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**COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL AND THE EUROPEAN PARLIAMENT**

**Development of agri-environmental indicators for monitoring the integration of
environmental concerns into the common agricultural policy**

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1. INTRODUCTION

This Communication represents an initiative by the Commission to report on the work undertaken with regard to the development of indicators for monitoring the integration of environmental concerns into the common agricultural policy (CAP).

It describes the political context for the development of agri-environmental indicators, analyses the need to develop such indicators in relation to the ongoing process of reforming the CAP, reviews the progress made with their development, and identifies key challenges and actions for future work. On the basis of these elements, the Commission considers that in order to meet the growing policy needs the information system for monitoring the integration of environmental concerns into the CAP has to be further developed, strengthened and consolidated, in particular by establishing a permanent and stable arrangement for its management.

The Communication is accompanied by a Commission staff working document, which describes in greater detail the work done on developing and compiling the agri-environmental indicators, sets out the main findings and elaborates on the proposals outlined in this Communication.

2. THE POLICY CONTEXT FOR THE DEVELOPMENT OF AGRI-ENVIRONMENTAL INDICATORS

The Cardiff European Council (June 1998) endorsed the principle that the environmental dimension should be integrated in all Community policies. It also stressed the importance of developing appropriate environmental indicators to assess the impact of different economic sectors – including agriculture – on the environment, and to monitor progress in integrating environmental concerns.

The Helsinki European Council (December 1999) adopted the strategy for integrating the environmental dimension into the CAP. The strategy sets environmental integration objectives for water, land use and soil, climate change and air quality, as well as landscape and biodiversity, affirming that the preservation of natural resources is an essential element for the long-term sustainability of agriculture. In its conclusions, the Council requested a regular reporting on progress in integration, based on agri-environmental indicators.

The Göteborg European Council (June 2001) endorsed the EU Sustainable Development Strategy¹, which requires that the economic, social and environmental effects of all policies be taken into account in decision-making. It also adopted the conclusions of the Agriculture Council (April 2001) on environmental integration and sustainable development in the CAP, inviting the Commission to regularly monitor and evaluate the Council's integration strategy, and calling upon the Commission to continue its efforts to further improve the set of agri-environmental indicators and to define the statistical needs for these indicators.

In response to the Council's requests, the Commission issued two Communications. The first Communication "Indicators for the Integration of Environmental Concerns into the

¹ COM(2001) 264, "A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development".

Common Agricultural Policy”² identified a set of 35 agri-environmental indicators and presented an analytical framework for their development.

The second Communication “Statistical Information Needed for Indicators to Monitor the Integration of Environmental Concerns into the CAP”³ elaborated further on the indicator concept and identified potential data sources and information needed to make the indicators operational.

These two Commission Communications provided the conceptual input for the launching of the IRENA operation (Indicator Reporting on the Integration of Environmental Concerns into Agriculture Policy) in September 2002. This operation, which was aimed at developing a set of agri-environmental indicators, was finalised at the end of 2005.

The Renewed EU Sustainable Development Strategy, adopted by the European Council in June 2006, reaffirmed that sustainable development has to be integrated into policy-making at all levels, by promoting coherence between all EU policies and ensuring that major policy decisions are taken in full knowledge of their economic, social and environmental impact.

3. INTEGRATING ENVIRONMENTAL CONCERNS INTO THE CAP

3.1. Progress in integrating the environment into the CAP

By managing a large part of the European Union’s territory⁴, agriculture plays an important role in the conservation of the EU’s environmental resources. Over centuries, farming has contributed to the creation and maintenance of a wide variety of semi-natural habitats and agricultural landscapes, which host a rich variety of wildlife and support a diverse rural community.

During the past few decades, European farming has changed considerably and it will continue to change in the future. Technological developments (e.g. improved agrochemicals and seeds, better livestock breeds) have allowed farms to increase yields, thereby making farming more competitive. However, changes in land use and farming practices, linked to specialisation and intensification, have also been associated with negative impacts on water, soil, air, biodiversity and habitats. At the same time, the abandonment of farming in marginal areas, driven by social and economic factors, is posing a serious threat to the farmed environment and to rural landscapes.

The latest reforms of the CAP have responded to the double challenge of reducing agricultural pressures on the environment and favouring the delivery of environmental services by farming.

