

EUROPEAN
EVALUATION
HELPDESK
FOR RURAL DEVELOPMENT



REPORT

IMPROVING DATA MANAGEMENT AND INFORMATION SYSTEMS FOR THE PURPOSE OF CAP EVALUATION

GOOD PRACTICE WORKSHOP
ONLINE, 16-17 MARCH 2021

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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>).

REPORT

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LIST OF ACRONYMS

ANOVA	Analysis of variance
ASIS	Ada Semantic Interface Specification
CAP	Common Agricultural Policy
EAFRD	European Agricultural Fund for Rural Development
EFA	Ecological Focus Area
ENRD	European Network for Rural Development
EU	European Union
FADN	Farm Accountancy Data Network
FLAGs	Fisheries Local Action Groups
FLINT	Farm-level Indicators for New Topics
FMIS	Farm Management Information System
FSDN	Farm Sustainability Data Network
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
IACS	Integrated Administration and Control System
IT	Information Technology
LAGs	Local Action Groups
LPIS	Land Parcel Identification System
MA	Managing Authority
MEF4CAP	Monitoring and Evaluation Frameworks for the Common Agricultural Policy
MIND STEP	Modelling Individual Decisions to Support the European Policies
MS	Member State
NIVA	New IACS Vision in Action
NOAA	National Oceanic and Atmospheric Administration
NGO	Non-governmental Organisation
NRN	National Rural Network
PA	Paying Agency
PSM	Propensity Score Matching
RDP	Rural Development Programme
SEAMLESS	System for Environmental and Agricultural Modelling; Linking European Science and Society
Sen4CAP	Sentinels for Common Agriculture Policy
SDGs	Sustainable Development Goals
SP	Strategic Plan
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

The 16th Good Practice Workshop of the Evaluation Helpdesk on 'Improving data-management and information systems for the purpose of evaluation', took place online on 16-17 March 2021. It brought together 119 participants from 26 different EU Member States, including RDP Managing Authorities, evaluators, European Commission representatives, researchers, National Rural Networks, and other evaluation stakeholders. The overall objective of the workshop was to reflect on innovative experiences in relation to data management and information systems for the purpose of evaluation in the context of the CAP. To this end, the workshop explored EU level projects that deal with data infrastructure, collection and monitoring, seeking to identify their relevance and usefulness for evaluation.

The first day of the workshop focused on experiences from EU level projects bringing innovation into data management systems such as IACS, notably through the Sentinels for Common Agriculture Policy (Sen4CAP) and New IACS Vision in Action (NIVA) projects. Examples from the practical application of the projects were presented from Castilla y León (Spain) and Denmark concerning the use of Sen4CAP products and from France concerning their work on agri-environmental indicators in the context of NIVA. A common conclusion from the practical experiences is that these EU level projects can contribute to data accuracy and improved decision making for policy purposes.

The second day brought together experiences from EU -level projects aiming to improve the scope and quality of indicators for evaluations of the CAP, notably Farm-level Indicators for New Topics (FLINT) and Monitoring and Evaluation Frameworks for the Common Agricultural Policy (MEF4CAP) projects and practical experiences from Ireland and Hungary. Finally, the VERIFY project provided input on monitoring and verification of greenhouse gases, and the Modelling Individual Decisions to Support the European Policies (MIND STEP) project provided input on the development of an integrated data framework.

All the projects offered useful insights on how their outputs could be relevant for evaluations of the CAP:

- **Enriching and expanding existing data sources / databases** is at the core of Sen4CAP and NIVA in relation to IACS; and of FLINT and MEF4CAP in relation to FADN. IACS and FADN databases are commonly used for evaluation. Sen4CAP provides Sentinel derived information to build larger data sets, while NIVA introduces further digital innovations in IACS systems, relevant for monitoring and evaluation. Whereas FLINT collects additional data to modernise the FADN, MEF4CAP will bring further digitalisation that may be relevant also for the Farm Sustainability Data Network (FSDN).
- **Providing new and/or better data for indicators and development of new indicators.** Indicators are a key tool for CAP evaluations. In addition to bringing new data for existing indicators (e.g., satellite and sensor data in MEF4CAP, Sentinel derived data in Sen4CAP and NIVA, Greenhouse Gas (GHG) observation estimates in VERIFY, harmonised data for indicators in MIND STEP), these projects also develop new indicators that may be relevant for future evaluations of the CAP (e.g., sustainability indicators in FLINT or proposed new agri-environmental indicators in NIVA).
- **Creating interfaces between databases that were not previously linked** is useful for Managing Authorities and evaluators who often in the past struggled to derive data from a variety of different sources. The prime focus of MIND STEP for instance is the development of an integrated data framework bringing together FADN and other farm economic databases. MEF4CAP also looks into linking national datasets for a broader use in policy evaluation. At the same time, one of the NIVA products focuses on the interoperability between IACS and farm management information systems.
- **Improving governance of data management**, notably through cooperation between farmers and other data providers, researchers and Paying Agencies, with a potential to involve also evaluators and Managing Authorities, the latter being the key stakeholders for designing and managing evaluations of the CAP. In addition to the strong links between researchers and Paying Agencies, NIVA offers further evidence of a multi-actor approach employed for the development of indicators.

1 SETTING THE FRAME

1.1. Introduction

As Member States are approaching the end of the current programming period, which paves the way for planning the ex post evaluation of RDPs 2014-2020 and is also marked by the preparation of the CAP Strategic Plans post-2020, the Evaluation Helpdesk has undertaken a review of existing experiences at Member State and EU level regarding data management. Issues related with properly functioning, efficient and quality data management and information systems are a constant challenge for Member States when evaluating results and impacts of RDPs. For this reason, it is important to take stock of existing experiences with the aim to answer some overarching questions: What worked and what did not work so well in 2014-2020 in relation to data management? What can be learnt from EU - level projects and Member State experiences in the field of data management and information systems for evaluation purposes, including, where relevant, using FADN, IACS and other databases /data sources? Are there any innovative data collection and processing methods that can be used for evaluations in the context of the CAP?

