EUROPEAN EVALUATION HELPDESK FOR RURAL DEVELOPMENT

European Commission

REPORT

ASSESSMENT OF RESOURCE EFFICIENCY AND CLIMATE

GOOD PRACTICE WORKSHOP
ONLINE, 28-29 SEPTEMBER 2020

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The Evaluation Helpdesk is responsible for the evaluation function within the European Network for Rural Development (ENRD) by providing guidance on the evaluation of RDPs and policies falling under the remit and guidance of DG AGRI's Unit C.4 'Monitoring and Evaluation' of the European Commission (EC). In order to improve the evaluation of EU rural development policy the Evaluation Helpdesk supports all evaluation stakeholders, in particular DG AGRI, national authorities, RDP managing authorities and evaluators, through the development and dissemination of appropriate methodologies and tools; the collection and exchange of good practices; capacity building, and communicating with network members on evaluation related topics.

Additional information about the activities of European Evaluation Helpdesk for Rural Development is available on the Internet through the Europa server (http://enrd.ec.europa.eu).

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LIST OF ACRONYMS

CAP	Common Agricultural Policy
CEQ	Common Evaluation Question
CRI	Complementary Result Indicator
DG AGRI	Directorate General Agriculture and Rural Development
DiD	Difference in Difference
EC	European Commission
EEA	European Environment Agency
EMEP	European Monitoring and Evaluation Programme
ENRD	European Network for Rural Development
EU	European Union
Eurostat	Statistical Office of the European Commission
FA	Focus Area
FADN	Farm Accountancy Data Network
GHG	Greenhouse gas
IACS	Integrated Administration and Control System
JRC	Joint Research Institute
IPCC	Intergovernmental Panel on Climate Change
KWh	Kilowatt hours
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale (original acronym)
LIFE	L'Instrument Financier pour l'Environnement
LPIS	Land Parcel Identification System
LUCAS	Land Use and Coverage Area frame Survey
MA	Managing Authority
NECD	National Emission Ceilings Directive
OECD	Organisation for Economic Cooperation and Development
PA	Paying Agency
PSM	Propensity Score Matching
RE	Renewable Energy
RDP	Rural Development Programme
TOE	Tons of Oil Equivalent
UNDCC	United Nations Convention to Combat Desertification

EXECUTIVE SUMMARY

The 14th Good Practice Workshop (GPW) took place on 28-29 September 2020, with the overarching objective to reflect on experiences in relation to the assessment of resource efficiency and climate action, with a view to preparing the ex post evaluation of RDPs 2014-2020 and to identify lessons learned related to the future CAP indicators.

The workshop brought together 75 participants from 23 different EU Member States and focused specifically on how to facilitate and improve the assessment of resource efficiency and climate, notably efficiency in energy use, the supply and use of renewable energy sources and GHG and ammonia emissions with the use of the complementary result indicators (CRIs). The workshop offered valuable insights on how to resolve specific issues identified for the calculation of these indicators on how and what to improve when preparing the ex post evaluation and the future CAP evaluations.

Five case studies were presented. One from Sweden on assessing the efficiency in energy use for agriculture and food processing and one from Estonia focusing on renewable energy production. Three other presentations were focused more prominently on emissions, including a case from Slovakia on assessing reduced emissions of nitrous oxide, assessing reduced ammonia emissions from Belgium-Flanders and Austria who presented on both indicators. In addition, a climate expert commented the case studies while making recommendations and suggestions for future assessments. Furthermore, the research experience of the Joint Research Centre (JRC) broadened the perspective by presenting meta-analysis as a method for assessing the effects of agricultural practices on the environment. The workshop culminated in a number of key lessons for MAs and evaluation stakeholders:

Lessons learned related to the assessment of resource efficiency (energy)

- **Both primary and secondary contributions contribute to resource efficiency and should therefore be assessed.** The quantification of secondary contributions remains more challenging, as data availability for secondary contributions is generally worse than for primary contributions. Possible solutions include to validate the operations database for secondary contributions or to look at certified energy audits. In the case where the investment produces renewable fuels such as pellets, etc. (but not energy), then additional indicators can be used to help answer the CEQ (e.g. amount of renewable fuels produced). Such renewable fuels will produce renewable energy as a secondary effect. Additional indicators will support evaluators to address the CEQ when investments target renewable fuels, circular economy, etc. which are not addressed by R.15.
- **Common units of measurement are important for comparisons, but the data and time required for conversion should not be underestimated.** Energy data from applicants, as well as, different measures and types of energy may be provided in different units. This requires the conversion into TOE per thousand euros, which is best done using certified national conversion tables where they exist. When data on standard output and conversion coefficients are missing one can use industry standards or similar investments or consult IACS/LPIS.
- **Netting out is a challenge to be overcome with the use of alternative approaches.** Netting out can be challenging due to missing data for the control group. A national energy efficiency scheme may be used as a basis for netting out the results for energy efficiency. This may be possible if a similar exercise has been carried out in the context of this scheme and its results can potentially be adapted to the RDP situation. Similarly, netting out renewable energy results may be done through similar studies in the framework of 'national support schemes' or through a qualitative approach.

Lessons learned related to the assessment of climate (GHG and ammonia emissions)

- **There is a variety of data sources that can be used for the assessment of climate**, ranging from EU level ones like IACS/LPIS to national ones like animal registers and operations databases. The case studies presented show it is possible to design targeted databases to capture the data for the calculation of the contributions of certain RDP investments on climate/environmental objectives. Such databases should be constantly updated and expanded and keeping track of ongoing research on new types of investments can also serve to this end.
- **Secondary contributions are not only important but may be the only ones for GHG emissions**. The assessment of secondary contributions in the cases presented highlighted the positive effects of RDPs for reducing GHG emissions.
- **Lack of available data on the before situation and other data for netting out can often jeopardise the assessment.** Farm level data is needed but it is not always available or accurate. This can be overcome by looking for historical data (e.g. IACS/LPIS for soil, animal registry for livestock, FADN or FSS if farmers can be identified, sales data, fertiliser sales expert data, farmers records from cross-compliance for fertilisers). Likewise, consultations with local experts and extension services can be used to help net out results. Case studies and lessons from other studies that net out results in other contexts can also be useful.
- **Expert knowledge and/or national IPCC or NECD reports may be required for abatement and emission coefficients**. The cases showed it is important to try and find the best way to choose activity data and also use data from the IPCC. The advantage of having sufficient and detailed data is that it is possible to use higher tier methods for assessing emissions.
- **Meta analysis is useful for the ex post evaluation as an evidence-based approach.** The JRC research study on the assessment of the effects of agricultural farm practices on emissions showed that by using meta-analysis instead of isolated expert opinions, the risk of bias is reduced, the repeatability and transparency are higher, robust data repositories can be built and it is possible to identify knowledge gaps.

