AGRIGRID

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

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Report D5 Methodological grids for natural handicap payments

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List of abbreviations

CAP Common Agricultural Policy

CZ Czech Republic

DE_{NRW} Germany – Federal State of North Rhine-Westphalia

EC European Commission

EEC European Economic Community

EU European Union

EUR Euro

FADN Farm Accountancy Data Network

GAEC Good Agricultural and Environmental Condition

GFI Gross Farm Income

ha hectare

H^A Mountain area type in Czech Republic
 H^B Mountain area type in Czech Republic

LFA Less Favoured Area

LVZ Landwirtschaftliche Vergleichszahl, an indicator measuring the quality of

agricultural land

MJ NEL Megajoule Net Energy for Lactation

RD Rural Development

RDP Rural Development Programme RDR Rural Development Regulation

SMR Statutory Management Requirement

t tonne (1,000 kg)

UAA Utilised Agricultural Area

1. Introduction

This report addresses the development and application of measure-specific methodological grids which will make the calculation of natural handicap payments more harmonised and transparent in the European Union (EU) member states. The developed grids are equally applicable for analysing existing natural handicap payment schemes and for designing new ones.

The aid to farmers in less favoured areas (LFA) is a longstanding measure of the Common Agricultural Policy (CAP) and all member states have chosen to implement it. Originally set up in 1975 (Council Directive 75/268/EEC), the less favoured area schemes provide natural handicap payments (compensatory allowances) to farmers in mountainous areas or in other areas where the characteristics of the physical landscape or other factors of disadvantageous nature result in higher production costs.

The policy objectives of natural handicap payment measures have evolved over time. Under the Council Regulation (EC) 1698/2005, the payments contribute, through continued use of agricultural land, to maintaining the countryside as well as to maintaining and promoting sustainable farming systems. In other words, natural handicap payments sustain agriculture which delivers public goods, such as valuable landscapes, biodiversity and soil conservation, in fragile areas where the risk of abandonment of agricultural land is a crucial issue. In the preceding support schemes, socio-economic indicators were also used for delimiting less favoured areas along with the natural handicap indicators. In addition, the prevention of rural depopulation was an explicit objective in the early schemes.

LFA payment schemes have been critically evaluated many times. For instance, the European Court of Auditors (2003) have criticised that, in many cases, the classification of less favoured areas has been based on deficiently substantiated evidence. This may have led to differences in the treatment of beneficiaries.

Nevertheless, redesigning the LFA payment schemes has not yet succeeded, and also the latest attempt to redefine LFA classification in connection with the guideline setting for rural development for the programming period 2007-2013 failed. Therefore, the Council decided to continue LFA policy within the framework of the new Rural Development (RD) Council Regulation (EC) 1698/2005, but with the provisions of the Council Regulation (EC) 1257/1999 unchanged until January 2010.

Currently, three types of LFA are recognised until January 2010:

- 1. Mountain Areas are characterised as those areas handicapped by a short growing season because of a high altitude, or by steep slopes at a lower altitude, or by a combination of the two. In addition, areas north of the 62nd parallel are regarded as mountain areas.
- 2. Other Less Favoured Areas are those areas in danger of abandonment of agricultural land-use and where the conservation of the countryside is necessary. They 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.
- 3. Areas Affected by Specific Handicaps are areas where farming should be continued in order to conserve or improve the environment, maintain the countryside, preserve the tourist potential of the areas, or to protect the coastline.

The eligible area under other LFAs has tended to increase over the years and the delimiting criteria have become more and more varied from one member state to the other. Instead, the mountain area classification is based on clearly defined criteria and the areas with specific handicaps are limited by legislation to a maximum of 10% of the national territory. Therefore, the redesign of the LFA payment scheme from January 2010 relates to other less favoured areas.

