



AGRIGRID

**Methodological grids for payment calculations in rural development
measures in the EU**

**Review of payment calculations in natural handicap
payment schemes for mountain areas and other areas with
natural handicaps**

WP3

MTT Agrifood Research Finland

Antti Miettinen, Jyrki Aakkula and Laura Kröger

Contact: antti.miettinen@mtt.fi

With contributions from:

The Macaulay Institute (MLURII)

Federal Agricultural Research Centre (FAL)

Agricultural University of Athens (AUA)

Research Institute of Agricultural Economics (VUZE)

Lithuanian Institute of Agrarian Economics (LAEI)

National Institute of Agricultural Economics (INEA)

Instituto de Desarrollo Rural Sostenible (IDRiSi)

Agrotec Polska Sp. z o. o.

August 2007

Contents

| | | |
|--------|--|----|
| 1. | Introduction..... | 1 |
| 2. | Comparative analysis..... | 1 |
| 2.1. | Basic data of the RD measure..... | 2 |
| 2.1.1. | Overview of natural handicap payment schemes..... | 2 |
| 2.1.2. | Payment differentiation..... | 3 |
| 2.2. | Methods of payment calculations..... | 5 |
| 2.2.1. | Eligibility criteria, scheme commitments and management practice changes..... | 5 |
| 2.2.2. | Processes of payments calculation..... | 7 |
| 2.2.3. | Comparison of baseline requirements affecting payment calculations..... | 8 |
| 2.2.4. | Limitation of payment level..... | 8 |
| 2.2.5. | Interrelations between natural handicap payment schemes and other RD measures..... | 8 |
| 2.2.6. | Problems encountered during payment calculation process..... | 9 |
| 2.3. | Data sources..... | 11 |
| 2.3.1. | Used data..... | 11 |
| 2.3.2. | Lacking data..... | 11 |
| 2.4. | Contextual information..... | 11 |
| 2.4.1. | Uptake of natural handicap payment schemes and public expenditures..... | 11 |
| 2.4.2. | Administrative structure involved in payment calculations..... | 13 |
| 3. | Conclusions..... | 14 |
| | Annex..... | 15 |

List of abbreviations

| | |
|-------------------|---|
| CAP | Common Agricultural Policy |
| CZ | Czech Republic |
| CZK | Czech Koruna |
| DE _{NRW} | North Rhine-Westphalia (Germany) |
| EC | European Commission |
| ES | Spain |
| EU | European Union |
| EUR | Euro |
| FADN | Farm Accountancy Data Network |
| FI | Finland |
| GAEC | Good Agricultural and Environmental Condition |
| GBP | British Pound |
| GFI | Gross Farm Income |
| GR | Greece |
| ha | hectare |
| HUA | Highly Unfavourable Area (in Lithuania) |
| IACS | Integrated Administration and Control System |
| IT _{UMB} | Umbria (Italy) |
| LFA | Less Favoured Area |
| LFASS | Less Favoured Area Support Scheme (in Scotland) |
| LPIS | Land Parcel Identification System |
| LT | Lithuania |
| LTL | Lithuanian Litas |
| LU | Livestock Unit |
| LUA | Less Unfavourable Area (in Lithuania) |
| LVZ | <i>Landwirtschaftliche Vergleichszahl</i> , an indicator measuring the quality of agricultural land |
| MJ | megajoule |
| mm | millimetre |
| n.a. | not applicable |
| n.d. | no data |
| NUTS | Nomenclature of Territorial Units for Statistics |
| PL | Poland |
| PLN | Polish Zloty |
| RD | Rural Development |
| RDP | Rural Development Programme |
| SCO | Scotland |
| SMR | Statutory Management Requirement |
| t | tonne (1 000 kg) |
| UAA | Utilised Agricultural Area |
| WTO | World Trade Organisation |

1. Introduction

This summary review focuses on the payment calculation methods of compensatory allowances (natural handicap payments) in nine EU member states and regions under the Council Regulation (EC) 1698/2005. The member states and selected regions include the Czech Republic, Finland, Greece, Lithuania, North Rhine-Westphalia in Germany, Poland, Scotland, Spain, and the region of Umbria in Italy.

Natural handicap payments in mountain areas (211) and in other areas with handicaps (212) contribute, through continued use of agricultural land, to maintaining the countryside as well as maintaining and promoting sustainable farming systems. These payments compensate for farmers' additional costs and income foregone related to permanent handicap for agricultural production in the area concerned.

In the Czech Republic, Finland, Greece, Lithuania, North Rhine-Westphalia in Germany, Scotland and Spain, the objectives of natural handicap payments include continued agricultural land use and farming activities in naturally less favoured areas. The continued use of agricultural land will promote sustainable farming systems and contribute to the conservation of the environment, biodiversity and rural landscape in the Czech Republic, Finland, Greece, Lithuania, Scotland, Spain, and the region of Umbria in Italy. It was also mentioned that the maintenance of minimum rural population level or viable rural communities is an objective in the Czech Republic, Finland, Greece, Spain, and Umbria.

The summary review mainly follows the structure of the questionnaires sent to the partner countries. After this brief introduction, Section 2 provides information about payment calculation methods. The analysis aims at answering the following key questions:

Key review questions

- What kinds of natural handicap payment schemes exist in the partner countries?
- What kinds of payment differentiation are applied in the partner countries?
- What differences exist in eligibility criteria, scheme commitments and management changes?
- How natural handicaps are measured and compensated in the partner countries?
- How much do the payment levels vary across the partner countries?
- What types of data are used in the calculations and what sources are used?
- What problems are identified in the calculations and how are these dealt with?

Concluding remarks are presented in Section 3. A detailed description of the payment calculation process in each reviewed state and region is presented in the Annex of this document.

2. Comparative analysis

Section 2 sums up the common aspects of natural handicap payments and compares the differences in payment calculations across selected countries and regions together with a comparison of payment development toward the previous Rural Development Programmes.

2.1. Basic data of the RD measure

Section 2.1 will give an overview of the applied natural handicap payment schemes and payment levels. Also the existence of payment differentiation will be considered.

2.1.1. Overview of natural handicap payment schemes

Table 2.1 gives an overview of the implemented natural handicap schemes in the partner countries. All examined states and regions have chosen to implement at least one natural handicap payment scheme. In Lithuania and Scotland, there are no mountain areas and only measure 212 is taken up. In Finland, mountain and other areas with natural handicaps can be identified, although natural handicap payments are not differentiated according to the classification of mountain and other areas with natural handicaps.

Table 2.1 Overview of natural handicap payment schemes

| | Mountain areas (211) | Other less favoured areas (212) | Number of payment rates | Level of payment (EUR per ha) | |
|-------------------------|-------------------------|---------------------------------------|----------------------------|----------------------------------|---------------------|
| | | | | from | to |
| CZ | ✓ | ✓ | 6 | 91 ^{a)} | 157 ^{a)} |
| DE_{NRW} | ✓ | ✓ | 5 | 25 | 115 |
| ES | ✓ | ✓ | 3 ^{b)} | 57 ^{b)} | 120 ^{b)} |
| FI | ✓ | ✓ | 3 | 150 | 210 |
| GR | ✓ | ✓ | 9 | 65 | 160 |
| IT_{UMB} | ✓ | ✓ | 2 | 100 | 200 |
| LT | - | ✓ | 2 | 56.50 ^{c)} | 75.30 ^{c)} |
| PL | ✓ | ✓ | 3 | 47.08 ^{d)} | 84.16 ^{d)} |
| SCO | - | ✓ | 6 | 48.75 ^{e)} | 77.55 ^{e)} |

✓ = yes, - = no

^{a)} Applied exchange rate: 29.784 CZK/EUR

^{b)} Base payment rates

^{c)} Applied exchange rate: 3.4528 LTL/EUR

^{d)} Applied exchange rate: 3.8 PLN/EUR

^{e)} Applied exchange rate: 0.667 GBP/EUR

Mountain areas

States and regions (except Finland) classify mountain areas according to altitude and/or slope. High altitude results in a short growing season. At a lower altitude, farming may be hindered by steep slopes. On the whole, the classification of mountain areas uses clearly defined criteria such as minimum altitude or minimum slope. In Finland, the mountain area classification is based on location north of the 62nd parallel and certain adjacent areas.