1 SETTING THE FRAME

1.1. Introduction

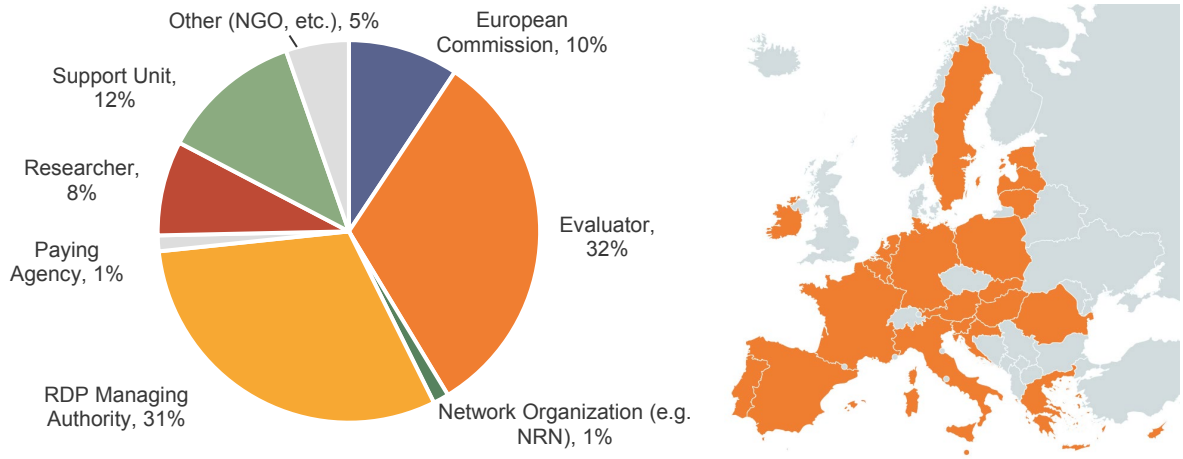
Common Agricultural Policy (CAP) interventions play an important role in contributing to the preservation and improvement of the environment and in combating climate change and will continue to do so into the future. However, **Annual Implementation Reports submitted in 2019 showed diverse challenges** in relation to assessing the contribution of the Rural Development Programmes (RDP) to the objective of **resource efficiency and climate**:

- **Efficiency in energy use**: the lack of measures programmed primarily under FA 5B was one of the most frequently mentioned limitations to assess achievements under this focus area. In some RDPs, measures supporting energy savings were not active yet or there was the limited interest by potential beneficiaries. In some cases, the information on energy consumption was not collected though the monitoring system which created the problem with accessibility of data for the assessment. Some MAs faced some challenges in calculating the ratio between energy savings and standard output.
- **Supply and use of renewable energy sources**: the lack of data on the actual supply and use of renewable energy has been an important challenge for the assessment, particularly for obtaining data after finalising RDP projects. The values reported for the corresponding complementary result indicator present a high variability and data inconsistencies, not allowing comparisons or aggregations at the EU level.
- **GHG and ammonia emissions**: the calculation of the complementary result indicators entails difficulties related inter alia to weaknesses in the monitoring system (e.g. lack of systematisation in the collection of data for emissions due to their diffused nature or outdated data), methodological issues (e.g. due to changing versions of national emission inventories or lack of national equivalent IPCC coefficients for Tier 3 calculations or different units of measurement) or more broadly conceptual issues like the fact that climate-energy is not conceptually integrated in the intervention logic as a transversal issue. These issues have led to a high variability in terms of values reported for the complementary result indicators.

In this context, as highlighted by Ms Marili Parissaki (Evaluation Helpdesk) in the opening of the event, the Good Practice Workshop (GPW) No 14 has the overall objective to reflect on experiences in relation to the assessment of resource efficiency and climate, with a view to preparing the ex post evaluation of RDPs 2014-2020 and helping to identify lessons for the related future CAP indicators. The specific objectives were to **exchange practices** on how to assess resource efficiency and climate; to **resolve specific issues**, particularly those that relate to the calculation of the complementary result indicators; and to **identify needs for further support** for Managing Authorities and evaluators.

75 participants from 23 different EU Member States attended the online event, including RDP Managing Authorities, evaluators, EU level representatives (e.g. European Commission, ENRD Evaluation Helpdesk), researchers, National Rural Networks, and other actors.

Figure 1. Participants of the Good Practice Workshop by role and Member State



1.2. Policy and evaluation framework

Ms Sophie Helaine (DG AGRI, Head of Unit C4 Monitoring and Evaluation) set up the frame of the workshop with a presentation on 'Ex post evaluation of RDPs: Reflections and outlook', giving an overview of the policy framework for the ex post in the context of the transitional regulation, as well as some key action points to better prepare for ex post evaluations. The energy and climate related indicators are important as they are associated to the Green Deal EU targets. The findings of ex post evaluations can be used to improve the quality of ongoing interventions and provide evidence for potential changes, to identify opportunities for simplification and reduction of regulatory burden and to improve the legitimacy, transparency and accountability of rural development policies. The ex post is relevant for the future CAP as findings and recommendations will feed the CAP impact assessment.

After the presentation, participants raised the following questions:

It has been mentioned that for the correct calculation of net effects of carbon emissions it is important to collect data from Tier 3. How many Member States have calculated data from Tier 3? Is there a methodology that could be used? In Slovakia there is no data on this issue; establishing a database would be a solution.

The Commission informed that it is not known how many Member States are using Tier 3. A few years ago, no Member State was using Tier 3, but the current situation remains unexplored. The Commission announced that a tender on a methodology study to calculate GHG emissions on farms has been launched.

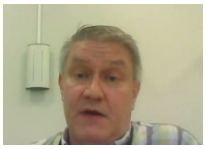
1.3 Overview of Thematic Working Group 8

Mr Valdis Kudins (Evaluation Helpdesk) presented a summary of the current Helpdesk's activity Thematic Working Group No 8 'Ex post evaluation of RDPs 2014-2020: Learning from practice'. The objectives of this exercise are to address weaknesses in the assessment of RDP achievements and impacts; to improve the calculation of result and impact indicators; and to tackle emerging issues in the assessment of priority areas (e.g. social indicators, environment, climate). Regarding the assessment of resource efficiency and climate, the Thematic Working Group No 8 has three main outcomes: the update/clarification of the fiches for complementary result indicators and the fiches for answering Common Evaluation Questions 11-14 (Annex 11 to the Helpdesk's guidelines 'Assessment of RDP results'), as well as an improved template for reporting on complementary result indicators (CRI) ex post. These will be available on the ERND Evaluation Helpdesk's website by the end of October.