In this report, we will follow, when applicable, the guidelines set in the current rural development regulation (RDR) (Council Regulation (EC) No 1698/2005). However, the presented logic framework is of general nature. Although it can be used in the analysis of the current regulation, its main purpose is to address various principled issues which should be taken into account in the design of any natural handicap payment scheme. When we operationalise the logic framework and move to the development of the methodological grids for actual payment calculations, the requirements and elements of the current regulation gain more weight. For this reason, we deal with two rural development measures:

- 1. natural handicap payments in mountain areas and
- 2. natural handicap payments in other areas with handicaps

as well as two corresponding natural handicap payment grids. The two measures and grids capture the main bundles of handicap factors posing a threat to the continuation of farming in LFAs. The grids are separate but, since they are identical, we will often present them together.

For the development of natural handicap payment grids, it is important that natural handicap payments per hectare of Utilised Agricultural Area (UAA) should be fixed based on the farmers' additional costs and income foregone related to the handicap for agricultural production in the area concerned according to the new RDR. In the previous schemes, the legal requirements were to make an effective contribution to compensation for existing handicaps and to avoid

overcompensation.

The fact is that the natural handicap payment schemes in the EU countries vary considerably in terms of both design and implementation. This is why we present in more detail two examples of natural handicap payment calculations. The examples help to understand how the developed methodological grids are put into action and how they are applied in different natural conditions and institutional environments.

The selected examples for the application of grids are natural handicap payments in mountain areas in the Czech Republic (CZ) and natural handicap payments in other areas with handicaps in the Federal State of North Rhine-Westphalia in Germany (DE_{NRW}) (Table 1). The calculation approach utilised in CZ will represent the Balance Sheet (FADN) approach¹. In DE_{NRW}, the Practices approach is used and a natural handicap is measured via land productivity. This kind of measurement of the natural handicap is most probably relevant in the future (post 2010) natural handicap payment system.

Table 1. Selected examples for the application of the grids

| Measure | Selected examples | Country/Region | |
|---------|---|-------------------|--|
| 211 | Natural handicap payments in mountain areas | CZ | |
| 212 | Natural handicap payments in other areas with handicaps | DE _{NRW} | |

The structure of the report is as follows. Section 2 introduces the logic framework which gives an overview on the calculation process of natural handicap payments. Baseline requirements are discussed in Section 3. The effect of cross compliance² to the payment calculation is somewhat different when dealing with the natural handicap payments instead of the other RD measures. Examples of the utilisation of the Balance Sheet (FADN) approach and the Practices approach are shown in Section 4. Payment differentiation criteria are reviewed in Section 5 and concluding remarks are in Section 6.

2. Logic framework

In this section, the logic framework illustrates the calculation process of natural handicap payments and contributes to the design of methodological grids for compensatory allowances.

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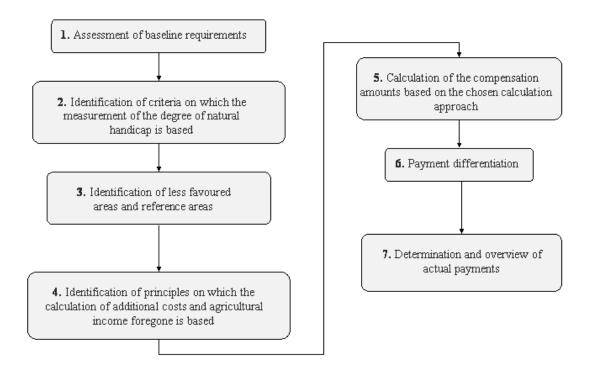
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¹ The Balance Sheet (FADN) approach and the Practices approach are dealt with in Section 4.

² Cross compliance consists of two parts: Statutory Management Requirements (SMRs) and Good Agricultural and Environmental Conditions (GAECs).

The same framework is employed in the development of both grids i.e. the natural handicap payments grid in mountain areas and the natural handicap payment grid in other areas with handicaps. The logic framework is depicted in Figure 1.

