D5.7 FINAL REPORT ON THE EVALUATION OF SERVICES

Project: Monitoring of Environmental Practices for Sustainable Agriculture Supported by Earth Observation

Acronym: ENVISION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 869366.

Document Information

Grant Agreement Number	869366	**Acronym**	ENVISION
Full Title	Monitoring of Environmental Practices for Sustainable Agriculture Supported by Earth Observation		
Start Date	1st September 2020	**Duration**	36 months
Project URL	https://envision-h2020.eu/		
Deliverable	D5.7 Final report on the evaluation of services		
Work Package	WP5 – Business Cases Implementation and Evaluation		
Date of Delivery	**Contractual**	M38	**Actual** M38
Nature	Report	**Dissemination Level**	Public
Lead Beneficiary	EV ILVO		
Responsible Author	Tuna Coppens		
Contributions from	Panagiotis Ilias		

Document History

Version	Issue Date	Stage	Description	Contributor
D0.1	30/10/2023	Draft	First Draft	EV ILVO
F1.0	31/10/2023	Final	Final	EV ILVO

Disclaimer

This document and its content reflect only the author's view, therefore the EASME is not responsible for any use that may be made of the information it contains!

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

CONTENT

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

LIST OF TABLES

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

LIST OF FIGURES

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

List of Abbreviations

A/A	Abbreviation	Description
1	AB	Advisory Board
2	BAP	Business Cases Action Plan
3	BC	Business Case
4	BCE	Business Case Evaluators
5	BCF	Business Case Facilitator
6	BIG	Business Cases implementation Guide Lines
7	CA	Consortium Agreement
8	Cbs	Certification Bodies
9	DP	Data Provider
10	EC	European Commission
11	EnU	End Users
12	EO	Earth Observation
13	EU	European Union
14	LHCs	Lighthouse Customers
15	Pas	Paying Agencies
16	PC	Project Coordinator
17	PP	Platform Provider
18	PSC	Product & Service Consumers
19	SOC	Soil Organic Carbon
20	SP	Services Provider
21	WP	Work Package
22	WPL	Work Package Leader
22	PMI	Project Management Institute
23	PBA	Professionals Business Analyst
24	CCLR	Collect Create Link and Rate
25	HE	Horizon Europe (Program)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Introduction

ENVISION's overall objective is to fulfil the need for continuous and systematic monitoring of agricultural land, shifting the focus from fragmented monitoring limited to specific fields and dates (or time windows) to territory-wide and all-year-round monitoring. Acting as a trailblazer for organisations that monitor environmental- and climate-friendly agricultural practices stemming from EU policy. To achieve this, ENVISION aims to develop its toolbox of services that meets its potential customers' need for continuous and systematic monitoring of sustainable agricultural practices through a customer-driven process with meaningful collaboration with future customers (Business customers, Lighthouse Customers).

In the ENVISION project, WP5 Business cases implementation and evaluation plays a critical role in the succession and effectiveness of the project. More specifically, the developed ENVISION platform, data products and services will be used, tested and evaluated in various business cases within WP5 to ensure that the developed services reach the required maturity and can cover specific customer needs related to the Common Agricultural Policy (CAP).

In this specific deliverable, the scope is to report the final evaluation of the developed Envision data products and services from three different perspectives related to;

- business value and acceptance,
- performance, usability, effectiveness
- and impact at economic, environmental and societal levels.

This document will provide necessary feedback from future customers[1] in order to support the improvement of the data products and services (WP3 and WP4) and to support the commercialization and dissemination activities of the ENVISION project (WP6 and WP7).

This deliverable consists of 4 chapters,

- The first chapter presents the general objectives of WP5 and Task 5.3, as well as the interactions between T5.3 and the other tasks and WPs.
- The second chapter provides an overview of the methodological framework. It describes the applied methodology, tools and tailoring elements for a comprehensive and robust evaluation process, including the necessary definitions and explanations of the concept and fields in which the products will be evaluated.
- The third chapter consists of the steps taken in compliance with the methodology adopted for the evaluation process, together with the work carried out under each step and the outputs of this work.
- The information and data gathered and analysed (questionnaire data, interview data, collected impact indicator values) are presented in chapter 4.
- The last chapter of the deliverable summarises the overall findings.

[1] Business customers (ENVISION partners NPA, LV, CAPO, OCS), who are project partners and who will participate from beginning of the project to its completion.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

1 Introduction WP5 and Task 5.3

1.1 WP5 objectives and the role of Task 5.3 Evaluation of business cases

WP5 main objective is to deploy, test and evaluate ENVISION data products and services developed in WP3 and WP4. In short, within WP5:

- **Products and services** developed within WP3 and WP4 **are used and tested under different conditions** by the Business Customers (BC) and the Lighthouse customers (LC).
- **Product and services are evaluated** for each business case individually.
- **Evaluation results** were used to improve the data products and service (WP3 and WP4) and to support the commercialization and dissemination activities of the ENVISION project (WP6, WP7).

In the ENVISION project, WP5 Business cases implementation and evaluation plays a critical role in the succession and effectiveness of the project. More specifically, the developed ENVISION platform, data products and services were used, tested and evaluated in various business cases within WP5 in order to ensure that the services developed, reach the required maturity and can cover specific customer needs related to the Common Agricultural Policy (CAP).

To achieve the above-mentioned objectives, Task 5.3 aims to evaluate each business case individually, focusing on three different perspectives related to:

- The performance, usability and effectiveness.
- The business value and acceptance.
- The impact on an economic, environmental, and societal level.

