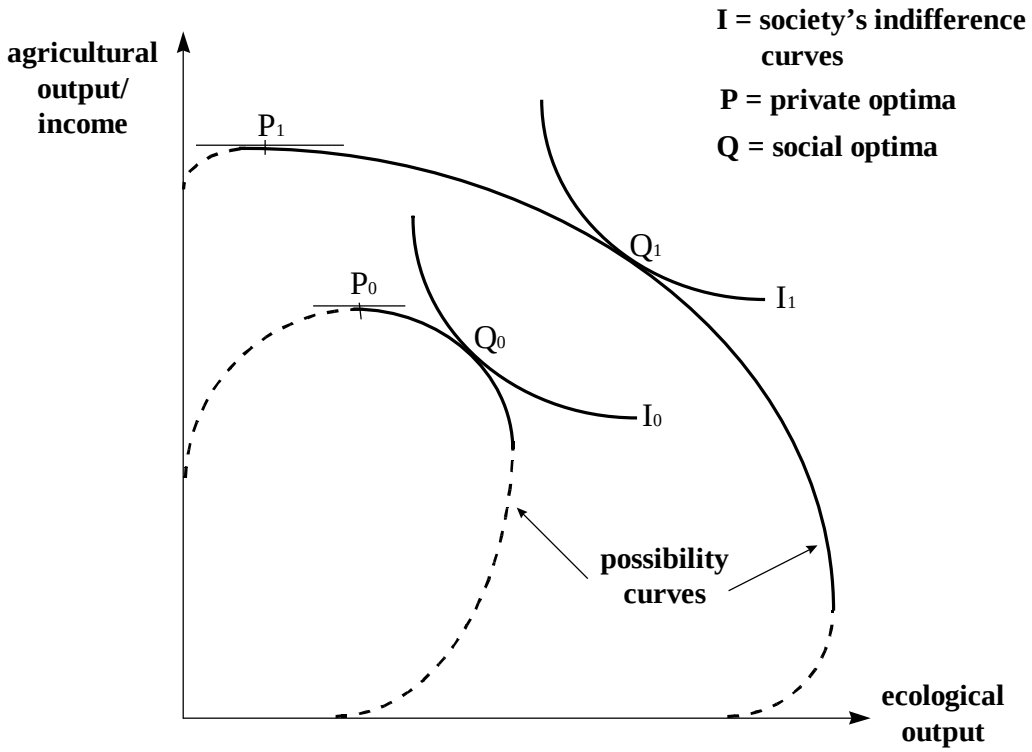


Figure 2 shows two different transformation curves. The dotted prolongations of these curves aim to demonstrate that at a very low level of ecological performance income can only be increased by raising the ecological performance as well and vice versa. As the same income level along the dotted curve can be realised with a higher ecological output as well, these points are not efficient. The same applies with respect to the ecological performance. Thus each curve as a whole can be regarded as the respective possibility curve of production, whereas the drawn through part of the curve represents the transformation curve which equals the efficient production points. While the relation between the two kinds of output is complementary along the dotted part of the curves, both outputs are incomplete substitutes along the drawn through transformation curves.

The inner transformation curve represents the situation of traditional agriculture. Here agricultural income and ecological output are highly correlated. This is anything but extraordinary. As was said before, agriculture used to carry out its activities in harmony with the nature since the environment was the irreplaceable basic factor of production. Because the individual farm aims at maximising their income, P_0 represents the individual optimum, without considering any public subsidies or compensation payments. Anyhow, when the social utility function is represented by the indifference curve I_0, then the social optimum will be in Q_0. As can be seen, both optima are very close together. Therefore, in this case the social loss is relatively small when the market mechanism results in the private optimum. In the case of the outer transformation curve, which represents modern agriculture, these two optima diverge much more leading to a higher loss of social welfare when the private optimum P_1 is realised.

Due to mechanisation and technological progress etc. the transformation curve shifted outward. Over time it became possible to produce more agricultural as well as ecological output. However, another effect of modern techniques is that the nature as the basic factor of production could be substituted at least partially more and more by modern inputs such as relatively resistant and/or high yielding varieties, fertilisers, pesticides etc. To avoid the resulting loss of social welfare, ways have to be found to internalise the positive externalities of agriculture on the environment. As the individual behaviour aiming at profit or income maximisation cannot be changed, these externalities must be internalised in the market price to minimise the loss of social welfare. This internalisation has to be done by the means of market oriented policy instruments, since they are the only way of providing

economic incentives to farmers for the production of ecological output. These incentives have to compensate for the income loss caused by the forgone agricultural output.

3.5. Aspects of Sustainability and Related Disciplines

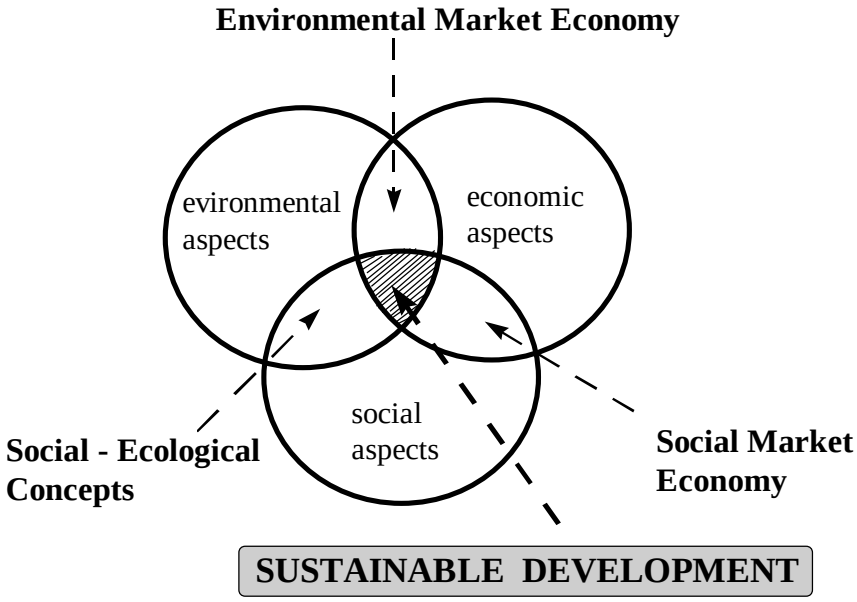
Lately the concept of sustainability has become increasingly famous though until now no clear and unique definition of the term 'sustainable development' exists. Basically, the discussion about this term started in 1972 when the Club of Rome revealed that economic growth is limited by the stock of natural resources. Later on, the original concepts of sustainability were expanded, so that this term nowadays refers to a balanced relation between ecological, economical and social goals. This is reflected by the shaded area in figure 3, where all three dimensions intersect. As soon as only two dimensions intersect, it cannot be spoken of a sustainable economy anymore according to this widest definition of sustainability.