Figure 1. Logic framework for the design of natural handicap payment grids



1. Assessment of baseline requirements

Farmers have to fulfil the Statutory Management Requirements (SMRs), Good Agricultural and Environmental Conditions (GAECs) and national/regional regulations to receive natural handicap payments. Therefore, at the first step of the logic framework, cross compliance and all relevant baseline requirements, which may affect the eligibility and calculation of natural handicap payments, are screened.

2. Identification of criteria on which the measurement of the degree of natural handicap is based

In the second step, the criteria indicating natural handicap for agriculture are identified. The measurement of the degree of natural handicap is challenging and requires statistical data from several areas and the use of measurable and analytically sound indicators. A single indicator may not be sensitive to all natural handicaps and may not lead to appropriate results. The definition and application of indicators should be clear and transparent.

Furthermore, it should be noted that some member states have also utilised socio-economic indicators (i.e. other than natural handicap indicators) when implementing natural handicap payment schemes. Since there are more targeted measures available to tackle socio-economic handicaps, these indicators should be avoided.

3. Identification of less favoured areas and reference areas

The delimitation of areas with other handicaps than mountain areas is currently an issue in the political debate. The classification of LFAs should be based on clearly defined criteria.

For example in CZ, mountain areas are H^A areas 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.

Those municipalities or cadastre territories which do not meet the above criteria but are situated inside an 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) are H^B areas.

The reference areas are those areas where there are no permanent natural handicaps and with which LFAs are compared.

4. Identification of principles on which the calculation of additional costs and agricultural income foregone is based

At the fourth step, either the Balance Sheet (FADN) approach or the Practices approach may be utilised depending on the availability of data required in the calculation process. In the Balance

Sheet approach, only FADN entries are allowed. In the Practices approach, costs and revenues related to specific practices can be used and non-FADN entries are allowed.

In theory, other calculation approaches are also possible if the chosen calculation approach includes net income foregone and additional agricultural cost categories. Transaction costs are not included in the natural handicap payments calculations.

5. Calculation of the compensation amounts based on the chosen calculation approach

This step includes the comparison of the less favoured area and the reference area and the calculation of the additional costs and agricultural income foregone as a result of the permanent natural handicap which farmers in the less favoured area are subject to. Basically, there are two ways to calculate the compensation amounts using the selected calculation approach. It is possible to compare the differences in the productivity of arable land or the differences in gross margins between the areas.

6. Payment differentiation

The sixth step includes payment differentiation decisions. First, there is a principal decision whether to differentiate the payments or not. The differentiation of natural handicap payments enables authorities to pursue national or regional objectives and make enhanced payments in areas with more severe natural handicaps. In practice, the differentiation of natural handicap payments has also been based on criteria other than natural handicaps.

7. Determination and overview of actual payments

At the beginning of the final step, it is confirmed that the calculated payments lie between the RDR limits. According to the rules in force, the annual natural handicap payment can vary between a minimum of 25 EUR/ha and a maximum of 250 EUR/ha in mountain areas (150 EUR/ha in the other areas with handicaps). Some countries also apply national minimum and maximum criteria or payment ceilings. Calculated payments may also be adjusted (or decreased) due to budgetary or some other policy reasons.

Finally, the actual payment rates and additional costs and net income foregone are presented.

3. Baseline

The introduction of compulsory cross compliance from January 2005 may have tightened the basic requirements of land management. This change in the baseline practice must be taken into account when calculating most payments under the RDR, since it is the difference between the baseline practice and the RD commitment requirements which determines the amounts of additional costs and income foregone and the amount of, for example, agri-environmental payment.

The concept is somewhat different when we consider natural handicap payments, since the baseline practice is then basically the same as the RD commitment i.e. to continue farming and comply with the minimum requirements. Table 2 provides examples of the Finnish SMRs and GAECs.