1.2 WP5 and Interactions with other WPs

To support a better understanding of the WP5 role within the Envision project, we will describe the interactions of WP5 with the other WPs below (Figure 1):

- The identification of Paying Agencies' (Pas) and Certification Bodies' (CBs) needs occurs in WP2 Commercial Service Requirements. WP5, under Task 5.3 considered user requirements identified in WP2 as a baseline for the performance, usability and effectiveness evaluation process.
- WP3 designs and develops the EO-enabled data products offered through the ENVISION platform while considering the end user needs identified in WP2.
  The results of WP3 (data products) were used (Task 5.2) and evaluated 5 (Task 5.3) in WP5. WP5 therefore identifies the needed improvements and updates in the evaluation reports, considering identified needs and priorities (WP2), and **provide them to WP3 actors in the evaluation reports,** using the WP2 user stories as a baseline.
- WP4 designs and develops all aspects of the ENVISION platform. The identified end-user needs of WP2 feed into WP4, and there is an exchange of information among WP2 and WP4 as the platform and ENVISION service are **co-produced** with the end-users to ensure that they are tailored to their needs**.**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

WP4 (services) results were used (Task 5.2) and evaluated (Task 5.3) in WP5. WP5 identifies the needed improvements and updates in the evaluation reports, considering identified needs and priorities (WP2), and provide them to WP4 actors.

- **The added value and acceptance** of the proposed services were evaluated in the WP5 (Task 5.3) to feed WP6
- WP5 (Task 5.3) evaluation results were provided to WP6 and WP7 to support the **commercialization and dissemination activities** of the ENVISION project.

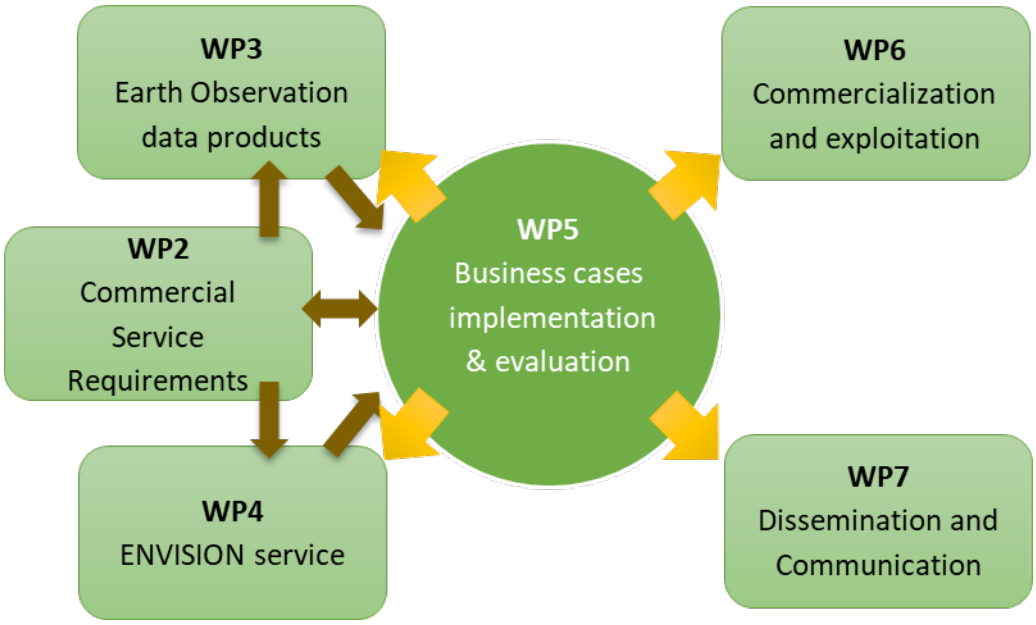

Figure 1. WP5 (Task 5.3) interactions

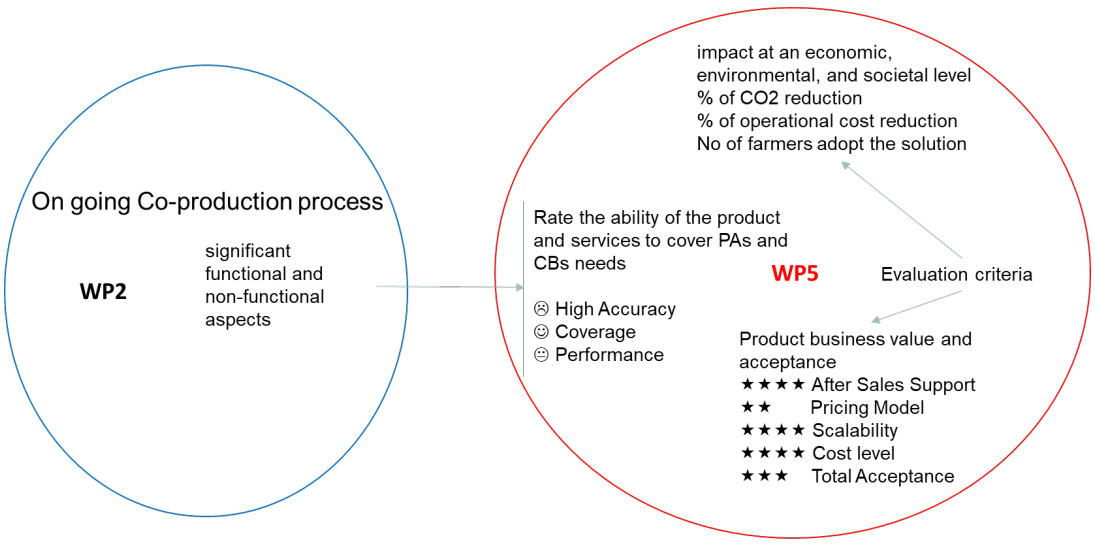

Figure 2. WP5 used WP2 outcomes to rate the product and services' performance, usability and effectiveness.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

1.3 BC Customers and their role in BC evaluation Process

During the business cases implementation and evaluation, the ENVISION products and services were tested and evaluated by:

- Business customers (ENVISION partners NPA, LV, CAPO, OCS), who were project partners and who participated from the beginning of the project to its completion and
- Lighthouse Customers which were not members of the consortium and were participating in ENVISION voluntarily.

