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The challenge of monitoring environmental priorities: the example of HNV farmland

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Abstract

Assessment of the environmental outcomes associated with agricultural and rural policy is becoming increasingly important. The High Nature Value (HNV) Farmland indicator included within the EU's Common Monitoring and Evaluation Framework for rural development is taken as an example of the parameters used for environmental monitoring. The different methods used across the EU to estimate the extent and condition of HNV farmland are compared, and issues and challenges related to different approaches are discussed.

Keywords: HNV, High Nature Value, environmental monitoring.

JEL classification: Q

1. INTRODUCTION

In recent years, increasing emphasis has been placed on the non-market benefits of agricultural and rural policy, and in particular the environmental policy impact of policy instruments. The ongoing debate about the future of the Common Agricultural Policy (CAP) makes it clear that environmental outcomes are a key priority area for many stakeholders and for the public in general.

This, taken together with the increasing focus on evaluation and policy performance within the European Union (EU), means that it becomes ever more important to be able to measure, monitor and assess environmental characteristics in a reliable and consistent manner.

The example of High Nature Value (HNV) farmland provides an interesting and informative example of the issues and challenges linked to environmental monitoring for use in policy development and implementation. This paper provides an overview of the methods used to assess HNV farmland across the EU, but many of the points made are equally applicable to monitoring other environmental parameters.

2. THE GROWTH IN IMPORTANCE OF THE HNV CONCEPT WITHIN AGRICULTURAL AND RURAL POLICY IN THE EU

The concept of HNV farming has been emerging as a policy consideration within the EU for some considerable years.

In Cardiff in June 1998 the European Council instructed the Commission to report on the integration of environmental concerns into Community sectoral policies. In order to meet this requirement within the agricultural sector, the Commission identified a set of agri-environmental indicators, including HNV farmland (European Commission, 2000).

These were developed within the IRENA project (European Environment Agency, 2005) Subsequently a streamlined set of 28 agri-environment indicators (AEIs) was developed and work has since progressed under the auspices of a Joint Memorandum of Understanding signed by European Commission DGs AGRI and Environment, Eurostat, the Joint Research Centre (JRC) and the European Environment Agency (EEA).

In the Kiev resolution on Biodiversity (United Nations Economic Commission for Europe, 2003), European Environment Ministers committed themselves to identifying HNV farmland areas by 2006, and to introducing favourable management of a large proportion of these by 2008.

For the 2007-2013 programming period, the Community Strategic Guidelines for rural development highlight the preservation and development of HNV farming systems as a priority (Council Decision 2006/144/EC). This focus was reinforced through the introduction of biodiversity as one of the new challenges for the CAP within the "Healthcheck" in 2009 (Council Regulation (EC) No. 73/2009). As a result, over recent years Member States have been devoting increasing efforts to identifying HNV areas within their territory, using a range of different techniques.

In the future, as the Europe 2020 strategy document (European Commission, 2010a) with its emphasis on sustainability, respect for the environment and the prevention of biodiversity loss makes clear, the importance of environmental considerations in EU policy making will continue to grow.

The focus on biodiversity has been developed further with the commitment of the Environment Council in March 2010 to "Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss" (European Commission, 2010b). This target was subsequently endorsed by the European Council.

In common with other Community policies, CAP policy post-2013, including rural development policy, will be closely aligned to overall EU objectives. Work on preparing the post-2013 CAP framework is well underway, and legislative proposals are due to be submitted to the Council and the Parliament later this year.

In addition to defining objectives and targets to focus EU policy effort, the Barroso II Commission has also identified a stronger role for evaluation in the development and implementation of policies (European Commission, 2010c).

In order to address these political commitments, the monitoring and evaluation system for rural development is being reviewed and revised to ensure that it will be capable of demonstrating the contribution of post-2013 rural development policy to overall EU objectives. In this context, indicators related to biodiversity, such as HNV farmland will clearly be necessary.

In parallel to the work on the rural development policy framework, the AEI project continues to evolve. As environmental objectives become increasingly important for both pillars of the CAP, and in order to rationalise resource use, complementarity and convergence

between the AEIs and the rural development indicators is being sought where possible. HNV farmland is one example of an indicator that fits neatly into both exercises.

