MEF4CAP

Monitoring and Evaluation Frameworks for the Common Agricultural Policy

Lessons learned brief

Demonstration Case 1, Ireland: Modernising farm data collection and exploring new ways of visualising farm data.

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Short summary of the Demonstration Case, its rationale and objectives:

Below we give a summary of Demonstration Case 1 (abbreviated DC1), which was carried-out in Ireland. This is in terms of the objectives of the DC, the technologies examined, the indicators identified and the stakeholders engaged with.

Two **technological processes** were considered in this demonstration case. Specifically:

1. **Digital Data Flows** i.e., developing digital data flows for the Farm Accountancy Data Network (FADN) data collection agency and;
2. **Dairy Farm Sustainability Data Dashboard** i.e., the development of a prototype farm sustainability dashboard for Key Performance Indicators (KPI) visualisation.

The **indicators** the technologies intend to address differ depending on the two processes above:

- **Digital Data Flows for the national FADN data collection agency:** farm-level technical and financial data (e.g., relating to purchased inputs and outputs sold) is routinely collected on Irish farms for use in the Teagasc National Farm Survey (the Irish FADN). This manual process could be digitalised by automating data flows from existing databases. Investigating the feasibility of this by developing a digital data flow from dairy processors is one objective of this demonstration case. Digitalisation of other data flows (such as from administrative data) could also be explored
- **Dairy Farm Sustainability Data Dashboard**: this data (alongside other ancillary data) was used to develop a prototype farm sustainability data dashboard for use by farmers, advisors, and researchers. In creating the dashboard, the objective was to make possible the interrogation of farm level economic and environmental indicators, and to support learning in the achievement of improved farm sustainability. Discussions are ongoing with stakeholders on a final list of relevant indicators for dairy farms. These would include metrics across the following themes: Greenhouse gas emissions, ammonia emissions, water quality, biodiversity, innovation, soils, weather, farm structure, farm technical performance, production costs, profit and balance sheet data.

Which stakeholders are these technologies aimed at?

There are several stakeholders who stand to benefit from these two processes.

Digital Data Flows for the national FADN data collection agency. The beneficiaries would be:

1. Teagasc -the FADN national liaison agency for Ireland (both the data collectors and users of the data),
2. Farmers (in both their capacity as data providers and users)

However, to derive the full benefit, implementation of this technology requires the co-operation first and foremost of the dairy processors in order that the data can be transmitted to the national FADN liaison agency.

Dairy Farm Sustainability Data Dashboard. The beneficiaries would be:

1. Farmers, since it would aid their understanding of their farm sustainability;

2. Farm advisors, since they would have a tool to educate farmers in understanding farm sustainability performance;
3. Researchers, as they easily access data for analysis and visualisation;
4. Policy makers, since it would allow them to understand which farms are making progress in terms of improving sustainability and at what rate;
5. Industry stakeholders e.g., dairy processors, since they would have evidence to show better sustainability performance over time.

We can reflect and draw some conclusions on the technologies suggested in the DC, on the data and indicators generated and on the adoption process altogether.

First of all, what is the "readiness" level (from both a technological and social perspective) of the technologies suggested in this DC? Are these ready to be adopted and if not immediately so, why is this?

Can the technologies be adopted by all type of stakeholders or different ones should be used depending on farmer types (small scale, large scale, etc.)?

An overview is provided separately for the development of (i) Digital Data Flows and (ii) Dairy Farm Sustainability Data Dashboards

(i) **Digital data flows for the national FADN data collection agency**

As we anticipated this entails a transition from manual to digital data flow in the collection of some farm data for FADN. The **stakeholder** in this case is the FADN data collection/Liaison Agency.

On the "readiness" level of the technology suggested, ICT capacity exists in moving from a manual to a digital data flow with regard to farm related data held by dairy processors i.e. farm-level data on purchased inputs and output sold (milk). However, work is required in guiding this process i.e., there will be a need for an agreed protocol around what data are required, the appropriate format and how the data will be shared etc. This may result in a training need for relevant staff.

The key benefit here is the adoption of the technology by dairy processors to allow for the transmission of data to the FADN data collection agency. The farm level data that the dairy processors hold relates to their milk supplier farmers. In principle the technology could be adopted by all dairy processors.

What about the data and indicators used/generated in this case ?

Communication is continuing with dairy processors to agree on a list of suitable variables, of which there is a broad range available over time. A large selection of these is contained in the prototype dashboard developed (see screenshots below).

What motivates the dairy processor to adopt the proposed technologies to benefit the data collection agency?

- Reduced data collection burden for data collection agency
- Less time spent by the farmer in providing data to the data collection agency

- Together the above would provide potential for cost savings and time efficiencies in the data collection process
- Improved data collection efficiency and accuracy
- Fewer transcription errors, reduced risk of disagreement with other data sources
- Speedier reporting of farm data for use by stakeholders and policy makers
- Scope to collect a broader range of sustainability data from farmers such as social sustainability indicators or evidence of environmentally sustainable changes in farm practices

What are the barriers that the dairy processor faces when adopting the technologies to benefit the data collection agency?

