MEF4CAP

Monitoring and Evaluation Frameworks for the Common Agricultural Policy

Lessons learned brief

Demonstration Case 2, Spain: Use of digital information flows in the agri-food sector

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Short summary of the Demonstration Case, its rationale and objectives

The EU Farm to Fork Strategy will ensure that farmers conduct more detailed tracking of all the tasks they carry out in their holdings. Special concerns are on the use of fertilizers, pesticides and water consumption. In Spain there is currently no system for obtaining information on inputs at parcel scale (although a survey on farmers' performance is carried out every five years). The digital farm book is a tool that allows farmers to keep record of all these issues. Up to now, it was only mandatory for phytosanitary products. Two Royal Decrees (RDs) for SIEX[1] and for sustainable nutrition in agricultural soils, will make it compulsory for farmers, from July 2023 onwards, to provide this information.

This Demonstration Case 2 (abbreviated DC2) was carried-out in Spain. It aimed to develop a digital farm book connected via an Application Programming Interface (API) with the public administration, in such a way that the mandatory information requested, is transmitted.

The main technologies used in DC2 are the digital farm book and a Geographic Information System or GIS (namely ArcGIS) integrating data streams derived from various sources (e.g., Earth Observation services, in-situ detection networks, and farm-level data). This will help overcome the constraints to information access characterized by the highly fragmented agricultural sector.

Farmers play a leading role in this system as the main information providers and owners of the information. It is therefore important to generate a bond of trust, and, to this end, a contract has been established between agri-food cooperatives and farmers for the exchange of non-personal data.

In addition to trust, it is necessary to generate mechanisms which allow farmers to benefit from providing this information. To this end, dashboards have been designed where farmers, their advisors, and technicians in general, will be able to consult information on phytosanitary products, fertilizers, and irrigation in almost real-time.

In particular, the cooperative members (the farmers) and their advisors will be able to monitor their performance and ensure their alignment with the policy demands, mainly based, as we anticipated, on the Farm to Fork Strategy. This is relevant as valuable information is returned to the farmers, who are the ones that own and provide the data.

We can make some reflections 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 (technological, social) of the technologies suggested in this DC? Are they ready to be adopted or do they need more time for this? And if not immediately ready, why is this?

All the technologies used in DC2 are available on the market. Still, it has been necessary for the technology providers to adjust the digital farm book tool to the administration's requirements.

The ambitious objective of interconnectivity between multiple information systems has caused uncertainty among farmers and their advisors who will have to take the burden of capturing the information. Conveying the benefits that will be obtained in the medium and long term has

[1] Sistema de Información de Explotaciones Agrarias: Farm Information System.

been difficult since it seems to be a complex and challenging process for those who are unfamiliar with digital tools. The farmers lack of knowledge about digital technologies means that training in the use of the digital field notebook is required. In addition, courses on Geographic Information Systems for advisors have already been carried out as these are complementary tools that help them deliver better technical services.

At this first stage of the mandatory implementation of the digital farm book for all farmers in Spain, we have opted for a *minimalist* tool that complies with the legal requirements but is not complex. However, some cooperatives requested to integrate this with their Enterprise Resource Planning (ERP) software, to have a mechanism that allows to trace the purchases of phytosanitary products and fertilisers and compare them with what is applied in the field.

This is a scale-up project. It means that the tool needs to be constantly improved. Transitioning from a manual and non-systematized data capture to a digital, recurring, and more complete system is a complicated process. Once the process dynamics and the use of the technologies are understood, it will be possible to integrate extra features such as ERPs.

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

DC2 has attempted to develop a basic yet complete tool which allows any farmer to use it. Of course, some training will be required for less experienced farmers and technicians, but the simple structure allows easy navigation through the tool.

Larger cooperatives are expected to have a larger number of members and, therefore, will have more tasks. However, the system fits any type of cooperative.

During March and April 2023, the tool will enter the testing phase. The content of the digital farm book is continuously updated. Therefore, a final version with which farmers can interact has yet to be made available. Data from the cooperative farms such as Cuatro Rayas are currently being uploaded to the application's test environment. Data uploading will allow for simulating the connection to the information systems when the digital farm book is officially implemented.

What about the data and indicators generated in this DC? Anything missing that needs to be considered?

The indicators generated in DC2 come from the data that farmers will record when managing their farms. Farmers will have to register phytosanitary treatments, post-harvest treatments, fertiliser treatments, irrigation, soil analysis and other tasks related to the National Strategic Plan of the Common Agricultural Policy.