It can be expected therefore that assessment of the extent and condition of HNV farmland will remain an important element within the toolkit used to describe the impact of agriculture on the environment, and as part of the rural development monitoring and evaluation system. Improving capacity to make these assessments will also therefore remain an important objective.

3. WHAT IS HNV FARMLAND?

Much has been written about what constitutes HNV farmland (e.g. Baldock et al, 1993; Cooper et al, 2007), and it is not the purpose of this paper to enter into an exhaustive discussion of either the development of the concept or the range of opinion on the subject. Rather, a basic summary of the current widely accepted position will suffice here to place the work described in context.

HNV farmland results from a combination of land use and farming systems. Some "natural values", related to high levels of biodiversity or the presence of certain species and habitats, depend on certain types of farming activity. The dominant feature of HNV farming is low-intensity management, with a significant presence of semi-natural vegetation, in particular extensive grassland. Diversity of land cover, including features such as ponds, hedges, woodland is also a characteristic.

A broad classification of HNV farmland into three types was first proposed in 2003 (Andersen et al, 2003), with subsequent modifications (Paracchini et al, 2006):

- Type 1: Farmland with a high proportion of semi-natural vegetation.
- Type 2: Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc.
- Type 3: Farmland supporting rare species of a high proportion of European or world populations.

This typology has now been widely adopted, and has formed the basis of guidance provided in the context of monitoring HNV farmland within the EU rural development framework.

4. HNV INDICATORS WITHIN EU RURAL DEVELOPMENT POLICY

Within the EU, rural development support is provided through multi-annual programmes drawn up by national or regional programming authorities and approved by the European Commission. The Rural Development Programmes (RDPs) are co-financed jointly by the EU and the Member States (MS) and are implemented under "shared management" rules. For the 2007-2013 programming period, a new system for the assessment of rural development policy was introduced, known as the Common Monitoring and Evaluation Framework (CMEF). The

CMEF provides a common basis for monitoring and evaluation of RDPs throughout the EU, assessing progress in programme implementation, and the results and impacts achieved, on a consistent basis across programmes, thus allowing aggregation to EU level.

The CMEF is composed of a series of elements, including the introduction of on-going evaluation to support and enhance the quality of evaluation activities, a set of indicators established in relation to the hierarchy of policy objectives, methodological guidance for policy evaluation, and a framework of support to foster learning and capacity building. Two of the indicators within the CMEF relate specifically to HNV farmland:

- Baseline indicator 18[1]: HNV farmland and forestry. The CMEF Handbook defines this indicator as the Utilised Agricultural Area (UAA) of HNV farmland, expressed in hectares.
- Common impact indicator 5[2]: maintenance of HNV farmland and forestry. This indicator encompasses changes in both the extent and condition of HNV farmland. Extent is defined as the area of HNV farmland and forestry expressed either as an absolute area (ha) or as a percentage of UAA and/or forest land. No standard definitions for assessment of condition are given.

In addition to the definitions given in the CMEF Handbook (DG Agriculture and Rural Development, 2006), further guidance on the measurement of the HNV indicators has been prepared by the EU Evaluation Helpdesk in order to assist MS and evaluators in establishing, updating and interpreting indicator data. Two guidance documents address the HNV issue specifically, "The application of the High Nature Value impact indicator" (Evaluation Expert Network, 2009), and "Approaches for assessing the impacts of the Rural Development Programmes in the context of multiple intervening factors" (Evaluation Expert Network, 2010).

The CMEF approach to assessing HNV farming and forestry acknowledges the varied histories and experience of environmental monitoring across the EU. In some places established traditions of species and population monitoring, typically undertaken by volunteers working with NGOs such as England's County Wildlife Trusts, have built up detailed records of the locations and populations of targeted habitats and species dating back many years. In other parts of the EU environmental monitoring is relatively undeveloped and data is scarce. This is one reason why the CMEF does not prescribe a specific method for the assessment of either the extent or the condition of HNV farmland.