Two customer segments were involved in the project:

- Paying Agencies using ENVISION to monitor environmental and climate requirements of EU policies related to agriculture,
- Certification Bodies using ENVISION to monitor organic farming requirements.

And in addition:

- Farmers, through the mobile application.
- Third parties (i.e. devs) through the Add-on development.

Business customers act as business stakeholders and therefore, they actively develop the evaluation criteria and evaluate the project data product and services. Both PAs and CBs ensured the demand-driven design of the project services and their value proposition and help pave the way for their market acceptance and uptake after the project. The following tables provide a brief overview of the Business customers and their roles in the BC implementation and evaluation Process.

<table>
<tr><th colspan="2">Cyprus Business Case</th></tr>
<tr><td colspan="2">Customer: CAPO
Type of organisation: Paying Agency (PA)</td></tr>
<tr><th>Data Products</th><th>Services</th></tr>
<tr><td rowspan="4">DP1: Analytics on Vegetation and Soil Index Time-series</td><td>Stubble burning identification on arable land</td></tr>
<tr><td>Detection of illegal land clearing in Natura2000 protection areas</td></tr>
<tr><td>Minimum soil cover for soil erosion</td></tr>
<tr><td>Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas,</td></tr>
<tr><td>DP2: Cultivated crop type maps</td><td>-Confirmation of GSAA,
-Smart sampling for OTSC inspections,
-Crops diversification compliance</td></tr>
<tr><td colspan="2">Short description: CAPO, the Cyprus Agricultural Payments Organization, which is responsible for the management of CAP payments, i.e. the Cyprian PA.

CAPO will be responsible for the Cypriot business case and they will use and evaluate Envision data product and services. This Business case focus on employing ENVISION’s services to monitor farming activities undertaken in the context of CAP..</td></tr>
</table>

Table 1. Short description of the Cypriot BC customer’s.

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

Lithuania Business Case	
Business Customer**:* **NPA** ***Type of organisation: Paying Agency (PA)	
Data Products	***Services***
***DP1**:* Analytics on Vegetation and Soil Index Time-series	Stubble burning identification on arable land,
	Harvest events detection
	Minimum soil cover for soil erosion
	Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas,
DP2: Cultivated crop type maps	Confirmation of GSAA,
	Smart sampling for OTSC inspections,
	Crops diversification compliance
DP3: Grassland Mowing Events Detection	Grassland Activity Monitoring and Management
Short description: NPA, the National Paying Agency under the Ministry of Agriculture of the Republic of Lithuania, i.e. the official PA of Lithuania that manages the financial support for agriculture and the implementation of the EU CAP measures. NPA will be responsible for the Lithuanian business case and they will use and evaluate Envision data product and services. This Business case focuses on employing ENVISION's services to monitor Cross-Compliance, Direct Payments and Rural Development Programs' (RDP's) AE-linked requirements.	

Table 2. Short description of the Lithuanian Business Cases customers.

Flemish Business Case	
Business Customer: **LV Flanders** (BE) ***Type of organisation**:* Paying Agency (PA)	
Data Products	***Services***
***DP4**:* Soil condition monitoring	Top-soil qualitative soil organic carbon estimations
Short description: LV, the Flemish Department of Agriculture and Fisheries and Paying Agency, i.e. Flanders' official PA in charge of the financial support for agriculture and the implementation of CAP. LV will be responsible for the Flemish business and they will use and evaluate Envision data product and services. Flemish business case focuses on Soil Organic Carbon Monitoring at the parcel level, using EO-data and ML techniques. its goal is to simplify and enhance the SOC monitoring process to meet the CAP requirements for cropland	

Table 3. Short description of the Flemish Business Cases customer

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

<table>
<tr><th colspan="2">Serbian Business Case</th></tr>
<tr><td colspan="2">Customers: OCS

Type of organisation: Certification Body (CB)

Data Products: Crop growth monitoring, Grassland mowing/ploughing, Cultivated crop type maps, Vegetation status

Service: Monitoring organic farming requirements Distinction of organic vs conventional farming practices</td></tr>
<tr><th>Data Products</th><th>Services</th></tr>
<tr><td rowspan="2">DP5: Crop growth Monitoring and identification of organic farming practices</td><td>Distinction of organic farming practices</td></tr>
<tr><td>Crop growth monitoring</td></tr>
<tr><td colspan="2">Short description: OCS, is the authorized control body that deals with the control and certification of organic products, i.e. the Serbian Organic Certification System.

OCS will be responsible for the Serbian business case and they will use and evaluate Envision data product and services. This Business case focuses on employing ENVISION’s services to demonstrate how the uptake of EO technology can improve the overall monitoring of organic certification requirements such as farmland expansion, biodiversity, GHG emissions, water and soil.</td></tr>
</table>

Table 4. Short description of the Serbian Business Cases customers.

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

2 Methodological Framework For Business Case Evaluation

This section gives an insight into the methodology we've used. It covers the methods, tools, and customization aspects employed to ensure a thorough and robust evaluation process including clear definitions and explanations of the key concepts and areas where product assessments took place. For a more comprehensive understanding of the Evaluation methodology, additional details are available in D5.3.