2 SHARING EXPERIENCES

2.1 Experiences from assessing energy efficiency and renewable energy

2.1.1. Increase in efficiency of energy use in agriculture and food processing in RDP supported projects



Mr Eric Markus (Analyst, Swedish Board of Agriculture - SE) gave a presentation with the title CRI R.14 'Increase in efficiency of energy use in agriculture and food processing in RDP supported projects'. The Swedish approach was to conduct a before-after analysis and provide a gross calculation. Data was retrieved from the operations database, Eurostat Standard Output values and the National energy authority conversion tables to have a uniform unit, and IACS for validation of production values.

Mr Dimitris Skuras (Evaluation Helpdesk) provided expert input by stressing the main take away points from the Swedish case study. The major issues related to the CRI R.14 include inter alia the question on how to view and treat secondary contributions which remains open, as data availability for primary contributions is high (98 % of the cases) but rather low for secondary contributions (50% of the cases). He also stressed that the unit of analysis (TOE) is not user-friendly. It is not being used in similar non-RDP evaluations and thus conversion is needed before comparing the results. TOE is a unit more suitable to the macro level signaling large savings and thus when used with euro in the denominator the indicator results in very small numbers (at the area of decimals) which do not facilitate and support interpretability. Finally, data is often missing (Standard output and conversion coefficients) and netting out is challenging due to missing cases. Against this context, Mr Dimitris Skuras highlighted some recommendations:

- **Primary and secondary contributions:** recommendations relate to validating the operations database, especially for secondary contributions; or asking for certified energy audits (in accordance with national energy efficiency schemes).
- **Units and Data:** it is recommended using (TOE) per 1000 euro to report the indicator R.14 and certified national conversion tables if they exist, because they include more data on different kinds of energy sources and fuels; using similar activities for activities whose the Standard Output is missing; and using industry standards from the national energy efficiency schemes and consult IACS/LPIS and animal registry.
- **Netting out the results:** it is suggested to try to net out the results by matching beneficiaries to non-beneficiaries. If the national energy efficiency scheme has carried out a similar exercise, considering a potential adaptation of its results to the RDP situation and trying to provide a net result (even under scenarios and hypotheses) may be an alternative solution as well.

After the presentation, participants posed the following questions to the presenter:

Is data reported by applicants based on their own measurements?

Which devices/procedures are available to applicants to measure e.g. energy consumption?

Mr Eric Markus explained that for the project in Focus Area 5B, a large number of applicants took part in the training and advice to undertake energy estimates before and after the investments, so the estimations, audits and calculations are believed to be quite accurate.

In the case of Focus Area 2A, there is more uncertainty regarding the estimation of energy use after the investment, as it is challenging for most applicants who do large investments to calculate to what extent they have been saving energy.

In Sweden, were there any investments in the processing sector or were they only in farms? In processing sectors there are no standard output coefficients, so there must be another option to calculate the output.

Mr Eric Markus answered that for the calculation of this indicator, investments from the food processing sector were not included. They were not included in the calculation nor on how the RDP is contributing to this priority. More detail can be found in Annex 11.

Mr Dimitris Skuras added that a good strategy around this issue is to estimate gross outputs for firms.

The Commission acknowledges that this was the first time this type of indicator was introduced. The results show that the Swedish RDP is really achieving something. Do the measurements only account for energy savings or do they also include efficiency related to standard outputs? How many of the beneficiaries would increase production, how many were keeping output the same but just increasing efficiency? A lesson learnt is that having to relate everything to standard output increases the complexity and the data that is needed.

Mr Eric Markus explained that in Focus Area 2A for secondary contributions, most beneficiaries increased the production as well, as this goes together with Focus Area 2A Investments in competitiveness.

In the case of focus area 5B, it was noticed that as a rough estimate about a third or half of the investments went hand in hand with an increase in production.

2.1.2. Renewable energy production from supported projects

Mr Mati Mõtte (Rural Economy Research and Analysis Institute of Economics and Social Sciences - EE) presented the experience of Estonia for the calculation of 'CRI R.15: Renewable energy production'. A simplified methodology was used in order to calculate net effects and an indicative comparison was made with renewable energy production of the agricultural sector. Data was only collected for secondary contributions on measures M 4.1 and M 6.4. Different interventions were classified thanks to the prior cooperation between the Managing Authority, Paying Agency and the evaluator, which allowed identifying the suitable investments in the application forms.

Mr Eduard Matveev (Rural Economy Research and Analysis Institute of Economics and Social Sciences - EE) acknowledged that the calculations were made in KWh and then converted in TOE. Some limitations of the evaluation exercise include, first of all, data availability in the applications and lack of time. It was the first experience on these calculations. Future efforts will be made to calculate the energy produced by the projects by the end of the year. Energy for primary production will also be included.

Mr Dimitris Skuras (Evaluation Helpdesk) provided expert input by stressing the main take away points, key issues and recommendations, from the Estonian case study.

- **Installed capacity and energy generation derive only from secondary contributions,** mainly from support for investments in agricultural holdings (M 4.1) and the support for investments in the creation and development of non-agricultural activities (M 6.4). Many projects support investments in forestry technologies and in processing of forest products (M 8.6) which support the focus area objectives but do not produce renewable energy. A recommendation to assess this issue would be to develop additional indicators.
- **Regarding the units of measurement,** the study suggests the use of kWh at the project level and GWh at the macro level. This may be easier for retrieving and recording raw data, for aggregation purposes, for converting (or recording) energy generated. However, at the end of the day,

expressing CRI R.15 in TOE is essential because the corresponding Headline Indicator (CEQ 24) is reported in this unit.

- **Data** remains an important challenge as well. Firstly, it is necessary to identify the projects that contribute to CRI R.15. As mentioned above, not all projects flagged as having primary or secondary contributions to Focus Area 5C generate renewable energy; some generate renewable fuels. Renewable fuels (pellets, bioethanol, etc.) are commodities, not energy. Furthermore, the estimation of CRI R.15 in the Estonian case study is cumulative and there is missing data on the control group. It may be possible to approach the netting out of CRI R.15 by similar studies in the framework of 'national support schemes" or by using a qualitative approach'.

Links to the presentations

CRI R.14: Increase in efficiency of energy use in agriculture and food processing in RDP supported projects - (SE) Eric Markus, Analyst, Swedish Board of Agriculture (Managing Authority

CRI R.15: Renewable energy production - Overview of Estonia - (EE) Mati Mõtte, Rural Economy Research and Analysis Institute of Economics and Social Sciences

2.2 Experiences from assessing climate (GHG and ammonia emissions)

2.2.1 Reduced emissions of nitrous oxide

Mr Marek Pihulič and Mr Matej Smieško (Slovakia) gave a presentation with the title 'Calculating CRI 18 in Slovakia: Reduced emissions of nitrous oxide'. To calculate the reduction of emissions of nitrous oxide through the RDP Measures 10 and 11, sample farms were identified, data was extracted from a national database, and the counterfactual quantitative method PSM DiD was applied.