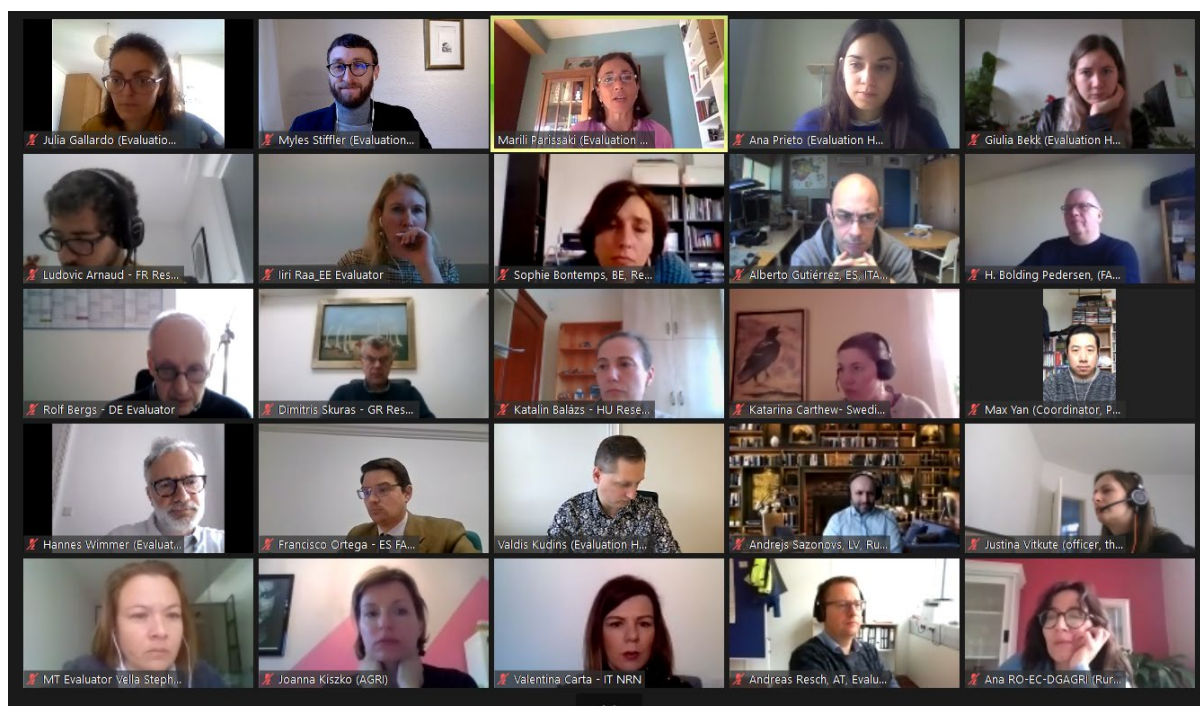
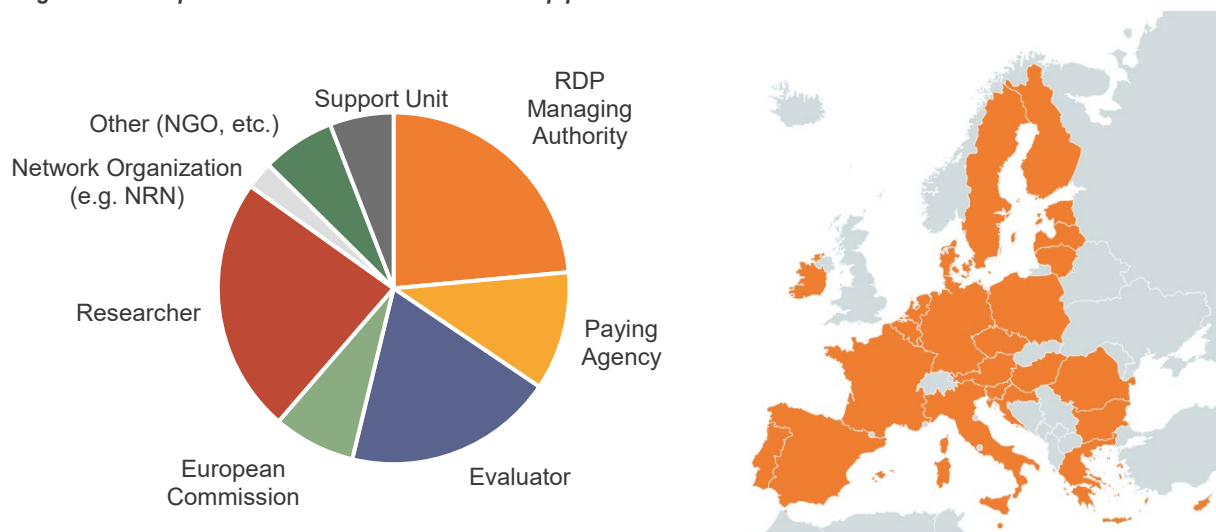
In order to answer these questions, the Good Practice Workshop No 16 'Improving data management and information systems for the purpose of CAP evaluation' explored EU level projects that deal with data infrastructure, collection and monitoring, seeking to identify their relevance and usefulness for evaluation in the context of the CAP.

The overall objective of the workshop was to reflect on innovative experiences in relation to data management and information systems for the purpose of evaluation in the context of the CAP. Specifically, it aimed at: exchanging experiences from existing research projects/studies and data management practices at EU and MS level in order to identify useful elements and innovative approaches that can help improve data management and information systems; discussing specific issues/criteria that can facilitate or hamper the incorporation/transfer of identified approaches into data management and information systems at Member State level; and identifying needs for further support, principally for Managing Authorities (MA) and Paying Agencies (PA), but also for evaluators and data providers, in relation to the above issues for improving data management and information systems for the ex post evaluation and future CAP evaluations.

The architecture of data management and information systems differs amongst Member States and the scope of the workshop was therefore not to analyse the way these systems are set up, but to present innovative experiences that can help improve them to gradually build more efficient systems for the evaluation of the future CAP, which are also useful for the upcoming ex post evaluation of the current programming period. For this reason, the workshop adopted an open and flexible approach, going beyond existing guidelines and the specific evaluation requirements of the current Common Monitoring and Evaluation System or the future Performance Monitoring and Evaluation Framework. Research projects and studies, holistic and innovative approaches were therefore the backbone of the workshop.

119 participants from 26 different EU Member States attended the online event, including RDP Managing Authorities, evaluators, European Commission representatives, researchers, National Rural Networks, and other evaluation stakeholders.

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

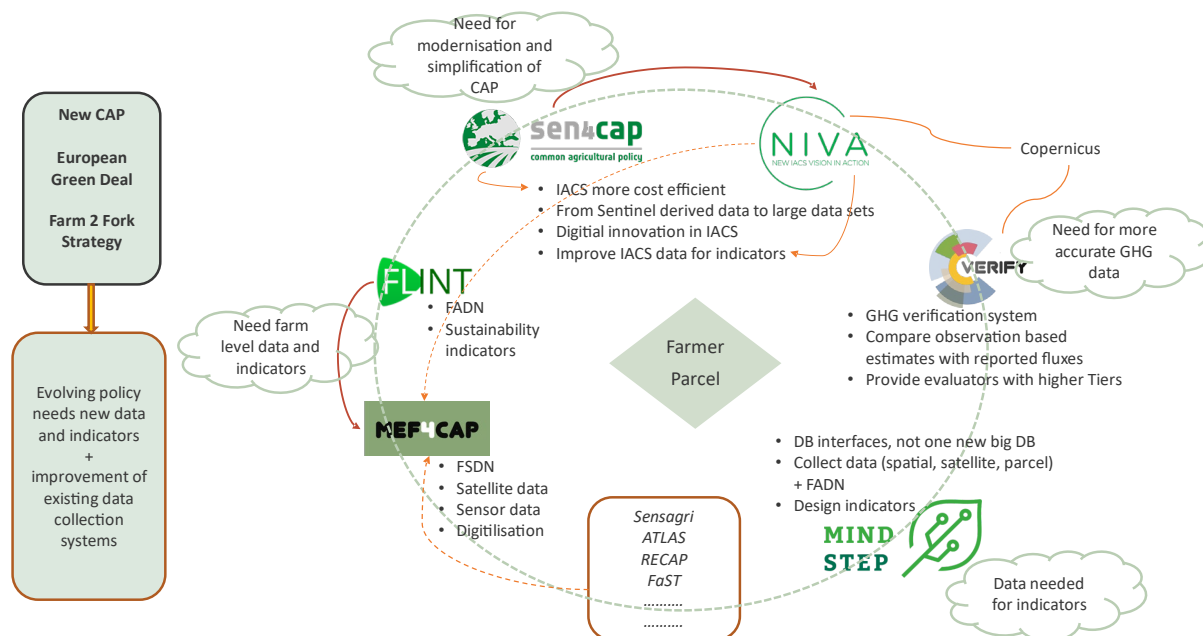


1.2. Policy and evaluation framework

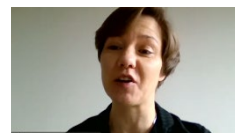
Ms Marili Parissaki (Evaluation Helpdesk) introduced the content of the workshop with an overview of EU level projects to be presented at the workshop (Figure 2). The evolving policy context, consisting of a new Common Agricultural Policy, the European Green Deal including the Farm to Fork Strategy, requires new or improved data and indicators as well as improvements in existing data collection systems. Several research projects at EU level are under way to address these needs and, for the purposes of the workshop, the Helpdesk selected a few of them to analyse their relevance for evaluations of the CAP. Projects are born out of needs related to better data, new indicators and simplification, and their common denominator is their focus at the farmer or parcel level. Starting from that level, they work on collecting policy level data in connection with FADN (FLINT) and expanding

datasets taking into account technological developments (MEF4CAP), increasing the traceability and cost efficiency of IACS (Sen4CAP) while also introducing digital innovation (NIVA), creating database interfaces (MIND STEP) or more concretely focusing on specific indicators like GHG emissions to verify reported values (Verify).

Figure 2. Overview of EU level projects presented at the workshop



Ms Doris Marquardt (Research Programme Officer, DG AGRI, Unit B.2 Research sector) presented an overview of EU level projects. Ms Marquardt highlighted the different types of monitoring, evaluation, and controls in agriculture, explored the potential of the diverse sources and methods of data collection and generation, and finally mentioned the Horizon Europe Candidate Partnership 'Agriculture of data', which aims at using the potential of data technologies in combination with earth and environmental data to support policy monitoring and evaluation and sustainable agriculture.



