

Methodology fact sheets
for 6 indicators proposed
in Commission Communication
COM(2001) 144 final

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11 - Energy use

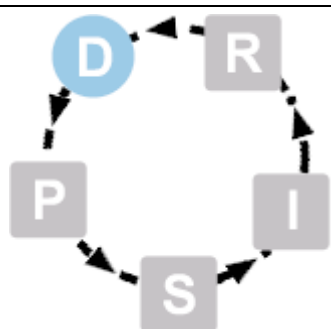
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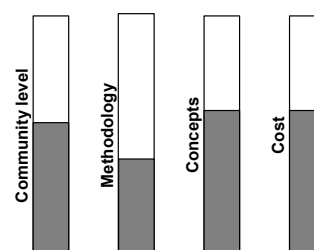
- Annual use of energy by fuel type
- Annual use of energy/ha of crop or LSU (production would be better than area, but is not feasible)

Source:

- Eurostat (Sirene)
- FADN
- OECD
- Member States



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

In order to reduce emissions of CO₂, which contribute to the greenhouse effect, agriculture in common with all sectors of the economy must use energy rationally and improve energy efficiency. It must also be encouraged to develop the use of renewable energy sources.

In terms of total agriculture energy consumption, electricity purchased can also be a significant factor (climatic regulation in certain livestock systems, storage of fruit and vegetables).

It would be useful to think about developing this kind of indicator by production (e.g. TOE/ha of wheat and TOE/breeding sow).

Limits:

The FADN collects information on total expenditure on fuel but provides no data on the amounts purchased or on fuel type. Some questions should be added to the survey in order to obtain more relevant results. Furthermore, the FADN represents only a sample consisting of 60.000 European farms.

A limitation regarding development of the indicator "Annual consumption of energy used to produce inputs" is that no data is available at European level. However, some MS results are available and it is possible from these results and on the basis of fertiliser consumption to extrapolate and develop the indicator at national level.

Tool:

The Eurostat database "Sirene" gives information on the development and status of energy supply and demand in the EU Member States. The domain contains structural data on energy industry, prices on the main energy sources by type of consumer (industrial or domestic), external trade of energy commodities and internal energy flows. The internal flows cover production, transformation and consumption of energy products: fossil fuels (coal, oil and gas), nuclear energy, electricity and renewable energy sources.

FADN collects information on total expenditure on fuel.

Output from OECD joint working party on agriculture and environment December 2002 (document "Developing Agricultural Energy Indicators – A Proposal [COM/AGR/CA/ENV/EPOC (2002)104]") serves as the basis for indicator development on consumption of energy used to produce inputs. The OECD work could also lead to indicator development on the agricultural energy used from renewables.

Proposal:

There is a lot of information on energy but the figures concerning agriculture need to be extracted. Some Member States have the necessary information. It needs to be cross-referenced and there needs to be a study of the methodologies used, so that they can be more widely known.

Some thought must also be given to adding questions to the FADN.

Set up a relationship between indicators 11, 19 and 27. Indicator 11 should show the energetic efficiency, indicator 19 should show the contribution of agriculture to greenhouse effect and finally indicator 27 should show the ecological services provided by agriculture in term of renewable energy production.

References:

At Community level:

"Non-food and energy crops: a long tradition and future potential" - Alain Joaris - in "Agriculture, environment and rural development: facts and figures - The challenges of agriculture" – 1999 – p. 97 to 108: http://europa.eu.int/comm/agriculture/envir/report/en/n-food_en/report.htm

FADN: Three Member States (B, DK, NL) have at least some information in their national farm returns, and Sweden is about to start collecting data for a sub-sample in 2002. However, in Belgium the regionalisation of data collection is seen as a factor that prevents the possibility to include these data into the EU farm return.

Five Member States (F, I, L, S, UK) indicate that the data is available on the farm level, although only Italy and Finland do not set any conditions to include these data into the EU farm return.

In the Member States:

United Kingdom: "23 - Direct energy consumption by farms" in "Towards Sustainable Agriculture - A Pilot Set of Indicators" - MAFF - p 42 and 65: <http://www.defra.gov.uk/farm/sustain.htm> from ADAS reports prepared for MAFF "Indicators for Sustainable Agriculture; Energy Indicators within UK Agriculture.

Denmark: Data are available on the consumption divided on type of fuel (already published).

Sweden: Some figures about used amounts of fuels and electricity in agriculture sector are available. These figures and the methods of calculation however ought to be developed.