Another equally important consideration is the variation in HNV farmland existing within MS and regions across the EU. The data and methods most appropriate for identifying farmland with HNV characteristics differ according to the type of HNV observed. MS authorities are

[1]The baseline indicators were used to describe the initial situation of the programme area, and fed in to the establishment of a SWOT analysis, needs assessment and the framing of programme objectives.
[2]The impact indicators feed in to the evaluation process, and, when combined with appropriate methods, assist in determining what has really been achieved with the resources used.

naturally predisposed to invest more in those linked to the predominant HNV types within their territory.

So, the CMEF asks programme authorities to provide an assessment of the extent and condition of HNV farmland within the RDP area, but leaves the choice of data sources, subsidiary indicators and methodology free, although guidance and methodological support has been provided.

5. METHODS USED FOR THE ASSESSMENT OF HNV FARMLAND

A glance at the initial data submitted by programme authorities within the CMEF gives some idea of the difficulties encountered in assessing HNV land. Of the 90 RDPs for which data would be expected[3], a value was provided for 74%. The majority of these (44% of all territorial RDPs) gave an absolute value in hectares, whilst 29% submitted either a percentage of UAA or an alternative quantification.

In spring 2010, all MS were asked to provide details of the methodology used to establish the data for the CMEF HNV baseline indicator within their programmes. The following summary of the methods currently being used has been compiled from the information submitted by national and regional programming authorities throughout the EU.

It should be noted that many correspondents commented that the methodology originally used to provide baseline data would benefit from improvement. A high proportion of programme authorities have used the Mid-Term Evaluation (MTE) of the RDP as an opportunity to refine or develop more appropriate approaches. The MTE reports, which were all conducted by independent, external evaluators, were completed at the end of 2010. It is likely that this exercise has lead in many cases to improved methodologies and better estimates of the extent and state of HNV farmland.

As a consequence of development work carried out through on-going evaluation activities and the MTE, the status of the methodologies submitted varied from descriptions of that actually used to derive the data originally submitted at the time of RDP approval, through work completed later, methods defined for use in the MTE but which had not yet generated results, to draft proposals for further development. For the purposes of this exercise, which aims to assess the various methods used, their outcomes and the advantages and disadvantages of different approaches, the most recent developments communicated by each MS were taken into account, provided that the methodology had reached a stable definition. This means that the methods included in this analysis were not necessarily those used to provide the figures currently included in RDPs, nor do they represent the overall EU situation at any particular fixed moment in time. This is an evolving exercise and further development will certainly emerge as a result of subsequent analysis of the MTE reports.

[3] 4 RDPs concern only the national networks of the respective MS and so the HNV indicators are not relevant.

Table 1: Methods used to identify HNV farmland, and effectiveness in identifying the 3 HNV types

Case	IRENA/ EEA	Land cover	Soil/ altitude	Management schemes	Farming systems	Species data	EU desig.	National desig.	Other habitat identification	Site sampling	IACS/ LPIS	Type 1	Type 2	Type 3
1				X							X	XX	X	
2							X		X			XX		
3							X	X						XX
4		X					X		X		X	XX		XX
5							X	X	X			X		XX
6	X											XX	X	
7										X		XX	XX	XX
8		X					X					XX		
9		X	X			X	X	X	X			XX	XX	XX
10							X	X				X		XX
11							X	X				X		XX
12		X			X							XX	XX	
13							X		X			X		XX
14		X			X		X		X			XX		XX
15		X		X			X		X			XX	X	XX
16	X												XX	
17	X											XX	X	
18		X										XX		
19		X		X	X		X	X			X	XX	X	XX
20		X		X	X	X					X	XX	X	X
21		X			X	X						XX	X	XX
22		X										XX	X	
23		X			X	X						XX	X	XX
24		X			X						X	XX		
Total	3	13	1	4	7	4	12	6	7	1	5	18+4	4+9	13+1

For methods, X= method used; For HNV type, XX = identified, and X = identified to some extent

From the information provided, 24 separate submissions could be identified which contained sufficient methodological detail to allow common analysis. Taken together these cover all or part of 22 MS.