Link to the presentation:
[Overview of EU level projects](#)

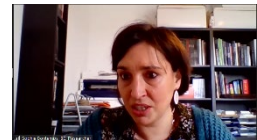
2 SHARING EXPERIENCES

2.1 Day 1 - Experiences from EU level projects bringing innovation into data management systems such as IACS

2.1.1 Experience from SEN4CAP

Project overview, Sophie Bontemps

Ms Sophie Bontemps (Sen4CAP, Project coordinator, UCLouvain - Université Catholique de Louvain) presented 'Sen4CAP Open Source System to Support the CAP Reform Using Sentinel-1 and -2 for Continuous Near Real Time Agriculture Practices Monitoring'. The project Sen4CAP aimed to provide evidence of how Sentinel derived information can support the modernisation and simplification of the CAP in the post 2020 timeframe, and to provide validated algorithms, products, workflows and best practices for agriculture monitoring. Four pilot cases were conducted in 7 Member States, as well as wider tested by Paying Agencies. Sen4CAP proposed four products to be used by the Paying Agencies: map of crop types, growing vegetation indicators, grassland mowing detection and agricultural practices monitoring. The validation of the Earth Observation (EO) products was done through farmers data collected by Paying Agencies and visual interpretation of Planet Very High Resolution time series.



Link to the presentation:

[Sen4CAP Open Source System to Support the CAP Reform Using Sentinel-1 and -2 for Continuous Near Real Time Agriculture Practices Monitoring](#)

For more information on Sen4CAP, you can visit its website:

<http://esa-sen4cap.org/>

SEN4CAP in Castilla y León, Spain, Alberto Gutiérrez García



Mr Alberto Gutiérrez (Paying Agency, Castilla y León, Spain) presented the practical experience from Spain from using the Sen4CAP products. The PA of Castilla y León was one of the pilot cases of Sen4CAP, and it incorporated the project's products in its Checks by Monitoring procedure in 2019. Sen4CAP provided a downloading tool for Sentinel 1, 2 and L8 images, a pre-processing engine for Sentinel 1 and 2, a toolbox of validated algorithms and workflows to compute markers for agriculture monitoring and a vector intersection with data from the previous processes. These tools offered the PA another point of view to make a decision on some inconclusive parcels and it is foreseen that new markers from Sentinel 1 will be defined in the future. The conclusions from the pilot experience were that Sen4CAP provides interesting products to produce markers within a Checks by Monitoring framework, and additional information that improves decision making. A final challenge is the integration of Sen4CAP's markers in the administrative part of IACS.

Link to the presentation:

[Checks by Monitoring and the use of Sen4CAP products: Castile and León \(Spain\)](#)

SEN4CAP in Denmark, Naya Sophie Rye Jørgensen

Ms Naya Sophie Rye Jørgensen (Paying Agency, Denmark) presented the experience from applying Sen4CAP in Denmark. Although Denmark was not one of the pilot cases of the project, the Danish PA was interested in testing the products of Sen4CAP to analyse if they could improve its CAP monitoring system. The Danish monitoring system is already using Copernicus data to calculate land cover and vegetation indices. Satellite analysis is being conducted on crop classification, ploughing, mowing and non-compliance classification. Sen4CAP can potentially complement this analysis with maize harvest and tillage detection. The PA is currently assessing these two tasks by combining several markers from Sentinel 1 and 2. Validation showed that the accuracy of the data was very high. In the future, Sen4CAP products could be used for crop classification, monitoring of Ecological Focus Area (EFA) practices, detection of mowing and grazing and creating a marker database. In general, these products would be useful for individual tasks such as catch crop and maize harvest, which are not part of the automated setup in Denmark.

Link to the presentation:

[Sen4CAP: Application and evaluation in Denmark](#)

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



How easy or complex was it to integrate markers in IACS with the Sen4CAP system in the pilot countries?

Only Spain integrated in IACS. Mr Gutierrez explained that the integration itself was not difficult. The most difficult part is to make the software running but support from the Sen4CAP team is provided.

Are markers derived from training areas to enable supervised classification of sites and dynamics or are they just benchmarks?

Mr Gutierrez explained that the markers are a concept introduced by the Joint Research Centre. They constitute a kind of properties in the sentinel signals that can help monitoring or identifying practices or crop types. The Spanish database is a way to interpret these markers. For example, the markers will be classified with artificial intelligence with respect to crop type. In other cases, there is no artificial intelligence, but a weekly assessment. Markers constitute an interpretation of the meaning of the signal.



What are the costs for a Paying Agency to implement such a system?

Mr Gutierrez explained that Sen4CAP is an open-source software. Paying Agencies can install it and take advantage of all the products. Hardware/cloud computing cost depend on follow-up actions, but a cost analysis has not been performed so far.

Ms Bontemps clarified that the objective of the project was not to provide a solution that is already fully parametrised and fully operational. It is a tool that provides the basis, and open-source for installation. There will always be some fine-tuning needed for each Member State.

Has Sen4CAP been used or linked with FADN data?

No, Sen4CAP does not have any links to FADN.



What kind of data needs to be delivered by the Paying Agency to make the system work? For example, in the case of geotagged photos from Lithuania: is it necessary that the Paying Agency really delivers that kind of detailed information to get the most out of the system?

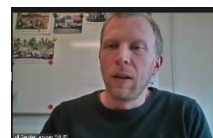
Ms Bontemps explained that the geotagged photos are not an input for the system, but they have been used to validate specific products generated by the system.

Mr Gutierrez clarified that the main input that Sen4CAP needs is the geospatial declaration from farmers, so that the system can run all the processors mainly to derive the crop type map. The geotagged photos are out of the scope of Sen4CAP.

2.1.2. Experience from NIVA

Project overview, Sander Janssen

Mr Sander Janssen (NIVA, Project coordinator, Wageningen University & Research) presented the NIVA project: 'Digital Innovations in IACS systems and their relevance for monitoring and evaluation'. The objective of NIVA is to analyse and propose how IACS could be modernised and improved for the new CAP, partly through the use of Earth Observations. NIVA applies the technological innovations from a range of projects, incl Sen4CAP. Beyond that, it aims to improve the farmer performance assessment, which is measured through indicators at the farm level. The long-term vision is to move from an annual cycle towards a multi-annual evaluation of agri-environmental and climate measures. The involvement of stakeholders, especially farmers, is necessary for that purpose. From the experience of NIVA, it was concluded that IACS is very valuable to assess indicators but needs further development in terms of format, accessibility, dynamism of parcels and harmonization in order to be useful for analysis. Furthermore, data sharing from and towards IACS systems is a key practice for better evaluation.



Link to the presentation:

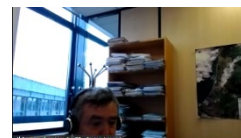
[Digital Innovations in IACS systems and their relevance for monitoring and evaluation](#)

For more information on NIVA, you can visit its website:

<https://www.niva4cap.eu/>

NIVA in France, Emmanuel de Laroche, Ludovic Arnaud, Christian Bockstaller

Mr Emmanuel de Laroche (Paying Agency, France), Mr Ludovic Arnaud (Paying Agency, France) and Mr Christian Bockstaller (INRAE - National Research Institute for Agriculture, Food and Environment, France) presented the work on agri-environmental indicators in the context of NIVA. The French PA is implementing a use case of NIVA, focusing on proposing agri-environmental indicators. A multi actor approach has been applied to develop the indicators, including the development of the software, processing the data, and discussing the relevance of results. Three relevant indicators for the objectives of the next programming period have been selected: carbon storage, nitrate lixiviation and biodiversity. The indicators are based on Sen4CAP standards and developed in open source. A 3-Tier approach has been used with the aim to extend the system all over the EU. The indicator on carbon at



Tier 1 level is available and was successfully tested in France, Spain, Denmark and the Netherlands. Tiers 2 and 3, which are under development, will offer higher levels of accuracy, although they require additional data.

Link to the presentation:

[NIVA in France: Agri-environmental indicators \(UC1b\)](#)

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



IACS data is very useful for indicators, but it is still not ready for analysis. Could more detail be provided?

Mr Janssen explained that IACS data was collected for the purpose of payments, not for indicators. Hence some things need to be adjusted as it is tricky to use the same data for different purposes. For example, if you need yearly data for the carbon indicator that was tested in France, you need to decide what parcel reference to use.