2.1 Applied Methodology and Tools

To achieve WP5 objectives, **products and services are evaluated** for each business case individually and from three different perspectives related to:

- **The performance, usability and effectiveness.** We rate the ability of the product and services to cover PAs, and CBs identified needs using developed user stories within WP2 describing user requirements (functional and non).
- **The business value and acceptance.** We evaluate product business value and acceptance for each business case, using criteria co-developed with the BC actors within the WP5 and indicators that quantify the business value and acceptance.
- **The impact on an economic, environmental, and societal level**. We assess the impact across economic, environmental, and societal dimensions. This evaluation incorporates jointly developed impact indicators capable of representing both qualitative and quantitative values.

To support the above-mentioned objectives, within T5.3 we identify and tailors a suitable methodology to support the co-development of the evaluation criteria. The methodology needs to formulate standard, accepted, suitable, and representative evaluation criteria for the a) business value and acceptance and b) economic, environmental, and societal impact.

A suitable methodology can generate functional outcomes and ensure transparency and standardization of the evaluation process. Additionally, it allows us to move quickly from the macroscale level (impact assessment) to the microscale level (solution acceptance for specific focus groups). The macroscale level deals with expected societal (including environmental), economic and technological impact generated by the results of the Envision project, which are the services and products. The microscale level aims to assess the business value and acceptance of the Envision product and services to specific focus groups, which in our case are the business customers (PAs and CBs). The Defined tailoring elements of our methodology are presented in D5.3 section 2.2.1.

2.2 Economic and social impact assessment

For the impact assessment, we focused on evaluating the Envision product and services at an economic and societal level using impact indicators.

The impact can be described as positive and negative primary and secondary long-term effects the intervention produces, whether directly or indirectly, intended or unintended.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

The dimensions of Impact on which we focused in the project are described below using the Horizon Europe programme Guide as a source.

- **Societal Impact:** Impacts on societal benefits, human well-being, and fulfilment of human needs, such as an increase in productivity, improvement of working conditions, contribution to human health, improvement of policy and decision making, and raising consumer awareness.
  Improving the environmental and climate performance of farmers and your business, with a special focus on environmental sustainability, biodiversity and the European Green Deal objectives
  Example: Decreasing soil and water pollution and GHG emissions, Soil Degrade,
- **Economic/Tech Impact:** What economic and technological benefits do the services bring to your business, farmers, and society.
  Example: Increasing efficiency, decreasing costs, increasing profits, contributing to standards setting.

Limitations and Challenges of the impact assessment

Below, we briefly summarised the difficulties we faced with the impact evaluation process

- Providing baseline values for impact assessment requires the use of various sources, such as proprietary data, available literature, statistical data, expert knowledge.
- No source is available due to the lack of historical data,
- Difficulties in accessing certain data. Most indicators require data collection from different sources (farmer, agricultural pesticides/ herbicides/ herbicides suppliers) rather than Pas or CSs.
- Lack of time to collect the relevant data frequently for comparison with baseline value.
- The fact is that even if comparison data can be collected frequently,
  - the intended impacts cannot be measured over a short time period such as the life of the project.
  - Data collected for comparison (for the Indicators such as: reduction in working time, travel costs, number of trips for on-site inspection, etc) cannot reflect the actual values that should be generated by the use of envision data-products and service. Because BC customers, in addition to using and testing the services to see if the services are reliable to run their business, they also run their business in a traditional way. In some cases, they carry out additional (more than usual) on-site checks for product validation.

2.3 Evaluation of the business value and acceptance

To evaluate the business value and acceptance for each business case, we used the criteria developed with the BC actors as a basis and enriched them with consideration on the project objectives. Acceptance criteria are the conditions that need to be met before a solution is accepted. They are used to measure whether a customer is satisfied with the solution built. Acceptance criteria form the basis of acceptance tests and are essential in evaluating the solution during product review sessions, where product owners or business stakeholders decide whether to accept and release the developed solution. Determining the acceptance criteria involves reviewing requirements and analysis models

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

with business stakeholders to identify how the business stakeholder would approve something as done.

For evaluating the business value and acceptance of the proposed services, considering the relevance of the project objectives, we have identified several fields and categorised them in the following concepts;

- **User Acceptance:** To assess whether the Product is easy to use and working for the end-user correctly , the identified fields is; **User friendly.**
- **Business Acceptance**: To assess whether the product meets the business goals and purposes or not with a main focus on business benefits/ added value (finances and other), the identified fields are; **Reduced time and effort, Added economic value-benefits, Usefulness.**
- **Regulations/Compliance Acceptance**: To determine whether the Product compliance the rules and regulations that are defined by the government of the pilot countries and also to assess if the proposed product and services can contribute to compliance with National plan and agri-environmental rules, the identified fields is; **Regulatory compliance.**
- **Operational Acceptance**: To assess the operational readiness of the Product, the identified fields are; **Accessibility, Flexibility and Scalability, Quality, Completeness and Specialisation, Support service availability.**

2.4 Evaluation Of The Performance, Usability And Effectiveness

This section deals with the evaluation of the product and services in terms of performance, usability and effectiveness. For the evaluation, we used a criteria-based evaluation approach. To define the criteria, we used the user requirements identified in WP2 in the form of user stories.

Before further explaining the criterion-setting process, we think it is important to explain the relationship and differences between criteria for testing and requirements (user story).

Both user requirements (can be in form of user story) and criteria are useful for different sides of product development.

User requirements define what the developers of the product and service are required to do, user story defines the requirement for any functionality or feature from the perspective of a person who wants to use that feature, while acceptance criteria help determine whether the product works as expected, it defines the 'Definition of done' for the user story or the requirement.

In this context, we have formalised the user stories developed in WP2, into criteria to measure whether the product is ready or whether further improvements and updates are needed.

The custom-made method used to establish the criterion for evaluating the performance, usability and effectiveness of the product and services is shown below.