Statistics Sweden is carrying out a TAPAS 2003 project concerning this indicator. It consists of two parts:

Review of existing statistics and methods to receive information for environmental accounts.
Carrying out a sample survey on use of energy in agriculture.

Italy: Data are available. From 2003, data on energy expenditures will be collected by type of fuel. Quantities will be also available.

Austria: The estimation of the diesel use is done by combining FADN data with statistical data on diesel use by crop type by ha. The annual consumption is then evaluated quite precisely.

Portugal: For the country, the only relevant renewable energy source is biodiesel. The others are insignificant. It is possible to know the biofuel consumption by the way of administrative data.

Belgium: The Centre of Agricultural Economics has devoted several studies to the energy use in green houses.

In the applicant countries:

Estonia: An energetic balance is available and additional data could be obtained from the annual questioning of farmers.

13 - Cropping/livestock patterns

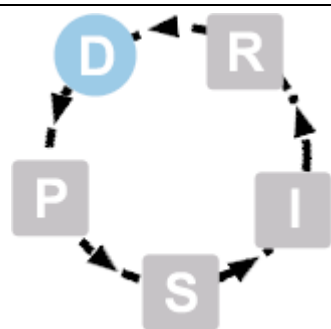
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Description:

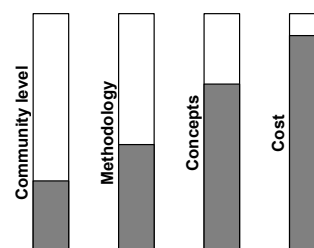
Share of each holding in each category of a Community typology to be developed

Source:

- FSS
- Member States or local authorities
- FADN (DG AGRI)



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

Management of livestock and parcels of agricultural land is a matter for the individual approach of each farmer (crop rotation, pasturing, etc). Changes in land use may have an impact on the environment (natural habitats, landscape, etc), even if the impact is often poorly understood. Classifying holdings according to a typology to be developed would make it easier to understand the problem.

Limits:

The typology to be developed will be useful if for each type defined it is possible to assess (even roughly) its impact on the environment.

Tools:

- Survey of structure and typology of agricultural holdings (with adjustments to be discussed),
- Bibliography of national or local studies designed to classify farmers' strategies and practices,
- Preparation of a new Community typology,
- Supplementary data sources to classify holdings still to be defined

The EEA is currently working on defining a High Nature Value farming area indicator. Proceedings of an expert meeting are available and consultation on a related call for tender will be carried out shortly. We are convinced that such an indicator has to go beyond the present protected area information to be useful in policy assessment. Otherwise it would only duplicate indicator No 4 and would not correspond to the interpretation of the concept in other Commission documents.

This indicator will also build on cropping/livestock patterns, this is relevant here. We agree with the ESTAT proposal that the development of relevant EU holding typology is a promising way forward in this context. Existing studies such as in the ELPEN project or the dairy systems analysis for DG ENV could help in this regard (EEA).

Proposal:

It is necessary to give methodological consideration to the crop and livestock systems to be covered.

It will then be necessary to compile a typology (possibly limited in scope) of the holdings involved in

order to be able to calculate the proposed indicator.

Spain wants that the newly defined typologies reflect in detail the farming practices and the production systems typical of Mediterranean agriculture.

Austria would like that this indicator be put together with indicator 15. Typology could be based on the following criteria calculated at the regional level: ratio grass-land/arable land, winter crops/spring crops, cereals/maize, bare set-aside/green set-aside, crop forage/maize silage...

Portugal considers that basic information could be obtained by the FSS or/and the census.

Germany wants to put together this indicator and indicator 15. It asks about the necessity of these indicators: a classification already exists at the Community level (FSS) and the indicators are weakly linked with environment.

France would like to bring this theme closer to the theme of indicator 16. A new typology could be built taking into account the farm type of holdings but also the impact on the environment. Of course, this new typology will not modify or replace the existing typology.

References:

At Community level:

ELPEN (European Livestock Policy Evaluation Network) project

The Environmental Impact of dairy production in the EU: Practical Options for the Improvement of the Environmental Impact: <http://europa.eu.int/comm/environnement/agriculture/studies.htm>

In the Member States:

Denmark: Basic data are available but the indicator needs to be developed.

Italy: Production techniques will be surveyed from 2003. Nevertheless, it will be presumably adopted for a restricted number of farms.⁴

In the applicant countries:

Estonia: Agricultural census could be a data source. The development of this indicator in Estonia depends on the methodological development of the concept at the European level.