Since 1992, the CAP has increasingly been adapted to better serving the aims of sustainability by means of a fundamental reform process designed to move away from a policy of price and production support to a policy of direct income aid and rural development measures. The next step in that reform process was Agenda 2000, which laid down that the CAP should not only improve the competitiveness of EU agriculture, guarantee food safety and quality and stabilise farm incomes, but also provide

² COM(2000) 20 of 26 January 2000.

³ COM(2001) 144 of 20 March 2001.

⁴ Over 40% of the land in the EU-25 is occupied by agriculture.

environmental benefits, enhance the rural landscape and support the competitiveness of rural areas across the European Union.

The 2003 CAP reform⁵ took forward the integration of environmental concerns into the CAP. It reinforced a number of measures that encourage land use and practices compatible with the protection of environmental resources, both in the first pillar (market and income policy) and in the second pillar (rural development policy).

In the first pillar, the main measures are decoupling, mandatory cross-compliance and modulation. The decoupling of most direct payments from production reduces many of the incentives for intensive production that have increased environmental risks. With cross-compliance, the full granting of direct payments is conditional on observance of a number of statutory management requirements on the whole farm, including environmental standards. The beneficiaries of direct payments are also obliged to maintain all agricultural land in good agricultural and environmental condition. Modulation makes it possible to transfer support from the first to the second pillar, which can increase the budget available for agri-environmental measures.

The 2004 reform of the market regimes for tobacco, olive oil, cotton and hops, along with the sugar reform of 2005, confirmed the change of direction taken by the CAP in 2003.

In the second pillar, a number of measures exist to promote the protection of the farmed environment. The new Rural Development Regulation for the period 2007–2013⁶ links environmental measures to the objectives of the Sixth Community Environment Action Programme⁷. The Community strategic guidelines⁸ identify three priority areas for measures to improve the environment and the countryside: biodiversity and the preservation and development of high nature value farming and forestry systems and traditional agricultural landscapes, water, and climate change. The main new measures are more explicit support to farmers in Natura 2000 and other high nature value areas. Support for areas with handicaps and for agri-environment measures is maintained. In the future, cross compliance will also apply to most of the environmental measures.

These developments of the CAP call for better monitoring of the evolution of agricultural production systems and land use patterns at regional level and of its effects on the environment. While other indicator exercises from the EU (e.g. Structural, sustainable development, rural development indicators) and other international organisations (e.g. OECD, Convention on Biological Diversity) include some agri-environmental indicators, a set of indicators targeted to measure the progress of environmental integration into the CAP is necessary to assess the impact of policy decisions, identify shortcomings in current measures and needs for new policy initiatives and, where appropriate, to improve the targeting and tailoring of the measures to local conditions.

⁵ Council Regulation (EC) No 1782/2003 of 29 September 2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers (OJ L 270, 21.10.2003, p. 1).

⁶ Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (OJ L 277, 21.10.2005, p. 1).

⁷ Decision 1600/2002/EC of the European Parliament and of the Council laying down the Sixth Community Environmental Action Programme (OJ L 242, 10.9.2002, p. 1).

⁸ Council Decision 2006/144/EC of 20 February 2006 (OJ L 55, 25.2.2006, p. 20).

3.2. The need for agri-environmental indicators in support of the policy process

The integration of environmental concerns into the CAP is a dynamic process that requires regular monitoring. Agri-environmental indicators are key tools in this monitoring exercise. They can serve a variety of policy purposes:

- to provide information on the current state and ongoing changes in the condition of the farmed environment;
- to track the impact of agriculture on the environment;
- to assess the impact of agricultural and environmental policies on the environmental management of farms;
- to inform agricultural and environmental policy decisions;
- to illustrate agri-environmental relationships to the broader public.

A coherent system of agri-environmental indicators must be able to capture the main positive and negative effects of agriculture on the environment and to reflect regional differences in economic structures and natural conditions. In this way it will provide valuable information for assessing agriculture policy in terms of its contribution to the preservation of environmental resources on which the future of agriculture and society at large depend.

4. PROGRESS WITH THE DEVELOPMENT OF AGRI-ENVIRONMENTAL INDICATORS

4.1. The IRENA operation

The purpose of the IRENA operation was to develop and compile, for the EU-15, the set of 35 agri-environmental indicators identified in the Commission Communications COM(2000) 20 and COM(2001) 144, at the appropriate geographical levels and, as far as possible, on the basis of existing data sources.