- There needs to be a farmer agreement (in terms of data sharing from source)
- There is a requirement for dairy processor buy-in and goodwill to facilitate digital data flows to the FADN data collection agency
- GDPR and data privacy agreements must be upheld, and data security guaranteed
- There will be an ICT/human resources requirement on both the dairy processor and data collection agency sides – initial investment may be high in terms of time/money, especially if the objective is to collect such data from a substantial share of the farm population

Given the barriers identified, in the next table we have summarised which actions/measures should be in place to overcome them and by whom:

Barriers	Measure	Stakeholders involved
Requires stakeholder (in this case dairy processor) buy-in to facilitate digital data flows to data collectors	A clear demonstration of benefits such as more timely, and detailed farm data and the capacity to better demonstrate (prove) the sustainability credentials of dairy suppliers (farmers).	Data collectors/ Liaison agency/ Advisory services
Needs farmer agreement	Engage and liaise with farmers on the process involved and benefits of same.	Data collectors/ Liaison agency/ Advisory service
GDPR and data sharing agreements	Prepare a clear briefing note and agreement on data sharing for farmers. Undertake training for staff on their obligations.	Liaison agency
ICT and human resources	ICT training may be required for relevant staff. Likewise, investment will be needed to refine the data sharing process, and the logistics of same.	Liaison agency/ ICT colleagues

(ii) Dairy Farm Sustainability Data Dashboard

The technology in question is an interactive sustainability data dashboard to be used by Irish dairy farmers and other stakeholders.

A prototype dashboard has been developed, using data from FADN and a number of other sources. The interface is currently being further refined in conjunction with stakeholders and there is agreement from two dairy processors to provide data for 6 farms in total to pilot the process.

On the readiness level, training may be required for some farmers to interact with such a dashboard (in a meaningful way). Guidance will need to be provided for all users.

With appropriate training the technology could be adopted by all dairy farmers. Farmers would need to learn how to use the dashboard interface and how to interpret the available data/metrics.

What about the data and indicators in this case?

There is ongoing discussion on the specific data to be utilised. A broad range of data over time is available from a number of sources and this has been integrated into the prototype dashboard (below) for three sample FADN farms.

What motivates farmers to adopt the proposed technologies?

- Efficient use of data to facilitate farm-level analysis and decision making by farmers
- Provides more comprehensive data presented in a user-friendly format
- Informs farmers in terms of appropriate/identified KPIs for their farm
- Allows for more tailored/bespoke farm advice based on the (summarised) data
- Provides data (and proof) on the sustainability status of the farm, and trends over time
- Allows for the benchmarking of farms relative to other farms or relative to a target level of performance (with a range of performance metrics (KPIs) possible)
- Aids in improved (and informed) farm management
- A more digitally confident farmer in an ICT era

And what are the barriers that the farmer may encounter?

- Concern around how the data will be used and by whom, e.g. compliance/regulation
- Farmers may distrust the process for managing who can access/use their data
- Concern about data privacy: some farmers may want to keep all of their data private
- Skillset lacking for some farmers: Some may be unfamiliar with the dashboard concept and may struggle with dashboard navigation
- Reluctance among farmers or farm advisors to try something new - inertia/fear, attachment to traditional report formats
- Lack of training/education in interpreting and utilising such data
- Risk of data overload, uncertainty about which data is more/less important, which KPIs numbers indicate good/moderate/poor performance
- Time constraints in learning/adapting: farmers may perceive other farming tasks to be more important and then relegate dashboard engagement so that it does not get the appropriate prioritisation of their time allocation.

In the next table below, we have again summarized possible measures to be taken and by whom, this time from the farmer perspective:

Barriers	Measure	Stakeholders involved
Concern around how the data will be used e.g. compliance	Involve farmers in the discussion at an early stage to improve awareness and buy-in.	Data collectors/ Liaison agency/ Advisory services / Processors
Concern about data privacy	Prepare a clear briefing note and agreement on data sharing.	Data collectors/ Liaison agency/ Advisory service
Skillset lacking for some	Training rollout	Liaison agency/ Advisory services
Reluctance to try something new – inertia/fear	Engagement and education to understand and reassure	Liaison agency/ Advisory services / Processors
Time constraints	Engagement and education to demonstrate benefits	Liaison agency/ Advisory services / Processors

Feedback from the national workshop

(i) *Technology* **- Digital Data Flows for the national FADN data collection agency:** *Transition from manual to digital data flow in the collection of some farm data for FADN Stakeholder – Data collection/Liaison Agency*

There was broad agreement that stakeholder buy-in is required to ensure the smooth integration of data from disparate sources. Firstly, there needs to be agreement and engagement with ICT colleagues to facilitate the changes required so as to ensure that ICT people are aware of the required data for the digital data flow and in what file format. Secondly, relationship building and trust in the use and control of farmers' data are crucial to ensure continued farmer authorisation of the digital data flow process. The use of the data to facilitate the calculation of sustainability metrics is of crucial importance given the need to demonstrate improvements in agricultural sustainability over time.