After the presentation, participants posed the following questions to the presenters:

Could you confirm if the national Slovak database on the use of fertilizers is at farm level? Not the statistical office but a specific database?

Mr Matej Smieško clarified that the national database is a special database which collects data on every use of fertilizer on every parcel. Data includes the crop produced in a year, the type of fertilizer and other types of content in fertilizer besides nitrogen, like phosphorous. The database also distinguishes between artificial and natural fertilisers from livestock.

What was the size of the sample of farms? How many farms were in the group of treated and untreated? Could you explain which AECM (agro environmental measures) were used?

Mr Matej Smieško answered that 139 farms were treated and 1200 were untreated. There were roughly 1000 farms in total which participated in both measures (40% of the sample).

Mr Marek Pihulič answered that regarding the measures, all sub-measures of measure 10 were included: integrated production in orchards, in vineyards and in production of vegetables, where only restricted use of chemicals, fertilizers and pesticides is allowed, additional sub-measures included biotopes on pastures and grassland and bird protected areas.

Does this number represent the situation before or after matching? Were the 139 treated matched with the 1200 untreated?

Mr Matej Smieško stressed that the figures represent the situation before and after matching. There are methods to match more than one treated to untreated, for example, using coefficients. The most successful matching algorithm in bias reduction was 'next neighbour' and the parameter was set to 3.

Who collects the data?

Mr Marek Pihulic answered that the Official Slovak Authority (Central Control and Testing Institute in Agriculture) collects the data on all inputs in agriculture: phytosanitary, seeds, pesticides, etc.

You looked at fertilizer use, but there are other climate effects. For example, in organic agriculture, it is expected that the use of diesel goes up, because of the type of weeding used.

Mr Marek Pihulic recognised this is something currently missing and that should be addressed. As evaluators, they will recommend to the Slovakian authorities to work on the listing of all activities that contribute positively or negatively to climate change. By creating a system, it will be possible to obtain data for these activities at the farm level. For example, regarding the consumption of fuel, the larger emissions of GHG stem from livestock. Therefore, the focus should be set on livestock production currently and in the future and, if possible, arable land production should also be monitored.

Is the collection of data on the use of fertilizer at farm level voluntary or is it linked to agri-environmental measures where it is compulsory for farmers?

Mr Matej Smieško clarified that it is legislative obligation for nearly all farmers, legal entities and single farmers. There are roughly 19000 applicants for IACS, 300-400 organic farmers, 1000 applicants for agro-environmental measures and in this database, there are roughly 4000 farmers. Mr Matej Smieško estimated that 7000 farmers are obliged and 4000 provide data on the use of fertilizers; which means that the majority provides.

Regarding the recommendation to establish a list of activities in the area of livestock production for GHG emissions and collecting data at the farm level; where are you looking for this data? Will this be the next agricultural survey? In 2023, countries will be obliged to collect data for Eurostat, however the question for Eurostat does not fit with the required data for GHG calculations.

Mr Marek Pihulic suggested that a new survey should be created. The examples of the Netherlands, Germany and maybe Denmark are good references (they seem to be using Tier 3 approaches).

For the calculation of emissions, was the same methodology that was applied in the official inventory report for UNFCCC followed? Are the same emission factors, etc. used?

Mr Marek Pihulic clarified that the same methodology was used in presented calculations. In the calculation of CRI R.18, national coefficients were used and the IPCC conversion factor was used only for N to N_2O and GWP for N_2O in order to transform N_2O to CO_2 equivalent.

Do you calculate the reduction of emissions per measure? For example, do you calculate the reduction of emissions for organic agriculture?

Mr Matej Smieško answered no, the reduction of emissions has been calculated for the combination of agro-environmental and organic farming measures, which means that treated farms participated with all their agricultural area in either of the two or in both measures.

Some 'whole farm carbon assessment tools' have counted proxy emission values for different farming and livestock practices, maybe these could be interesting references?

Participants commented that there is a Carbon Navigator in Ireland and CAP'2ER in France.

2.2.2 Reduced ammonia emissions

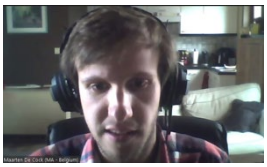
Georg Dersch and Michael Anderl (Austria) gave a presentation with the title 'Calculating CRIs 18 & 19 in Austria: Reduced emissions of methane and nitrous oxide & reduced ammonia emissions'. They used expert judgements, the model Landscape DNDC and the IPCC Guidelines to assess the results. The measures assessed were M 10 and M 11 for CRI R.18 and M 10, M 14 and M 4 for CRI R.19. The sources of data were the IACS database and GHG national inventory.

After the presentation, participants posed the following questions to the presenters:

You do calculate an abatement of ammonia due to injection, but what about the nitrogen that does not go to the air, the NO2 emissions? Do you forget those with this approach? What you win with indirect you will lose with more direct emissions.

Mr Michael Anderl answered that the farmers should use good practice and fertilize according to demand, it is good if they increase efficiency because that would mean that they use less fertilizers. There could be a problem if the efficiency is increased in a certain moment of the chain but there is no effect because there are still emissions. It is assumed that farmers have to fertilize in good agricultural practice, and therefore, that farmers will use less fertilizers.

2.2.3 Calculating CRI R.19: Reduced ammonia emissions. Experience from Flanders, Belgium



Mr Maarten De Cock (Flanders) presented 'Calculating CRI 19: Reduced ammonia emissions. Experience from Flanders, Belgium'. A national sustainability database has been created, which collects data from the farmers, experts and scientific literature. This database was useful for the calculation of primary and secondary contributions.

After the presentation, participants asked the following questions to the presenter:

Is there a link between IACS and the sustainability database?

Mr Maarten De Cock answered that only investments are incorporated in the database. Since investments are non-IACS measures, there is no link between the two.

If you calculate the emissions, do you need to have the activity data of the farms that are part of the RDP?

Mr Maarten De Cock clarified that the data is gathered from the farmers directly and calculated.

Would it not be possible to apply the coefficients from the database to investments that were implemented before 2016? Or is it that farmers were not asked for the relevant information in their applications for support?

Mr Maarten De Cock stressed it would not be possible since the necessary data regarding the investments are missing. There is information about the investments made before 2016 but that is insufficient for the calculations. It would be an administrative burdensome process for the farmers to collect this data afterwards. That is why only the data from 2016 were used.