The ecological dimension of sustainability aims at maintaining the environmental quality. This does not mean that the environment should not be used at all or be left to its own devices, instead the accumulation of pollutants should not overcompensate the nature's absorption ability.

In terms of economic aspects efficiency is to be realised. Ecologically, this aim can be justified, as only sufficiently profitable activities can survive the economic competition. If they are not able to such a performance, the economic activities will not be helpful for the realisation of environmental aims either.

The social aspects of sustainability refer to the justice in the society. Any political measures that favour particular groups of the society while discriminating others are inconsistent with sustainability, since such a policy certainly leads to social tensions in the long run. Therefore, similarly to the economic aspects, such policies cannot help to realise environmental sustainability, even if environmental aims are central to the policy measures, as these measures have to be stopped sooner or later when social injustice and tensions become too great.

Figure 3: Aspects of sustainability



With regard to all these three aspects the complexity becomes clear. Hence, sustainability cannot be measured easily with simple criteria. But it is a positive concept in as far as it wants to influence future developments

positively referring to the chances that should be taken, such as new technological innovations, the use of renewable resources etc.

Concerning European agriculture, a policy concept was developed by agricultural scientists of different disciplines in 1991. Based on the fundamental problems of agriculture and environment and the future requirements, basic policy principles for an integrated environment oriented agricultural policy were developed. According to this concept, the term 'sustainable agriculture' refers to environmental protection as well as to the realisation of a reasonable income for efficient and non-polluting farmers. But it also includes budget control, stable markets and international trade agreements in its aims. [22]

These points make clear, how important it is to include economic aspects in the sustainability concept. As already indicated, economic profitability is a prerequisite for carrying out economic activities. This becomes evident when looking at organic farming activities. This kind of farming is sustainable only because of the similar per capita income that can be realised through relatively high producer prices in comparison to conventional agricultural commodities. In general, it can be said that today's environmental policy mainly operates with legal restrictions which usually do not meet the requirements of sustainability, especially as these restrictions normally are not related to economic efficiency at all. Therefore, similarly to the other sectors of the economy, sustainable development of farms can generally only be obtained, if the economic and political framework is adjusted to environmental objectives. These conditions that have to be newly created have to make sure, that a non-polluting behaviour along a farm's sustainable development path becomes more profitable than conventional farming. Basically, these new conditions should lead to a substitution of capital and energy by relatively labour intensive new technologies. This would also aim at the social component of the sustainability concept as such a partly substitution of capital by labour might also help to solve today's high unemployment.

4. Impact of the EU Agricultural Policy Reform on Regional Competition

The reform of the EC's agricultural policy from 1992 has not integrated environmental and landscape problems of European agriculture into a comprehensive agricultural and environmental policy concept. It is difficult, to find elements of the reform, which are in line with the available conceptual framework of sustainable agriculture, in opposite, the reform itself does not seem to be sustainable, since the discussion about the 'reform of the reform' has started shortly after this reform was carried out.

As the main driving force for the reform, one can very clearly identify the traditional agricultural policy problems and the actual financial and international trade problems.

The reform can basically divided into the following elements: Firstly, those that changed agricultural prices and market regulations, and secondly, additional programs and payments for afforestation, environment protecting production practices etc.[23] Though these last measures seem to be more environmentally oriented, in fact they are not. Also the financial volume spent for these measures is rather limited.[24] Since the supplementary measures are used only partly, the reform does not guarantee a non-polluting agriculture in the European Union at all. However, there are further criticisms that can be summarised as follows:

- The reform leads to additional bureaucratic and administrative elements within the agricultural policy system. The reform has added new elements to the system without abolishing any existing instruments, leading to a rising dependency of the farmers upon bureaucrats. Instead of introducing more market oriented elements, the EU's agricultural policy system is moving more and more towards a planned system.

[22] For an explanation of the specific elements of the concept compare Wageningen Memorandung, 1991, *"A view on agriculture in the European Community"*, Wageningen.

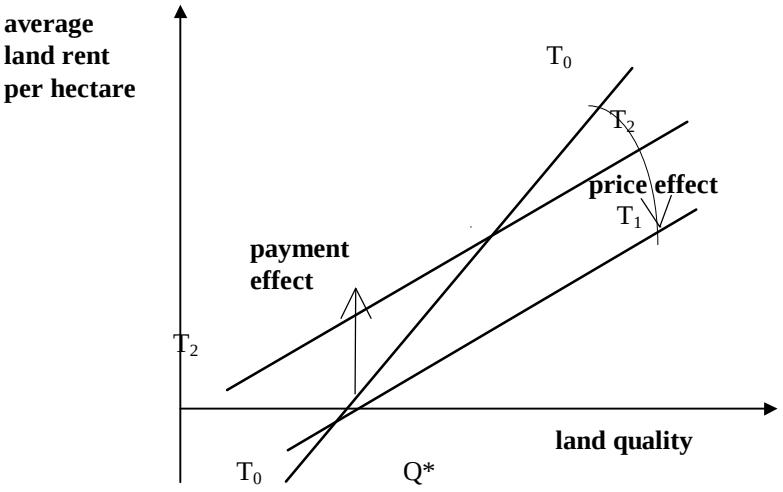
[23] For more details see Bauer, S., 1993, "EG-Agrarreform: Eine erste Bewertung aus marktwirtschaftlicher und umweltpolitischer Sicht", in: *Zeitschrift für angewandte Umweltforschung*, 6. Jahrgang, p.97-104.

[24] A more detailed argumentation can be found in Bauer, S., 1993, "EC agricultural policy and its impact on land use and environment", in: *EUROMAB*, Vol.3, October, p.24.