(ii) *Technology* – **Dairy Farm Sustainability Data Dashboard:** *Development of a farm data dashboard*

For the dashboard to be a success the broad community of stakeholders in the agri-food sector need to promote its use by farmers, therefore enabling them to take actions to improve farm sustainability.

Key to the success of the dashboard will be its capacity to demonstrate improvement in sustainability over time. The dashboard that has been developed should not be considered as a finished product. Ongoing refinement of the dashboard is likely to be necessary given the evolving monitoring and evaluation framework in the new CAP, and commercial pressures

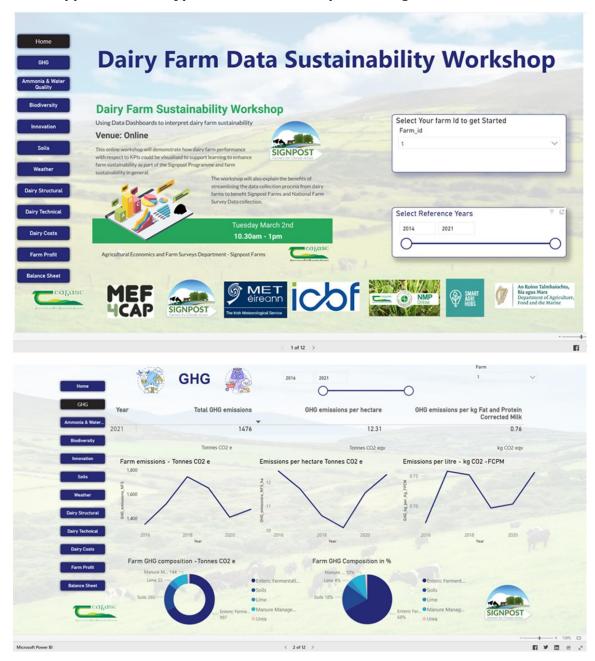coming from industry and consumers to improve sustainability across a wide range of topic areas.

Dashboards are a powerful tool, bringing the capacity to analyse data in many different ways. However, some concerns were voiced by dairy processors and experts in knowledge transfer that the farmer may be overwhelmed with data and may struggle to draw key inferences to identify the actions necessary.

Reflections on the applicability of the DC to other contexts (other users, other member states, other indicators).

This DC has broad applicability for both the development of digital data flows and farm sustainability dashboards across FADN and Member States.

In the case of digital data flows, this process, which was piloted in this example with dairy farms, could be generalised to other farm types and could be adopted in other Member States. Other sources of data could be utilised e.g., administrative data or other commercial data for agriculture (from e.g., banking institutions or other input suppliers, other types of farm data or datasets relating to e.g., weather, soil and grass growth).
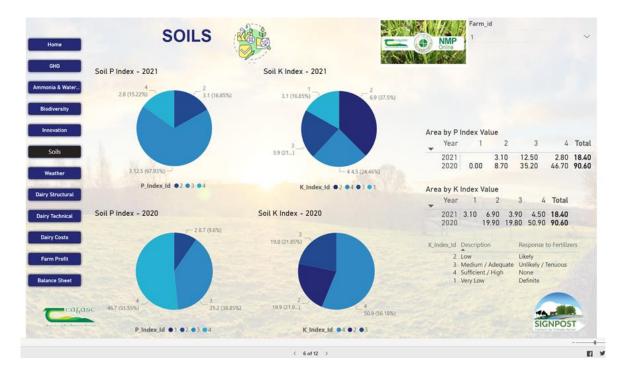
For the sustainability dashboard, again the approach was piloted for dairy farms but could be adapted to cover other farm types. In addition, other sources of data could be utilised and indicator sets could be widened as appropriate. The dashboard could also allow for the benchmarking of individual farm performance against the average farm in the population or against the better performing farms. Although the prototype dashboard has been developed for Ireland, there is potential for this format to be used across other Member States.
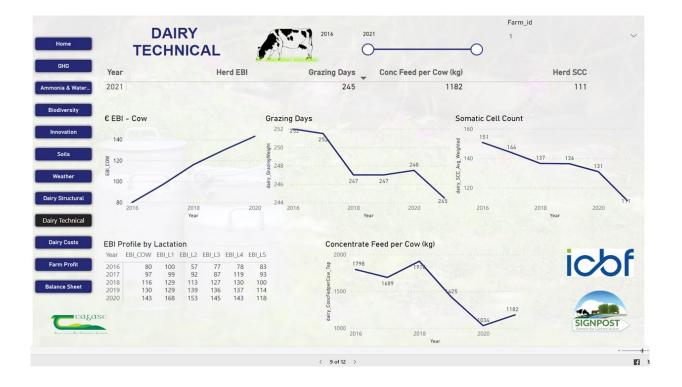
Appendix: Prototype dashboard – example of design and selected KPIs