How did you fund this very useful sustainable database? Did you use the technical support funds from the RDP?

Mr Maarten De Cock clarified that the MA of the Flemish RDP is part of the Department of Agriculture and Fisheries. This department has its own study unit. The development of this sustainability database was the work of this study unit together with the management service. No external funds were used, nor technical assistance.

Are farmers paid for data provision, or what is the incentive of them to provide data?

Mr Maarten De Cock answered that farmers are not paid for data provision. Providing data is mandatory in order to receive investment support.

How are you going to calculate CRI R.18 and CRI R.19, for measures M 1, M 2 and M 16?

Mr Maarten De Cock stressed that at the moment these measures are not incorporated in the database and the effects on the ammonia and methane emissions are only indirect. In these cases, output (ex. number of projects, etc.) is used as an approximation since a quantitative calculation is not yet possible.

Links to the presentations

Calculating CRI 19: Reduced ammonia emissions - Experience from Flanders, Belgium - (BE) (Maarten De Cock, Flemish Managing Authority)

Calculating CRIs 18 & 19 in Austria: Reduced emissions of methane and nitrous dioxide & reduced ammonia emissions - (AT) (Georg Dersch, AGES and Michael Anderl, Umweltbundesamt)

Calculating CRI 18 in Slovakia: Reduced emissions of nitrous oxide - (SK) (Marek Pihulič and Matej Smieško, Evaluators)

2.2.4 Comparative analysis of climate effects presented in the case studies

Mr Dimitris Skuras presented a comparative analysis of the cases of Slovakia, Flanders and Austria. The main issues identified are the following. There are multiple sources of GHG emission reductions – e.g., investments, agro-environment measures and dedicated climate measures. There is also a heterogeneity of data sources: unique national databases (e.g., Slovakia), a database build specifically for dealing with sustainability issues (e.g., Flanders) and data drawn from models triangulated by experts and academics (e.g., Austria). The methodology also differs from case to case; Slovakia follows an econometric approach to estimate gross and net results, Flanders calculates directly the gross results and approximates the net with qualitative information and in Austria the before-after situation is calculated at a macro level. All case studies highlighted the challenges for the ex-post and beyond: How to extend the methodology to soil management in Slovakia, how to expand the database in Austria and how to access more detailed data in Flanders.

	SLOVAKIA	FLANDERS	AUSTRIA
CRI	**R.18**	**R.19**	**R.18 and R.19**
GHGs or NH_3	CH_4, N_2O	NH_3	N_2O and NH_3
Measures	10, 11, 12, 14	4, 10	10, 11, 14
Main focus	Fertilizer reduction	Investments in stables and manure management	Abated N in the form of fertilizers, shallow injection and trailing hose spreading of slurry
Data collection	Ad hoc-survey Farm level	Permanent database Farm level	Ad hoc-aggregate RDP level
Data sources	Operations DB IACS/LPIS Animal registry National Fertilizer DB	Sustainability database	Operations database IACS/LPIS Animal registry
Emission coefficients	IPCC adjusted	Flemish NECD	IPCC, UNECE and EMEP/EEA
Methodology	Samples of control and treatment groups	Gross effect of individual investments and measures in the database	Average N abatement estimated by the LandscapeDNDC model, cross validated by expert judgment
Netting out	PSM on differenced (PSM-DiD)	Not quantitative	Before-after at RDP level
Major challenges	Extend methodology to agricultural soil management	Expand database to agri-environment-climate commitments and more types of investments	Access detailed farm level data from records kept by farmers to construct representative data samples (data protection issues)

After his presentation, Mr Skuras opened a debate by asking the following questions to the presenters:

Belgian case study

Managing the sustainability database created by Flanders is a dynamic process as the database expands constantly. The most important contribution is that it builds evaluation capacity, since it identifies which data is necessary, where does it need to be expanded, what is a better way to store information and what measures have an impact. Mr Skuras posed the following questions: Would you see interesting the effort of financial and human resources for other Member States, especially in view of the ex-post and the new programming period? Do you recommend such an investment to better organise evaluation?

Mr Maarten De Cock answered that the database is very useful to calculate investments where effects on climate can be quantified and recommends that other Member States apply it. It is a dynamic process and will need to be expanded, but it provides a good basis to start analysing not only environmental but also other indicators for the ex post, as well as post 2020 indicators.

He also mentioned that the creation of such a database depends on the measures taken by different Member States and whether it is possible to quantify these measures. The advantages and disadvantages should be considered at a Member State level.

Austrian case study

Austria´s calculation includes a very detailed information of the effects and evaluators put effort in detailing the different pathways of GHG reaching the air, through the triangulation using a model and the support of academic literature. Mr Skuras asked Austria if (and how) data protection issues prevented or obstructed a better evaluation outcome, and if Austria would recommend the same approach to other Member States with similar data protection issues.

Mr George Dersch explained that especially for the Nitrate Directive and also for agro environmental measures, farmers have to do many records for the farms, and also for special fields and special cultures. They have to calculate surpluses and in the past it was argued that farmers should be concious of the problems related to that. In the next programme, if possible, these surpluses of nitrogen will be integrated in the next fertilising rate. If a big surplus has been detected in the trial year, in the following year the N fertiliser rate should be reduced at a percentage of the surplus. It might also be a big problem in the future but maybe we can overcome it because stakeholders are now interested to work with this recorded data of the farms.

Slovak case study

Certain management practices were not accounted. Mr Skuras asked which are the data restrictions and if there is a strategy to overcome them. He further asked what improvements are foreseen for the ex post.

Mr Matej Smieško replied that there was no data on manure management at farm level. A similar test and calculation on livestock was performed but the difference came only from the changes in the number of cattle. It was not based on activities or impact of RDP on these activities. The less animals there were, the less CO_2 emisisons were produced. The strategy is only to suggest to the Managing Authority to provide such data in the future. It is not possible to have it for the ex post, since this data starts from 2013 and it is not available now. A possibility is to start collecting it in 2021. This database or this survey data will be used for the next programming period.

Mr Matej Smieško also commented that what was calculated on the use of fertilizers was also going to be applied in the use of pesticides. The problem with pesticides is that it is difficult to compare an

amount of pesticides use because different pesticides have different substances; for example, sometimes 1 litre per hectare is applied, and in another application there is 100 kilograms per hectare and the 1 litre per hectare has a larger impact than these 100 kilograms per hectare of another active substance contained in the pesticide. The issue is how to deal with it when trying to quantify the real effects of pesticides on the environment.