The outputs delivered by the IRENA operation are the following:

- (1) 40 indicator fact sheets⁹ and their corresponding data sets, covering 42 indicators and sub-indicators;
- (2) an *Indicator Report*, which reviews agri-environmental interactions on the basis of the indicator results and describes the progress made in the development and compilation of the agri-environmental indicators;
- (3) an *Indicator-based Assessment Report* on the integration of environmental concerns into the CAP, which assesses the usefulness of the indicator system for policy evaluation; and
- (4) an *Evaluation Report*, which analyses the implementation of the IRENA operation, evaluates the indicators and data sources used, and identifies areas for future work.

⁹ Although the number of indicators identified in COM(2000) 20 is 35, some are divided into sub-indicators. Moreover, an indicator on atmospheric emissions of ammonia was added following a request by Member States.

4.2. Key results regarding indicator development

The IRENA operation has led to substantial progress in the development of agri-environmental indicators at EU-15 level, and particularly regarding concepts, identification of data sources and compilation of data sets. Annex 1 of the Commission staff working document provides the list of the 42 indicators and sub-indicators concerned, and describes their definitions, data sources, geographical reporting level, and the time series used.

The main results can be summarised as follows:

- out of the 42 (sub-)indicators, 11 have been evaluated as being useful, 30 as being potentially useful, and only one is considered as having low potential. However, within each group, there are indicators at different levels of development (see section 6);
- about one third of the indicators are based on data at regional level (NUTS¹⁰ 2 and 3). Nearly two thirds are national-level indicators. Several indicators of the state/impact domains were developed on the basis of modelled data or case studies;
- with regard to the temporal scale, about half of the indicators use time series. Eighteen indicators cover the period between 1990 and 2000.

Moreover, the IRENA operation has generated a substantial amount of knowledge and expertise on the technical feasibility of the indicators and their interpretation. A large amount of information has been gathered on the state of and trends in environmental conditions relating to agriculture, and on the measures available to deliver environmental integration.

Through the IRENA operation, close co-operation and communication on agri-environmental indicators have been established between the Commission, the European Environment Agency (EEA) and the Member States. Member States¹¹ provided useful feedback on the indicator fact sheets and the Indicator Report, in particular regarding indicator concepts, data quality and data presentation.

5. CHALLENGES FOR FUTURE WORK ON AGRI-ENVIRONMENTAL INDICATORS

During the IRENA operation, several limitations became apparent in a number of indicators:

- (1) deficiencies in the data sets related to certain indicators, in terms of harmonisation (e.g. farm management), data quality (e.g. genetic diversity), geographical coverage (e.g. water quality) and/or availability of data series (e.g. area under organic farming);
- (2) the models underpinning the computation of certain indicators need methodological improvement or further validation (e.g. soil erosion; soil quality);
- (3) some indicators still require further conceptual improvement (e.g. farm management; landscape state; high nature value farmland areas).

¹⁰ Nomenclature of Territorial Units for Statistics.

¹¹ The "Agriculture and Environment" group of Eurostat was the consultation forum with the Member States for the IRENA operation, in association with the EEA-EIONET agriculture group.

These limitations do not invalidate the usefulness of the indicators for agri-environmental analysis. Rather, they suggest that further work is needed on these indicators to improve the concepts and methodological approaches, improve data collection methods, develop new data sets where necessary, and improve/validate existing modelling tools.

Based on their level of development, the IRENA indicators can be grouped into three categories (see also the table in the Annex):

- A. operational indicators, for which concepts and measurement are well-defined, and for which data are available at national and, where appropriate, at regional level;
- B. indicators that are well-defined but have not reached their full information potential because of a lack of regional or harmonised data, or owing to weaknesses in the modelling approaches on which they are based;
- C. indicators that need substantial improvements in order to become fully operational. This category includes indicators that still need conceptual and methodological improvement, and indicators where the quality of existing data needs to be improved, new data need to be collected, or where the underlying models need further elaboration and validation.

In addition, the indicators need to be extended to also cover the new Member States.

6. THE WAY FORWARD: FUTURE WORK ON AGRI-ENVIRONMENTAL INDICATORS

On the basis of the elements mentioned above, three key challenges for future work on EU agri-environmental indicators can be identified:

- streamlining the IRENA indicator set, while strengthening its relevance for policy purposes;
- consolidating the selected set of indicators, extending the coverage to the new Member States and correcting existing weaknesses;
- setting up a permanent and stable arrangement needed for the long-term functioning of the indicator system.