15 - Intensification/extensification

a/c

Description:

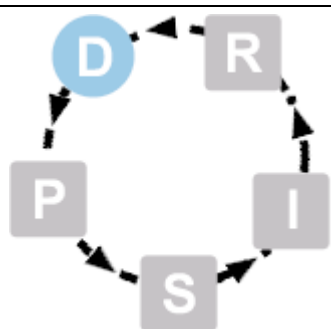
Trends: Intensification/extensification, specialisation will monitor trends in the intensification /extensification and specialisation of farm holdings.

There is no over-riding main indicator to monitor the trends in agricultural intensification/extensification and specialisation. Therefore a list of indicators is proposed:

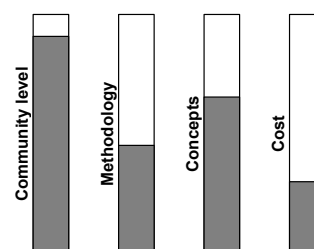
- Trends in agricultural land devoted to fodder production
- Trends in crop yields for selected crops
- Trends in production of cereals, meat, etc per labour unit.
- Trends in livestock units per ha of agricultural holding
- Trends in crop rotations

Source:

- FSS
- FADN
- IACS



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

Intensification is the increase in the level of production by unit of area. It is obtained thanks to an increase in the level of inputs according to certain limiting factors (space, labour force, capital). It is generally conveyed by a decrease in the effectiveness of added inputs. The inputs which are wasted have an environmental cost, whether they are fertilisers, feedingstuffs, energy or water. The link between intensification / extensification to environmental threat is not straightforward therefore indicators have to be selected that provide a clear message.

Limits:

There is tremendous variety in the different cases, depending on the type of inputs, the limiting factors and the economic and social interest of increased production. There is a need therefore to develop a Community typology of Agricultural Holdings that goes beyond the EUROSTAT typology based on specialisation and economic size, but which also considers land use and input levels. It is also necessary that the newly defined typologies reflect in detail the farming practices and the production systems typical from the Mediterranean agriculture.

The spatial units used must be relevant with regard to environmental threat but also to constraints.

Intensification and extensification are often difficult to link to environmental threat - intensification can also mean better environmental performance, and the use of better and more modern technology with less emissions, more efficient irrigation, fertiliser application and crop protection techniques etc.. – extensification can also reflect farmland abandonment, infestation by weeds and the loss of biodiversity.

Tools:

- Data from the farm structure survey (labour force, area, and livestock numbers) and the FADN and production data are available. They must be used in conjunction according to administrative divisions in order to construct the various indicators to be selected.
- Improved Community typology of Agricultural Holdings, that considers land use and input levels, as well as specialisation and economic size, can be used to identify areas of intensification and specialisation.
- The use of a GIS would make it possible to calculate indicators for more appropriate spatial units
- IACS data could provide information on crop rotations, as crop data is provided at the parcel level and reported annually

Proposal:

A pilot study needs to be conducted in order to select the most relevant indicators. Once they have been selected and validated by the Member States, these indicators should then be capable of being compiled at Community level.

References:

At Community level:

"Twenty years of agriculture in Europe - Ever larger holdings but different economic situations" - C. Vidal and P. Marquer - *Statistics in focus*, theme 5 "Agriculture and fisheries" - 9/2000 – 8 pages

<http://europa.eu.int/comm/eurostat/Public/datashop/print-catalogue/EN?catalogue=Eurostat&collection=02-Statistics%20in%20Focus&product=CA-NN-00-009--I-EN>

"Intensification" and "Yield of Crops" in "Proposal of Agri-Environmental Indicators - PAIS - Final report" - p 59 and 271

In the Member States:

Denmark: Data are available for the indicators 1 and 2. For the third indicator, only data on labour unit for 1999 are available.

Italy: Data are available

Portugal: Information can be collected or is available except for manpower by crop unit.

In the applicant countries:

Estonia: Data could be available but extra funding will be necessary to analyse data and their quality. Furthermore, new variables need to be included.

16 - Specialisation/diversification

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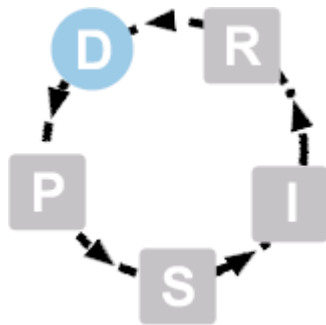
Description:

Some proposals in line with COM(2001) 144 can be made:

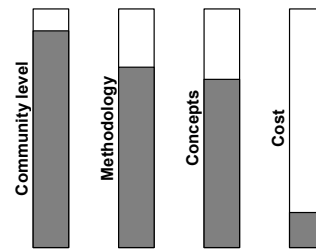
- 1) Importance of and changes in type of farming,
- 2) Proportion of farmer's income generated by non-agricultural activities on the farm, also links environmental issues, e.g. income from environmental activities such as agri-environmental schemes
- 3) FSS: proportion of farm household income generated off-farm.