How uneven was the situation in terms of data and information series in the different Member States or project partners? How were these challenges addressed?

Mr Janssen explained that a digital cross comparison)¹ analysis was performed to check what aspects are more progressive in one Paying Agency or in another. There is a strong digitalisation happening. The NIVA project is showing that there are differences in the technical implementation and governance of the IACS system in the Member States. Some Paying Agencies have strong Information Technology (IT) departments, others outsource IT to private actors. There is the technical side and also the organisational side which affect how innovation is dealt with and how it can be implemented. Pathways to see how this can work in the future will get clearer.



All the collaborations are between research institutes and Paying Agencies, as Paying Agencies are the main data providers. But if the projects are to be used for evaluation, more Managing Authorities should be included in these partnerships. Paying Agencies are interested in monitoring and checks, while Managing Authorities are responsible for evaluation. For instance, it could be good to include the intervention aspects in these projects.

Mr de Laroche described that all Paying Agencies in all the Member States will eventually have to implement this monitoring system in the coming years, as it has to be operational in 2023. However, Member States do not know yet how the system of sentinel data will be used concretely. This will depend on the measures that will have to be monitored for the next programming period. However, a lot of these markers need to be collected for the purpose of monitoring anyway. As IACS data is available, the

¹ ASIS is an open and published callable interface between an Ada (programming language) environment, which includes valuable semantic and syntactic information, and any tool requiring information from this environment. (ISO/IEC 15291:1999)

monitoring data should also be available for the purpose of evaluation. Contact needs to be made between PA and MA to ensure that data is accessible.

NIVA has computed data related to three agri-environmental indicators. Has the project also provided the indicator values then to evaluators so that a pilot could be done on how to answer Common Evaluation Questions by making usage of these three new agri-environmental indicators? Is there a possibility that evaluators in France can make use of these values and make a test, to prove the robustness of these indicators and the purposefulness to answer the Common Evaluation Questions?

Mr de Laroche explained that the NIVA project embarked on a multi-actor approach, including the Managing Authorities or the competent authorities of the Ministry of Agriculture; however, so far, there was not a real process or requirement concerning evaluation purposes. Currently, there is a loop with farmers and with the biodiversity agency, but with the MAs, the loop has not been completed yet. In any case, MAs should be amongst the main users of these indicators too.



Were the calculation of these three indicators made for beneficiaries of RDP measures or in general?

Mr de Laroche clarified that the calculation was done in general. It was not performed for the purpose of the support of a specific aid. In the case of carbon storage, the calculation can be used also for the private sector because there is a market for carbon in the EU that has been open for agricultural activities. Mr Bockstaller explained that for the three indicators, it is an exercise to introduce the best compromise between scientific knowledge and data availability.

Evaluators are interested in using these first steps and findings. To evaluate Pillar I, evaluators will face a big challenge. NIVA experience could be a very good way to approach answering the Common Evaluation Questions. The transition period can be used to test this approach.

Mr de Laroche agreed that the current Good Practice Workshop was indeed the opportunity to make the link between research and evaluation.



2.2. Day 2 - Experiences from EU level projects aiming to improve the scope and quality of indicators for evaluation of the CAP

2.2.1. Experience from FLINT

Project overview, Hans Vrolijk

Mr Hans Vrolijk (FLINT, Project coordinator, Wageningen University) presented 'FLINT: Farm Level Indicators for New Topics in Policy Evaluation. Monitoring and evaluation of sustainability goals'. FLINT focuses on the current and future CAP sustainability and environmental objectives, and it aims to demonstrate the feasibility of collecting policy-relevant data in different administrative environments and how new farm level indicators can be used to evaluate and improve the targeting of policies. Environmental, economic and social indicators have been selected and defined. The additional collection of data for these indicators can be connected to, and therefore complement, FADN. This is important to analyse the cost effectiveness of policies and to evaluate the synergies and trade-offs of policy measures on the economic, environmental and social performance of farms. The conclusions from the FLINT experience are that the collection of additional data in the scope of FADN provides advantages for farmer participation and quality assurance, although it demands extra financial and human resources. The additional FLINT indicators on sustainability topics were used in several evaluation to prove the value for policy analysis. A recommendation for Member States is to collect FLINT data on a subsample of farms.



Link to the presentation:

[FLINT: Farm Level Indicators for New Topics in Policy Evaluation](#)

For more information on FLINT, you can visit its website:

<https://www.flint-fp7.eu/>

FLINT in Ireland, Trevor Donnellan

Mr Trevor Donnellan (Teagasc - Agricultural Economics and Farm Surveys, Ireland) presented the lessons learned from the implementation of FLINT in Ireland, including the country-level needs assessment and identified data needs on social and environmental data in Ireland. The project provided guidance on methodology and a better international comparison. Social and environmental sustainability indicators were developed, and consequently the collection of data on these topics has been expanded. Some lessons from this experience include: the need to reduce duplication in data collection; the importance of combining datasets and taking into consideration the frequency of data collection; the importance of the personal relation between the data collector and the farmer due to the sensitivity of social data; and the need for timely data collection. At the same time, it is important to ensure the collection of diverse environmental data to address multiple environmental data needs.



Link to the presentation:

[Evolution of farm data collection in Ireland The lessons that have been learned](#)

FLINT in Hungary, Szilárd Keszthelyi

Mr Szilárd Keszthelyi (AKI - Institute of Agricultural Economics, Hungary) presented the FLINT data collection experience in the Hungarian FADN. FLINT contributed to complement data collection on sustainability in Hungary. The additional data was useful to calculate GHG and ammonia emissions, for agricultural policy and rural development evaluation. The characteristics of the Hungarian data management system allowed a good integration of FLINT's input, mainly a good partnership with data collectors, a data recording system ready to implement new data collection, and two extra data collections per year. From the Hungarian experience with FLINT, a positive conclusion was that the collection of data in the scope of FADN provides advantages in terms of farmer participation and quality assurance.



Link to the presentation:

[Flint data collection experience in Hungarian FADN](#)

2.2.2. Experience from MEF4CAP, Hans Vrolijk

Mr Hans Vrolijk (MEF4CAP, Project coordinator, Wageningen University) presented 'Monitoring and Evaluation Frameworks for the Common Agricultural Policy. Integration of needs and opportunities.' MEF4CAP aims to identify future needs for sustainability information from different stakeholders in the agri-food sector and connect them with technological developments to improve monitoring. MEF4CAP builds on several other EU level research projects, e.g., satellite innovations from projects such as SEN4CAP and FLINT to modernise farm level data collection in the scope of FADN and the proposed FSDN. The project is implementing four demonstration cases to explore the potential of new technologies: benefitting from increased digitalisation of financial/administrative processes in the agri-food sector and the voluntary exchange; addressing limitations of Earth Observation addressed with sensor networks at farm level; linking national datasets for a broader use in policy evaluation and integrating agri-environmental data for different purposes. For example, one of the cases is exploring solutions to collect information from different existing sources for the certification and inspection in organic farming. Through these demonstration cases and the assessment of potential and limitations, MEF4CAP will connect future needs with technological opportunities and will contribute to the development of better CAP evaluation frameworks.

Link to the presentation:

[MEF4CAP: Monitoring and Evaluation Frameworks for the Common Agricultural Policy](#)

For more information on MEF4CAP, you can visit its website:

<https://mef4cap.eu/>

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



FLINT indicators are maybe suitable to evaluate the cost-effectiveness of measures. Are there any cases in the FLINT practical applications on this?

Mr Vrolijk explained that cases exist from the perspective of the Netherlands, where there is a big challenge with respect to nutrient balances and there are serious policy objectives for reducing nitrogen and phosphate surpluses. Technical measures can be analysed, as well as the different scenarios in which nutrient surpluses are reduced. Then, it is easy to calculate which package of measures would result in a certain decrease of surpluses and what the economic consequences of these packages are. In

this way the most cost effectiveness of policy measures can be evaluated. The same analysis would apply to national emission ceiling: to what extent are different scenarios possible and what are the different consequences of these scenarios.

The FADN data set has been designed to be representative for the economic dimension. If now the environment is considered, what about the representativity?