6.1. Streamlining the IRENA indicator set and strengthening its policy relevance

In the light of the conceptual and technical limitations of certain indicators, a critical choice has to be made regarding the list of indicators that are to be maintained and further developed.

A key criterion for this choice is the relevance of the indicators as an information tool for policy-making. In this respect, it is necessary to consider that monitoring environmental integration entails several levels of analysis and assessment regarding, for instance, specific sectoral measures, horizontal policy instruments, rural development programmes, etc., within an overall integration strategy. To perform the analyses at these different levels, it is important to have a coherent set of agri-environmental indicators that captures the regional diversity of agricultural production systems (e.g. specialisations, production patterns, farming methods), as well as the positive and negative influences that they exert on the different environmental resources. Moreover, the whole set of indicators should

remain adaptable to future policy needs, for example, in response to evolving water policies, new CAP measures, or trends in the wider socio-economic context.

Certain agri-environmental indicators are currently being considered for inclusion in the Common Monitoring and Evaluation Framework for the rural development programmes for the period 2007–2013. These common indicators cover priority environmental issues, i.e. biodiversity and high nature value areas, water, and climate change¹².

A further criterion for the selection of the indicators that should be maintained is the technical feasibility of their development. The IRENA operation has shown that certain indicators are too complex or their development would require a disproportionate investment of resources.

Finally, in the future, some IRENA indicators are proposed to be treated as sub-indicators of other indicators with which they are closely associated.

With a view to covering the different levels of monitoring environmental integration, and based on the work carried out until now, the Commission proposes:

- to maintain a core set of 28 indicators, which includes 26 IRENA indicators and two new indicators covering new agri-environmental issues (see table annexed).

6.2. Consolidating the selected set of indicators, extending the coverage to the new Member States and correcting existing weaknesses

The IRENA operation has broadly achieved its objective of using the available and easily accessible agri-environmental information and data at EU-15 level. It is now important to maintain the streamlined set of indicators, update the corresponding databases and extend their coverage to the new Member States.

However, it is also important to overcome the limitations that currently restrict the information potential of certain indicators. To this end, efforts need to be made during a transition period for the conceptual and methodological improvement of these indicators and for the collection of the necessary data or better access to existing data, in particular at regional level. In this respect, the full involvement and commitment of the Member States, which are ultimately responsible for data collection, is necessary.

The Commission suggests that the following actions be undertaken:

- to further develop existing legislation related to agricultural data, both statistical and administrative, with a view to covering the data needs for agri-environmental indicators more effectively;
- to set up and develop new EU surveys, where appropriate, particularly regarding farm management practices and the use of farm inputs;
- to examine, in the context of the ongoing process of updating the Farm Accountancy Data Network (FADN), the scope for improving and extending the use of the FADN in order to respond to the increasing demand for agri-environmental reporting and analyses;

¹² These indicators are: population of farmland bird species, high nature value areas, gross nutrient balance, and production of renewable energy.

- where necessary, to improve and validate the modelling frameworks;
- to continue looking for better indicators for agricultural biodiversity, habitats and landscapes;
- to explore possibilities for gathering better data:
 - from environmental monitoring systems, in particular under the Nitrates Directive, the Water Framework Directive and the Birds and Habitats Directives;
 - through spatialisation methods (e.g. redistribution of agricultural data reported at administrative level to other geographical units) and other techniques related to spatial data (e.g. area-frame surveys, geo-referencing methods);
 - from non-public data providers (e.g. pan-European common bird monitoring database); this may require the consolidation and harmonisation of existing data sets to increase their transparency and quality;
 - through other European initiatives, such as Global Monitoring for Environment and Security (GMES) and the Infrastructure for Spatial Information in Europe (INSPIRE);
 - through the Global Earth Observation System of Systems (GEOSS);
- to strengthen co-ordination with other indicator activities¹³.

6.3. **Setting up a permanent and stable arrangement needed for the long-term functioning of the indicator system**

Defining the relevant indicators, calculation methods and data sources is only a part of the work required to build the information system for monitoring environmental integration.

To arrive at a fully operational system that can serve the various policy purposes, the work carried out during the IRENA operation on a temporary basis needs to be transformed into a stable process of systematic collection of the data needed for developing, compiling, maintaining and updating the indicators. This requires a permanent and stable arrangement under the lead of Eurostat, on the basis of close co-operation with the Statistical Offices of the Member States and the Ministries of Agriculture and Environment, and in collaboration with other European bodies (such as the EEA).