Other less favoured areas

Other less favoured areas exhibit all of the following handicaps: land of poor productivity, production which results from low productivity of the natural environment, and a low or dwindling population predominantly dependent on agricultural activity. Therefore, other less favoured areas than mountain areas may be classified according to the variables measuring the condition and productivity of agricultural land, economic performance and rural population issues. These include:

- indices of soil quality (CZ, FI, LT)
- quality of agricultural land measured by the LVZ indicator at the smaller scale than a parish (*Gemarkung*) (DE_{NRW})
- value of integrated coefficient (Agricultural Production Space Valuation Ratio) measuring soil quality, climate, location of the land and water relations (PL)

- stocking densities which measure the quality of land (SCO)
- yield of grain crops per hectare (LT)
- value of total agricultural production per capita employed in agriculture (LT)
- population density (CZ, LT, PL)
- share of the farm population (PL)
- average annual population regression (LT)
- the share of workforce in agriculture (CZ, LT)

The above criteria vary widely across the countries and regions. Furthermore, some criteria are nationally specific and not easily comparable across different countries.

Areas affected by specific handicaps

In addition, the Czech Republic, Poland and Spain classify their less favoured areas into three categories according to Council Regulation (EC) 1257/1999, i.e. mountain areas, other less favoured areas and areas affected by specific handicaps. Areas affected by specific handicaps are those where farming should be continued in order to conserve or improve the environment, maintain the countryside, and preserve the tourist potential of the areas, or in order to protect the coastline. Those areas are also found in Lithuania (extreme Karst zones and flooded parts of the lower reaches of the river Neman).

Payment rates and levels

The number of per hectare natural handicap payment rates varies from two in Lithuania and in Umbria, Italy, to nine in Greece. In North Rhine-Westphalia, Germany, only maximum payment levels per land quality class are defined and the actual payment varies within a given range depending on budgetary conditions. Hence there are five payment rates in DE_{NRW}. The levels of payment vary significantly between and within states and regions. The highest compensation allowances (EUR150-210 per ha) are paid in Finland. The range between the minimum (EUR100 per ha) and the maximum (EUR200 per ha) payment levels is largest in Umbria, Italy.

Development of payment levels

In three partner countries (FI, GR and LT), natural handicap payments remained at the same levels when moving from the previous programming period to the programming period 2007-2013. Spain raised base payments in mountain areas by 25% and in depopulated areas by 27%. In the Czech Republic and Poland, increases in payments (by 6-7% and by 24%, respectively) are caused by the exchange rate changes. The payments in CZK and PLN remained at the same levels. Payments in some categories have increased and some have decreased in Scotland and Umbria (Italy). In contrast, there has been a significant decrease (20-39% compared to the previous programming period) in payment rates in North Rhine-Westphalia (Germany) because of changes in support for grassland following the 2003 CAP reform and due to budgetary reasons.

2.1.2. Payment differentiation

All examined states and regions, except the region of Umbria in Italy, differentiate natural handicap payments. In Umbria, payments are no longer differentiated according to annual and permanent crops vs. other land uses as they were in the previous programming period (2000-2006). The differentiation of natural handicap payments is widespread because it enables authorities to pursue national or regional objectives and make enhanced payments in areas with more severe natural handicaps. Payment differentiation methods are summarised in Table 2.2.

Table 2.2 Existence of payment differentiation

| | CZ | DE _{NRW} | ES | FI | GR | IT _{UMB} | LT | PL | SCO |
|---|----|-------------------|----|----|----|-------------------|----|----|-----|
| Geographic regions | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ |
| Soil quality/land productivity (at municipality level) | ✓ | (✓) | - | ✓ | - | - | ✓ | ✓ | ✓ |
| Soil quality/land productivity (at farm level) | - | ✓ | ✓ | - | - | - | - | - | ✓ |
| Grazing categories | - | - | - | - | - | - | - | - | ✓ |
| Farm size | - | - | ✓ | - | - | - | ✓ | ✓ | - |
| Farm income | - | - | ✓ | ✓ | - | - | - | - | - |
| Agricultural land use (crop area/crop choice) | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| Farmer characteristics | - | - | - | - | ✓ | - | - | - | - |
| Island/peripheral location | - | - | - | ✓ | ✓ | - | - | - | ✓ |
| Population density | ✓ | - | - | - | - | - | - | ✓ | - |
| Farm population share | - | - | - | - | - | - | - | ✓ | - |
| Socio-economic factors | - | - | - | ✓ | ✓ | - | - | - | - |

✓ = yes, - = no

In one way or other, geographic regions at different scales are utilised in payment differentiation almost everywhere. For example in Finland, several environmental and socio-economic indicators have been utilised to determine three coherent geographic regions which cover the whole country. In contrast in North Rhine-Westphalia (Germany), payments are differentiated at farm level, in so far as for each field of the farm, the payment is determined depending on the location of the field in a specific *Gemarkung*, each of which has been assigned an LVZ value.

The difference in productivity of soil between areas at municipality level is involved in the Czech payment calculations. Also in Lithuania, soil productivity index is utilised as a device to differentiate payments at municipality level. In Poland, the Agricultural Production Space Valuation Ratio measuring of soil quality, climate, location of the land, and water relations is utilised. In North Rhine-Westphalia, Germany, payments are differentiated at farm level using the LVZ indicator which measures natural production conditions. In Scotland, stocking densities are used to define grazing categories which reflect the land quality.

Key payment differentiation criteria

- Geographic regions
- Soil quality or land productivity
- Agricultural land use

Spain differentiates payments at farm level according to farm size, farm income and land use (forage and crop areas). Land exceeding the first 100 hectares on the holding is excluded in the payment calculations.

Payment differentiation is related to farm size also in Poland and Lithuania. In Poland, natural handicap payments are not paid to farms larger than 300 hectares. In Lithuania, per hectare payments are smaller for larger farms (See also Section 2.2.4). Favouring smaller farms by exclusions of large farms or varieties in payments is based on the assumption that smaller farms will contribute to the environmental quality and the viability of rural communities better than larger ones.

In Greece, payments are differentiated in favour of trained (green certificated) and young farmers or successors of early retired farmers. The level of payment depends also on the crop choice.

Island and/or peripheral location is seen as a disadvantage and a basis for payment differentiation in Greece and Scotland.

Population density and the proportion of population related to agriculture are used to differentiate the less favoured areas and at the same time also the compensatory allowances in Poland.

In-house discussions concerning differentiation of payments

Possibilities of natural handicap payments depression (i.e. reduction in per hectare payment according to farm size) have been discussed in-house in the Czech Republic. The Finns have considered the differentiation of natural handicap payments according to plant species or production lines. In Scotland, it has been discussed in-house if and how to completely decouple natural handicap payments from livestock numbers and agricultural production to address the WTO Green Box concerns.

Moreover, it is likely that the national and regional administrations are waiting for the EU Commission to take a first step and set the guidelines for the 2010 natural handicap payment scheme reform. Therefore, administrations may be reluctant to reveal their thoughts, which would explain why there have not been any reported in-house discussions about the subject.

2.2. Methods of payment calculations

Section 2.2 investigates the methodology and determination of the actual payment levels of compensatory allowances. The objective is to identify tools, variables and parameters used in calculations, the central focus being on identification of additional costs and foregone income, and possible cost savings in less favoured areas.

The baselines (i.e. the conditions resulting from national law and cross-compliance), which cannot be paid out within the natural handicap measure payments, are also introduced and problems occurred during the specification and calculation of payments are discussed.

2.2.1. Eligibility criteria, scheme commitments and management practice changes

Eligibility criteria

An overview of applied eligibility criteria is presented in Table 2.3. Minimum farmed area eligible for natural handicap payments is at least 1 hectare in Lithuania, 1 hectare of grassland in the Czech Republic, 2 hectares of UAA in Greece, 2 hectares in Spain (except in Canary Islands where the eligibility threshold is 1 ha), 3 hectares in Finland and 3 hectares of eligible forage land in Scotland. In North Rhine-Westphalia, Germany, at least 3 hectares of the farm land must be located in a less favoured area.

Table 2.3 Overview of eligibility criteria

| Criteria | CZ | DE _{NRW} | ES | FI | GR | IT _{UMB} | LT | PL | SCO |
|---|----|-------------------|----|----|----|-------------------|----|----|-----|
| Minimum farmed area | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Continuous agricultural activity (for at least 5 years) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Cross-compliance | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Farmer's age | - | - | - | ✓ | ✓ | - | - | - | ✓ |
| Place of residence conditions | - | - | ✓ | - | ✓ | - | - | - | - |
| Targeted crop or land use (e.g. grassland etc.) | ✓ | ✓ | - | - | - | - | - | - | - |
| Some agricultural land use not eligible for payments | ✓ | ✓ | - | ✓ | - | - | - | - | - |
| Special requirements for the meadow or pasture support | - | - | - | - | - | - | ✓ | - | - |
| Stocking density requirements | - | - | ✓ | - | - | - | ✓ | - | - |

✓ = yes, - = no

Farmers must also carry out an eligible agricultural activity on a continuous basis for at least five years. Scotland has included the requirement to keep livestock. In the region of Umbria, Italy, farmers must own land in natural handicap areas until 31 December 2009, and they are required to farm for at least five years starting from the first natural handicap payment.