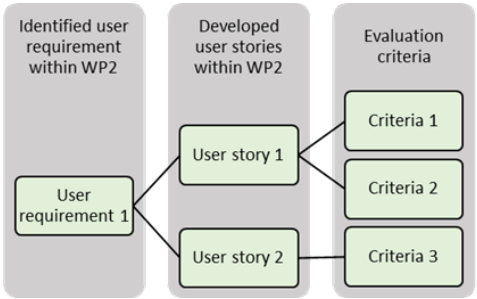

Figure 3. Setting criterion for the performance, usability and effectiveness evaluation

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

3 Steps For Business Case Evaluation

The following steps were undertaken for the Business case Evaluation.

- The evaluation methodology and criteria were determined under D5.3.
- Preparatory work was carried out for data collection, including refining and enriching the developed criteria and indicators.
- The data products were linked to the evaluation criteria for each BC.
- The results of the preparation process were discussed with relevant project partners and BC actors, and their suggestions and comments were incorporated for finalization.
- Questionnaires and templates were developed using the finalized criteria and indicators and distributed to BC actors for data collection.
- The workshops were organized to interviews with BC customers.
- In the final step, the collected data was analyzed, and the results were prepared to be presented in deliverables.

3.1 Preparation For The Feedback Collection

The development of evaluation criteria and their associated indicators was a collaborative effort with active participation from BC actors. In this regard co-developed evaluation criteria and their indicators provide a clear direction of what is necessary, the expected effect on target groups and the priorities of the Focus group (PA, CB).

However, before starting with feedback collection, we conduct some preparation work for more effective, direct and easier evaluation

As a preparation for the feedback collection; we performed the following activities,

- Refine Impact Indicators
  - Review and analyse the co-developed criterian and indicators that were co-developed (in D5.3) by BC actors, to create a renewed list of criteria and indicators that define clearer implications on the impact of Envision solutions. During the process, we tried to preserve the content and logic of the focus group input and avoided significant substantive changes.
  - We conducted a similar exercise for the second evaluation round, taking into account the results from the first round. This iterative approach allowed us to further refine the list of criteria and indicators, making it more relevant and precise.
  - Identify indicators we need to refine as a way to present impact scale and significance.
  - Define per indicator the type of the values and their range. Enrich the acceptance indicators to capture missing perspectives of solutions acceptance and to avoid overlaps with the evaluation criteria related to performance, usability and effectiveness.
- Evaluation criteria were linked to the specific data products and business cases so that data products within business cases could be evaluated individually.
  This approach allows for a more accurate and comprehensive evaluation of project components, tailoring data products to the different requirements of business customers (both Primary Audiences and Corporate Businesses). Consequently, this method increases the likelihood of market acceptance and adaptability.
- Develop questionnaires to collect data and feedbacks for the evaluation.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

3.1.1 Refined Indicators And Development of Data Collection Template

The renewed list of criteria and indicators, along with the linked data products, are presented in Table 5.

KPI No	KPI Description	Linked Impact Criteria and Impact Dimensions	Linked Data Products
1	% Decrease in mistakes performed during on-site inspections (by CB or PA)	Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech Impact-Social Impact).	DP1 , DP2, DP3, DP5
2	% Decrease in number of farmer declaration mistakes	Improve the objectivity- transparency and reliability of the inspections (Economic /Tech Impact -Social Impact)	DP1 (Cyprus BC), DP2, DP5
		Increasing the farmer's income(Economic/Tech Impact -Social Impact)	
3	% Decrease in work time for monitoring and inspection activities	Reduce time(Economic/Tech Impact).	DP1, DP2, DP3, DP5
4	% Decrease in time spend for administration work	Increasing the farmer's income(Economic/Tech Impact -Social Impact);	DP1(Cyprus BC, DP2 (Cyprus BC)
		Reducing the administrative burden(Economic/Tech Impact -Social Impact);	
		Reducing the time(Economic/Tech Impact)	
5	% Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC	improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (-Social Impact).	DP1, DP2, DP3, DP4, DP5
6	% Increase in the number of new employments for relevant work in your organization	Providing new jobs (Economic/Tech Impact -Social Impact)	DP1 (Lithuanian BC), DP2 (Lithuanian BC), DP3, DP4, DP5
7	% Increase in the number of new products/services/processes by building on the ENVISION solution.	Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social Impact)	DP1, DP2, DP3, DP4, DP5
		improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social Impact)	
8	% Decrease in number of records farmers shall keep	Reduce the administrative burden (Economic/Tech Impact -Social Impact)	DP1 (Cyprus BC), DP2 (Cyprus BC), DP3, DP4, DP5
9	% Decrease in amount of used paper for monitoring and inspection activities	Natural Resource use efficiency (Social Impact- Economic/Tech Impact Impact);	DP1 (Cyprus BC), DP2 (Cyprus BC), DP5
		Cost reduction (Economic/Tech Impact);	