Mr Vrolijk explained two aspects of FADN: First, FADN is a sample to evaluate agricultural policies based on farm size and the type of farming. For an environmental sample, these would very likely be stratification variables. Second, in relation to field of observation, FADN looks at farms above a certain economic size because they are affected by the agricultural policies. FADN is primarily a tool to evaluate these agricultural policies. If we come to the conclusion that all kind of environmental objectives and agricultural policies address also smaller farms, then there should be a discussion to change the field of observation of FADN. So stratification is not a real issue, but there could be a discussion on extending the field of observation.



Regarding data collection typologies: what was meant with 'own staff data collection'?

Mr Vrolijk clarified that FADN systems differ amongst the 27 Member States. In a couple of cases, the task of the FADN is within institutes which have their own staff to collect the data (e.g., IE Teagasc, but also NL). This is what is meant. Staff from the institute that is responsible for FADN data collection.

Regarding the running cost that would increase by 40%: who could take care of this cost? Would it be on the farmer?

Mr Vrolijk clarified that this was an estimation of the cost increase. It depends on the Member State and on the kind of data collection. If the question is who is going to pay for this, the answer should definitely not be the farmer. It should be the Member State or the European Commission who would pay for the costs. Compared to the CAP spending, it is still a limited amount, so it would make sense to finance these costs from the European perspective. Some scenarios in which the data collection could be financed by reducing the sample size in Member States have been calculated.

Mr Vrolijk explained that the list of indicators was made before the Green Deal. The main message is that it is possible to adapt this data collection to new



In the project, a lot of elements of future strategies for rural areas are added, (e.g., elements of Farm to Fork Strategy or the Water Directive). It is very important to include not only the environmental aspects but also social sustainability: where elements of social strategies and other policies also included?

topics in policy evaluation. The advantage would be, now that we have the Green Deal and the Farm to Fork Strategy, to prioritize and shorten this list of indicators to reduce costs.

In the Hungarian case, how easy it is for farmers who opt for the logbook system to adapt to this system?

Mr Keszthelyi explained that what is known so far is that the quality of the data still needs to be improved and farmers currently do not register everything in this logbook. However, the information that is available now is just the basis and the system can be improved.



Regarding the 'rural vitality' or 'quality of life' of the Irish case: is this information taken only from farmers, or is there a kind of survey conducted in rural areas covering more profiles for this social indicator?

Mr Donnellan clarified that the information is only taken from farmers as the focus of study does not extend beyond agriculture, i.e. the wider rural economy is not specifically examined.

Regarding the neutrality of FADN, in the Hungarian case, the information that is being collected already benefited by a kind of support: to what extent can it be considered that the sample is being biased for these environmental indicators?

Mr Keszthelyi agreed that there is a kind of bias in this sample, this is taken into account and now there is the task to eliminate the bias, there are processes with the FADN sample to increase its quality.



How is the information that will be necessary for the FSDN collected? For example, the information on soil, which needs to be collected on the field, and not via administrative forms. Furthermore, regarding the information that is collected from administrative sources: what are the points of collection?

Mr Keszthelyi explained that everything that is not administrative information is asked on the spot from the farmer. Regarding the data quality and the weighting scheme, the weighting of the indicators is different from the EU calculation of absolute values. However, statistically it can be proved that the Hungarian national weighting scheme is better than the EU weighting scheme.

Mr Donnellan clarified that the project has access to some administrative data. The challenge at the moment is General Data Protection Regulation (GDPR) issues, as the data that is currently being collected in the short term is a lot more data than the one required for FADN, so there are questions like: why should this data be collected, is there an

obligation coming from the European Commission? Since this is not the case, there is more effort required in order to negotiate legitimate access to administrative data for research purposes. A relevant FSDN regulation, providing a basis on which to seek such data, would be extremely helpful.

Mr Vrolijk further explained that the main advantage of the FLINT approach is that there is a direct contact with the farms, and it is possible to make use of the GDPR because it also prescribes some rights for the farmers to make use of the data.. If the farmer agrees to share the data, the institution who collected the data should facilitate the re-use of the data.

A lot of this data can be obtained from single applications. Any comments?

Exactly, farmers can be asked for forecasts in very different fields, like business plans. These can be later compared with real outcomes with simple Analysis of variance (ANOVA) tests. The problem is that administrations hesitate to put that burden on farmers. (Question answered by a German evaluator).



Ideally, the survey would be one consolidated survey with the same population sample. Can data be collected on all indicators? To what extent does the administrative burden on the farmer increase? How willing are farmers to provide data?

Mr Donnellan explained that the project has tried to reduce as much as possible the number of questions to farmers. This is done by gaining access to administrative data. They have tried to –pre-populate parts of the questionnaire with data from other sources, therefore allowing the amount of other data (social and environmental) that can be collected to be increased, without increasing the burden on the farmer. Overall, it is a difficult balancing act. Farmers may become impatient about the amount of time. The increase has been done on a very gradual basis, trying to limit the amount of data requested from the farmer by considering what data exists elsewhere, and seeking where possible to only ask farmers questions that they alone can answer.

Through the FADN, FLINT collects data on the global performance of the farm and not about a specific investment. Therefore, how is the attribution gap dealt with? Can it be considered in this case that farmers are the right persons who know the complexity of the investment and who can therefore deal with the attribution gap of the investment?

Mr Donnellan clarified that farmers are not asked to establish this relationship.

2.2.3. Experiences from VERIFY and MIND STEP

Experience from VERIFY, Philippe Peylin

Mr Philippe Peylin (VERIFY, Project coordinator, Climate and Environment Sciences Laboratory) presented 'VERIFY: Observation-based system for monitoring and verification of greenhouse gases'. VERIFY aims to improve the methods, data availability and data quality to calculate GHG emissions and sinks for European countries. A verification system has been developed to estimate CO₂, CH₄ and N₂O based on land, ocean and atmospheric observations. These estimates are compared with the reported fluxes by Member States to the United Nations Framework Convention on Climate Change (UNFCCC). The resulting operational data flow includes annual updates of GHG national inventories and VERIFY estimates, which will allow policy makers and evaluators to access synthetic information in the form of GHG flux synthesis (including different approaches) for each country.



Mr Dimitris Skuras (Evaluation Helpdesk Thematic Expert) reflected from the point of view of evaluation on the outputs of the project. Mr Skuras firstly highlights VERIFY's achievements: VERIFY quantifies the sinks and sources of GHGs in the land-use sector and is able to track land-based mitigation activities. Furthermore, VERIFY produces practical policy-oriented assessments of GHG emission trends, as well as emissions time series and gridded maps for different activities and gases. Mr Skuras further acknowledged the possible use of VERIFY in the process of policy evaluation. The time series can constitute an analysis for revealing and assessing policy impacts (e.g., Changes in trends of GHG fluxes), as well as discontinuity analyses and breakpoint detection. Gridded maps can be used in spatial statistics modelling, to reveal the potential impact of regional / local policies.

Link to the presentation:

[VERIFY: Observation-based system for monitoring and verification of greenhouse gases](#)

For more information on VERIFY, you can visit its website:

<https://verify.lsce.ipsl.fr/>

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

Is the data resolution level of VERIFY the national level? Is there a plan to enhance the resolution to a small-scale grid level? The Sentinel 5b imagery provides this data.

Mr Peylin clarified that behind the time series and the gridding scale with different resolutions, for CO₂, the project has run the bottom-up level resolution of 10 km across Europe. For now, the GHG emissions are still associated with large uncertainties, because there is some noise, so there is more confidence in discussing integrated control at a larger scale. Some information can be provided at a smaller scale, but there is a strong caution not to oversell the product.



Linking VERIFY to the NIVA presentations with Tier 1, 2 and 3 approaches, which Tier is underlying these calculations?

Mr Peylin explained that most advanced countries that have the largest statistical facilities used up to Tier 3. Tier 2 involves statistical data specific to the Member State, and Tier 3 relates to having regional or more complex model data. The bottom-up approach used by VERIFY relates to Tier 3. However, the models used by the project are not exactly used by the inventory agencies even if they use a Tier 3 approach. For the forest sector, the VERIFY approach is quite precise at smaller scale because it also relies on national forest inventories.

The intention of the European Commission is to have tools that are also applicable to countries outside the EU.

One of the most crucial points of the Green Deal is climate neutrality. Could VERIFY project tools be applied to this issue?

Mr Peylin clarified that the VERIFY project can contribute to the global collective progress towards the target of emissions. In this context, the methodology can be useful.