In the EU, natural handicap payments are subject to cross-compliance which consists of two parts: statutory management requirements and good agricultural and environmental conditions.

Key eligibility conditions

- Minimum farm size
- Continuous agricultural activity
- Cross-compliance
- Farmer's age requirements
- Residential requirements
- Land use requirements/restrictions
- Stocking density requirements

The eligibility rules in some member states include age requirements for farmers. Beneficiaries have to be adult individuals (GR). In Finland, the farmer or his/her spouse must be at least 18 years of age (16 in SCO), and Finnish farmers over 65 years of age are not eligible to receive natural handicap payments.

In Greece, farmers have to be permanent residents of the intervention area, unless they have the status of semi-nomadic livestock producers. In Spain, beneficiaries must live in the municipality where the holding is situated or in the surrounding area.

There is a special eligibility criterion in North Rhine-Westphalia. Payments are exclusively granted to grassland, clover, leys, clover grass and lucernes. In the Czech Republic, natural handicap payments are paid only for grasslands. In Finland, wild pastures, wild meadows, and open grazing grounds are not accepted as eligible areas or areas under commitment, nor are areas covered by an undertaking to withdraw arable land permanently from agricultural production.

In Lithuania, in order to get support for meadows or pastures, the farmer has to fulfil at least one of the requirements below:

- to produce agricultural products for the market
- to have 0.2 LU/ha
- $\frac{1}{3}$ of crops has to be on arable land.

In Spain, holdings must have a stocking density of 1 LU/forage ha or 2 LU/ha if the average rainfall is above 800 mm/year. The minimum stocking density is 0.2 LU/ha.

Possible special commitments and contractual prerequisites

In the Czech Republic, the farmer must ensure that grasslands are grazed or mowed at least twice a year (in justified cases once a year) within the stipulated time. The mowed biomass has to be removed from the plot.

Furthermore in the Czech Republic, the farmer has to comply with the herbivorous livestock density limits on a set date. The density shall range from 0.2 LU/ha on grassland to 1.5 LU/ha on registered agricultural land farmed, provided that farming does not take place within the first degree protection zones which protect the yield or the surface or groundwater sources intended for drinking water supply.

In Scotland, the farmer must maintain the eligible activity for the majority of the calendar year, i.e. at least 183 days. These need not be consecutive days: breaks in eligible activity are acceptable, provided that the periods of activity amount to at least 183 days per year in total. To comply with the payment or scheme requirements, farmers must farm the area continuously for five years from the first payment. The farmer is expected to maintain the stocking density at a level which reflects the natural disadvantage of land to avoid either under- or over-grazing.

Land use or management practice changes

One of the objectives of the natural handicap payments is to maintain agricultural land use. In most EU member states, natural handicap payment measures do not include any land use or management requirements, other than the commitment to fulfil cross-compliance. It was mentioned, however, that in Greece semi-nomadic livestock producers have to continue moving their flocks to the intervention area for the whole duration of their commitment.

2.2.2. Processes of payments calculation

The reviewed countries and regions use many kinds of methods in measuring the natural and other handicaps. For example in Finland and Spain, several different variables are utilised to measure natural and socio-economic handicaps and to define natural handicap payments at municipality and farm level, respectively. However, most often data on revenues and costs (gross profits) of a farm located in a less favoured area are compared to the corresponding data of a farm located in a non-least favoured area to define the differential for the basis of payment rate. This kind of approach is utilised in the most straightforward way in the Czech Republic and Lithuania, but also in Greece, Poland, and Umbria (Italy). Also in Scotland, the calculation of gross margin losses for less favoured area farms has been added to the calculation process.

A detailed description of the payment calculation process in each reviewed state and region is presented in the Annex. Payments rates are seldom drawn directly from income and cost data, because there also exist policy objectives and budgetary issues involved when determining the payment rates. Therefore, the logic behind the payments calculation is not always transparent.

Despite criticism, the payments usually reflect the severity of the handicap within the region or the state, but since there are no generally accepted European baselines, the payments vary significantly at the EU level and do not exhibit comparable compensation levels.

2.2.3. Comparison of baseline requirements affecting payment calculations

In order to receive natural handicap payments, farmers have to fulfil GAECs and SMRs with their national laws and regulations. Instead, there is no evidence that these requirements have any impact on payment calculations in the partner countries.

2.2.4. Limitation of payment level

None of the reviewed states or regions provides any payments within the natural handicap payment scheme which exceed the maximum limits stated in Council Regulation (EC) 1698/2005.

National payment ceiling and other maximum and/or minimum criteria are reported in Table 2.4. Spain and Scotland apply minimum payments. Maximum criteria or systems in which payment per hectare decreases are applied in Lithuania, Poland, Spain, and North Rhine-Westphalia (Germany).

Table 2.4 Overview of national payment ceilings and maximum/minimum criteria applied

| State or region | Minimum criteria | Maximum criteria |
|-------------------|----------------------------------|--|
| CZ | - | - |
| DE _{NRW} | - | EUR12 271 per beneficiary |
| ES | EUR300 per holding | EUR2 500 per holding |
| FI | - | - |
| GR | - | - |
| IT _{UMB} | - | - |
| LT | - | For areas up to 150 ha, the support is 100%. Later, the payments will be reduced as follows: For areas from 151 to 250 ha, the support is 85% From 251 to 500 ha, the support is 70% From 501 ha support is 50% If the annual budget of the measure is exceeded, the amount of payments can be reduced proportionally for all applicants or the payment can be reduced annually by the difference of the basic direct payment in running and last year. |
| PL | - | 1-50 ha – 100% of payment 50.01-100 ha – 100% of payment 100.01-300 ha – 100% of payment Farms larger than 300 ha lack of payments |
| SCO | EUR577.50 per farm ^{a)} | - |

^{a)} applied exchange rate: 0.667 GBP/EUR

Payments are kept at the same per hectare rate regardless of the farm size in the Czech Republic, Finland, Greece, and in the region of Umbria, Italy.

2.2.5. Interrelations between natural handicap payment schemes and other RD measures

There are no such mechanisms in place in which would limit possible combinations of natural handicap payment schemes with the other RD measures in the reviewed states and regions. It

was only mentioned that farmers receiving retirement pension (or similar payments) are not eligible for natural handicap payments.

Furthermore, in Spain, some specific RD measure payments (first afforestation of agricultural land) are increased by 10% if the holding is within a natural handicap area. Also in Lithuania, priority points will be added if the afforestation is carried out in less favourable areas.

Furthermore, it has been discussed in Lithuania that lower yields of organic farms in less favoured areas are possibly compensated twice: first time by organic farming payments and second time by natural handicap payments.

2.2.6. Problems encountered during payment calculation process

Table 2.5 provides a country-by-country summary of the problems encountered during the specification and calculation of natural handicap payment levels. Most of the problems arise from heterogeneous natural conditions and inability to incorporate this heterogeneity into calculation models. In addition, several countries suffered data problems.