- The massive transfer payments are basically meant to preserve the priorily existing income distribution, instead of an orientation on generally accepted social or ecological criteria. This leads to a high inefficiency of spending public money from taxpayers and will therefore lead to a very low acceptance in the society, especially as this policy does not seem to be sustainable in the long run.
- The set aside program neither makes much sense from the economic nor from the ecological point of view. Payments given for setting aside the principally scarce factor land is a waste of resources and does not fit with the principle of an efficient and environment oriented use of resources. Obviously, the politicians, who argued for world market prices in the EU do not believe very much in the market mechanism in agriculture. In addition, those areas or plots set aside are not necessarily the ecologically most valuable but usually the least productive ones.
- From the regional and landscape point of view, the reform, particularly the compensation payments, will lead to some stabilisation of marginal areas. Many calculations show, that in marginal areas the effect of decreasing agricultural prices will be overcompensated by the transfer payments. This means, that the withdrawal of agriculture from marginal areas will be slowed down. This positive effect from the regional point of view and also from an environmental and landscape perspective is, however, coupled with relatively high income transfers. But as it is expected, that these transfers are reduced drastically in the medium term, an extreme change of the land use in marginal areas is going to occur, resulting in economic, social and ecological problems of the respective regions. Therefore, also from this point of view, the reform is not sustainable, even though it involves some positive short term effects in marginal areas.
- Finally, the reform neither solves the ecological problems involved by intensification, specialisation and regional concentration in agriculture, nor does it stop the tendencies observed in the past.

That is, why the Common Agricultural Policy has been criticised primarily by environmentalists as well as by economists. In fact, it is difficult, to find out a clear orientation of the reform on the fundamental long-term problems of the agricultural sector. From this global point of view, the reform turns out as a very narrow and short term oriented superficial compromise. Since all affected interest groups can find some positive aspects within the reform package, they have more or less accepted the compromise without analysing the relevant long term consequences. However, the reform's inconsistency and the missing long term orientation also reflect the dilemma of agricultural policy, since on the one hand its knowledge of ecological interdependencies is incomplete but on the other hand the sensitivity and uncertainty of the population increases.
The change regarding the relative situation of the different areas, especially with respect to the shift of average land returns, can be explained by means of figure 4.

Figure 4: Impact of the EU's agricultural policy reform on regional competition



Source: own representation

If the horizontal axis represents the land quality in the sense that the further one moves to the right of the origin the more productive the land and thus the higher average productivity and if the vertical axis depicts the respective average returns of the land per hectare, then the average land rent will increase continuously as the land quality rises. This original situation can be characterised by the rather steep curve T_0T_0. However, if agricultural product prices are lowered, as was done by the reform under question, where at least some prices were adjusted to the world market level, then this steep curve turns downwards and becomes T_0T_1 (without considering production costs), as the average income effect increases with average land productivity. In other words, the higher the land quality the higher the average output per hectare, and thus the higher the forgone income per hectare. Consequently, this leads to a relatively lower income loss per hectare for less arable land. At the same time, farmers receive some compensation payments per hectare land, without distinguishing between the price effects on the average output explained above. These general payments can be represented by the upward shift of the T_0T_1 curve to T_2T_2. In comparison to the original situation, this leads to a decrease of income per hectare for all areas with a land quality higher than Q^*, whereas that of the lower quality land is increased. As can be seen from this figure, does even more land become profitable, since the average return of low quality land, such as marginal land or disadvantaged areas is increased considerably.

Though this policy relieves the income pressure of farmers in disadvantaged areas, still, this reform is not any more than an alleviation and hence cannot be a general solution as can be seen at the various problems already mentioned.

5. Policy Conclusions

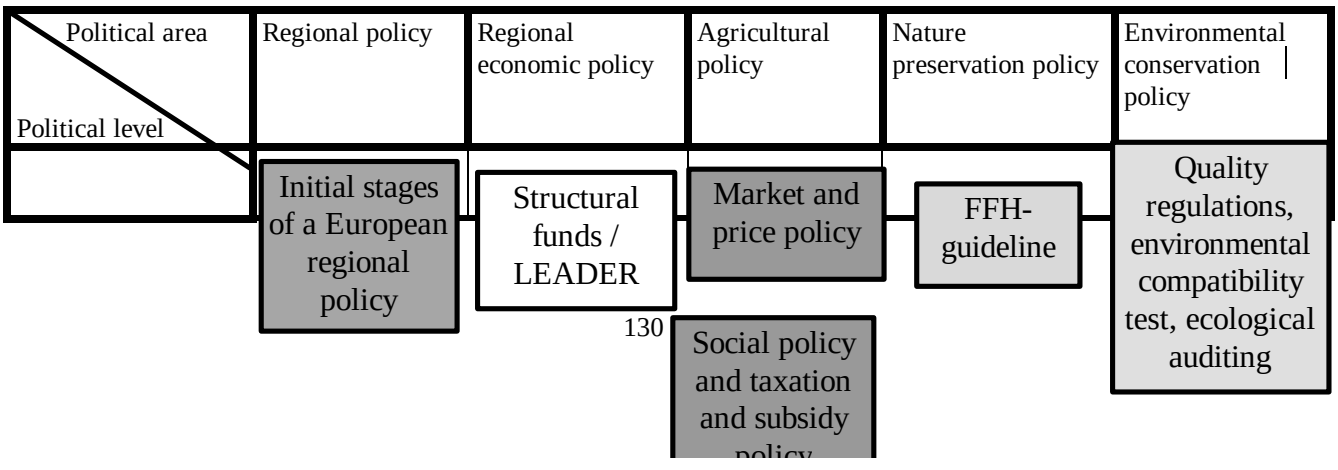
5.1. Legal Measures for Environmental Policy