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

10	% Decrease in pesticides/ herbicides/ herbicides use	Food quality/ security and safety(Social Impact);	DP4, DP5
		Cost reduction(Economic/Tech Impact)	
		Less environmental pollution(water-Soil) (Social Impact);	
11	% Decrease in chemical fertiliser use	Less Soil/ Land degradation (Social Impact);	DP1, DP3, DP4, DP5
		Environmental pollution(water-Soil) (Social Impact):	
		Cost reduction(Economic/Tech Impact),	
12	% Increase in biodiversity in farmland/ grasslands	Less environmental pollution(water-Soil) (Social Impact);	DP1(Cyprus BC), DP2 (Cyprus BC), DP3, DP4, DP5
		Less Soil/ Land degradation (Social Impact);	
13	% Increase in the use of environmentally friendly agricultural practices (no-till farming, agroforestry, crop rotation)	Environmental pollution (water-Soil) (Social Impact);	DP1 (Cyprus BC), DP2 (Lithuanian BC), DP4, DP5
		Less Soil/ Land degradation (Social Impact)	
14	% Increase in the soil organic matter	Lower emissions (Social Impact); Less Soil/ Land degradation (Social Impact);	DP1 (Lithuanian BC), DP3, DP4
		Less Soil/ Land degradation (Social Impact);	
15	% Decrease in number of travelling with motor vehicles for on-site inspection	Lower emissions (Social Impact);	DP1, DP2, DP3, DP5
		Cost reduction (Economic/Tech Impact)	
16	% Increase in number of publications and dissemination activities	improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social Impact)	DP1, DP2, DP5
17	% Decrease in number of fraud statement	improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social Impact);	DP1, DP2, DP3, DP5
18	% Increase in number of datasets to support the development of technologies that allow the continuous and systematic monitoring of agricultural practices through earth observation	Creation of datasets for further scientific research (Social Impact)	DP1 (Cyprus BC), DP2 (Cyprus BC), DP4, DP5
19	% Increase in number of relevant historical databases	Creation of datasets for further scientific research (Social Impact)	DP1 (Cyprus BC), DP2 (Cyprus BC), DP4, DP5
20	% Increase in number of farmers who benefit from CAP/EU agri-environmental policies based direct payments	Increasing the farmer's income (Economic/Tech Impact -Social Impact)	DP1, DP2, DP3

Table 5. Refined Impact criteria and Indicators.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

3.1.2 Enriched and Prioritised Acceptance Criteria

We enriched the acceptance criteria under the defined concept (see section 2.3) to cover all aspects related to the acceptance of solutions by a Business customer.

The list of acceptance criteria and linked data products can be seen in Table 6

Field	Acceptance criteria	Cyprus BC Data Products	Lithuanian BC Data Products	Flemish BC Data Products	Serbian BC Data Products
Reduced time and effort	Reduce the number of travel trips for on-site inspection.	DP1, DP2	DP1, DP2, DP3		DP5
	Reduce the time spent on monitoring activities	DP1, DP2	DP1, DP2, DP3		DP5
	Reduce time for administrative work	DP1, DP2	DP1, DP2, DP3		DP5
	Reduce effort and improve operational performance	DP1, DP2	DP1, DP2, DP3		DP5
User friendly	Ease of use	DP1, DP2	DP1, DP2, DP3	DP4	DP5
Accessibility	Acceptable price and payment plan to acquire and integrate the necessary technology	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Acceptable operating and maintenance costs for the Envision services	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	To have the necessary infrastructure to install and operate the services	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	To have financial and technological capacity for data collection	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Acceptable needed training time for the end user	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Acceptable cost for the end user training	DP1, DP2	DP1, DP2, DP3	DP4	DP5
Added economic value-benefits	Return of investment ratio/ increased profits	DP1, DP2	DP1, DP2, DP3		DP5
	Reduce Business operation cost	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Increase the productivity	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Prevent penalties and loss of funding by alerting the beneficiary of possible non-compliances	DP1, DP2	DP1, DP2, DP3		DP5
	Fair price/quality ratio.	DP1, DP2	DP1, DP2, DP3	DP4	DP5
Flexibility and Scalability	Integration and interoperability with the existing system	DP1, DP2	DP1, DP2, DP3	DP4	DP5

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

	Be aligned with the organisation's workflows and time constraints	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Scalability of services/ Ability to expand and build more	DP1, DP2	DP1, DP2, DP3	DP4	DP5
Usefulness	Useful info for policymakers	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Further, increase knowledge, raise awareness of earth observation monitoring technologies	DP1, DP2	DP1, DP2, DP3	DP4	DP5
Regulatory compliance	Contribute to compliance with current CAP policy and EU agri-environmental rules	DP1, DP2	DP1, DP2, DP3	DP4	
	Contribute to compliance with National plan and agri-environmental rules	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Consistency with recent relevant legislation and policy developments/ New CAP	DP1, DP2	DP1, DP2, DP3	DP4	
	Alignment with EU and national regulations /laws	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Compliance with the existing certification/ accreditation programs/ regulations.				DP5
	Adaptability/applicability of ENVISION services to the updates of certification/accreditation standards.				DP5
	Compliance with GDPR / address issues of privacy and confidentiality.	DP1, DP2	DP1, DP2, DP3	DP4	DP5
	Services will be available for at least the duration of the new CAP	DP1, DP2	DP1, DP2, DP3	DP4	
Quality, Completeness, Specialisation	Provide a more robust and efficient monitoring method and services compared to the other alternatives (maturity, effectiveness) in the market	DP1, DP2	DP1, DP2, DP3		DP5
	Provide a complete package suite to cover all important services for monitoring activities	DP1, DP2	DP1, DP2, DP3		DP5
	ENVISION is well-focused in terms of its design as it is more targeted in the monitoring of specific rules instead of monitoring general changes in the agricultural landscape elements.	DP1, DP2	DP1, DP2, DP3		DP5
Support service	Acceptable service level agreement	DP1, DP2	DP1, DP2, DP3		DP5
	Provide support services to install, integrate, repair, use and maintain the product and services properly	DP1, DP2	DP1, DP2, DP3		DP5
	Provide training for the end users on data collection and use of the services	DP1, DP2	DP1, DP2, DP3		DP5
	To continue provide necessary support after the project (After sale support)	DP1, DP2	DP1, DP2, DP3		DP5

Table 6. Prioritized acceptance criteria

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

3.1.3 Defined Performance, Usability And Effectiveness Evaluation Criteria

For the performance, usability and effectiveness evaluation of the developed product and services, We used user stories generated from the user requirements developed in WP2 in the form of criteria to measure whether the product is ready or whether further improvements and updates are needed (see section 2.4).