Table 2. Examples of filled-in *Linkage Table*

| Type of baseline Description | | Baseline practice | RD commitment | |
|------------------------------|---|--|--|--|
| SMR | Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources. The Finnish Government has issued a decree (931/2000) on the restriction of discharging nitrates from agriculture into waters to implement the requirements of the EU Nitrate Directive. | The whole of Finland has been classified as a vulnerable zone in accordance with the EU Nitrate Directive. Therefore, the Government Decree (931/2000) regulates, among others, animal manure storage, application of animal manure, fertiliser amounts and nitrogen analysis in every reference area (if any can be found) in Finland. | In a similar manner, the Government Decree (931/2000) regulates animal manure storage, application of animal manure, fertiliser amounts and nitrogen analysis in every less favoured area in Finland. | |
| GAEC | Untilled headlands | Arable parcels alongside watercourses and main ditches must have an untilled headland of at least 0.6 m, to which fertilisers and plant protection products are not applied. | In the similar manner in every less favoured area in Finland, arable parcels alongside watercourses and main ditches must have an untilled headland of at least 0.6 m, to which fertilisers and plant protection products are not applied. | |

In addition, a change in cross compliance affects the farming practices both in the less favoured area and the reference area (i.e. those areas where there are no permanent natural handicaps). In theory, the effect on the payment level is ambiguous and it depends on which area the impact on farming costs is relatively bigger. At the same time, it is also possible to argue that a change in the farming practice should have no effect on the level of the natural handicap payment, since this measure should be proportional to the difference in the natural handicap between the areas

which remains unchanged.

4. Cost/revenue components

In this section, we will demonstrate the use of different payment calculation approaches.

4.1 Balance Sheet (FADN) approach

The Balance Sheet (FADN) approach is utilised in the natural handicap payment calculation in mountain areas in CZ.

The agricultural income foregone i.e. the difference in SE410 Gross Farm Incomes (GFIs) per hectare between farms situated in the reference area (i.e. in an area where there are no permanent natural handicaps) and in the mountain area is calculated as follows:

Based on the FADN data, the three year average GFI in the reference area is EUR392.16 ha⁻¹ (Table 3).

To determine the disadvantage in mountain areas, the difference in GFIs (in terms of EUR/ha) between the farms in the reference area and the mountain area is calculated with the help of the percentage of lower economic production, 64%. The percentage is based on the agreed system of Land Point Value. The disadvantage in mountain areas is 64% of the three year average GFI in the reference area or equal to EUR249.49 ha⁻¹ (Table 3).

Table 3. Example of the application of the Balance Sheet (FADN) approach in the natural handicap payment calculation in ${\bf CZ}$

| Variables | Relevant FADN entries | Reference area | Mountain area | Difference |
|--|---|--------------------------|------------------|--------------------------|
| Difference in GFIs | SE410 Gross Farm Income | €392.16 ha ⁻¹ | | €249.49 ha ₁ |
| Savings in factor costs due to lower intensity | SE360 Depreciation SE370 Wages paid SE375 Rent paid | | | -€99.79 ha ⁻¹ |

In addition, there are savings in factor costs due to lower intensity for those farms situated in the mountains. In the Czech calculation example, factor costs consist of SE360 Depreciation, SE370 Wages paid and SE375 Rent paid. They are determined for the mountain area according

to selected production areas within the Czech Farm Accountancy Data Network.

The savings in factors costs (EUR/ha) in the mountain area are calculated by subtracting the factor costs in the mountain area from the respective factor costs in the reference area. After that, the savings in factor costs as a percentage of disadvantage in the mountain area is calculated by dividing the savings in factor costs in the mountain area by the difference in GFIs. However, the resulting percentage is not directly used in the further calculations but, for simplicity, one common percent (i.e. the average equal to 40%) for all less favoured areas has been determined.

Savings in factor costs due to lower economic intensity in the mountain area is 40% of the disadvantage in mountain areas and equal to -EUR99.79 ha⁻¹ (Table 3).

Thus, the calculated payment level equals to $EUR249.49 \text{ ha}^{-1} - EUR99.79 \text{ ha}^{-1} = EUR149.70 \text{ ha}^{-1}$.