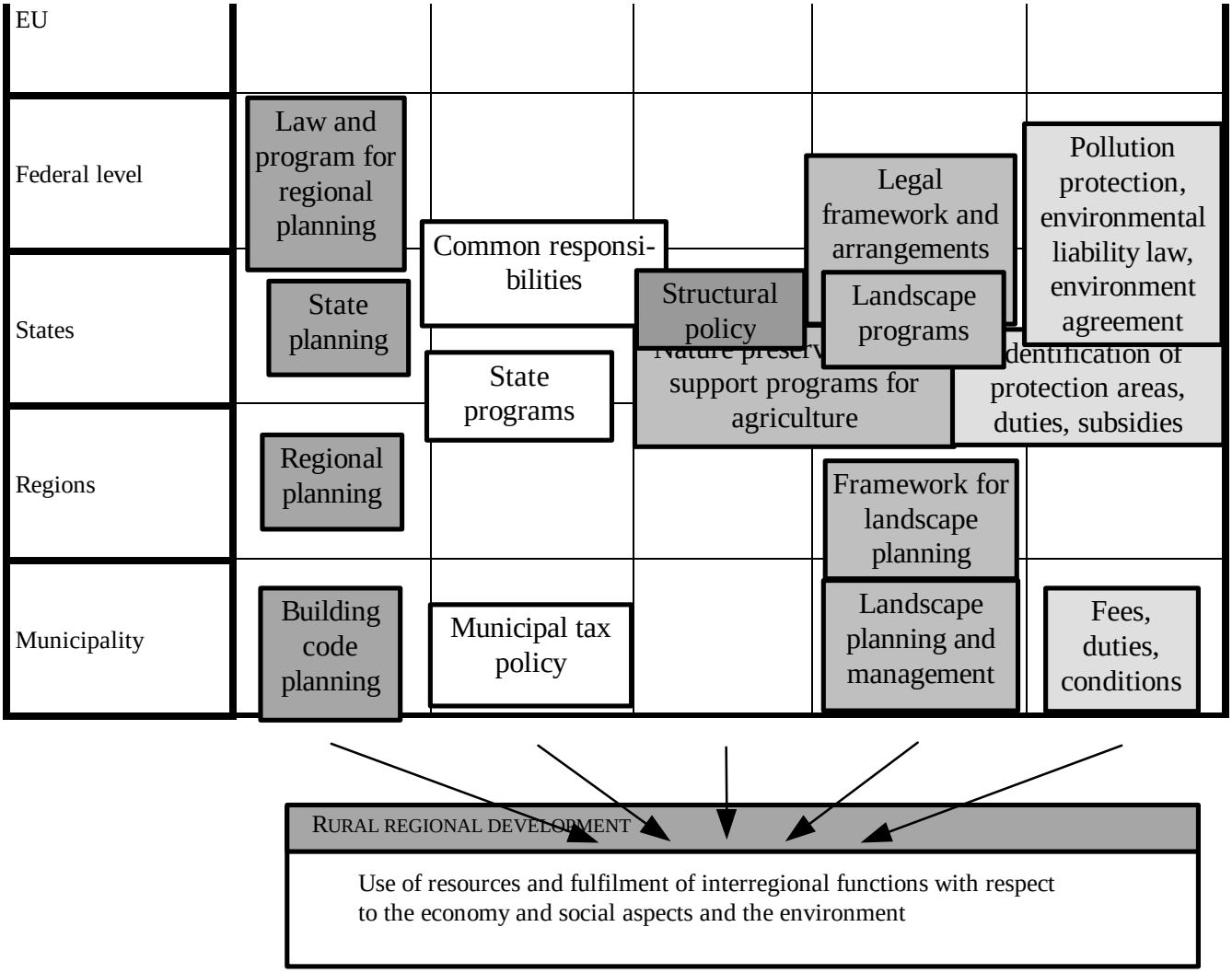
Environmental objectives are more and more considered in many areas of politics. This is reflected in the preamble to quite a lot of laws, decrees and legal guidelines, where at all political levels claims and expectations regarding the environment are made clear. Also in the agricultural report of the German federal government, one of the four main objectives of federal agricultural policy refers to environmental conservation. From the ecological point of view it is gratifying to see that environmental objectives are considered similarly as other legal aims. Most laws and decrees are comprehensive and with regard to the future, aiming at sustainable development. Basically, to a large extent there seems to be mutual consent within society as well as between different political groups about the necessity of considering environmental conservation. However, this mutual consent does not go as far as it would be essential for the formulation of definite environmental policy strategies.

Figure 5 aims at giving an overview over the different areas of policy responsible for actions with respect to rural development and the environment in the European Union and in Germany. Horizontally ordered are the different political areas, whereas the various political levels are listed vertically.

Rural development, and thus also that of disadvantaged areas, depends on all these different levels and areas of politics. Especially in terms of the fulfilment of rural areas' interregional functions and the use of natural resources, these levels' measures have to be co-ordinated as environmental, economical and social concerns are affected. As can be seen by the large number of political areas and levels and the resulting huge number of legal measures, it is quite difficult to co-ordinate all these measures firstly within one level and secondly also across all different policy levels.

Figure 5: Important political areas and levels of decision-making for the environment and rural areas

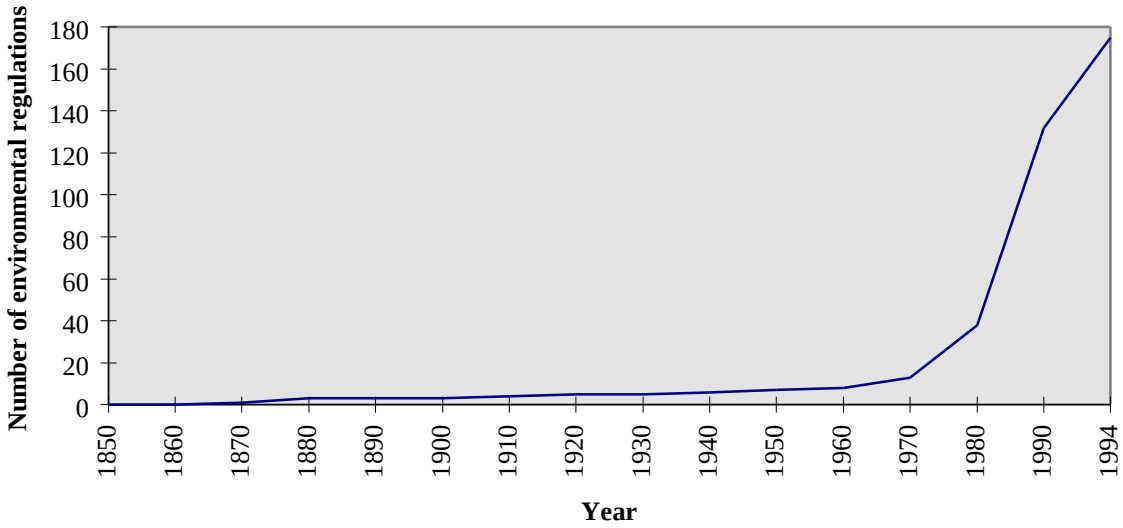




Source: according to Bauer, S., Abresch, J.-P., Steuernagel, M., 1995,"Gesamtinstrumentarium zur dauerhaft umweltgerechten Entwicklung ländlicher Räume", Gutachten für den Sachverständigenrat für Umweltfragen, in: *Materialien zur Umweltforschung*, Heft 26, Stuttgart, p.91.