2.2.5 Broader experiences from the Joint Research Centre (JRC)

Dr Andrea Schievano (JRC) presented systematic reviews and meta-analysis as methods used by the JRC to synthetise scientific evidence regarding the effect of farming practices on several environmental and climate impacts. By using these synthesis methods instead of expert opinions, the risk of bias is reduced, , the repeatability and transparency are higher, robust data repositories can be built and it is possible to identify knowledge gaps.

After the presentation, participants asked the following questions to the presenter:

Has the study been published?

Dr Andrea Schievano explained that only the general methodology was presented, and the JRC is applying a specific version of the methodology to assess the potential impact of farming practices to support the evaluation of the CAP Strategic Plans. This methodology will be published soon.

Mr Andrea Furlan (DG AGRI) added that this methodology is being applied to a big number of farming practices, around 70, and it is done for internal use of Geo hubs. The results of the first practice – agroforestry- are available, and the analysis will continue with the other practices until the end of 2021. Then we can reflect on how to publish the results if it is useful for Member States, evaluators, etc. For the moment, it is something for Geo hubs.

In meta-analysis it is necessary to select what fits the research and summarise it to fit the regional level. If you do not have data, what is your opinion about using methodology or asking experts?

Mr Andrea Furlan agreed that it is necessary to have experiments, and it might not be applicable to case studies where data are not collected using scientific criteria.
The lack of data at local level is quite often a problem.

Dr Marta Pérez-Soba (JRC) added that, when sufficient data are available, regional differences can be extracted from the meta-analysis (differences in soil, climate, management approaches, etc).

Expert opinion is characterized by high risk of bias. How did you determine the defined selection criteria (extracting, screening data, etc.) that you have referred to?

Dr Andrea Schievano highlighted that expert opinion is quite equivalent to a non-systematic review. The experts base their opinion on a partial subset of the overall available evidence on a topic. Non-systematic reviews do substantially the same, because they are not based on a rigorous method that allows to collect all available evidence to respond one scientific question. On the contrary, a good systematic review is based on a clearly repeatable and transparent methodology to collect all available evidence. Criteria for literature search, selection and data extraction are determined depending on the information that is needed, but they are always clearly stated. This gives a quantification of the eventual bias that is present in the available knowledge.

If the assumption is that the experiment is biased, then applying meta-analysis may lead to biased result?

Dr Andrea Schievano stressed that one single experiment is never biased. Each experiment is influenced by local factors that might be unknown. The analysis of factors and how they influence the result can be done only by comparing different results all together (in a meta-analysis). The synthesis of all available experiments can lead to understand whether there is a general tendency in the available literature to show results only of one specific type and therefore 'unveil' some bias.

Ms Marta Pérez-Soba added that experiments can be considered biased, when a researcher unconsciously affects results or data in an experiment due to subjective influence. Therefore, the results are not correctly obtained. This is why a non-rigorous selection of experiments, which may coincidentally include several 'wrong' experiments, and then the conclusions are biased. This is indeed what happens with expert opinion or non-systematic reviews. Meta-analysis solves this problem, by setting rigorous criteria for selection of data, analysing statistically all the available data and quantifying not only the mean effect size, but also the confidence interval that tells us whether the effect is robust because there is small variation in all the values, or it is uncertain because the variation is large.

Taking into account that RDP's measures addressing environmental objectives could vary from one RDP to another, is it possible to use meta-analysis to scale up results at regional/national level to the national or EU level?

The answer is no. Dr Andrea Schievano explained that this is typically something done with models. It could be possible to perform a meta-analysis of all results available at EU level regarding the effect of a specific RDP measure, if all results were collected using comparable methods and rigorous data collection methodologies. However, models can be based on basic data collected using meta-analysis.

Is the centralised repository of farming activities available at the moment for agroforestry publicly or internally for DG AGRI?

Mr Andrea Furlan replied that the first results are still only available internally and the templates and methodologies need to be developed.

Link to the presentation

The effects of agricultural practices on the environment: Methodology used for synthesis studies (systematic review and meta-analysis) - (EU) (Marta Pérez-Soba, Andrea Schievano, Jean-Michel Terres and David Makowski, JRC and INRAE)

After these sessions, participants were divided into smaller online groups and worked together on identifying solutions on how to improve/facilitate the calculation of complementary result indicators (see Annex).

3 CONCLUDING REMARKS

The outcomes of the discussions on the case studies, research studies and expert input, together with the group work provided some suggestions on how to improve/facilitate the calculation of the complementary result indicators for the ex post evaluation as well as future evaluations.

Suggestions for improving the assessment of energy efficiency and renewable energy

- The **validation of the data** provided by beneficiaries guarantees its quality. This can be done in various ways such as validating data with beneficiaries' energy bills, energy authorities, energy audits or beneficiary surveys.
- **Finding the right information** is not always easy due to the variety of instruments, investments and sources. This can be facilitated by **using the potential of application forms** to collect the necessary data from early on, (e.g. on energy use) using harmonised units of measurement. To ensure the consistency of data in applications, these can be more structured and predefined, with support/training provided to applicants on specific data items or a user friendly methodology or tools for calculating energy consumption for instance.
- Linked to the previous point, obtaining data is time consuming. It is therefore suggested to **start data collection** on the potential contribution of projects to energy efficiency or renewable energy **early enough** through surveys, interviews, assessments, calculations, potentially as an ongoing evaluation process.
- **Filling data gaps** for estimating the energy capacity can be done by looking inter alia for certified energy installed, energy sold to the grid, national inventories and electricity meters (if installed).
- **Obtaining data on secondary contributions is very important**. Sometimes, secondary contributions are larger than the primary ones or even the only contributions to a result indicator. Various EU and national sources offer data that are valuable for the estimation of CRIs or of additional indicators. Case studies and beneficiary surveys for similar national programmes as well as project applications are also important sources of information and data.
- **Harmonising measurement units** can be achieved inter alia by using coefficients, using checking tools, validating data or consulting the approaches used by international organisations.
- **Netting out results** can be facilitated by identifying control groups with the help of databases, surveys and case studies, while studies elaborated in other frameworks may also provide inspiration and solutions.

Suggestions for improving the assessment of climate (GHG and ammonia emissions)

- To **facilitate data collection**, a first step is to define well the data to be collected by asking precise questions on all the data items required for the emission calculations (e.g. liquid system, solid system, abatement technologies). A second step is to ensure continuous data collection (e.g. on fertilisers and pesticides and other inputs) starting from the application form where data included there can be used for emission calculations. Data privacy should not be used as an excuse as there are ways to overcome this issue, e.g. by coding in databases.
- **Databases are vital for assessing the effects on emissions.** To maximise their usefulness, it is important to collect farm level data, to promote simplification (e.g. request simple data from beneficiaries), to use the application forms as a key source of data, to build new databases while also exploring links with existing databases (e.g. IACS, FADN) and to ensure consistency with IPCC and regulation authorities. Databases should be 'live' with scope for expanding and with the possibility to be constantly updated with new data.