The criteria defined, based on user stories are shown below.

User Story – Requirement	**Acceptance criteria**	**Related Data Product No**
As a Controller, I would like to receive data of crop type maps every two weeks from the middle of April to the middle of August (ideally mid-September)	(1)Ability to receive data of crop type maps with two-week frequency from the mid- April to mid-September.	DP2
As a Controller, I would like grassland mowing and grazing layers every two weeks from June till November with more than 85% accuracy	(2) Ability to receive grassland mowing and grazing layers with two-week frequency from June till November.	DP3
	(3) Data product of Grassland mowing/ploughing provides more than 85% accuracy.	DP3
As a Controller, I would like to receive crop type and grassland mowing maps that are at least 95% accurate compared to in situ data	(4) Data product of cultivated crop type maps and grassland mowing/ploughing provides at least 95% accuracy compared to in situ data	DP2, DP3
As a Controller, I would like to receive vegetation status maps with a priority on EFA catch-crop fields and all fallow land fields	(5) Ability to receive vegetation status maps with a priority on EFA catch-crop fields and all fallow land fields..	DP1, DP2
As a Controller, I would like to be able to mask layers of interest with information from ENVISION outputs, for example to check parcels which intersect with soil erosion results, or to link crop type maps with grassland mowing layers	(6) Ability to mask the layers based on the outputs of a Envision service.	DP1 (Lithuanian BC), DP2, DP3, DP5
	(7)The masked layers could be visualised on the Envision platform	DP1 (Lithuanian BC), DP2, DP3, DP5
As an Organisation, we would like to be able to identify and distinguish between organic and conventional crop, and to monitor pesticide/ herbicides use on the declared plots because this is an important objective in many agri-environmental policies	(8) Ability to identify and distinguish between organic and conventional crop.	DP1 (cyprus BC), DP5
	(9) Ability to monitor the pesticide and herbicide use on the declared plots (malpractices more generally) indirectly through crop growth monitoring data product.	DP1 (cyprus BC), DP5
As an Organisation, we need to receive information about the specific crop types even in very small and narrow parcels, or at least a coarser level of classification with a group of possible crop types	(10) Ability to receive information about the specific crop types even in very small and narrow parcels, or at least a coarser level of classification with a group of possible crop types	DP1, DP2, DP3, DP5
As an Organisation, we want to get ENVISION outputs per parcel, especially for information on yield of each crop	(11) Ability to get Envision outputs per parcel, especially for information on yield of organic crops.	DP2 (Cyprus BC), DP5
As an Organisation, we want to get information once a year about the crops of neighbouring plots that are not involved in organic production (neighbouring to the plots that the organisation inspects)	(12) Ability to get information once a year about the crops of neighbouring plots that are not involved in organic production..	DP5

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

As an Organisation, we would like to get data once a year for the crop types of conventional plots that belong to the same farmers that are involved also in organic production, even if the organisation's primary target is monitoring the farmer's organic crops	(13) Ability to get data once a year for the crop types of conventional plots that belong to the same farmers that are involved also in organic production.	DP5
As an Organisation, we would like to track reductions in the number of plants through several times of the year, because this could be an indication of potential damages to crops that can result to events such as the re-cultivation of different crops on the same parcel, which is illegal	(14) Ability to track reductions in the number of plants through several times of the year..	DP1 (Lithuanian BC), DP5
As an Organisation, we would like to see the colour of crops / plants on parts of parcels (i.e. borders) for several times of the year, because changes in colour could indicate pesticide/herbicide use and can also help track events of illegal burning of crops	(15) Ability to see the colour of crops / plants on parts of parcels (i.e. borders) for several times of the year to monitor pesticide/herbicide use.	DP5
	(16) Ability to help to track events of illegal burning of crops.	DP1
As an Organisation, we need the performance of the system to be fast, to enable quick testing.	(17) The performance of the system (data processing) is fast and enable quick testing.	DP1, DP2, DP3, DP5
As an Organisation, we want the system to provide us with errors against legislation that we can communicate to farmers	(18) The system can provide with errors against legislation so that we can communicate to farmers.	DP1, DP2, DP3
As an Organisation, we need to be able to integrate services in our own applications. It is important to us that the ENVISION toolbox features as many standards as possible and that the various outputs are downloadable or easy to share via APIs so that we can analyse them in our own existing systems (interoperability and potential to transfer/download data)	(19) The ENVISION toolbox features as many standards as possible and the various outputs are downloadable or easy to share via APIs (potential to transfer/download data).	DP1, DP2, DP3, DP5
	(20) Envision data products and services enable seamless integration and interoperability with an existing system.	DP1, DP2, DP3, DP4, DP5
As an Organisation, we need all our data to be stored in one place	(21) Relevant outputs and data can be stored in one place (the ENVISION database for the ENVISION lifetime).	DP1, DP2, DP3, DP5
	(22) Ability to download outputs (i.e., shapefiles, csv files etc.), share via APIs or access the data storage online..	DP1, DP2, DP3, DP4, DP5
As an Organisation, we want the services to process information about newly declared parcels in bulk and efficiently to be able to receive outputs for such new parcels	(23) The services can process information about newly declared parcels in bulk and efficiently. So that we can receive outputs for new parcels	DP1, DP2, DP3, DP4, DP5
As an Organisation, we want to have an idea of the accuracy of the output of a service through relevant indicators and sufficient documentation of the methodology, as well as to receive notifications when the accuracy degrades throughout the cultivation period	(24) The specific methodology followed to estimate the accuracy of measurements is documented on the platform.	DP1(Cyprus BC), DP2(Cyprus BC), DP5
	(25) Accuracy is provided for the entire service outputs.	DP1, DP2, DP3, DP5
	(26) Ability to receive notifications when the accuracy degrades throughout the cultivation period	DP5
	(27) The services are/will be stable and functional for the ENVISION project lifetime	DP1, DP2, DP3, DP4, DP5