The establishment of such a permanent and stable arrangement should be a priority task for future indicator development at EU level. This task includes identifying and allocating among the partner institutions clear responsibilities for the management of the new information system on a permanent basis, without creating new bureaucratic structures.

The Commission proposes:

- to establish a permanent and stable arrangement needed for the long-term functioning of the indicator system. This is a long-term project that requires the support and the full participation and commitment of the Member States, in particular as regards the collection and delivery of the necessary data.

¹³ See last paragraph of chapter 3.1.

ANNEX

Proposal for a consolidated agri-environmental indicator set

| DPSIR | | No | Indicator | Level of development | Main limitations/improvement needed ¹ (X) | | | | |
|-----------------------|-------------------------------------|----|--|----------------------|--|-------------------|-------------------------------|---------------------------|---|
| Domain | Sub-domain | | | | Conceptual improvement | Model improvement | Availability of regional data | Data quality ² | |
| | | | | | | | | S | O |
| Responses | <i>Public policy</i> | 1 | Agri-environmental commitments | B | | | | | X |
| | | 2 | Agricultural areas under Natura 2000 | A | | | | | X |
| | <i>Technology and skills</i> | 3 | Farmers' training levels and use of environmental farm advisory services | A/B | X | | | | X |
| | <i>Market signals and attitudes</i> | 4 | Area under organic farming | A | | | | | |
| Driving forces | <i>Input use</i> | 5 | Mineral fertiliser consumption | B | | | X | X | |
| | | 6 | Consumption of pesticides | C | | | X | X | |
| | | 7 | Irrigation | A | | | | | |
| | | 8 | Energy use | B | X | | X | X | |
| | <i>Land use</i> | 9 | Land use change | B | | | X | | |
| | | 10 | Cropping/Livestock patterns | B | X | | | X | |
| | <i>Farm management</i> | 11 | Farm management practices | B/C | X | | X | X | |
| | <i>Trends</i> | 12 | Intensification/extensification | A | | | | X | |
| | | 13 | Specialisation | A | | | | | |
| | | 14 | Risk of land abandonment | C | X | X | | | |

Proposal for a consolidated agri-environmental indicator set (continued)

| DPSIR | | No | Indicator | Level of development | Main limitations/improvement needed ¹ (X) | | | | |
|------------------------|----------------------------------|--------------------------------|-------------------------------------|----------------------|--|-------------------|-------------------------------|---------------------------|---|
| Domain | Sub-domain | | | | Conceptual improvement | Model improvement | Availability of regional data | Data quality ² | |
| | | | | | | | | S | O |
| Pressures and benefits | <i>Pollution</i> | 15 | Gross nitrogen balance | B | | | X | | X |
| | | 16 | Risk of pollution by phosphorus | New | X | X | X | X | X |
| | | 17 | Pesticide risk | New | X | X | X | X | |
| | | 18 | Ammonia emissions | B | | X | X | X | X |
| | | 19 | Greenhouse gas emissions | A | | | | | X |
| | <i>Resource depletion</i> | 20 | Water abstraction | C | | | X | | X |
| | | 21 | Soil erosion | B | X | X | | | |
| | | 22 | Genetic diversity | C | X | | X | | X |
| | <i>Benefits</i> | 23 | High nature value farmland | C | X | | | | |
| 24 | | Production of renewable energy | B | X | | X | X | X | |
| State/Impact | <i>Biodiversity and habitats</i> | 25 | Population trends of farmland birds | B | | | X | | X |
| | <i>Natural resources</i> | 26 | Soil quality | C | X | | X | | X |
| | | 27.1 | Water quality – Nitrate pollution | B | | | X | | X |
| | | 27.2 | Water quality – Pesticide pollution | B | | | X | | X |
| | <i>Landscape</i> | 28 | Landscape – state and diversity | C | X | X | X | X | X |

¹ More details on indicator description and measurements, and the improvements needed, are provided in Annex 2 of the Commission staff working document.

² Data sources that need improvement: S = statistical data sources (e.g. Farm Structure Survey), Farm Accountancy Data Network; O = other sources (e.g. administrative data; annual progress reports on the implementation of Rural Development Programmes).