The descriptions were assessed in relation to the data sources and methods used to identify HNV farmland, and the type of HNV land identified. A summary of the results is shown in Table 1.

5.1. Approaches for assessment: 1. Extent

As can be seen from the table, a wide variety of methods are currently being used, either singly, or in combination. Perhaps unsurprisingly, the most commonly occurring methods are based on land cover and statutory designations.

Unsurprising in the first case because the original work on identifying HNV land at EU level was largely based on CORINE land cover data (European Environment Agency, 1999, 2004, 2005). If the three instances using the original IRENA/EEA data or method are included, then 16 out of the 24 cases rely strongly on land cover data, although the majority enrich and refine the approach by incorporating other methods too. Land cover data sources include grassland inventories, and other surveys as well as CORINE data. Methods combined with land cover include expert panels to enhance criteria through the incorporation of data on altitude and soil quality, or combination with species' distribution databases.

The use of statutory designations, at EU level particularly NATURA, but also others such as protected water management areas, and national designations, such as nature reserves and national parks, can also be understood: they offer a predefined basis which can be used quickly and simply, and their status as important for particular species or habitats is their "raison d'être", so they are unlikely to be contested. Countries and regions relying wholly or predominantly on designations tend to be those where the original land cover approach proved unsuited to conditions on the ground, often because the grid size was too coarse to identify the complex pattern of land use, or because of difficulties in distinguishing between land classes (e.g. extensive semi-natural grassland and abandoned land).

The summary table does of course obscure the detail of the methodologies. In some cases HNV areas identified from land cover data were complemented by land within designated areas, explained largely by a drive to improve identification of Type 3 HNV. In other cases designated areas were used as an additional filter, with a different group of land classes selected within and outwith NATURA areas. For another group, the starting point was the designated areas, and a limited number of specific land cover classes or habitats were added on to provide a more complete picture of HNV status.

Five of the reported methods involve IACS/LPIS, but again not all with the same objective. In some cases, once HNV land has been identified, a GIS HNV layer is overlaid with LPIS so that only agricultural parcels are included in the final figure. In other cases, IACS/LPIS is used in a pro-active way to identify HNV farmland, through calculations of stocking density,

parcel size, proportion of permanent pasture or areas included in certain agri-environment schemes.

Approaches using the farming system as a predictor for HNV farmland are being used or tested in a number of programme areas. The seven cases recorded cover as many individual methods, ranging from simple identification of agricultural land managed organically, through data from the EUROSTAT Farm Structural Survey (FSS) or the Farm Accounts Data Network (FADN) to individual farm scoring using data from comprehensive farm registers.

A small group include land entered into management contracts in their assessment of HNV farmland. This may be specific agri-environment schemes focussed on biodiversity, or other national schemes supporting HNV land. In all cases this was additional and subsidiary to other methods, and appears intended to identify land which would otherwise have been excluded from consideration, because for example the farm type was not included in the list of farming systems identified as most likely to employ management practices supporting HNV farmland.

5.2. Approaches to assessment: 2. Condition

Whilst all the methods provide an estimate of the extent of HNV farmland, very few even attempt to assess condition or quality. The only instance recorded which currently includes a graded assessment of condition, using an ordinal scale, is the method based on extensive field sampling. Various other authorities indicated that further work is continuing on the assessment of condition, for the most part proposing sampling on a limited basis. Some databases, such as the Belgian Biological Assessment Map, do exist, but they are not updated regularly, and are resource-intensive to maintain. Sampling techniques allow extrapolation to regional or national level, but are not suitable for the identification of particular situations at farm or parcel level.

5.3. Identification of the three types of HNV farmland

Table 1 shows the effectiveness with which each of the methods is considered to identify the three types of HNV farmland. Whilst it may appear strange that apparently similar methods should generate different results, it must be remembered that programme authorities are likely to devote more attention to those types which are most important within their area, and that this may affect not only the assessment method chosen, but also the relative weight given to different types of analysis, resulting in a different emphasis and outcomes.