Regarding evaluations and data, it was a challenge during the project to bring communities together. There should be an overall willingness to open up to new approaches and increase awareness of the meaningfulness of the work that is being done.

Experience from MIND STEP, Marc Müller

Mr Marc Müller (MIND STEP, Researcher, Wageningen Economic Research) presented 'MIND STEP Project: Data requirements for indicators on European policies related to agriculture and data management'. MIND STEP aims to improve agricultural policy analysis by developing Individual Decision Making models, as well as improving policy monitoring by developing an integrated data framework. The project is currently designing and setting up database specific interfaces. These standardised interfaces will be developed for Farm Economic Databases such as FADN and National Farm Statistics, as well as for bio-physical databases/large scale data. Solutions proposed by MIND STEP are improving data storage and processing capacities, creating version control systems and continuous integration. The transferability of MIND STEP products depends on the data protection regulations of each Member State, since it relies on parcel level data linked to individual farms.



During the discussion that followed, Mr Müller stressed that MIND STEP hopes to address the needs from other data users by combining FADN data with non-FADN data to fill gaps, to have detailed information available, and to make use of publicly available information. Users of FADN data can be potential users of MIND STEP's methods. MIND STEP is developing also software solutions like fadnUtils and not only conceptual linkages. These software solutions are intended to be published as packages for the R programming language, which is widely used in statistics. Once you have data from FADN you can combine it with data from other sources through standardized approaches.

Link to the presentation:

[MIND STEP Project Data requirements for indicators on European policies related to agriculture and data management](#)

For more information on MIND STEP, you can visit its website:

<https://mind-step.eu/>

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



How costly would it be for a Member State to integrate databases? Do you already have mapped the interest of authorities in doing so?

Mr Müller acknowledged that the costs related to the collection of FADN data and combining different types of information are unknown. Probably, the monitoring cost would not be an issue, but certain administrative boundaries can be more difficult to overcome, statistical organisations might not always cooperate easily, as they are also restricted by legislation. It could be consulted how much personnel within MIND STEP has been dedicated to combine those datasets.

You mentioned that this farm level model was developed by Bonn University. Who is the audience, who uses it?

Mr Müller explained that the FarmDyn model is used for particular agri-environmental research questions. It started being applied to answer questions such as GHG emissions related to the dairy sector in Germany, or the level of phosphate emissions from the pig sectors. FarmDyn results are typically published in scientific journals or forums, but not necessarily in publications addressing general audiences. Apart from the University of Bonn, Wageningen Economic Research and the Centre wallon de Recherches agronomiques use FarmDyn. The other individual farm level model in MIND STEP is IFM-CAP, which was developed by JRC Sevilla and is calibrated to all FADN farms. FarmDyn is richer in technical detail, not only concerning labour requirements for field operation but also the feed requirements of animal herds and crops.



You elaborated a handbook, who uses it, who is the target group? Will it be publicly available on the website of the project?

Mr Müller clarified that the handbook is being written for the project itself. Because of the high numbers of partners in MIND STEP, it is necessary to agree on standards to process the data. The handbook includes, for instance, fadnUtils as a R-package that can easily process FADN data.

The handbook is a deliverable of the project MIND STEP project and could be released for public download as in the case of previous projects like SEAMLESS (System for Environmental and Agricultural Modelling; Linking European Science and Society) Wider audiences could be interested in that.



Something important for people that work with FADN is that the different tools to work with data provide the necessary protection of individual data. Would that be possible in MIND STEP? Many times, we have to ask a farmer that is taking part on the survey, information that is

Mr Müller agreed that data protection is an issue. In the Netherlands, researchers with valid research interest may apply for permission to combine certain datasets at farm level, although the publication of the derived results remains constrained. This is not possible in many other European countries. The current perspective is that it is not practical to frequently ask individual farmers for their consent. For

personal, about loans for example, and it is very important that this information is protected.

instance, obtaining location data is very sensitive for data protection. Farmers can be asked for permission to use location data, but that is a lot of work and probably problematic. Therefore, it appears to be better to derive probabilistic estimates for a farm to be located in a certain agro-ecological zone. This will be tested for Germany and possibly the Netherlands in the MIND STEP project.

It would be interesting if you have a practical output, do you have an example from the Netherlands when the evaluators have already used it?

Mr Müller explained that the output is being developed, therefore that type of example is not available now. The handbook will be finished by the end of April and it is still unknown if it will be disseminated and who will use it. This is still work in progress. What is already known is that JRC who is a partner in the project, has a clear interest in using the handbook.



Is it possible to use behavioural model as a baseline to compare with CAP beneficiaries?

Mr Müller explained that the behavioural specification of the individual decision models to evaluate, for example, the willingness of farmers to participate in certain CAP programmes or invest in new management practices, will be improved. This could be used to evaluate the uptake rate by groups of CAP beneficiaries.

In Member States where that data at individual farm level is not available, is there any alternative way to collect the data or use the model?

Mr Müller clarified that the MIND STEP project does not suggest better ways to collect data. It rather points to data gaps and proposes methods to close them based on existing information. Statistical organisations may take this as a suggestion to close data gaps directly.



3 CONCLUDING REMARKS

The outcomes of the discussions on the EU level projects presented at the workshop, their practical application and expert input, together with the group discussions, provided insights on their potential transferability. The detailed outcomes of the group discussions in relation to the transferability of the EU projects' outputs and experiences are included in the **Annex**. It includes the elements that are relevant for evaluation, the potential for transferability (criteria and obstacles for transferability) and aspects that need further clarifications stemming from some open questions arising from the discussions.

Criteria that may facilitate the transferability of EU level project outputs

- **Adaptation of systems and tools.** One of the key factors is to identify and implement the necessary adaptations of existing data collection and monitoring systems. These may relate for instance, to the identification of additional or different data points for measurement, the inclusion of additional or different collection frequencies or broadening the sample type or size.
- **Development of methodologies for facilitating transferability.** On the one hand, methodologies for data collection such as the creation of data registers for the collection of specific data or standardised collection of spatial and micro data may be more applicable in different contexts. Projects that offer a standardised methodology for data collection or indicator development may be easier to transfer. On the other hand, evaluation methodologies would need to consider the use of the indicators developed by these projects, for instance, the sustainability indicators proposed by FLINT or the agri-environmental indicators in NIVA.
- **Involvement of MAs and evaluators.** The EU level projects presented at the workshop involve mainly Paying Agencies. MAs are also important users of the data particularly for evaluation purposes and should be involved in projects that deal with data management and information systems. A good starting point is when MAs design interventions as at that stage they can also decide what monitoring data is needed as well as data for assessing their contribution to programme or CAP objectives when conducting evaluations at a later stage. Evaluators can potentially also be involved from early stages, for instance, when markers databases are created, they may discuss markers that are useful for evaluation. Overall, a closer collaboration between MAs and evaluators who are evaluation stakeholders and researchers who are both users of data (Sentinel data, farmer data, etc.) and tool developers, may facilitate the transfer of these experiences at Member State level for evaluation purposes.
- **Training and transfer of knowledge.** Training may be required on the use of new data, new systems or new indicators developed. Similarly, the transfer of knowledge can also be achieved through the events already organised in the context of these EU level projects or other events or meetings tailor-made to the needs of MAs and/or evaluators.
- **Managing the burden to farmers.** Implementation of data collection approaches at Member State level should take into account the interests of farmers and the potential burden on them. The so-called 'use cases' of these EU level projects at Member State level stress the need to strike a balance between how much information can be asked from farmers (often sensitive personal information) and how much is already available through other sources. Data collection 'for' the farmer and not only 'from' the farmer has been at the core of these projects, thus ensuring that where possible any potential 'burden' serves the wider purpose to use data for developing/improving policy.