Figure 6 indicates how environmental goals were implemented in legal actions in the past. The immense increase in the number of environmental laws and other legal guidelines over the last 25 years is incredible. During this period the number of legal actions multiplied manifold, whereas this number has been relatively stable for the 100 years before. But the success of all these regulations is rather limited and therefore must be evaluated very critically. In addition, the large number of these regulations involves bureaucratic and administrative problems and increases the restrictions for individual enterprises and households. Instead of this presently ever increasing number of legal regulations, systems offering economic incentives could have been much more efficient.

Figure 6: Development of the number of environmental laws and other legal regulations



Source: according to Willig, M., 1993, Die Umweltakademie Fresenius

5.2. Elements for an Integrated and Market Oriented Policy for Sustainability in Rural Areas

It is certainly not realistic to expect noticeable adjustment of the political decision-making institutions to the prerequisites of sustainability in the short run. Instead, the traditional areas of politics have to be adapted firstly to the new requirements before all environmentally relevant areas can be integrated to improve the co-ordination of the already existing political instruments.

However, the necessity for legal measures in the future depends very much on the extent to which the subsequently proposed market oriented policy instruments are integrated in future environmental policy. Since experiences demonstrate that legal guidelines alone cannot promote and realise environmental goals when they contradict the market mechanism and therefore oppose an efficient allocation, also market based activities have to be utilised. Nevertheless, to some extent also legal actions are always needed, even if the other policy instruments work efficiently. In other words, accepting a market economy as the basic means of allocation all measures for environmental conservation should be compatible with the market mechanism. This means, the state has to provide an appropriate legal framework within which prices adjust accordingly to market processes and without government interventions. At the same time, prices have to be directed by the market in a way to internalise environmental externalities and to realise an efficient allocation of resources.

With respect to an environment oriented agricultural policy it is important to analyse whether the ecological objectives are in harmony with the economic and the agricultural objectives or not.[25] In addition to the so far mentioned environmental and economic concerns, the new agricultural policy should also be based on generally accepted policy principles concerning social aspects, accordingly to the broad concept of sustainability. In general, the social policy component should take care of people who are under the pressure of income and social security. This policy has to be oriented on individual criteria, as e.g. living conditions and individual problems. To avoid distortions of the market mechanism because of social policy, it should provide only for a specified minimum living standard for everybody. Above this level the income distribution has to be set up by the market mechanism. Moreover, the basic orientation of a market oriented policy for sustainability in rural areas also has to include corrections for environmental purposes and public goods. To actually realise this market oriented policy, the basic

[25] Examples for complementary as well as for contradicting goals are given in Bauer, S., 1990, "Landwirtschaft und Umweltpolitik - Überlegungen aus ökonomischer Sicht", in: *Zeitschrift für angewandte Umweltforschung*, 3. Jahrgang, Vol.2, p.142.

orientation including social and environmental aspects has to be transformed into a number of policy measures to be adopted.

The first market oriented measure that seems to be particularly important is that of taxes on environmentally dangerous inputs and production techniques. These taxes should be applied to internalise the negative external effects of agriculture at the EU level and thus provide the European farmers with a new economic framework and uniform conditions of competition. As was made clear in chapter 2.2., many of these effects can be put down to a high and ever increasing use of modern inputs, such as fertilisers, pesticides, energy etc. In general, a tax on such inputs can decrease their use and thus lead to a more closed farm based material circle also resulting in declining pollution. In the long run, the research for technical progress would be directed towards relatively input saving technologies as far as the taxed inputs are concerned. The positive adjustments of such a tax system on the environment can be summarised as follows. Firstly, the intensity of agricultural production declines having a positive impact on biodiversity. Secondly, due to relatively high input prices farms would start to lower their level of specialisation. Thirdly, also regional concentration could decrease when it becomes less profitable to produce agricultural commodities in large concentrations, as the necessary inputs become more expensive. This would actually lead to comparative advantages for less favoured areas, as their production possibilities become more important when other areas are not used as intensively as before. And fourthly, especially energy taxes provide incentives for the development and the use of energy saving technologies.

In addition, input taxes seem to have advantages in comparison to legal measures in terms of administrative costs as the realisation and control of the former appears to be less difficult. Also the adjustment possibilities of a tax system are greater and easier to accomplish than those of legal guidelines.

Another main instrument is that of payments for ecological output to internalise the positive externalities of agriculture. In general, farmers are not paid for their ecological output at all. Therefore, since farmers are as profit oriented as any other entrepreneur, they have no incentive to produce such an output besides some complementary environmental goods which arise automatically with agricultural production. Because of the rising substitutive relations between agricultural and ecological output replacing the formerly complementary connection, as was explained in chapter 3.4., the problem of diminishing ecological output has accelerated during agricultural development in all industrialised countries. Hence, a price for specific positive externalities has to be introduced to obtain a new private optimum that is more in line with the social optimum.[26] By paying the farmers a certain subsidy, which should be calculated according to specific ecological criteria, the positive externalities are internalised in the farmers' profit maximisation. The criteria should provide incentives for the different positive externalities in dependence of the regional shortage and importance of the respective effects, thus differentiating the payment regionally. Giving the farmers market oriented incentives to produce environmental goods by paying them, generally leads to a much more efficient allocation rather than realising the production of such goods by legal measures.
However, until now many practical problems concerning implementation, adminstration and control of such subsidies are not solved, as it is not settled yet which ecological elements are of distinctive importance for a sustainable development. It is also difficult to measure and value ecological effects monetarily so far. Thus, quite some research and case studies have to be done before farmers can be paid for the positive environmental effects they generate.