Table 2.5 Problems within payment calculation process

| | Problem | Solution | Unsolved problems |
|-------------------------|--|--|---|
| CZ | Payment calculations are based on a three year average of FADN data with the reference period 1999-2001. At that time, it was not possible to use Land Parcel Identification System (LPIS) data and some simplification was necessary. As a result, there is a difference between farms in LFA versus used production areas. | More farms of different LFA types have been included in FADN. Also longer time lines of operating results are used within LPIS in combination with FADN. Final payment is the same as in the period 2004-2006. | In the case of differentiating LFA payments more than current 6 rates, the total amount of 1 200 enterprises in FADN will become insufficient. Data from the structural survey are poorly usable in the Czech conditions, because of large farms and high diversity of landscape conditions which cause that farms are allocated in more types of LFA while farms' centre is set according to municipality and not according to land in LFA. |
| DE_{NRW} | Determination of grassland yield levels and yield level reductions in different LVZ categories. Determination of cereal prices for calculations of replacement costs. | Determinations are based on available data sets. Political and budgetary conditions played an important role for the design of the directive. | Depending on farm and farm management, uniform area payments result in over- or under-compensation of individual farms. An exact farm-specific income compensation is principally not possible with average premiums. |
| ES | The use of a common system for a large area (the national territory) with very variable physical and socio-economic conditions is the basic problem. In the least productive areas, payments undercompensate the natural handicap, while in more productive areas they over-compensate it. | The system aims at weighting the payments in favour of smaller holdings, as these are in most danger of abandonment. In Navarra and Basque Country, the formulae used are slightly more sophisticated taking into account the location and remoteness of the holding, slope, etc. | The utilised formula gives more points to more productive land categories of land. Pensioners are excluded from the scheme, even though farmers in the most marginal areas are often of advanced age. As the pension is higher than the LFA payment, there is an incentive to give up farming. |

| | | | |
|-------------------------|---|--|---|
| | The scheme does not reach its objectives, because the payment levels are low and do not have a sufficient influence on farmers' decisions. | | Less favourite areas also include productive land (even irrigated cropping areas). |
| FI | Since natural handicap is a complex issue, several indicators must be used to measure it. The problem is to determine which indicators to use and how to weight them. | A research project has been launched to study the indicators of the less favoured status and, thus, the need for updating the territorial division of LFA payments in Finland. | - |
| GR | Difficulties were mainly related to lack of adequate data. | An interim scheme was suggested and historical data with the reference period of 2003-2006 was used. | - |
| IT_{UMB} | The disadvantage in the region of Umbria is heterogeneous. There are areas which do not need compensatory allowances, but there are also less favoured areas where the current payment rate is underestimated. Another issue is the lack of data. The FADN database is not up-to-date. | No specific solutions have been developed. The ideal would be for every micro-area to have different payments, but this solution is too complex to manage. As regards the database, it should be representative of the territory. | A unique payment for the whole region 1) includes the revenue of farmers producing typical products and/or located in tourist areas, and 2) implies an undercompensation for actually less favoured areas. A possible approach could be an analysis at farm level or in small areas, as with territorial contracts in France. |
| LT | Lack of reliable technical and economic data of small holdings. The evaluation of land quality only partly measures its real quality. Shortage of methodological experience. | FADN data was applied, although it represents quite big farms (area about 40 ha per holding). It is under discussion to create a new system of land quality evaluation. Advice given by other institutions in Lithuania and some foreign neighbouring countries were utilised. | All main problems were solved. Methodological experience will increase during time. |
| PL | n.d. | n.d. | n.d. |
| SCO | Lack of available time to develop a new scheme was seen as a major issue and problem which restricted potential options for a new scheme and led to the introduction of the interim scheme. In addition, it was not clear how future LFAs or handicap areas would be designated. | More complex alternatives for handicap payments have been postponed to after the year 2010 and an interim scheme has been implemented with only minimal changes compared to the previous support scheme. Moreover, research projects have been commissioned to provide evidence for future support options. | - |

2.3. Data sources

Section 2.3 identifies used data sources and requirements of additional data in payment calculations.

2.3.1. Used data

Farm Accountancy Data Network and national and/or regional farm statistics provided by ministry of agriculture, national statistical office or research institute are widely utilised in payment calculations.

- FADN data is used in the Czech Republic, Lithuania, Poland and the region of Umbria (Italy)
- Farm statistics (including IACS) and surveys are used at least in Spain, Lithuania, Poland and Scotland

Other utilised data sources vary significantly from Agreed System of Land Point Value based on Valued Soil-Ecological Units (CZ) to effective temperature sum and rainfall data (FI).

2.3.2. Lacking data

In many European countries, the need for additional data depends on the outcome of the review of natural handicap payment schemes designation. However, more detailed land classification data to create a land quality data base at holding level would be an improvement when measuring natural handicaps or disadvantages.

Based on the answers, lack of data is not an issue in North Rhine-Westphalia (Germany) or Spain. The problems there arise mainly from tight budgets. The Germans even question whether exact precision in calculations is necessary, since payment levels are affected by limited budget and determined as a result of political bargaining.

2.4. Contextual information

Section 2.4 collects contextual information which enables statistical comparison between natural handicap payment schemes across examined states and regions. In addition, the administrative complexity of payment calculations is also briefly reviewed.

2.4.1. Uptake of natural handicap payment schemes and public expenditures

Table 2.6 provides information about the coverage of natural handicap payment measures in the partner countries. The largest UAAs are found in Spain (25 billion hectares) and Poland (18 billion hectares). The absolute areas under natural handicap payments are also largest in those states. The relative area under compensatory allowances is clearly highest in Finland: 95%. More than 50% of the UAA received natural handicap payments also in Greece, Poland, and Scotland.

Table 2.6 Uptake of the natural handicap payment schemes in 2005

| | CZ | DE_{NRW} | ES | FI | GR | IT_{UMB} | LT | PL | SCO |
|---|-----------|-------------------------|-----------|-----------|-----------|-------------------------|-----------|-----------|------------|
| Total UAA (mill. ha) | 4.259 | 1.512 | 24.855 | 2.267 | 9.163 | 0.361 | 2.590 | 17.737 | 6.115 |
| Area under natural handicap payment schemes (mill. ha) | 0.706 | 0.176 | 7.222 | 2.163 | 5.167 | 0.045 | 0.991 | 9.933 | 5.250 |
| Share in UAA (%) | 17 | 12 | 29 | 95 | 56 | 12 | 38 | 56 | 86 |
| Total number of farms (1 000 farms) | 44.8 | 51.2 | 1 069.7 | 69.5 | 824.0 | 43.5 | 226.7 | 1 782.0 | 51.1 |
| No. of farms entering in natural handicap payment schemes (1 000 farms) | 9.1 | 8.5 | 112.6 | 65.6 | 110.0 | 1.3 | 110.2 | 708.7 | 35.1 |
| Share in total number of farms (%) | 20 | 17 | 11 | 94 | 13 | 3 | 49 | 40 | 69 |

The great majority of beneficiaries are from Poland where 708 700 holdings received compensatory allowances in 2005. The proportion of farms receiving compensation payments is greatest in Finland (94%). The share of beneficiaries is below 15% in the Mediterranean region, Greece, Spain and Umbria (Italy), where there are several small farms below the minimum eligibility size threshold.

According to the data given in Table 2.7, total public expenditure on rural development measures in 2005 was highest in Greece (EUR2.3 billion), Spain (EUR1.4 billion) and Poland (EUR1.2 billion). Instead, expenditures on compensatory allowances were highest in Greece (EUR920 million), Finland (EUR421 million) and Poland (EUR320 million). Finland allocated the largest budgetary share of rural development funding through compensatory allowance schemes, 59% of the total compared to 10% in North Rhine-Westphalia, Germany, 8% in Spain and 4% in the region of Umbria, Italy.

Table 2.7 Public expenditure on compensatory allowances in 2005

| | CZ | DE_{NRW} | ES | FI | GR | IT_{UMB} | LT | PL | SCO |
|---|-----------|-------------------------|-----------|-----------|-----------|-------------------------|-----------|-----------|------------|
| Total financial expenditure for RDP (EUR million) | 209.2 | 127.1 | 1 442.4 | 711.9 | 2 305.1 | 157.3 | 164.1 | 1 201.5 | 178.1 |
| Financial expenditure for compensatory allowances (EUR million) | 94.6 | 12.7 | 122.6 | 420.5 | 920.4 | 6.6 | 59.2 | 319.7 | 86.6 |
| Share in RDP (%) | 45 | 10 | 8 | 59 | 40 | 4 | 36 | 27 | 49 |
| Average payment per ha (EUR) | 134 | 72 | 17 | 194 | 178 | 147 | 60 | 32 | 17 |
| Average payment per farm (EUR) | 10 426 | 1 502 | 1 088 | 6 412 | 8 367 | 5 085 | 537 | 451 | 2 470 |

Levels of payment vary significantly between the examined states and regions, ranging from an average per hectare payment of EUR17 in Scotland and Spain to EUR194 in Finland. The average level of payment per beneficiary is clearly highest in the Czech Republic (EUR10 426 per farm) where there are several large farms in less favoured areas.

2.4.2. Administrative structure involved in payment calculations

Table 2.8 identifies institutions involved in payment calculation and verification in the partner countries.