Source:

- 1) FSS
- 2) Income of farm households (in the future)
- 3) FADN



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

Diversification of activities is a medium-term strategy to manage risk. It may be:

- Strictly agricultural (livestock with several types of animal, development of new crops, etc),
- Non-agricultural on the holding (rural tourism, processing of agricultural products, etc),
- Agricultural or non-agricultural, but conducted off-farm.

Specialisation allows better economic efficiency and better command of techniques by farmers. It increases medium-term economic risk, however.

A clear definition of “diversification” must be proposed in particular in term of non-agricultural activities in the farm (is direct selling is an agricultural activity or not?). How many cultures or breeds are necessary to speak of “diversification”? etc..

Limits:

The physical diversity of land use and the fragmentation of polluting activities are also linked to the spatial organisation of holdings.

Tools:

- 1) Changes in the number of holdings of each type of farming at a detailed spatial level (region or even district),
- 2) It is foreseen to collect this type of information by statistics on farm household incomes (proportion of non-agricultural incomes)
- 3) FADN.

Proposal:

Still not fully worked out

References:**At Community level:**

"Total Farm Household Income (DAFRD, Ireland)" in "Proposal of Agri-Environmental Indicators - PAIS - Final report" - p179-180

In the Member States:

Greece: A national survey on multi-activity in agriculture has been conducted (to verify)

United Kingdom: "6 - Total income from farming" in "Towards Sustainable Agriculture - A Pilot Set of Indicators" - MAFF - p 20 and 63: <http://www.defra.gov.uk/farm/sustain.htm>

Denmark: The 3 indicators are relevant and data are available.

Sweden: There are no data sources to differentiate between household incomes from agriculture and from other kinds of enterprise.

Italy: Data are available (agricultural households incomes)

Portugal: It will be possible to obtain this indicator but this will be difficult to quantify. FSS could provide general trends.

In the applicant countries:

Estonia: Data could be available but extra funding will be necessary to analyse data and their quality.

17 - Marginalisation

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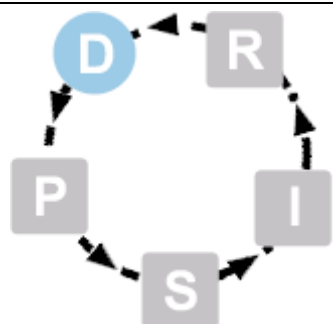
Description:

There is only one indicator in COM(2001) 144. A second is suggested here:

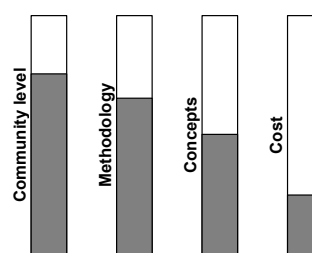
- 1) Proportion of holdings with farmers aged over 55, without a successor;
- 2) Proportion of holdings where the SGM per AWU is less than a minimum wage to be defined

Source:

- 1) Structural survey, FADN
- 2) Structural survey, Member States



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

Marginalisation is the increasing inability of a holding to provide an acceptable income. It may be the result of deterioration in the economic or physical environment. It increases the risk of cessation of activity on the holdings involved.

Marginalisation can affect holdings in an area or geared to the same production.

The location of such holdings is an important factor.

Care must be taken because the results could be misinterpreted. For example in Finland, often the value of production does not cover the variable costs but Finnish farmers are not necessarily marginalised.

Limits:

Marginalisation regards all holdings having certain characteristics. The disappearance of a holding because of the expansion of neighbouring holdings does not reflect the same phenomenon.

Tools:

- 1) Farm structure survey (labour force, SGM) and administrative data to fix the minimum wage threshold if it is in line with the minimum incomes applicable in the various Member States;
- 2) Farm structure survey for the age of farmers and national professional bodies for data on inheritance or addition of a question in the FSS for farmers aged over 55.

Study of spatial distribution of data in areas allowing comparison with socio-economic data (services, businesses, means of communication, etc).

Proposal:

A FSS spatial distribution test is in progress. If the results are consistent, the distribution should be validated by the Member States.

It should then be possible to calculate the two indicators at Community level.