The third main policy to be introduced in this context is that of interregional monetary transfers in relation to social criteria as well as infrastructural and environmental spill-over. This is important in so far as the regions have different functions to fulfil and their resources are used by various means. Hence, it is neither possible nor reasonable to expect that the common objective of even living conditions in all regions is realised in a way that all environmental and material circumstances are completely equal in all regions. Instead, this general objective has to be obtained with the necessary regional differentiation. Therefore, it makes sense that regions which generate

[26] For more details of environmental compensations see Streit, M., et.al., 1989, *"Landwirtschaft und Umwelt: Wege aus der Krise"*, Baden-Baden and Bauer, S., Schäfer, D., 1993, "Agrarökonomische Vorschläge und Vorstellungen zur Honorierung ökologischer Leistungen der Landwirtschaft", in: *Loccumer Protokolle: Die Honorierung ökologischer Leistungen der Landwirtschaft*, Loccum, p.65-94.

interregional or nationwide negative environmental externalities have to make payments to other regions which might have to bear these effects. Such a transfer system could give incentives to the regional administration for respective allocation decisions especially with respect to regional environmental investments. With the help of such interregional payments it might become profitable for a region to support environmental activities rather than an industrial area.

However, these political steps by themselves are not likely to solve or at least to stabilise the typical problems of rural areas. A comprehensive regional policy as well as additional measures of economic policy are also needed to avoid further migration of rural inhabitants and trade businesses from these areas. Therefore, it is essential to preserve a minimum population and infrastructure, as otherwise the social and ecological functions of rural areas cannot be guaranteed, whereas the problems of towns rise further with more in-migration. Additionally, more infrastructure measures have to be taken as well as new employment opportunities have to be brought about in rural areas using regional chances and comparative advantages.[27]

Especially with respect to disadvantaged areas, it must be recognised that particularly the lower political levels have the necessary knowledge about specific regional conditions and problems. Hence, despite the immense need for political integration, one has to remember the necessity for following the principle of subsidiarity.

6. Conclusions

From this paper's analysis, it can be concluded that rural regions in the EU as well as in most member countries are characterised by a high level of diversity. This regional diversity can be put down to different natural conditions, various locational factors, miscellaneous historical developments and policies and divers development opportunities.

In contrast, most of the policies applied are highly centralised at the EU or national level and therefore quite uniform not taking into account regional differences. This is especially true for regional and agricultural policies, but also for environmental policy. The specific problems are often not tackled by such policies and the most suitable development strategies are frequently not implemented. As experiences show, in many cases regional politicians and other key persons would like to follow development strategies other than those supported by the EU and national governments. As a result of this and of the segmented way in which regional, agricultural and environmental policies are carried out with a very low level of integration, the efficiency of the policies affecting rural areas turns out to be relatively low.

As a conclusion of this analysis, a reorientation of 'rural policies' should consider the following basic elements and principles[28]:

- The market mechanism has to be regarded as the basic and most efficient driving force for an efficient factor allocation and for structural and regional changes in the economy's and society's development (market economy).
- From the social point of view, there are good reasons for financial compensations and transfers between individuals as well as between regions in Europe. However, these transfers should be based on clear social and income criteria (social market economy).
- From the environmental point of view, regional spill-over exist in the sense of positive and negative externalities between regions. Also because of this reason, adequate financial compensations and incentive systems should be developed and implemented (social-environmental market economy).

[27] A list of examples for possible opportunities and potentials is given in Bauer, S., 1992, "Landwirtschaft und ländliche Räume: Integration regional-, agrar- und umweltpolitischer Erfordernisse", in: *Seminarberichte der Gesellschaft für Regionalforschung*, Vol.32.

[28] For more details see Rat von Sachverständigen für Umwelt, 1996, *"Konzepte einer dauerhaft-umweltgerechten Nutzung ländlicher Räume"*, Sondergutachten, Stuttgart.

– Finally, there are other public goods besides the environment with unbalanced regional burdens and utilities, as for example cultural and educational institutions, which also require financial compensations.

These principles for a reorientation of rural policies can guarantee an adequate co-ordination of regional policies including economical, environmental and social necessities. At the same time, such a policy reorientation would allow for more decentralised political decision-making and financial responsibilities at the regional level, where the real problems are best known.

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Developing a conceptual framework for agricultural and environmental policy adapted to Mediterranean areas
- some proposals derived from case studies

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INTRODUCTION

Why should we raise the question of an agricultural policy adapted to Mediterranean areas? Because the current CAP has severe negative effects on the economy, the environment and the life of rural Mediterranean societies.

Is it a problem of conception or application? The objectives and the internal logic of current policy will be discussed, as well as its possible effects on various regional situations. Beyond this, using examples to demonstrate situations where policy is not satisfactory, the logic and principles of another more suitable policy are outlined. Finally, in order to show better its effects and the conditions for success, the applications of this new policy are tested experimentally. These reflections on the subject will be presented in this paper.

LOGIC OF THE EUROPEAN AGRICULTURAL POLICY

First of all, please excuse the oversimplified aspect of this presentation : its objective is not to describe what technicians and experts know already, but only to retain some obvious facts relating to the significant consequences.

Even if some methods of implementation soften the general logic of the policy, we must consider that the essential preoccupation of the CAP is to regulate the quantity of agricultural products on the market, in order to stabilise prices and so to maintain the income of efficient farmers, as well as trying to reach the world market rate, dictated by the laws of supply and demand. This market law is the essential constraint on production, and the constitution of an income for the farmer implies that production should be as important as possible, and at the most satisfactory prices.

For any specific good, there are a range of areas which will be suitable for its production, but in addition there is a need for appropriate estate structures (concentration and expansion of properties), a race for labour productivity as well as for capital.

We can see positive aspects in this evolution of policy. However, there is another side :

1. It is well-known that in the most fertile areas, the race for productivity leads to excess which jeopardises the environment and public health (e.g. : excessive fertilisation, pesticide use etc.).
2. In the other areas :
   - elimination of a great number of farmers who change their activities and migrate towards other areas (principally urban) or become unemployed.
   - marginalisation of farmers who try to produce in non-competitive conditions (few and scattered lands, poor ecological potentialities, limited capital etc.)
   - loss of agricultural land (afforestation, fire etc.)