Table 2.8 Administrative structure involved in payment calculation

| | Institutions involved in | | |
|-------------------------|--------------------------|--|----------------------|
| | payment calculation | | payment verification |
| | number | names | number |
| CZ | 2 | VUZE – Research Institute of Agricultural Economics MoA – Ministry of Agriculture | 2 |
| DE_{NRW} | 1 | Agricultural Chamber of NRW | 0 |
| ES | 3 | Ministry of Agriculture (MAPA) Regional Government Rural Development Department Regional Government Agricultural Department | 3 |
| FI | 1 | MTT Agrifood Research Finland | 6 |
| GR | 2 | The Rural Development Management Authority A consultancy firm | more than 3 |
| IT_{UMB} | 3 | Umbria Region University of Perugia INEA - National Institute of Agricultural Economics | n.d. |
| LT | 29 | The Ministry of Agriculture of the Republic of Lithuania National Paying Agency (NPA) Lithuanian Institute of Agrarian Economics (LAEI) Committee on Rural Affairs of the Seimas Office of the Government of Lithuania Ministry of Finance Ministry of Social Affairs and Labour Ministry of Environment Ministry of Economy Ministry of Internal Affairs Ministry of Foreign Affairs Ministry of Culture Ministry of Transport Ministry of Education and Science Ministry of Health Lithuanian Fund for Nature Lithuanian Agricultural Advisory Service Association of agricultural high schools Farming women society Union of young farmers Union of rural communities Lithuanian rural tourism association Lithuanian farmers union Lithuanian Chamber of Agriculture Lithuanian association of agricultural partnerships Network of LAG's Union of family farms Lithuanian forest owners association Coalition of environmental NGO's | 2 |
| PL | n.d. | n.d. | n.d. |
| SCO | 1 | Scottish Executive Environment and Rural Affairs Department | 5 |

Usually one to three instances (typically ministry of agriculture and/or research institute and/or university) have been involved in payment calculation, Lithuania being an exception. In Lithuania, 29 institutions took part in the process of payment calculation.

3. Conclusions

Although some common themes exist, the payment levels and structures of natural handicap payment schemes vary significantly among the reviewed states and regions. In a way, this kind of result was expected, since natural conditions in Europe also vary noticeably and there is no robust measure of natural handicap or generally acknowledged reference level for payment calculations.

Most states and regions measure handicaps at municipality level, but some, such as Scotland, Spain and North Rhine-Westphalia in Germany, focus also at farm level. Soil and land quality are typical proxies which measure the severity of natural handicaps. Also, differences in farm incomes between farms located in less favoured areas and in non-less favoured areas are widely utilised.

However, it also seems that the implementation of natural handicap payments is not only dependent on natural conditions but also on economic, political and administrative conditions of the state or region. Therefore, the significance of natural handicap payments in national agricultural policy settings varies considerably. In future, more attention should be paid to the interplay between natural handicap payment schemes and other rural and agricultural policy measures.

Almost all reviewed states and regions differentiate natural handicap payments. This allows policy-makers to address regional and local variation better in the levels of natural handicaps but it also makes it possible to promote other objectives which may not be in line with the objectives mentioned in the Council Regulation (EC) 1698/2005. Consequently, the complexity of natural handicap payment schemes combined with multi-level goal-setting may jeopardise the transparency of payment calculations and their EU-wide just and equitable distribution.

Although the objectives of natural handicap payments have evolved and environmental objectives have received more attention, there is also a certain historical element involved especially in the calculation or setting of payment rates. This makes natural handicap payments foreseeable for the farmers but it may also hinder some necessary policy changes.

How should the natural handicap payment schemes be redesigned after 2010? The level of natural handicap payments should reflect the severity of the handicap measured against a number of regional/national and European reference points. The use of a single indicator may not be sensitive to all handicaps, although this would increase transparency and reduce administrative costs. The reviewed measure should probably also include some stricter requirements for farmers than just continuous farming and cross-compliance in order to make natural handicap payments more effective. In general, it would make sense that farmers were to influence their natural handicap payment rates by their production-related choices. For instance, the application of more environment-friendly farming practices would result in higher natural handicap payment rates.

Annex

Payment calculation processes in partner countries

Czech Republic

In the Czech Republic, natural handicap payments are made only for grasslands.

Table A1 Overview of the natural handicap payment scheme in the Czech Republic

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|---|-------------------|----------------------------------|--|--|
| | EUR/ha | % of calculated level of payment | | |
| Mountain areas - H ^A | 157 | 105% | <ul style="list-style-type: none"> Altitude \geq 600 m or Altitude \geq 500 m and at the same time slope steeper than 15% on the area larger than 50% of the total land area | ↑ ^{*)} +7% |
| Mountain areas - H ^B | 134 | 90% | | ↑ ^{*)} +6% |
| Other less favoured areas - O ^A | 117 | 105% | NUTS IV <ul style="list-style-type: none"> Soil quality < 34 points NUTS III <ul style="list-style-type: none"> Population density < 75 inhabitants/km² \geq 8% of workers in agriculture | ↑ ^{*)} +7% |
| Other less favoured areas - O ^B | 94 | 85% | | ↑ ^{*)} +6% |
| Areas affected by specific handicaps – S | 114 | 100% | <ul style="list-style-type: none"> Soil quality < 34 points or Soil quality \geq 34 points but < 38 points and at the same time slope steeper than 12.3% (7°) on the area larger than 50% of the agricultural area | ↑ ^{*)} +6% |
| Areas affected by specific handicaps - S ^x | 91 | 85% | <ul style="list-style-type: none"> Municipalities which due to an update of input data no longer meet the criteria for less favoured area classification | 0 |

Applied exchange rate: 29.784 CZK/EUR

↑^{*)} An increase in payment level is caused by the change of exchange rate

0 Measure didn't exist in the previous programming period

In mountain areas (H^A), the payment rate will be EUR157/ha if (a) the average altitude of the entire municipality or cadastre territory is at least 600 metres above the sea level or (b) the average altitude of the entire municipality or cadastre territory is at least 500 metres and at the same time the surface slope is steeper than 15% over an area larger than 50% of the total land area of the municipality or cadastre territory. In those municipalities or cadastre territories (H^B) which do not meet the above criteria, the payment rate is EUR134/ha if the areas are situated inside H^A area or have a common border with an H^A area and significantly exceed one of the above mentioned criteria (i.e. altitude or slope).

For other less favoured areas (O^A), the payment rate will be EUR117/ha in those municipalities or cadastre territories in which the value of land productivity is below 34 points and at the same time the population density within the NUTS III region is less than 75 inhabitants per km² and the share of workforce in agriculture, forestry and fisheries is at least 8% of the economically active population. In those municipalities (O^B) which are situated inside O^A area or have a

common border with an O^A area and the value of land productivity is not higher than 38 points, the payment rate is EUR94/ha.

For areas affected by specific handicaps (S), the payment rate will be EUR114/ha in those municipalities or cadastre territories in which the value of land productivity is lower than 34 points or in ones in which the value of land productivity is not greater than 38 and at the same time the surface slope is steeper than 12.3% over an area larger than 50% of the agricultural land area. In those municipalities (S^X) which due to an update of input data no longer meet the criteria for less favoured area classification, the payment rate is EUR91/ha.

The natural handicap payment rates are based on the difference in Gross Farm Incomes (GFI) between two farms situated outside and inside a less favoured area from which the production cost savings due to low intensity in the less favoured area are deducted.

To determine the disadvantage (i.e. lower economic productivity), for example, in mountain areas, the GFI difference is calculated with the help of a percentage of lower economic production. The percentage is based on an agreed system of Land Point Value. The land point value is equal to 55.8 outside the less favoured area (i.e. in the non-less favoured area) and in mountain area it is 20.3, representing a 64% decrease. Hence, the GFI in mountain areas is equal to $0.64 \times \text{GFI outside the less favoured area}$.

Savings of factor costs (depreciation, smaller wages and rents) are determined for a particular less favoured area according to selected production areas within the Farm Accountancy Data Network. For simplicity, one common percentage (40%) for all less favoured areas has been determined. Savings in factor costs due to the low intensity in the mountain area is $0.40 \times 0.64 \times \text{GFI outside the less favoured area}$.

Next, the amount of savings in production costs is subtracted from the total disadvantage (decrease of GFI). The calculated per hectare payment for permanent grassland in mountain area is

$$(0.64 \times \text{GFI outside less favoured area}) - (0.40 \times 0.64 \times \text{GFI outside less favoured area})$$

Hence if the GFI outside the less favoured area is, for example, EUR326.16 per hectare (a three year average), the calculated amount of payment for permanent grassland in the mountain area is approximately EUR150 per hectare.