References:

At Community level:

"Accessibility to Public Services (Countryside Agency, England)" p171-172
"Households in Receipt of Social Payments (Scottish Executive, Scotland)" p 175-76
"Total Farm Household Income (DAFRD, Ireland)" p 179-180

in "Proposal of Agri-Environmental Indicators - PAIS - Final report" -2001

In the Member States:

Denmark: The 2 indicators are judged not relevant. For the first one, only data about age of farmers are available. Data for the second indicator do not exist, but can be calculated.

Italy: From 2003, the composition of farm family will be surveyed.

Portugal: It is possible to quantify agricultural holdings with a SGM by LWU below to a defined level. It is also possible to quantify holdings with farmer older than 50 without successor. However, land abandonment is rare (integration with another holding) and the question of the holding continuity is a sensitive point.

In the applicant countries:

Estonia: Data are available for the second indicator. The first one needs more effort: checking of the data and their quality.

27 - Production of renewable energy (by source)

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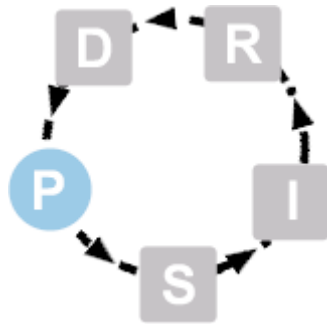
Description:

Two indicators resulting from COM(2001)144 are proposed:

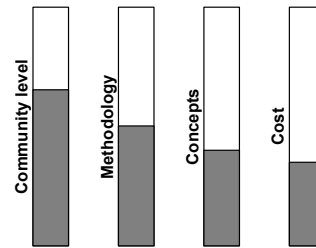
- 1) Area and volume of short rotation coppices
- 2) Area and production of oilseed crops intended for the production of biodiesel

Source:

- 1) Administrative data
- 2) FSS



POSITION (DPSIR model)



FEASIBILITY

METHOD

Concept:

Renewable energy sources such as biofuel or timber help to reduce the use of fossil fuels in the EU and to lessen energy dependence, but above all to cut net emissions of CO₂ (carbon sequestration).

The impact of these substitutions remains to be discussed.

A breakdown to show the amount of energy provided by renewable sources would be useful.

France remarks that it is necessary to differentiate the use of wood for energy and short rotation coppice. In France, fuel wood comes mainly from auto-consumption from traditionally managed woodlands or forests, or from sawmill waste.

Limits:

The energy balance in the case of CO₂ must be calculated for various hypothetical cases in order to obtain an indicator for the effectiveness of various solutions.

Pay attention with biodiesel because it has not really been proven that the energetic and ecological balances are positive.....

There are other sources of renewable energy available to holdings (biogas, burning of straw, wind and solar power, etc) but some of them are hard to quantify.

- 1) Short rotation coppices are only one component, albeit central, of the biomass produced on farms.
- 2) A complete energy balance for biofuel is an objective to be sought in the medium-term.

It is not possible at the moment to survey areas of industrial crops grown outside the scope of the CAP set-aside policy.

Tool:

- FSS
- Plant production statistics
- Industrial production data in volume terms
- Consolidated administrative data

Proposal:

Use must be made of the administrative data that are available on the subject at Community and national level.

Another possibility to study is the addition of questions in the FSS and/or plant production statistics on areas and production of short rotation coppices and oilseed crops intended for energy production.

For recording methane used by farms: see No 34 "greenhouse gas emissions".

References:**At Community level:**

"Non-food and energy crops" - Alain Joaris - in "Agriculture, environment, rural development: Facts and Figures – A challenge for Agriculture" – 1999 - p 97 to 108

http://europa.eu.int/comm/agriculture/envir/report/en/n-food_en/report.htm

DG AGRI document ? : contact M. L. HAENEL (G1).

In the Member States:

United Kingdom: "30 - Planting of non-food crops" in "Towards Sustainable Agriculture - A Pilot Set of Indicators" - MAFF - p 52 and 68: <http://www.defra.gov.uk/farm/sustain.htm>

Spain: data on areas could be collected by the contracts between farmers and industries producing biodiesel.

Denmark: It is relevant to develop an indicator on "production of renewable energy sources" but the two proposed indicators are not relevant for Denmark. Data are not available, but if the area and production of oilseed crops is big enough, it will be possible to develop data.

Italy: Data will be available from 2003 (Ministry of Agriculture). Biomass production for fuel use is a very limited phenomenon in Italy. Recovery of methane emitted from livestock manure should be investigated.

Portugal: indicator not relevant

Germany: From 2003, data will be available on the share of produced energy by biomass.

In the applicant countries:

Estonia: indicator not relevant