Potential obstacles (and some solutions) to the transferability of EU level project outputs

- **Data sharing of data already collected.** This is a big challenge given that there is some unwillingness on the part of organisations to share datasets in the mistaken belief that to do so is a breach of GDPR. In fact, GDPR sets down the appropriate rules that should be followed so that data can be legally shared.
- There are **potentially high costs** associated with collecting data and extending databases such as FADN or with data storage (e.g., cloud storage for processing large amounts of data) and maintenance. The combination of data sources and the creation of database interfaces may be a solution around this problem. However, these costs need to be analysed in relation to future gains, therefore a cost-benefit analysis is also relevant here.
- All these research projects require a **high level of technical expertise**, e.g., for spatial statistical modelling, farm level modelling or for designing some highly complex environmental indicators. This could be overcome with the training and knowledge transfer mentioned above, including involvement of relevant staff from MAs who could identify the technical aspects they need to manage before using the project outputs.
- **Technical difficulties** may be encountered, e.g., in defining the correct level of spatial resolution of satellite data, carrying out Tier 3 calculations and overcoming uncertainties, using different proxies for different areas, matching data from different databases, using certain software in different Member States, etc.

Despite the identified relevance for evaluation of these EU level projects, some open questions still remain in order to assess the extent to which they are transferable to Member States for evaluations of the CAP. Data accessibility issues need to be resolved so as for MAs and evaluators to be able to access data at the required level and overcome any privacy restraints. The interoperability of databases is questionable when it comes to combining FADN and IACS, while the costs involved in collecting, storing and managing large amounts of technical data are still unclear. Furthermore, the relevance of the new datasets and indicators for conducting counterfactual analysis remains to be seen. Finally, the involvement of MAs is a key concern, notably how to operationalise cooperation between PAs and MAs in the context of these projects or between Pillar I and Pillar II actors in view of the integrated CAP of the future.

The experiences from the EU level projects presented and discussed at the workshop will be further explored by the current Thematic Working Group '[Research Projects to Support Better Data for Evaluating the CAP](#)'. The Thematic Working Group is developing a knowledge bank of outputs from these and many other EU level and national research projects by emphasizing their potential relevance for monitoring and evaluation of the CAP and their usefulness in terms of providing additional data sources, databases, indicators and evaluation methods.

ANNEX

The presentations of the EU level projects were followed by smaller group discussions, where participants had the opportunity to debate and discuss the relevance of the projects for evaluations of the CAP and their potential for transferability at Member State level. The outcomes of the group discussions are presented in the following tables, together with some open questions that still remain to be addressed in order to transfer the project's outputs at Member State level. The outcomes of the discussions and open questions will be further explored by the current Thematic Working Group of the Evaluation Helpdesk on 'Research Projects to Support Better Data for Evaluating the CAP'.

Annex I: Transferability of Sen4CAP for evaluations of the CAP

Relevant elements for evaluation
In a nutshell: Sen4CAP outputs are made to facilitate the inspection for compliance process but have the potential to provide a source of new data for monitoring and evaluation, especially for environmental measures, that can contribute to evidence-based policy making.
Useful for data on agri-environmental measures for tillage and for eco-schemes , making it possible to measuring things that could not be monitored before. Work to be done with other types of crop as well.
Allows to learn dynamic features of agriculture instead of just static images. This would incentivise the implementation of agri-environmental measures. Currently, some MAs would not implement agri-environmental measures because they cannot monitor them.
<p>Markers database is useful for evaluation (especially environmental indicators):</p> <ul style="list-style-type: none"> • Markers can be used for evaluating environmental impacts of RDP. Especially: soil erosion of various farm practices. Linked to LPIS. If identified at parcel and farm level, it can be used in evaluations for soil erosion, organic matter, etc. • Markers have been used for monitoring crop status. They have also been used for the evaluation of the COVID-19 response, to see when certain activities happen at parcel-level and see how evaluation practices are affected by the circumstances.
The progress with new generation of satellite data is huge and will further improve. For instance, the classification of space (by remote sensing and satellite data) is extremely helpful because it enables running evaluations with spatial monitoring and spatial econometric models independent of administrative borders.
It allows to scale up the data collection and it is applicable to both Pillar I and Pillar II.
<p>Sen4CAP brings out the importance of open source. Participants of the workshop highlighted other open-source databases that may be useful in evaluation:</p> <ul style="list-style-type: none"> • For example, VIIS from the NOAA (US spatial monitoring), other SEDAC COVID-19 Viewer. These are tools that help visualize data and populations at very low scale. • In DE: H2020 Rural-urban outlooks. This project looks at how space is evolving. More information at: www.rural-urban.eu

Potential for transferability	
Criteria for transferability	Obstacles to transferability
<p>System adaptation:</p> <p>Explore the match with the current system being used and carry out the necessary adaptations.</p> <p>Training:</p> <p>In-house expertise and training may be required on the use of the data, including with support from Sen4CAP experts. Resources (human, time and financial) are required for the development of robust data systems.</p> <p>Involvement of MAs:</p> <p>Involve the MAs (not only the PAs) as they are also important users of the data particularly for evaluation purposes.</p> <p>The Sen4CAP data is useful for the MA to have in mind when designing interventions and commitments for agri-environmental interventions:</p> <ul style="list-style-type: none"> • Combining with appropriate commitments, e.g., when the MA designs commitments, what kind of monitoring can take place should be taken into account to follow compliance and implementation. • By using the information generated by the tool to group land management it is possible to see where certain commitments have taken place and where not. • Denmark was able to make judgement at parcel-level. Remote sensing was used to find out what is happening at parcel level and make decisions on administration. In the obtained images, parcels were coloured in green, yellow or red according to compliance. <p>Involvement of evaluators:</p> <p>If PAs are currently integrating Sentinel-data for the monitoring and evaluation of the CAP post-2020, evaluators should link to them, to discuss useful markers for better evaluation.</p> <p>Good knowledge of the relationship between the information of projects like Sen4CAP and the objectives of the RDP:</p>	<p>Data privacy:</p> <p>There are large differences between MS on the rules for sharing parcel data, some are more open than others. In some MS, farmers are reluctant to share their information.</p> <p>GDPR is sometimes used as an excuse for not sharing data that could be shared.</p> <p>Need for high expertise:</p> <p>Requires a lot of expertise at the PA level or a group of experts who know how to use information.</p> <p>Limitations of the outputs:</p> <p>Markers are not enough, there are many other factors to consider, and adaptations required for the tool to meet CAP requirements.</p> <p>Potentially high costs:</p> <p>Cost of cloud storage for the processing of the data – for example, in the pilot case in Castilla y León it was necessary to use 11 TB for storage. Maintenance costs may be high too.</p> <p>Technical obstacles:</p> <p>Input from the sampling fields was not perfect. Whether the 10 meters spatial resolution of the satellite data is actually sufficient for the purpose of assessing the environment (e.g., eco-schemes) is questionable.</p>

<ul style="list-style-type: none"> • The markers and information should somehow relate to the objectives that need to be evaluated. • How can the data of Sen4CAP be used to know if a certain objective is met or not? <ul style="list-style-type: none"> ➤ Information on, for example, if there is risk of soil erosion in a parcel. ➤ Information on the irrigation of the parcel and the water that is available in the parcel: then it is possible to evaluate implementation and objectives. 	
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Aspects that need further clarifications

Accessibility: It is unclear who has access and what are the privacy restraints. Access to data may be problematic if not involved with an agency or data provider.

Costs: It is unclear what are the costs of maintenance for the PA.

Topics covered: Whether it addresses data management issues in other areas beyond the environment.

Need to further clarify the link to evaluation: There is a need for a better picture of how these projects can actually be taken on in other Member States and how the MAs can use the outputs, through for instance, awareness raising and further networking between researchers, PA and MA.

Legal aspects: How can the database be integrated into IACS or what is the legal interoperability (as in NIVA)? It is also unclear whether there is a legal obligation for the PA to better use the Sentinel data as of 2023 (e.g., monitoring of conditionalities not possible without satellite images).

Quality of data: Need to clarify whether data can be improved and what the quality depends on.

Annex II: Transferability of NIVA for evaluation of the CAP

Relevant elements for evaluation
In a nutshell: NIVA offers tools and data for indicators at the farm level that can be useful for evaluators. The IACS is a robust system on which to build data systems. Its objective is primarily for monitoring purposes but its link to other systems is allowing for the development of enhanced data that can be used in evaluation of the CAP.
Useful for the ex ante evaluation of the CAP. NIVA offers the possibility to test the policy in advance if data and indicators are available (e.g., test potential eco-schemes), through an integrated modelling approach. It can help for an ex ante assessment of what crops the farmer would need and model potential weather effects.
Potential for indicators. NIVA offers the potential to be used for biodiversity, but also the possibility to build own indicators, especially for the analysis of the new eco-schemes.
Access to farm level data. NIVA provides data on the management of the farm which is not easily available. Such data systems are relevant for evaluators provided that they have access to data. External evaluators in particular tend to face difficulties in accessing data, particularly at the micro level, due to data privacy regulations.
Standardised methodology: NIVA standardises the methodology while building indicators so data is available throughout EU and enables comparability at EU level. At the same time, the Tier system helps to address the complexity.
The NIVA output is useful to cross check Tier 1 coefficients (calculated by evaluators) and see if these are appropriate in the MS situation.
Satellite imagery can be useful to obtain data in the context of the future CAP Strategic Plans. In some countries it is used on a smaller scale and will be expanded.