North Rhine-Westphalia, Germany

In North Rhine-Westphalia, Germany, natural handicap payments are granted exclusively for grassland, clover, leys, clover-grass, and lucernes. Compensatory allowance calculations are based on the replacement value of grassland yield reductions. Payments are differentiated at farm level according to the LVZ indicator which measures the quality of agricultural land.

Table A2 Overview of the natural handicap payment scheme in North Rhine-Westphalia, Germany

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|---|--|
| | EUR/ha | % of calculated level of payment | | |
| Mountain areas $LVZ \leq 15$ | ≤ 115 | 89.5% | EC legitimated fixed area in North Rhine-Westphalia. Payments are granted exclusively for grassland, clover, leys, clover-grass, and lucernes. | ↓ -20% |
| Mountain areas $15 < LVZ \leq 20$ | ≤ 90 | 87.5% | | ↓ -20% |
| Mountain areas $20 < LVZ \leq 25$ | ≤ 60 | 77.8% | | ↓ -27% |
| Mountain areas $25 < LVZ \leq 30$ | ≤ 35 | 66.1% | | ↓ -31% |
| Mountain areas $30 < LVZ \leq 35$ | ≤ 25 | 69.5% | | ↓ -39% |
| Other less favoured areas $LVZ \leq 15$ | ≤ 115 | 89.5% | EC legitimated fixed area in North Rhine-Westphalia. Payments are granted exclusively for grassland, clover, leys, clover-grass, and lucernes. | ↓ -20% |
| Other less favoured areas $15 < LVZ \leq 20$ | ≤ 90 | 87.5% | | ↓ -20% |
| Other less favoured areas $20 < LVZ \leq 25$ | ≤ 60 | 77.8% | | ↓ -27% |
| Other less favoured areas $25 < LVZ \leq 30$ | ≤ 35 | 66.1% | | ↓ -31% |
| Other less favoured areas $30 < LVZ \leq 35$ | ≤ 25 | 69.5% | | ↓ -39% |

↓ Decrease of payment level

There are five soil quality groups altogether. For $LVZ > 35$ no allowances are granted. It is assumed that in the most disadvantaged group ($LVZ \leq 15$) grassland yields are 25% lower compared with average yields. In the subsequent groups, yield losses are equal to 20%, 15% and 10%. As a final point, in the best soil quality group in which LVZ lies between 30 and 35, yield losses amount to 7%.

Farmers' net yield losses within each soil quality group are stated in terms of feed energy (MJ). In replacement costs calculations, purchases of wheat at EUR115/t have been assumed, which results in the cost of EUR0.153/10 MJ. Farmers' income losses (i.e. calculated payment levels) in each group are calculated by multiplying feed energy losses with this cost factor. The system is flexible so that the actual payment levels can be modified according to budgetary conditions.

Spain

The natural handicap payment scheme, summarised in Table A3, is mandatory for the autonomous regions in Spain (except for Navarra and Basque Country which have their own RDPs) and it regulates three different areas:

- Mountain areas with an assigned base payment rate of EUR94 per ha
- Depopulated areas with an assigned base payment rate of EUR57 per ha
- Areas affected by specific handicaps with an assigned base payment rate of EUR120 per ha.

Table A3 Overview of the natural handicap payment scheme in Spain

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|--------------------------------------|--|
| | EUR/ha | % of calculated level of payment | | |
| Mountain areas | 94 | n.a. | Mountain areas | ↑ +25% |
| Depopulated areas | 57 | n.a. | Depopulated area | ↑ +27% |
| Areas affected by specific handicaps | 120 | n.a. | Areas of influence of National Parks | = |

↑ Increase of payment level

= Same level of payment

When calculating the annual payment per holding, the following coefficients are taken into account along with the relevant base payment:

- A coefficient for the holding size (the bigger the holding, the smaller the payment per ha) (C1)
- A coefficient according to the farm income (when the farm income is less than 50% of the reference income) (C2)
- A coefficient for forage areas (C_i)
- A coefficient for crops areas (C_j).

The first two coefficients (C1 and C2) are applied to the base payment and the last two coefficients (C_i and C_j) are utilised when determining the area eligible for natural handicap payment (S.I.).

Coefficient C_i, applied to the forage area, receives values as follows:

| | |
|--|------|
| Hectares of permanent pasture | 1.00 |
| Hectares of grazeable pasture between 2 and 6 months | 0.50 |
| Hectares of grazed stubble and fallow | 0.15 |

Coefficient C_j, applied to the crop area, receives values along these lines:

| | |
|-------------------------------------|------|
| Hectares of irrigation | 1.00 |
| Hectares of extensive dryland crops | 0.50 |
| Hectares of woodland and scrubland | 0.30 |

The eligible payment area S.I. (in hectares) is calculated utilising the formula

$$S.I. = F.A._i \times C_i + C.A._j \times C_j$$

where

S.I. = Eligible Payment Area (in hectares)

F.A._i = forage area (in hectares)

C_i = coefficient for forage areas

C.A._j = crop area (in hectares)

C_j = coefficient for crop areas

Payment (in EUR) is the result of the following calculation

$$\text{Payment} = S.I. \times \text{base payment rate} \times C1 \times C2$$

The value of the coefficient C1, measuring eligible payment area of the holding, is determined as follows:

| | |
|-------------------------|--|
| First 5 hectares | 1.00 |
| From 5 to 25 hectares | 0.75 |
| From 25 to 50 hectares | 0.50 |
| From 50 to 100 hectares | 0.25 |
| From 100 hectares | 0.00 (i.e. land above the first 100 hectares on the holding is excluded) |

and the value of gross income coefficient, C2, is determined as follows:

| | |
|---------------------------------------|------|
| Less than 50% of the reference income | 1.20 |
| Over 50% of the reference income | 1.00 |

The minimum annual payment per holding is at least EUR300. On the other hand, only the first 100 hectares of a given holding are included in the payment.

In the Basque Country system, there are no specific base payments for each area, but only the same base payment corrected by a coefficient based on the specific characteristics of the holding (holding coefficient) which includes both environmental and social factors.

In Navarra, a combination of two systems is applied, with a base payment for each area modified by a holding coefficient.

Finland

In Finland, the natural handicap classification applies to the entire agricultural area. The regional classification of natural handicap payments in Finland is based on three geographical regions (area A, areas B-C1 and areas C2-C4) in accordance with the plan approved earlier for the regional allocation of the support for arable crops. Each municipality in Finland belongs to one of these regions and the payment depends on in which municipality the field in question lies. Handicaps in farming increase from the south towards the north of the country.

Table A4 Overview of the natural handicap payment scheme in Finland

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|--|--|
| | EUR/ha | % of calculated level of payment | | |
| Support area A | 150 | n.a. | The whole country. Three geographical regions based on the arable crops support areas used earlier | = |
| Support areas B1, B2 and C1 | 200 | n.a. | | = |
| Support areas C2, C3 and C4 | 210 | n.a. | | = |

= Same level of payment

In 1995 when Finland joined the EU, the regional differentiation of natural handicap payments was made utilising the plan for the regional allocation of the support for arable crops. The following variables were used in the determination of the plan and thus also in the determination of the natural handicap payment areas:

- Effective temperature sum
- Taxable income subtracted by the most important regional supports
- Taxable income in agriculture subtracted by the most important regional supports
- Per hectare yield of barley
- Quality of the field
- Soil type
- Potential accessibility
- Unemployment rate
- Net migration.

Although the above variables reflect differences among geographical regions in Finland, it is important to realise that other farming subsidies have also been taken into account when deciding the level of natural handicap payments within geographical regions. Therefore, natural handicap payments in Finland also compensate low CAP payments.

Greece

In Greece, there are two schemes for payments on natural handicaps: one for mountain areas and another for other less favoured areas. In both schemes, payments are differentiated according to regional and farmer characteristics. Young educated farmers living on the small Aegean islands are favoured over the others. The payment rate also depends on land use (L1-L4 in Table A5) and hence the payments are also differentiated according to those four land-use categories.