Type 1 HNV is clearly the most commonly identified type, with 18 of the 24 methods considered as well-adapted to identifying it and a further 4 assessing it to some degree. Identification of this type is highly correlated with the use of land cover approaches, which are generally considered a reasonable means of assessing Type 1 HNV, although they do not take account of quality. Overall Type 1 appears to be the most prevalent type of HNV farmland, although there are some questions as to whether all land identified would in reality qualify for Type 1 HNV status. Using land cover approaches it can be hard to distinguish between certain categories of land, for example extensive semi-natural grassland and abandoned land with

encroaching scrub, or the intensity of use of permanent pasture. One noteworthy variant of Type 1 HNV is grazed low density woodland which occurs widely across southern Europe. Several cases from these regions have adapted definitions and/or methods in order to take this category of land into account.

Type 2 HNV is the hardest to identify. Only four of the 24 cases were considered to identify Type 2 effectively, although a further 9 provide some assessment of the extent of this type of HNV farmland. The four cases use very different methods: one is based on physical site sampling, one very small and homogenous region uses the IRENA approach to calculate the density of field boundaries, one case uses farming systems data, and the fourth uses a complex combination of methods. This variety of approaches serves to underline the difficulties encountered in assessing this type of HNV farmland. Apart from site sampling, the other cases are highly context specific and would be hard to transfer to other regions, since they are either linked to the specific physical environment or reliant on particularly comprehensive data sets.

More than half the approaches are considered to be effective in identifying Type 3 HNV farmland. Since statutory designations focus on habitats of particular importance for specific species or groups of species, a correlation between use of designations and identification of Type 3 HNV has been assumed. Use of statutory designations is not however the only method which identifies this category: sample plots, expert panels and national species databases have also been used in some cases.

6. ISSUES AND CHALLENGES RELATED TO THE IDENTIFICATION OF HNV FARMLAND

- Although the link between farm system, management practices and HNV farmland is well-established, currently little use is made of farming systems data. This could be linked to the availability of appropriate data, but there are also other reasons. In some cases where this has been tried, the results have not correlated well with other methods. It is also recognised that the use of farm typologies as a filter to identify HNV-relevant management systems will exclude some farms which may have significant areas of HNV farmland, such as extensively managed grass-based dairy farms, or fruit growers with traditional orchards. Further investigation of how to combine systems data with other methods is needed.
- Landscape features such as hedgerows, ponds, small groups of bushes or trees within fields etc are not always counted as agricultural land. Depending on their size, they may be specifically excluded from agricultural parcels within LPIS. This complicates identification of Type 2 HNV in particular. The situation may improve following the development of the GAEC standard on landscape features in 2010 to include hedges, ponds, ditches, field margins, isolated trees and groups and lines of trees (Council Regulation (EC) No 73/2009). These features must now be recorded and retained. A similar issue exists in relation to grazed extensive woodland, which is frequently not considered as agricultural.

- Land cover methods do not always distinguish well between abandoned land with encroaching scrub, and extensive semi-natural grassland with patches of bushes or scattered trees. In the latter case, these features are an integral part of the habitat and an important contributor to HNV status. Improving definitions and guidelines to make a clearer distinction between the two would reduce this confusion. It would also assist policy implementation, by reducing the risk of farmers with HNV land being penalised because of the presence of such features, which are sometimes considered to render parcels ineligible for support payments.
- The inability to assess quality/condition is a widespread weakness of the methods currently used. Without information on condition, limited conclusions can be drawn about biodiversity status, and in particular trends over time, which are important for the assessment of the impact of RDP activities. Site sampling appears to be the only method which could currently provide an indication of condition, but this is unlikely to be adopted widely.
- Sampling can provide detailed data to identify all HNV types, and provide condition/quality assessments. However, whilst it can give a good indication of the situation at population level, it is not so reliable at lower levels. Full coverage necessarily involves fewer variables than sampling, and is better for extent than quality. It is often more reliant on proxy or derived indicators. More work is needed to establish ways of combining the two approaches.
- The territorial/spatial level at which the methods are applied ranges from entities such as parcel, farm, or commune, to grid squares. Whilst all of these can provide a general indication of extent of HNV farmland, and long-term trends, they have varying implications.
- In order to identify distinctly land classified as HNV which is agricultural, improved links to IACS/LPIS are likely to be needed. In some places these links have already been established, but only a minority of regions currently use IACS/LPIS in the calculation of HNV farmland. If HNV was ever to be used as a criterion for targeting policy measures or funding, as advocated by some environmental NGOs, such links would be essential.
- Derived or proxy indicators are likely to be less accurate in identifying HNV farmland than parameters directly related to biodiversity status. However, they are widely available, and often more consistent, easier to use and more frequently updated. Further verification work to establish the plausibility of derived or proxy indicators, using for example triangulation techniques would increase their reliability and acceptance.
- Existing data sets and sources relating to environmental parameters vary greatly in content, coverage, detail, quality and frequency of updating, They are determined by many factors such as historical practice, past policy priorities, the physical characteristics of regions/countries and availability of resources. The result is incomparable, inconsistent data availability across the EU. It is important to avoid a "Lowest Common Denominator" approach which only uses ubiquitous data sources. The highest quality and