In CZ, natural handicap payments are made only for grasslands, and in the Czech mountain areas, payments are differentiated between the H^A and H^B areas. The differentiating percentage is 105% for the H^A area and 90% for the H^B area.

The actual payment level for permanent grassland in H^A areas is $1.05 \times 149.70 \text{ ha}^{-1} = \text{EUR}157 \text{ ha}^{-1}$.

The actual payment rate for permanent grassland in H^B areas is $0.90 \times 149.70 \text{ ha}^{-1} = EUR134 \text{ ha}^{-1}$.

4.2 Practices approach

The Practices approach is utilised in the natural handicap payment calculation in other less favoured areas in DE_{NRW} where natural handicap payment calculations are based on the replacement value of grassland yield reductions.

In the less favoured areas, there are five soil quality groups altogether, differentiated according to the LVZ indicator measuring the quality of agricultural land

- LVZ ≤ 15
- $15 < LVZ \le 20$
- 20 < LVZ ≤ 25
- $25 < LVZ \le 30$
- 30 < LVZ < 35

For LVZ > 35 no allowances are granted (i.e. they may be considered as reference areas). In the reference area, farmers are assumed to receive average yields.

Table 4. Example of the application of the Practices approach in the natural handicap payment calculation in DE_{NRW}

| | Reference area | 30 < LVZ ≤ 35 | 25 < LVZ ≤ 30 | 20 < LVZ ≤ 25 | 20 < LVZ ≤ 15 | LVZ≤15 |
|------------------------------------|-------------------|------------------|------------------|------------------|------------------|--------|
| Net yields in MJ | 33,600 | 31,248 | 30,240 | 28,560 | 26,880 | 25,200 |
| Replacement cost value EUR/10MJ | 0.153 | 0.153 | 0.153 | 0.153 | 0.153 | 0.153 |
| Income EUR/ha | 514.08 | 478.09 | 462.67 | 436.97 | 411.26 | 385.56 |
| Income losses EUR/ha | | 35.99 | 51.41 | 77.11 | 102.82 | 128.52 |
| Modification percent | | 69.5% | 66.1% | 77.8% | 87.5% | 89.5% |
| Actual payment EUR/ha | | ≤ 25 | ≤ 35 | ≤ 60 | ≤ 90 | ≤115 |

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 equal 20%, 15%, 10% and 7%. Yield losses cause income losses to farmers in the disadvantaged areas.

The gross yield losses of farmers within each soil quality groups are stated in terms of feed energy (MJ NEL/ha). They are calculated for each soil quality group by subtracting the product of the average yield and the yield reduction percent from the average yield of grassland.

Next, the net yield losses of farmers (i.e. feed energy losses) within each soil quality groups are

calculated by assuming the common harvest loss percentage (30%) to all soil quality groups.

In replacement costs calculations, purchases of wheat at EUR115/t have been assumed, which results in the replacement cost value of EUR0.153/10 MJ. The income losses of farmers (EUR/ha) in each soil quality group are calculated by multiplying feed energy losses with the above cost factor.

The income losses of farmers are not fully compensated. For this reason, the calculated income losses are multiplied by modification percentages. The actual payment rates are:

- \leq EUR115 ha⁻¹ when LVZ \leq 15
- \leq EUR90 ha⁻¹ when 15 < LVZ \leq 20
- \leq EUR60 ha⁻¹ when 20 \leq LVZ \leq 25
- \leq EUR35 ha⁻¹ when 25 \leq LVZ \leq 30
- \leq EUR25 ha⁻¹ when 30 \leq LVZ \leq 35

5. Differentiation criteria

The differentiation of natural handicap payments is widespread among the member states and regions. Payment differentiation enables authorities to pursue national or regional development objectives and make enhanced payments in areas with a more severe permanent natural handicap. In practice, the differentiation of natural handicap payments has also been based on other criteria than the natural handicap.

Both natural handicap payment grids employ the following differentiation categories:

- 1. bio-geophysical characteristics of land
- 2. land use purpose
- 3. administrative differentiation.