Table A5 Overview of the natural handicap payment scheme in Greece

| Different payment schemes and payment categories | Level of payments | | | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----|-----|-----|---|--|
| | L1 | L2 | L3 | L4 | | |
| Mountain areas Young farmers with green certificate | 140 | 80 | 160 | 140 | Young farmers with green certificate | = |
| Mountain areas Young farmers and/or successors of early retirement | 125 | 80 | 150 | 125 | Young farmers and/or successors of early retirement | = |
| Mountain areas Other beneficiaries Aegean islands | 110 | 80 | 140 | 110 | Aegean island | = |
| Mountain areas Other beneficiaries Other areas | 100 | 80 | 110 | 100 | Other areas | = |
| Other less favoured areas Young farmers with green certificate | 125 | 65 | 150 | 125 | Young farmers with green certificate | = |
| Other less favoured areas Young farmers and/or successors of early retirement | 110 | 65 | 140 | 110 | Young farmers and/or successors of early retirement | = |
| Other less favoured areas Other beneficiaries Aegean islands | 100 | 65 | 125 | 100 | Aegean island | = |
| Other less favoured areas Other beneficiaries Other areas | 100 | 65 | 110 | 90 | Other areas | = |

= Same level of payment

Land uses:

L1 = Environmental measures, forage for sale, aromatic and pharmaceutical plants, leguminous, cereal and non-food crops

L2 = Other crops

L3 = Grassland with harvested forage for self consumption

L4 = Rough grazing areas (without harvested forages)

The payment rates reported in Table A5 vary between EUR65/ha and EUR160/ha. When determining the per hectare payment rates, the following have been considered:

- The economic impact of the handicaps on agricultural income in comparison to similar holdings in plain areas

- The reinforcement of the strategy towards the accomplishment of the objectives, especially those of the (long term) renewal of rural population and the promotion and encouragement of sustainable systems. The objectives will be achieved with the differentiation of natural handicap payments giving priority to the Aegean islands (due to the additional isolation problem), young farmers (as a supplementary incentive for installation), extensive farming and agri-environmental schemes (e.g. organic farming, integrated production systems etc.)
- On the other hand, there will be no support for intensive conventional production systems such as cotton, tobacco, vegetables and flowers, citrus fruits or sugar beet.

Umbria, Italy

In the region of Umbria, Italy, both natural handicap payments for mountain areas and natural handicap payments for other less favoured areas are applied.

Table A6 Overview of the natural handicap payment scheme in Umbria, Italy

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|--------------------|--|
| | EUR/ha | % of calculated level of payment | | |
| Mountain areas | 200 | 89% | Zonal, not focused | = Annual and permanent crops |
| | | | | ↑ +67% Other land uses (pastures, permanent meadows, etc.) |
| Other less favoured areas | 100 | 54% | Zonal, not focused | ↓ -33% Annual and permanent crops |
| | | | | = Other land uses (pastures, permanent meadows, etc.) |

↑ Increase of payment level

↓ Decrease of payment level

= Same level of payment

The payment calculation has been carried out by comparing costs, revenues and gross incomes of farms located in mountain areas (or in other less favoured areas) with those farms located in non-less favoured areas in the region of Umbria. The FADN database was used as the starting point. Additional costs consist of the difference between variable production costs. The difference in gross output measures foregone income.

Furthermore, per hectare calculations of additional costs and of income foregone must take into account all aspects that mountain areas (or other less favoured areas) bring on the whole farm structure as well as on the farm management costs, outputs and revenues. Therefore, payment calculation must be based on the comparisons of the whole farm systems, not only to comparisons of single productive activities (such as ground crops, tree crops, breeding).

Lithuania

In Lithuania, all less favoured areas are other than mountain areas. Those areas have been selected according to the following criteria:

- The value of total agricultural production per capita employed in agriculture is lower than 80% of the national average;
- The yield of grain crops is less than 80% of the national average;
- The density of population is below 50% of the national average;
- Average annual population regression is at least 0.5%;
- The share of working age population engaged in agriculture, hunting and forestry is above 15%.

In addition, in highly unfavourable areas (HUA), soil productivity is less than or equal with 32 points. In less unfavourable areas (LUA), it is between 32.1 and 35 points.

Table A7 Overview of the natural handicap payment scheme in Lithuania

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|--|--|
| | EUR/ha | % of calculated level of payment | | |
| Highly unfavourable areas (HUA) | 75.30 | 100% | <ul style="list-style-type: none"> • Soil productivity ≤ 32 points • Value of total agricultural production per capita employed in agriculture lower than 80% of the national average • Yield of grain crops less than 80% of the national average • Density of the population below 50% of the national average • Average annual population regression at least 0.5% • Share of working age population engaged in agriculture, hunting and forestry above 15% | = |
| Less unfavourable areas (LUA) | 56.50 | 100% | <ul style="list-style-type: none"> • Soil productivity between 32.1-35 points • Value of total agricultural production per capita employed in agriculture lower than 80% of the national average • Yield of grain crops less than 80% of the national average • Density of the population below 50% of the national average • Average annual population regression at least 0.5% • Share of working age population engaged in agriculture, hunting and forestry above 15% | = |

Applied exchange rate: 3.4528 LTL/EUR

= Same level of payment

The amounts of compensatory allowances are determined as a difference between the economic indicators of farms operating in favourable areas (grain crops-rape, plant production farming), and in less favourable areas (dairy production, mixed plant production-grass-feeding animal husbandry).

As a basis for income losses and cost savings calculations, the gross profits (EUR per hectare) on three areas (HUA, LUA and non-less favoured area) were calculated (cf. Table A8).

Table A8 Gross profits in three areas in Lithuania

| Areas | Total output EUR/ha | Output crops | Output livestock | Other output | Costs EUR/ha | Variable costs | Fixed costs | Gross profit EUR/ha |
|---------------------------|------------------------|-----------------|---------------------|-----------------|-----------------|-------------------|----------------|---------------------------|
| | 1 = 2 + 3 + 4 | 2 | 3 | 4 | 5 = 6 + 7 | 6 | 7 | 8 = 1 - 5 |
| HUA | 389.25 | 219.25 | 162.20 | 7.8 | 316.75 | 186.20 | 130.55 | 72.50 |
| LUA | 435.00 | 243.60 | 187.40 | 4.0 | 343.70 | 207.30 | 136.40 | 91.30 |
| Non-less favoured area | 497.80 | 471.20 | 22.60 | 4.0 | 350.00 | 203.60 | 146.30 | 147.80 |

After that, proposed natural handicap payments (i.e. gross profit differences between non-less favoured areas and highly and less unfavourable areas) were calculated:

Gross profit difference between non-less favoured area and HUA: $147.8 - 72.5 = \text{EUR}75.3/\text{ha}$

Gross profit difference between non-less favoured area and LUA: $147.8 - 91.3 = \text{EUR}56.5/\text{ha}$

Poland

Table A9 Overview of the natural handicap payment scheme in Poland

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|---|--|
| | EUR/ha | % of calculated level of payment | | |
| Mountain areas | 84.16 | 60% | <i>Gminas</i> (i.e. municipalities) in which over 50% of agricultural land is located above the altitude of 500 m above mean sea level. | ↑ ^{*)} +24% |
| Other less favoured areas Lowland zone I | 47.08 | 60% | Areas with agricultural productivity limitations related to low soil quality, unfavourable climatic conditions, unfavourable water conditions, unfavourable location of the land and demographic indicator and a considerable share of agricultural population | ↑ ^{*)} +24% |
| Other less favoured areas Lowland zone II | 69.43 | 60% | | ↑ ^{*)} +24% |
| Areas affected by specific handicaps | 69.43 | 60% | <p><i>Gminas</i> and registered districts of submontane regions, which have been set out for the purpose of the Act of 15 November 1984 on agricultural tax. At least 50% of agricultural land is situated over 52 m above mean sea level.</p> <p>These <i>gminas</i> are characterised by at least two of the following four features:</p> <ul style="list-style-type: none"> • average area of farms amounts to less than 7.5 ha • soils are in danger of water erosion • share of farms, which seized their agricultural production amounts to less than 25% of all farms • share of permanent pastures amounts to more than 40% in the land use structure | ↑ ^{*)} +24% |

Applied exchange rate: 3.8 PLN/EUR

↑^{*)} An increase in payment level is caused by the change of exchange rate

The main indicator for determining the mountain areas in Poland is the location of agricultural land above sea level. The *gminas* (i.e. municipalities) where over a half of agricultural land is located above the altitude of 500 m above mean sea level are considered mountain areas.

The Agricultural Production Space Valuation Ratio is the integrated coefficient consisting of soil quality, climate, location of the land, and water relations. As a result of analyses, it was decided that support in Poland would be granted only to those areas where the natural conditions exclude wheat cultivation. The Agricultural Production Space Valuation Ratio, population density and the share of population related to agriculture are used to determine the other less favoured areas (Lowland zones I and II).