Potential for transferability	
Criteria for transferability	Obstacles to transferability
<p>Adapting the NIVA solutions and tools:</p> <p>It is important to know and reduce uncertainties in the calculations, in order to use NIVA.</p> <p>It is also important to have more data points (a lot of work for each parcel).</p> <p>Involvement of MAs and evaluators:</p> <p>Involvement of MAs and evaluators is necessary, while collaborating with researchers who are the users of data (Sentinel data + Farmer data) and providers of the tool.</p> <p>Development of methodologies for using the NIVA data:</p> <p>Spatial and micro data is important to monitor changes and contributes towards the development of policies. However, it is not always possible to</p>	<p>Difficulties to access data:</p> <p>Access to FMIS to calculate Tier 2 and Tier 3. There is a lot of diversity even within sectors.</p> <p>Evaluators face difficulties to access data from farmers due to data privacy rules or due to the farmers' reluctance to provide data. In some countries they have difficulties to obtain data from the MAs or even from research institutes and universities.</p> <p>Meeting deadlines:</p> <p>PAs have to be ready by January 2023 with adapting IACS with more Sentinel data for control, but it is uncertain whether MS will meet this deadline.</p>

<p>use the same data to determine causal inference and thus determine the impact of RDP funding on indicators such as climate and environmental ones. NIVA offers scope in the development of methodologies which allow the use of such data for evaluation purposes.</p>	<p>Use of better IACS data for evaluation is more a challenge on the long term: some initiatives are needed.</p> <p>Limited capacity for counterfactual:</p> <p>NIVA does not currently provide data that can build control groups to distinguish between beneficiaries and non-beneficiaries.</p>
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Aspects that need further clarifications

Is there a plan to address uncertainties? All NIVA products are provided with uncertainties, and for Tier 3, there is uncertainty based on probability distribution. There are also uncertainties concerning basic statistics like average values and standard deviations.

Accessibility: How to access data from farm management systems.

Questions related to indicators: a) Whether indicators not linked to IACS only can be used for a counterfactual; b) when validation of indicators and test sites (ES, FR, IT) to measure the flux will be completed; c) more specifically, for the Nitrate leaching indicator, there is a need to clarify how it was calibrated in the NIVA project and whether it is comparable with other information sources.

Involvement of farmers: To what extent are they involved in a multi-actor approach to discuss relevant issues and data collection.

Questions related to governance: a) In regionalised MS, how to use NIVA for evaluation in the context of the future CAP when moving from regional to national level programmes; b) how to build cooperation between the PA and MA, given that the MA is at the core of the administrative reform of the next period; c) how to transfer the evaluation experience from Pillar II bodies to Pillar I bodies who do not have experience in evaluation.

Resources: It is unclear how many resources are required for the analysis of all the indicators or for adapting the NIVA outputs to the MS context/reality.

Managing farmers' expectations: Farmers do not know what data will be requested for CAP in the future. There are many actors requesting data from them, including from the private sector (e.g., banks). The question is therefore whether all this may create additional burden to farmers.

Link between IACS and FADN: Would these systems be linked allowing for the development of enhanced data?

Impact of CAP funding: When will the IACS data be ready for the analysis of indicators and hence for the evaluation of the CAP through these indicators?

Technical difficulties: Is the model scientifically correct in case different proxies for the different areas of all MS according to their given situation would be used? e.g., biodiversity

Annex III: Transferability of FLINT for evaluation of the CAP

Relevant elements for evaluation
In a nutshell: FLINT offers a sound basis for harmonised data collection across a number of areas (economic, social, environment) that can be used to evaluate policies with new farm level indicators.
Useful for the ex ante evaluation of the CAP: Data identified through FLINT can be used for the diagnostic analysis and ex ante impact assessment.
Using it as a pilot to potentially introduce new indicators .
<p>Useful for calibrating evaluations: Compare current projects in MS with these new methodologies (FLINT, MEF4CAP) and then find out what is the cheapest/best/least burdensome system of information collection.</p> <ul style="list-style-type: none"> • In Sweden: a project to assess nutrient balance has proved good at collecting data: nutrient balances for farms that have participated for many years (20 years). • In Ireland: collection of biodiversity data based on a research project (satellite imagery) to get detail of habitats around farms, analysed by ecologists. The methodology has been 90% effective in identifying habitats. • In Slovenia, mass scale photo usage by human operator (botanist) to identify habitat is questionable. To identify 80.000 grassland plots by a person is quite a challenge.
Good initiative to enrich FADN with more social and environmental indicators and a flexible use of the FADN database, although changing FADN is always a challenge.

Potential for transferability	
Criteria for transferability	Obstacles to transferability
<p>Adapt to a wider audience:</p> <p>For environmental questions, it is difficult to understand what is happening in rural areas asking only farmers; hence a wider audience is needed, including therefore FADN data and sample surveys in the total rural population for calibrating the results.</p> <p>Manage the burden on farmers:</p> <p>Data collection should take into account the interest of the farmers and the potential burden. The information should be made useful for farmers. Furthermore, information should be re-used if it is already recorded in a different system, e.g., invoices or registrations of veterinarians.</p> <p>Link between CAP and SDGs:</p> <p>Interesting to develop further and could be taken by MAs when drafting CAP Strategic Plans.</p> <p>Coordination between stakeholders:</p>	<p>Costs of extending the FADN database.</p> <p>Coverage of the sample can be a problem (e.g., in Italy FADN can only in rare cases be used for evaluation).</p> <p>Correctness of the data if there is a manual entry from farmers. FADN/FLINT allows for the cross reference of financial and material flows (e.g., pesticide receipts).</p> <p>If data from different databases cannot be matched, then how can it be used for evaluation. Due to direct contact with farmers this problem can be more easily solved.</p> <p>Uneven data situation in regionalised MS.</p> <p>More human resources are needed.</p> <p>Too ambitious for MAs? Too ambitious for MAs? Distinction should be made between evaluation studies at group level and decisions</p>

<p>Coordination between MA, evaluators and data holders to address the issue of data fragmentation at the level of administrative units.</p> <p>Development of methodologies:</p> <p>Create a register where this data (microbial, etc.) can be accessed by evaluators. Data could account for all farmers, not just supported, for the creation of control groups.</p> <p>Methodology for evaluation with the use of these indicators would be needed. Also, a methodology for dealing with different FADN structures in MS.</p>	<p>and controls at farm level. FADN protects privacy of individual farms.</p> <p>Reducing the size of the FADN sample in order to be able to add additional indicators might create problems for some countries.</p> <p>The time plan for developing FSDN by 2023 seems too ambitious for many MS. It should best be seen as an ongoing process. A sudden substantial expansion of FADN to become a comprehensive FSDN is not realistic (in the context of limiting resources). However, progressively developing the FSDN over the current decade is a worthy and realistic aim.</p>
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Aspects that need further clarifications

Questions related to timing: How to evaluate policies whose impacts will take some time, and/or for which data is not available? For instance, how to evaluate the impact in 2024-25 with the data available only for two or three years?

Data collection frequency: It is unclear how regularly data should be collected and how to fit it or finetune it into the CAP Strategic Plan data collection.

Representativeness: Can such projects make the sample representative enough?

Costs: The number of indicators is huge and requires a lot of data, with an unclear cost for data collection.

Data availability: Lack of data at different levels (especially at local level).

Technical questions: a) What does the logbook exactly mean; b) whether the software can be used by other MS as well; c) each MS is putting a lot of money in developing FADN, while it could be interesting to develop a software that is useful for everyone, developed from the point of view of those who developed it but adaptable to other situations.

Legal questions: Whether there is a need to provide a legal basis for sub-indicators.

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