Since the severity of natural handicap and thus productivity of arable land and the income received from agriculture vary between the areas, it has been necessary to differentiate payments according to biological, geological and physical characteristics of land. The natural handicap payment schemes and especially the differentiation of payments in other less favoured areas than mountain areas should be developed to this direction.

The elements of the second differentiation category, land use purpose, implicitly measure the type of production and the intensity of farming between the areas. The development objectives,

at which this payment differentiation category aims, are environmentally motivated, but they do not directly reflect the natural handicap.

The third differentiation category is administrative differentiation. This differentiation category reflects the development objectives of the member states and their administrations more than the degree of natural handicap.

The full list of differentiation categories and elements are reported in the Excel sheet with commitments, activities and differentiation elements found in the Annexes of this report.

6. Conclusions

Natural handicap payments are paid to farmers in Less Favoured Areas in recognition of higher production costs and/or lower incomes. All EU member states implement natural handicap payment schemes. Since the methods for the calculation of payments vary considerably among the member states and regions, there is an apparent need for the development of methodological grids which would set common guidelines and practices for the calculations. The goal of the methodological grids is to provide more transparent, verifiable and quantifiable determination of payment levels.

However, natural handicap payments differ from the majority of rural development measures in one crucial respect. In most cases, the payment or the amount of compensation is based on doing things differently than before. To receive natural handicap payments, farmers do not have to alter their production practices or engage into extra activities. They just have to commit to continuing farming and following cross compliance statutes.

The idea of natural handicap payments is to compensate the disadvantage caused by adverse natural conditions. Thus, a farmer's eligibility for the natural handicap payment depends on where his/her farm is located. This raises a fundamental question of how to measure the natural handicap. It has to be also considered when the natural conditions are adverse enough to make the farmer entitled to compensation. Rainfall, length of growing period, soil productivity and many other natural conditions vary significantly in different parts of the EU. A natural condition being the most critical factor reducing yields in one region may be completely irrelevant in some other region. Thus, it is extremely challenging to determine the degree of natural handicap.

As far as the methodological grid for payment calculations is concerned, at least an implicit determination of the degree of the natural handicap is required, because a reference area for the payment calculations has to be fixed. After the selection of the reference area, it is possible to proceed to the actual payment calculation which should be based on the difference in economic performance between farms in the reference area and farms in the area entitled to natural handicap payments. Unfortunately, there is no theoretically correct way to determine the payment level. In the Balance sheet (FADN) approach, which is based on data on past farm-level economic performance, the problem is that it is not necessarily known to what extent the difference in economic performances can be explained by the discrepancy in natural conditions. The Practices approach, in turn, is in most cases based on model calculations utilising expert judgements and monetary value estimations not derived from reliable statistical data.

It is also debatable if the definition of adverse natural conditions should be extended beyond bio-geophysical characteristics of farmland. The economic performance of farms in certain areas can be poor despite average natural conditions. For instance, a remote location or the lack of education leading to deficient vocational proficiency create adverse conditions which clearly make areas less favoured.

Nevertheless, the purpose of the developed methodological grid for natural handicap payment calculations is not to set guidelines on how to define the characteristics and degree of natural handicaps in different areas but to provide a well-grounded calculation procedure which makes it possible to both compare existing natural handicap payment schemes and design new ones in a transparent and methodologically sound way.

The determination of actual payment levels is always a political issue, but political decisions need to be justified and the design of policy measures must be based on argumentation which is understandable and detailed enough to be critically assessed and evaluated in all relevant societal contexts and by all stakeholders. We believe that the developed methodological grid for natural handicap payment calculations serves this purpose.

7. References

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European Court of Auditors, 2003. Special Report No 4/2003, Official Journal of the European Union C 151 of 27 June 2003.

Annexes

Annex 1

Excel sheet with lists of commitments, practices and differentiation categories and elements

Annex 2

Excel sheet with step-by-step examples of the application of the natural handicap payments grids