- **Explore the potential for transferring the modelling approaches** from one Member State to another. They offer the potential to use higher tier methods for the calculation of emissions, provided sufficient and detailed data and information are available.
- **Consider investing in meta-analysis** as a way to collect information from a long list of farming practices, to complement repositories of farming activities and to inform stakeholders on the role of agriculture in reducing emissions. Meta-analysis entails a high data collection potential, allows aggregation by combining all the existing information into one overall picture and can offer scientifically robust results. Collection of data at local level should also be performed as much as possible following scientific criteria (e.g. in collaboration with scientific institutions), which could make the data useful for evidence-based science in evaluating the effectiveness of measures in agriculture.

An overall concluding remark is that interinstitutional coordination between evaluation stakeholders can facilitate the collection, management and use of data for more reliable results on the complementary result indicators. Good cooperation can also lead to the identification of new/alternative sources of data and evaluation methods for assessing environmental effects.

ANNEX

GROUP WORK DAY 1

Discussions on the indicator R.14

 **What are possible issues for the ex post?**	 **What do you propose to improve the calculation of the indicator for the ex post?**
Data availability and quality	
Validation How to validate the data provided by beneficiaries and ensure its quality Impact of agricultural and food price volatility in the calculation of the indicator	Asking for beneficiaries' energy bill Collect data on/from beneficiaries in advance (be prepared) Use sample rather than all applications (fewer cases) Validate data with the energy authorities Use the energy audit to validate data
Finding the right information It is hard to obtain information on projects supported via financial instruments It is difficult to finding Standard output coefficients for all activities Adequate/sufficient data (e.g. enough projects) to calculate the indicator not always available Need to compare the energy type of financed machineries	**Develop a standardised way to handle different sources of information**, e.g. revision of all projects and their contribution to R.14 (early enough before ex-post) **Include data in application forms,** e.g. make suggestions for application data the beneficiaries must fill in e.g. on energy use before and after **Provide farmers with a sound methodology** and/or user-friendly tools for the calculation of energy consumption. For instance, farmers can use their smart phones (easy tool) Ensure that only energy consumption for agricultural activities are provided, not for other activities. Use approximate value when there is a lack of conversion values
Support / training applicants/beneficiaries for precise specifications How to ensure applicants knowledge of energy measures What if there are only 'qualitative' measures programmed in the FA? (type training) Should training be mandatory	IT system more specific in terms of data items, for instance, make suggestions on where farmers can click. In the future, training can help LEADER application forms record information on energy efficiency. Clearer requirements for applicants on energy efficiency
Secondary contributions Lack of identifiable secondary contributions in the operations database Non comparable data	Traceability between different databases Secondary contributions identification based on clear and simple approaches

Data collection	
Obtaining data is time consuming Data on energy consumption is provided late (investments which take time to finish) It is a resource intensive exercise as energy audits may not be available	Start collection of data early enough: make interviews, assessments, calculations Good planning at the outset on data collection In order to avoid the time pressure during the ex-post evaluation, it would be good to collect data already on an ongoing basis For the next programming period, the planning of data management must be clearly defined (at farm level) from the very beginning
Before and after data collection How to collect before and after data for each operation Before and after investment data for energy not always included	Case studies / beneficiary surveys Project applications and final reports
Uniform units How to ensure the same units of measurement are used	Use checking tool/process for units Validation of data-inputted Restricting certain numbers For comparability, use unit which other organisations (e.g. OECD) use as well Do calculations in KWh and only convert final figure at the end
Netting out the results	
Identifying control group How to identify/define a control group	Ensure there are farms with similar activity/ characteristics (size, climate, etc.) in the control group Compare outcomes with averages on energy use and production, etc. Concentrate on gross results rather than netting out (better to get good results, rather than poor/patchy net out)
Obtaining data on control group How to find data for comparable projects without financing How to find data for non-beneficiaries or non-RDP projects	**Other databases / Funds** FADN could be used – in the future, it would include farm sustainability data Screening other existing databases Using data from other (national) support/funding The use of data from LIFE projects could help in capturing net effects. **Surveys/case studies** Role of Evaluation plan to coordinate surveys Apply combined surveys, not just operational database Case studies on non-RDP projects

Discussions on the indicator R.15

What are possible issues for the ex post?	What do you propose to improve the calculation of the indicator for the ex post?
Data availability and quality	
Data availability in the operations database Data availability may be an issue if energy calculations are not in the operations database Lack of data in operations database (for before and after comparisons)	Searching in the **applications** Beneficiaries should report also after the implementation
Consistency of data in applications Quality of information in application forms differ from beneficiary to beneficiary Challenging to ask applicants the amount of energy, too often there are mistakes How to identify projects/interventions that contribute to RE Comparability with the GHG Inventory	More **structured and predefined applications** (e.g. use the same unit of measurement, add interventions that contribute to RE) Provide applicants with **examples** of interventions at EU level Harmonising data Involve **external expert** in the collection of secondary data (on the sample) Use data collected from **other statistics**
Validation of data	Data from applications at project level is collected in the operational base (instead of survey or manual data handling) Survey before ex-post evaluation
Secondary contributions Few projects with primary contributions to R.15 Challenging to collect data on secondary contributions	Develop additional judgment criteria / indicators
Data collection	
How to collect data when there are data gaps No clear ways to collect data (e.g. data partly available in the operation database) Data collection may be an issue for investments which do not sell energy to the grid e.g. pellet burners at households for heating Heating is not measured at farm level; it is difficult to collect data at the individual / farm level	Collect data through survey [with expert input] For energy generation it is good to search for energy sold to the grid For the energy capacity estimation, it is good to look for certified energy installed Install electricity meters at the beneficiaries (possible but not optimal for long-term effects). Carry out surveys **Use qualitative approach**: Percentage of satisfaction of the farm's self-consumption (farm level) with respect to the total needs Start data collection **as early as possible**