Areas affected by specific handicaps are determined due to the fact that there is a limited possibility to select cultivated plants species in the agricultural areas which are located in the submontane zone (350 m above mean sea level). The submontane areas are characterised by a small average area of farms and high fragmentation (several parcels per one holding, small width of fields), land rolling, a large share of grassland and a large share of population related to

agriculture. Agricultural production is also hindered by the agrarian structure and the large share of set-aside and fallow land.

The aim of natural handicap payments is to compensate for the difference in income obtained by holdings located within less favourable area compared to holdings located elsewhere. The differences in income result from lower yields and from the application of less demanding plants (rye, potatoes). The productivity of farms also differs on account of a lower level of fertilisation and the application of plant protection products in the farms located within the less favourable areas.

The payment calculations are based on the linear operational model of a farm for 210 production types of farms (considering soil quality, production structure, intensity), representing about 90% of farms and the same share of agricultural land in Poland. The FADN data and data from the Central Statistical Office are used for calculations.

In order to determine payment rates for lowland zones, the model farms were divided into three groups: a reference group, a group with smaller handicaps (zone I) and a group with significant handicaps (zone II). Similar methodology was applied in the case of the submontane zone. In order to calculate the payment rate for the mountain areas, extensive bovine farms on weak and medium soils were assumed as the basic type. The difference in income was obtained when compared to the zero level of agricultural income.

Due to limited budget and large agricultural land area in Poland, it is necessary to reduce the compensatory allowance rates proposed to 60% of rates fully compensating for the handicaps.

Scotland

In Scotland, an interim scheme of the LFASS is implemented until 2009. Four grazing categories (A-D) have been defined based on stocking densities to reflect the greater vulnerability of producers with very poor quality land. In addition, the Scottish Executive has allocated one of the four grazing categories to each business as a means of reflecting the land quality by calculating the stocking density on a farm based on the eligible livestock and land.

For the purposes of setting payment rates, land categories A and B are grouped together as “More Disadvantaged Land” and categories C and D are grouped together as “Less Disadvantaged Land”. These two groupings are given different payment rates per adjusted hectare also depending on the fragility category as outlined in Table A10.

Table A10 Overview of the natural handicap payment scheme in Scotland

| Different payment schemes and payment categories | Level of payments | | Targeting | Change in payment level from previous programming period |
|--|-------------------|----------------------------------|--|--|
| | EUR/ha | % of calculated level of payment | | |
| More disadvantaged land Standard areas | 56.75 | n.a. | Areas with lower transport cost | ↓ -3% |
| More disadvantaged land Fragile areas | 57.50 | n.a. | Mainland areas of disadvantage and higher transport cost | = |
| More disadvantaged land Very fragile areas | 77.55 | n.a. | Islands (i.e. Orkney, Shetlands, and Hebrides) | ↑ +10% |
| Less disadvantaged land Standard areas | 48.75 | n.a. | Areas with lower transport cost | ↓ -3% |
| Less disadvantaged land Fragile areas | 59.25 | n.a. | Mainland areas of disadvantage and higher transport cost | = |
| Less disadvantaged land Very fragile areas | 68.47 | n.a. | Islands (i.e. Orkney, Shetlands, and Hebrides) | ↑ +10% |

Applied exchange rate: 0.667 GBP/EUR

↑ Increase of payment level

↓ Decrease of payment level

= Same level of payment

It is important to point out that this interim scheme is a historic based scheme derived from 2006 LFASS payments. Hence, the current interim scheme reflects the differentiation used in the LFASS 2006. Basically, from 2007 to 2009 a farm receives the same amount of LFA support as in 2006. The only change introduced with the interim scheme was a minor shift of the budget from standard areas to very fragile areas by adjusting the payment rates for these two regions. Payment rates for standard areas have been decreased by 3% while payment rates for very fragile areas have been increased by 10%. There is no differentiation between mountain areas and other than mountain areas in Scotland.

The calculation of the area based entitlements in Scotland, as defined in the LFASS 2006, depends on eligible forage hectares, livestock units and grazing categories, fragility categories of areas, and an environmental element such as the livestock mix maintained. The Scottish Executive has outlined a four-step procedure to calculate the entitlements:

1. The amount of eligible forage hectares needs to take into account any ineligible dairy activities and minimum and maximum stocking density obligations. In this step, the amount of forage hectares will be reduced by the ineligible dairy land, the area used for dairy activities, applying the following equation:

$$(\text{Total litres of milk quota} \div 5\,730) \times 0.80 = \text{Ineligible dairy land}$$

To reduce the risk of overcompensation of less favoured area farmers, minimum and maximum stocking densities apply. If the stocking density is less than the defined minimum of 0.12 LU/ha, the entitlement will be based on the number of hectares that would have been required to support the livestock actually maintained, at 0.12 LU/ha (the minimum stocking density). Maximum stocking density is defined as 1.4 LU/ha, using the ratio of maximum stocking density and actual stocking density to adjust the amount of eligible hectares, if the maximum stocking density is exceeded.

2. The number of eligible hectares needs to be multiplied by the hectare values of the different grazing categories defined by stocking density to calculate the adjusted amount of eligible hectares. The different grazing categories, stocking densities and the hectare values allocated to the grazing categories can be summarised in Table A11.

Table A11 Hectare values of different grazing categories in Scotland

| Grazing category | Stocking density (in LU/ha) | Hectare value |
|------------------|-----------------------------|---------------|
| A | Up to 0.19 | 0.167 |
| B | 0.2 – 0.39 | 0.333 |
| C | 0.4 – 0.59 | 0.667 |
| D | 0.6 and more | 0.800 |

3. If at least 10% of the livestock units are cattle, the adjusted eligible hectares needs to be multiplied by an enterprise mix multiplier rewarding environmental and socio-economic benefits of keeping cattle in less favoured areas. The enterprise mix or hectare multiplier is 1.35, if between 10% and 50% of livestock units are cattle. If 50% or more of livestock units are cattle, a higher multiplier of 1.7 applies. These multipliers have been defined through stakeholder consultation.
4. Finally, the adjusted eligible hectares need to be multiplied by the appropriate payment rates depending on fragility markers (standard, fragile, very fragile), defined by lower and higher transport costs and island locations. Grazing categories (A, B, C and D) are put in two groups differentiating between more and less disadvantaged land.

In addition to the above procedure, the calculation of gross margin losses from a comparison of less favoured area and non-less favoured area farming systems has been added to the calculation process to justify the payment rates. It is however important to note that there is no direct linkage between the calculation of the gross margin losses and the proposed payments. The calculated gross margin losses are used to justify the proposed payment rates and show that the payment rates do not overcompensate for the natural handicaps of Scottish LFA farms. Table A12 shows the calculation of gross margin losses of LFA farms in comparison to non-LFA farms.

Table A12 Calculation of gross margin losses of LFA farms in EUR (£)

| | Gross margin per animal | Stocking rate in LU | Stocking rate in heads per ha | Gross margin per ha |
|---|-------------------------|---------------------|-------------------------------|--|
| Non-LFA | | | | |
| Gross margin - lowland suckler cow | | | | 181.50 (121.00) |
| Gross margin - lowland ewe | | | | 479.25 (319.50) |
| Weighted average Gross margin | | | | 276.92 (184.61) |
| | | | | |
| LFA - More Disadvantaged | | | | |
| Gross margin - hill suckler cow | 46.50 (31.00) | 0.2 | 0.2 | 9.30 (6.20) |
| Gross margin - hill breeding ewes | 15.35 (10.23) | 0.2 | 1.33 | 20.46 (13.64) |
| Weighted average gross margin | | | | 14.97 (9.98) |
| Gross margin loss due to LFA (276.92 – 14.97) | | | | 261.95 (174.63) |
| Proposed Payment* | | | | 56.75 – 77.55 (37.83 – 51.70) |
| | | | | |
| LFA - Less Disadvantaged | | | | |
| Gross margin - hill suckler cow | 46.50 (31.00) | 0.6 | 0.6 | 28.40 (18.60) |
| Gross margin - hill breeding ewes | 15.35 (10.23) | 0.6 | 4 | 61.38 (40.92) |
| Weighted average gross margin | | | | 44.90 (29.93) |
| Gross margin loss due to LFA (276.92 – 44.90) | | | | 232.02 (154.68) |
| Proposed Payment* | | | | 48.75 – 68.47 (32.50 – 45.65) |

Exchange rate: € = 1.5 * £

Data source: Scottish Rural Development Plan (version June 2007)