most appropriate data available in any region should be used, even if it is unique to that region.

- If a variety of different methods and data sources are to be used, mutual trust in the validity of alternative methods must be developed. This relies on transparency, and increased understanding. Methods must be shown to be acceptable in order to be accepted.
- In these days of cash-strapped public administrations, all expenditure, including that related to implementation and monitoring, must be carefully justified. Comprehensive approaches to environmental monitoring are not cheap. The resources devoted to assessing parameters such as HNV farmland must be seen to be proportionate and affordable. Resource constraints will have implications for most of the points listed above, and are likely to limit the widespread adoption of costly techniques such as site sampling.
- The purpose of identification of HNV farmland must be clear: different methods will be appropriate to meet different objectives. Methods which provide a robust assessment of the overall state of HNV farmland, and its evolution over time, may be unsuited for targeting policy measures or funding to support its maintenance. Monitoring indicators can operate on a broader more general scale, based for example on samples raised to population level, or regional level data, whereas targeting implies the identification of specific individual entities with particular characteristics, normally requiring precise information on individuals within the population. If directing public funds to support HNV farmland becomes a political commitment, then it will be necessary to identify eligible farms or parcels, and so different assessment methods may be needed.

7. CONCLUSION

This paper has outlined the wide variety of approaches and inventive combinations which are currently being used across the EU to assess the extent of HNV farmland. However, whatever the approach taken, the majority of programme authorities have one thing in common, that they are not fully satisfied with what they have done so far, and they have been continuing to work on improving their methods. Whilst good progress has been made in assessing the extent of HNV farmland, the assessment of its condition or quality still presents a considerable challenge. It must be said however, that the situation is much better today than it was even as little as five years ago. It is expected that the analysis of the MTE reports will provide new information both in terms of updating current assessments of HNV farmland and in the development of more effective methods.

Due to the variation in data availability across the Member States and regions of the EU and the range of physical situations (territory size, farm structure and systems, predominant land and habitat types), it does not appear feasible to propose one single method for the assessment of the extent of HNV farmland. It appears more realistic to work on refining the various existing methods, improving and demonstrating their reliability, and increasing their acceptability. The

goal would be to establish the "area of HNV farmland" as a common parameter, to be assessed within each individual programme area using methods suited to the prevailing bio-physical characteristics, and based on the highest quality and most appropriate data available, generating widely-accepted results which can give an overall picture at EU level.

The requirements for targeting measures or funds to support HNV farmland have significant implications for the methods used to assess and identify them. For use in policy targeting, there would need to be common acceptance of the validity of alternative methods, and methods would need to allow identification of individual target beneficiaries. Meeting these two objectives would demand robust, reliable, validated data available at the appropriate level.

What is needed in relation to assessing HNV farmland in the future depends on how the information will be used. Paradoxically, how it can be used also depends on what can be provided. This would also be the case for many other environmental parameters. There is thus a challenge to the evaluation community…….

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