The following indicators can be generated from the data that farmers will have to record monthly (within maximum 30 days) after the treatment has been carried out:

- N Balance per Hectare
- P Balance per Hectare
- K Balance per Hectare
- Crop Rotation
- NH3 Emissions per Farm
- NH3 Emissions per Hectare
- Adoption of (Natural) Biocontrols on Farms
- Pesticide Use on Farms
- Carbon Sequestration per Hectare
- Pesticide risk on Farms
- Water consumption on Farms

The indicators will be displayed on the dashboards. Here technicians will have the possibility to view the information automatically as the farmer records his activities in the farm book. This dynamic update of the information will facilitate technical advice and allow comparison between similar farmers to optimise resources.

What motivates stakeholders to adopt the proposed technologies?

The main motivations for adopting the digital farm book are diverse. During the various meetings we had, stakeholders stated that the main one is the need to comply with administrative regulations. Moreover, they consider the adoption to be helpful to improve data analysis to support decision making (in the mid to long term), benchmarking of farms for improvement, tailored farm advice, improvement of farm management performance and thus, economics (mid to long term). Also, something that is considered as beneficial is the interest young farmers have in digital technologies: this is regarded as a means of attracting young people to the sector.

Which barriers do stakeholders face when adopting the technologies?

Stakeholders face barriers in the adoption process: these are administrative burdens, lack of training, farmers' age, lack of awareness of digital technologies, and low internet connection in rural areas. Another factor that represents a particular barrier to adoption is the farmer's understanding that data will be used for control rather than policy improvements.

Given these barriers, which actions/measures should be in place to overcome them? Taken by whom?

To try to reduce adoption barriers, some measures could be taken. For example, in the case of a lack of training, technical advisory services and the government could provide training courses with case studies to familiarize farmers with information capture and handling of technological tools. The administrative burden could be lessened through the support of the cooperatives' advisory services, which would help farmers with the management of the digital farm book.

Regarding the limited internet connection in rural areas, more investment in infrastructure is needed, which could be covered mainly by the government and private initiatives. Finally, to ensure that farmers do not feel that the planned information capture technologies are not just a means of control, it is essential to have communication strategies in place to express the benefits and advantages that farmers can obtain from data sharing. From the cooperatives side an agreement was established where it is specified that the farmers are the owners of the data and can unsubscribe to the system at any time, thus protecting their privacy.

Feedback from the national workshop

On 26 January 2023, the national workshop of DC2 in Spain took place during the Agricultural Fair of Valladolid (AGRARIA). Approximately 250 people attended, among which 56% were agricultural advisors, 24% farmers, 7% from agri-tech, 5% university, and 5% from the administration. The ITACYL partners gave an overall presentation of the project, the main results and tasks accomplished so far, a brief introduction of each DC and the challenges ahead. During the session, several topics were discussed, such as the experience of Cuatro Rayas'[2] farmers, the adoption barriers they identified, the advantages of the new tools, and the different uses of the captured information. In addition, a fruitful dialogue was achieved with the attendees on the challenges posed by the digitalisation of agriculture in Spain.

During the event, the public expressed their concerns about the official implementation of the digital farm book. The main concern of the farmers is that they are unfamiliar with the digital tools, and with the increase of the administrative burden given that treatments will have to be registered at the latest one month after application.

They asked for a transition time when they will start using the farm book, but there are no sanctions in case of non-compliance. Concerns about excessive control by the administration accompany this. Sometimes the incentive to use the tool is seen in its obligatory nature, but not in the benefits that can be derived from implementing digital technologies in farm management.

On the part of the technical services, the main concern is that the burden for them will be duplicated, as they will have to do extra work, which may divert them from their main activities. This is because many farmers are expected to ask for help in filling-in the farm books.

However, there is also an optimistic view. Once they will become familiar with the tool, both technicians and farmers believe that they will be able to digitise a lot of information about the farms, improving advice through data analysis and even improving the farms' sustainability. They also expressed that this digitisation process of the countryside might make farming more attractive for young people.

[2] Cuatro Rayas is a cooperative winery and the largest producer in the Rueda wine appellation.

Final reflections including on the applicability of the DC results to other contexts (other users, other member states, other indicators).

The simplification of the capture and reporting of information on agricultural activities has a direct positive impact on the new CAP requirements, since the farm book will capture information that the administration will use for monitoring, evaluating, and eventually re-designing agricultural policies in the future.

An important aspect to consider is how information sharing and the underlying reasons for it are transmitted to the main data providers, the farmers. Benefits for farmers must be clearly communicated, so that they can be positively motivated by the implementation rather than seeing it as a new and alien administrative burden.

The application of the digital farm book is not limited to one territory or sector; on the contrary, it is fully scalable and adaptable, so that information on agricultural activities is systematised, differences and similarities between regions can be identified, and resources can be optimised.

Spain was the first EU country to require its farmers to submit farm-level data digitally. This new enforcement aims to improve the monitoring and evaluation efforts on the accomplishment of the EU agricultural policy related goals, through a new efficient and digitalised process. This is also expected to happen in most EU Member States in the years to come. Thus, this DC, its experience, and conclusions, could be very useful for the adoption of similar regulations for other member states.