It is not the CAP which induces this logic of production and which decides the world market. The CAP is only allowing it to operate while its essential aim is to stabilise prices.

Moreover, the CAP tries to soften the extreme effects on the agricultural population who cannot follow the productivity dynamic and the market. Therefore, the CAP “accompanies” them in their marginalisation and their disappearance, by softening the worst situation with some financial help.

Could it be different with a CAP whose aim is agricultural production, and which obeys principally the laws of the marketplace and the logic of production? It is logical that agricultural policy should be fundamentally based on the most productive and competitive production systems, and so, it is natural that the most efficient areas should be the reference.

SOME PROBLEMATIC CONSEQUENCES

Presented in that way, it is normal that the range of measures proposed by the CAP is not satisfactory for the less-favoured areas. This is not the place to describe all the regional situations which are considered to be disadvantaged and where the decisions taken to regulate production have aggravated the situation. Only one of the cases will be developed here and alternative policies will be put forward.

But let us emphasise the diversity of the disadvantaged regional situations which arises from different ecological environments (e.g. areas of dry and wet mountains) and from different historical pasts, especially regarding the date of integration in the World Market.

Historical situations have also resulted in a range of levels of population density, and some very different systems of land management. For example, how can one compare the situation in Andalucia, with its large estates and low population densities (Silva Perez, 1996), with the case of the Corsican Castagniccia, where high population until recently led to lands being divided into extremely small parcels with many co-owners dispersed around the world?

In such conditions, how could we be satisfied by the application of the same rules for areas so different? The application of such general rules is dangerous. I have underlined this problem before with the example of the EC measures concerning the discouragement of the production of mixed wines: the application of "grubbing-up" premiums in Corsica led for more than 10 years to the destruction of all traditional vineyards, without causing the disappearance of the big vineyards making mixed wines (cf. de Casabianca, 1995).

In the case of farm livestock, the introduction of premium to oblige dairy farmers to change to beef farming, and then to "extensify" the livestock system, has had a series of unforeseen effects :

- massive conversion of sheep dairy farmers into beef farmers
- desertion of pastures, which have been quickly invaded by shrubs
- appearance of so-called beef farmers. In fact, they are simply cattle owners and they do not manage their grazing system.
- proliferation of fires, to a certain extent due to these "false" farmers, who do not manage properly their grazing system but use it to allow the survival of their cattle, while deriving a source of income via the premia.

For this reason, an objective such as "extensification" of livestock systems, which is absolutely justified in high productivity areas, becomes catastrophic in areas already disadvantaged by the economy and by a context of handicaps, where agriculture is the ultimate activity for management of the land.

Elimination of this marginal, unproductive agriculture would have no effect on the market: "extensification" is not justified in these regions.

In such a context, we could analyse and diagnose a situation which could be summarised in such a way, for the dry Mediterranean area :

RUDIMENTS OF ANALYSIS AND DIAGNOSIS IN THE ARID MEDITERRANEAN

The rural areas in the non-irrigated Mediterranean have the following identical characteristics :

1 - Ecologically speaking, they have :

- a long and severe dry season
- a strong irregularity in the climate, especially in respect to monthly rainfall.

- a relatively high mean temperature, which limits the break in winter vegetation and which causes a strong development of spring vegetation which in summer, when dry is a fire-hazard.

2 - Socially and demographically, the great majority are characterised by a high rate of exodus; especially those in countries which have entered early into the dynamic of industrialisation and integration of the European market, if not the world market (e.g. Mediterranean mountains of France and Italy).

3 - Economically, most of these areas are far away from the centres of industrial revolutions. They did not benefit from the effects of development due to such proximity and their social destruction is even deeper when the process of recession started a long time ago (sometimes, more than a century ago).

For the rural areas in a country which recently joined the EC, the sudden competition of the market for agricultural products has induced a violent change and serious social destabilisation.

In both situations, industry and the service sectors could only offer alternative jobs for which the price was the abandonment of the land. Tourism could have acted as a substitute employer, when the possibilities were there, but it was a very seasonal activity and limited to a brief period.

4- Structurally, the speed at which the rural population disappeared prevented reorganisation of the farm structure, allowing then a modernisation of the farming systems. Sometimes, the historical context has added to the complexity of such situations.

To summarise these characteristics, it is clear that much needs to be done in these disadvantaged areas, which have been deserted by agriculture, and then became very sensitive to fire hazard, where the lack of any substitute activity has created a unemployment rate of 40%. Moreover, many people obliged to leave their agricultural activity did not have any social protection, nor any pension provided, having lost their jobs, which was a weak source of income and security.

We face directly what Bertrand Hervieu calls the ‘“social and spatial marginalisation” and what Germaine Tillon called the “turning the rural society into tramps”.

Society is not totally unaware and passive about this situation. If it cannot clearly analyse the causes and if its judgements are very often too hasty and mistaken, the idea of being the victims of a system elaborated by some managers of the European market or world market, who marginalise people who cannot or do not know how to be more efficient, is very strong.

Therefore, it is not surprising that these marginalised societies induce some survival , resistance, even parasitism mechanisms in which the agricultural activity remains a “refuge” sector, with an undefined function.

In such conditions, how may agricultural areas be included under the same CAP in regions with such different characteristics:
- areas where efficient competitive and dynamic agriculture has been practised, where the role of agriculture is defined, and important.
- areas where the population is in exodus, where the environment is harsh, and land not effectively managed, and where agricultural production is not significant.

These two very different cases require different treatment:

1 - In the first case, agriculture is an important activity, which has a role in the orientation of the CAP.
2 - In the second case, it is clear that agriculture cannot be considered only from an economic perspective:
    -its role of environment management is very significant
    -its social function of “refuge” should be taken into account and analysed

-its three functions should be integrated, taking into account specific situations (ecological, social, geographical etc.)

3 - Moreover, in terms of ethical justice, it is unfair that decisions are taken only to serve the interests of an advantaged group, without consideration of the consequences for the less advantaged.