Uniform units Incompatible units, e.g. we calculate renewable energy in KWh, not in TOE Issues may arise from investments producing thermal energy which must be converted to electric energy	In converting renewable energy to GHG not emitted, there are coefficients that apply for each type of energy KWh products classified in terms of type of source Harmonising measurement units and propose more standard output options
Netting out the results	
Missing data on control groups Netting out may be difficult if there are not available non-beneficiaries	It is better to use the national data for control groups Using values of context indicators
How to isolate from other intervening factors Other programmes contribute to the same type of projects e.g. solar PW is also supported with national schemes: difficult to isolate Data is collected on capacity, generation and technology used per application; however, not sure that netting out the contribution of the RDP would be possible	Methodologies / case studies from the Helpdesk Good practice database National Inventory **Qualitative approach** to net out results may be assisted by studies netting out the results in other frameworks
Interpretation of results (number of projects vs amount of energy)	Extrapolation to macro level (score system) related to Common Context Indicator Nutri score system but for energy (A-D) at project level
Other	
Lack of proportionality between budget and expected impacts Difficult to calculate effects/impact if the budget of the intervention is limited RED II directive which limits interventions in the first place	The assessment must be proportionally introduced on RDP level In the findings, the evaluator can explain the RDP design, keep indications for the future (qualitative description) The proposed methodology is ok and the needed common understanding is there

GROUP WORK DAY 2

Discussions on the indicators R.18 and R.19

 **What do you take away from the previous presentations for your work?**	 **Which are the challenges that could arise in the implementation of such approaches?**
Data collection	
Use application forms Collecting data from the application forms is very important Data provided while applying for support Data already in application forms offer data on the calculation of emissions Importance of secondary effects Historical data from farmers	How to involve farmers better How to eliminate the burden of collection (costs, time)
Define well what to collect Important to define well questions for data to be collected Information that is asked could be more precise Information from this PP to improve data collection in the future Important to have continued data collection Specific data for ammonia reduction Use national studies and surveys and improve them	Cannot use Satellite data Hard to start something that you know is going to increase in the future (data collection requirements) Keep in mind: relevant calculations of GHG emissions and ammonia based on calculations of MS. Finding new calculations is difficult. Other measures/interventions can have an effect and influence results
Data privacy Anonymisation of data provider, by coding of units in databases	Do not use data privacy as an excuse Data protection and the burden go against each other Political will to allow unique ID number (to cross with beneficiaries of CAP payments)
Institutional coordination Collaborate between responsible services for the submission of data Good coordination between evaluators and Managing Authorities.	
Use solid databases: databases are vital for assessing	
Farm level data Databases to include farm level data on inputs, fertilisers and pesticides. These are useful for evaluation studies Database used by Slovakia on the use of fertilizers at farm level Obligatory for farmers to report in Slovakia (national legal obligation)	High administrative burden for the collection of farm level data Good access to background data for agricultural enterprises Hard to get better data from the farmers. We are limited by IT systems and demand for simplicity.

Simplification Simplify data asked from farmers and apply the coefficients to calculate Keep it simple but add questions. It would require financial resources	Need to add additional questions at national level Data protection can be a challenge
Links to other databases Databases linked to other databases is very important Linking IACS with FADN in some Member States Explore the relevance of FAST (Farm Sustainability Tool) data tool	How can databases be better integrated and comparable Need cross identification of beneficiaries in databases
Build new databases Build a systematic database to include different technologies and factors, not only for emissions but also other indicators (e.g. sustainability database of BE-Flanders) Slovakia created the database as the FADN size was very small and needed to be enlarged	Difficult to see the link to IACS for the sustainability database
Use and expand existing databases to maximise their potential The operations database is the core of the evaluation, it is important to have high quality. It is important to plan and design from the beginning Austria has a lot of other data/information collected in the database LUCAS database: using microdata in a different way to get time series and info on issues so that it better fits the agricultural reality Expand FADN where possible	All possible data for emissions has not been collected in the **operations database** **FADN** database always recommended but too small samples Problem is still to get beneficiaries and non-beneficiaries Without solid databases, it becomes necessary to ask for expert judgements, which brings problems
Update with new data and experiences Bring the experiences shared with evaluators for further improvement of data collection and databases Use experiences from other MS to improve MA databases Use of literature (though scarce at national/regional level)	Cooperation between Ministries is necessary (e.g. in ES two different Ministries for data on emissions and another for Agriculture)
Consistency with IPCC and regulation authorities Interesting to improve Austria calculations for GHG and ammonia emissions but in accordance with IPCC and regulation authorities	Trade-off between using IPCC EF and detailed country level EF

Centralisation EU level Incentivising a project to centralise databases at EU and national level	EU level data is not a solution for all Eurostat questionnaires are not detailed enough for Member States
A variety of evaluation approaches	
Transferability Modelling used in Austria can be taken to other Member States. Methods can be adapted to the situation. Work done to improve EU level modelling. Something global that is applicable in a model is needed	Very important to work together with Austria board that does GHG and ammonia in the Member State. It is complicated if new emission factors are added.
Potential for higher tiers Flemish case: Modelling approach. Second and third effect of the measure can also be obtained Use emission factors in higher tiers, possible to link in Austria which has a lot of other data	Sticking with a low tier may have a positive effect on one measure and a negative effect on another measure
Advantages of modelling Modelling has less burden to farmers Do not need non-beneficiaries in the case of Belgium Use the same investment and agri-environmental measures	The different approaches which are considered good approaches differ in data intensity How to evaluate an effect of measures for reductions that occur in combination with increased production? How to assess the impact of M 1 and 2? How to deal with active substance expressed in different units of measure?
Investing in the Meta-analysis approach for evaluation	
High data collection potential Meta-analysis to combine all the information so that you can see an overall picture. Can help as a starting block. Collecting information of a big list of farming practices. Possible to collect data on fertilizers on measure level (big problem in AT)	Different assumptions in different studies. Therefore, different results may not be comparable.
Can complement other approaches Repository of farming activities, to be complemented with meta-analysis Combine approaches according to data availability Compare the methods and their level of bias JRC work can help add factors to modelling when necessary	Need to study the micro condition of each RDP (from the point of view of evaluation and not science) The different data situation in MS influences method-selection, which brings different quality of findings
Aggregation potential Synthesising existing meta-analyses (second order meta-analysis)	Different reporting purposes for Member States Need to be able to compare methods and results across Member States

Important to aggregate at EU level	Different calculation for GHG emissions and air pollutant and the evaluation estimations in different MS
Scientifically robust results Emission factor and a more scientifically robust approach If there is enough data, a coefficient for the specific area/region/MS can be assumed Important to know the effect of specific farming practices on reducing GHG	Different scales of evaluation? (implementation for RDP with many indicators and also synergies between measures)
Broader evaluation lessons	
Ex post evaluation will not change methodology, but indeed maybe for the next programming period	It is necessary to show the uncertainty of our evaluations
It is always better to do something than nothing: find new ways for evaluation, for example qualitative methods	
Great progress in environmental evaluation and discussion	
Good evaluation should be communicated to the national authorities	
Close link between national GHG inventory and evaluation	
Connect agriculture and climate	

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