AN ALTERNATIVE LOGIC FOR EUROPEAN POLICY

From all the considerations seen above, how may another more satisfactory approach, more adapted to the situation of these regions, be achieved?

To take diversity into account

There is of course a variability between the situations. In some, depopulation may be more or less important, with perhaps the possibility of another economic activity, like rural tourism, which may be integrated. This is, for example, what was done in Alpine areas, where skiing, as well as summer tourism, offered an interesting new potential.

There is therefore a need to identify some typical types of situations, to be able then to see their variability, without of course multiplying the typologies. These types of situations must be able to be used as reference points for the building of another logic and for the testing of such a new logic.

The environmental function

First of all, it should not be forgotten that the motivation for regulating the market for agricultural productions cannot be part of a agri-environmental policy, even if this preoccupation must be kept in mind.

However, it may be admitted that agricultural activity in principle is an efficient way of managing the environment, and such a **service** should be rewarded at its just value.

It is clear that this service does not have the same value everywhere, and even within the same region, there is a hierarchy of actions and situations, according to the strategic interest of this spatial management.

For example, in a region like the Cap Corse, where the agricultural exodus resulted in an invasion of shrubs and trees (maquis), and where strong winds enhance the risk of fires, it is essential that the priority should be given to the management of fields, which could act as a firebreak.

However, a farmer undertaking this kind of management, could use as well some fields which are not so efficient in term of fire protection, but which are logical to use in term of herd management. These fields could be then have a second rank importance, because they allow the activity of this farmer as well.

Other types of fields could be defined in this strategy. But before going further, it should be emphasised that **the environmental function of the agriculture requires zoning**, which should be done by experts, by local politicians, farmers and ecological groups.

The economic function

The law of the market being the cause of the catastrophic situation of disadvantaged areas, it seems logical not to take it as a basis of an agricultural policy for the disadvantaged areas. It does not mean of course that the economy should be ignored. This is evident because:

- on one hand, the environmental function cannot be the only justification and financier of the agricultural activity in an area,
- on the other hand, because, handicapped the same by an ecological context as by unfavourable structures, agriculture remains a relatively important activity, and is essential to valorise other activities, e.g. : rural tourism, which plays an essential role in the mobilisation of regional gastronomic resources, as well as the management of the landscape.

Therefore, it is important to orientate agricultural policy in a direction which will allow it to restructure radically the units of production still present on the land and apt to return to a "contractual" approach.

It is justified for farmers to be supported by the community, so that they provide an **active land management ,** such as :

- involvement in a zoning to protect against fire
- growing of products that enhance the gastronomic local heritage.

The credibility and efficiency of such a policy will depend upon its economic, ecological and social coherency, and upon its operational characteristics.

If the ecological coherency implies the insertion of fire prevention measures, the economic coherency will make sure that the farmer has a decent and regular income.

The social function

It is obvious that the last point mentioned above also is a part of the main social function of agriculture, in the considered areas.

However, social cohesion must be appreciated at a local level as well. It would be counter-productive if several systems to reward agricultural activity exist at a local level which are not compatible.

Currently, the premium for beef herds are considered as a pseudo-social management of the consequences of The Market and of the CAP, in these areas. These premium systems allow a large number of the farmers, who gave-up a non-productive activity, to keep their farmer status through cattle owning. Moreover, it guarantees them an income. However, this breeding system, principally of cattle, in which the animal doesn't have any productive aim, implies that the animals survive almost by themselves, in a "maquis" which tends to enclose itself. So, logically, the old tradition of burning comes back. The problem is that in the current agricultural context, these fires are not sufficiently controlled and may be devastating.

We may equally note that in addition to these people who were farmers before, some "new farmers", principally marginal people from urban areas, have bought cattle and become "passive farmers". So, the agricultural policy here is obliged to deal as well with a social problem, for which it doesn't really have any responsibilities.

So, it can be seen that in the name of social cohesion for the CAP that could be implemented, such facts should be tackled.

Once again, it can be seen how a satisfactory CAP should include the economical, ecological and social factors.

Operational approach

In the administration of zoning, it is necessary to include all the various local groups concerned, as well as those responsible at a higher level (department/region) for fund management. However, the local analysis shows that in the implementation of such a policy, some difficulties will arise. A local commission to monitor the implementation is necessary, as well as an operational structure given some powers of intervention and management.

Indeed, in the proximity of villages, it is usual to find a close and confused patchwork of land ownership, which often led to the desertion of such places, invaded then by maquis. So, in order to fight against fire, the community should implement a system of common management through an operational body (similar to SICA), with the power to buy out or take management actions, such as maquis removal, ahead of the owners of the lands.

It is obvious that such a role should be given to an organisation at the local level. An “agri-environmental” policy suggests here the well-known principle of ‘subsidiarity’.

Management of local differences

Even if Cap Corse is not the Castagniccia or the Balagne, and even less Sardinia or Andalucia, it is obvious that an agricultural policy in the disadvantaged areas of Mediterranean must be very adaptable.
The implementation of standards, regional or national, should be therefore banned, to maintain this adaptability.

Of course, some particular situations, such as the great risk of fire, could justify local financial intervention. However, the financial burden should be shared equally between the EC and the region concerned.

Of course, this does not mean that the excessively disadvantaged agriculture will be restored. Each small region would need to proceed to a zoning, with some priorities for the environmental contribution, and in each region, an incentive policy for regional products should be implemented.

CONCLUSIONS

This work was based essentially on the analysis of the rural areas with serious handicaps, especially in the Mediterranean areas (mainly Corsica). Contrary to the highly productive areas, the approach of real examples confirmed the hypothesis that agricultural policy and land resource management can not be realised with satisfaction by only using an economical approach, only justified by the laws of the marketplace.

The development of disadvantaged regions of the Mediterranean, which themselves reflect the downside of the play of market forces, demands an approach which integrates environmental and social aspects with an economic “revue” approach within the context of development.

Some distinct themes can be identified which are important for an agricultural and rural policy which addresses these concerns. In such a policy, which may be adjusted as a result of trials in a number of situations, each region should be left an important margin to take better account of regional and local diversity, without, however, leaving disadvantaged regions all the financial weight of such adjustments. The principle of subsidiarity should operate down to the local level.

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