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

As an Organisation, we want the output of services to be stable and the services set-up for long term use	(28) Possibility of using the services after the project ends (beyond project lifetime).	DP1, DP2, DP3, DP4, DP5
As an IT expert, I want the ENVISION platform to monitor itself and notify me if there is a problem, so I can be confident that everything is ok if I am not notified	(29) ENVISION platform can monitor itself and notify me if there is a problem through selected method (email, web application, etc.).	DP1(Lithuania BC) , DP2(Lithuania BC), DP3 (Lithuania BC)
As an Organisation, we want to be able to upload information for the enhancement of ENVISION services. In this context, we would like to also be able to provide in situ-data from fields	(30) Ability to upload and provide information and in situ data from fields for the enhancement of Envision services	DP1, DP2, DP3, DP5
As an Administrator, I need to know when ENVISION services' outputs are not available so I can warn the respective farmers that they need to provide the relevant information themselves	(31) Envision services provides indications if the values for certain pixels or plots are "Not Available - N.A.". So I can warn the respective farmers that they need to provide the relevant information themselves	DP1, DP2, DP3, DP5
As an Inspector, I want the results from ENVISION's remote monitoring services to be reliable and verifiable on the spot	(32) The results from ENVISION's remote monitoring services are reliable and verifiable on the spot.	DP1, DP2, DP3, DP4, DP5
As an Organisation, we need to receive outputs both as maps/layers and relevant tables/numeric information, as well as to receive time series of various indicators to study changes and emerging problems	(33) Ability to receive outputs in different standard data formats (i.e., shapefiles, raster files, csv data tables/ time series of various indicators) through the ENVISION platforms, in order to study changes and emerging problems	DP1, DP2, DP3, DP4, DP5
As an IT Expert, I want the toolbox to be installed on DIASes, or that DIASes offer the tools as a service, so it is preinstalled there, accessed and even maintained by the DIAS	(34) Envision services can be featured on DIASes (the toolbox can be installed on DIASes, or that DIASes offer the tools as a service so it is preinstalled there, accessed and even maintained by the DIAS).	DP1(Cyprus BC), DP2 (Cyprus BC)
As an IT Expert, I want good quality to characterise the ENVISIONplatform services in terms of ease of use, security and interoperability	(35) The product and services are easy to install and use	DP1, DP2, DP3, DP4, DP5
	(36) The product and services meet security standards	DP1, DP2, DP3, DP4, DP5
As a Controller, I would like to receive data for declared parcels across the whole country and not only specific zones	(37) Ability to receive data for declared parcels across the whole country and not only specific zones	DP1, DP2, DP3, DP4, DP5
As a Controller, I want ENVISION to be transparent regarding data sharing legal issues in the context of intellectual property and GDPR	(38) Envision data products and services to ensure transparency and security in the context of intellectual property and GDPR.	DP1, DP2, DP3, DP4, DP5
As an Organisation, we would like to be able to visualise historic data and all relevant to a plot information on the platform, for as far back in time as possible	(39) Ability to visualise historic data and all relevant to a plot information on the platform as far back as relevant data is available (i.e., from 2015 onwards, due to availability of satellite images relevant to the ENVISION services)	DP1(Cyprus BC), DP2(Cyprus BC), DP5
As an Administrator, I would like to receive ENVISION outputs from the time of submission and throughout the entire application period, in order to help applicants and explain possible implications of wrong declarations / ineligibility of plots, considering the eligibility criteria / rules for multiple agri-environmental schemes	(40) Ability to receive ENVISION outputs from the time of submission and throughout the entire application period.	DP1, DP2, DP3, DP4, DP5
	(41) Ability to help applicants and explain possible implications of wrong declarations / ineligibility of plots, considering the eligibility criteria / rules for multiple agri-environmental schemes, with Envision product outputs.	DP1, DP2, DP3, DP5

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

As an Inspector, I would like to see through the ENVISION platform what is important to check for each plot, according to a farmer's declaration. This is important as it will clarify the reason why certain parcels need to be checked according to the organisation's sample	(42) Ability to see what is important to check for each plot, according to a farmer's declaration, through the ENVISION platform..	DP1, DP2, DP3, DP5
	(43) Envision Service helps to clarify why certain parcels need to be checked according to the organisation's sample.	DP1, DP2, DP3, DP5

Table 7. Performance, Usability And Effectiveness Evaluation Criteria

3.2 Consultation and Workshops

After completing the preparatory work, which involved refining the impact indicators and acceptance criteria, the revised material was circulated to BC partners. Their insights and suggestions were carefully integrated into the ongoing process.

As a next step, individual workshops were organized for each Business Case (BC) to provide a platform for comprehensive review and in-depth discussion of the survey questions. Interviews were conducted during workshops to better understand the intended impact, business value and level of acceptance of Envision solutions for each BC.

These workshops, each lasting approximately 1.5 hours, and sometimes longer, were structured into two distinct parts.

- In the first part, the focus was on questions related to business value and acceptance. This segment allowed for a thorough exploration of how the proposed solutions aligned with the specific needs and expectations of BC customers.
- The second part of the workshop centered on questions related to the evaluation of product performance, usability and effectiveness. During this phase, the discussion delved into the practical aspects of how the data products performed within the BC context.

3.3 Developed Template, Surveys, for Data Collection

Development of Template for impact Indicators

Due to the limitations mentioned in section 2.2.4, it was very difficult to establish reference values for some indicators, and it may not yet be possible to establish comparative values for a given indicator. Therefore, we defined the indicator values using a hybrid approach (quantitative and qualitative values). Besides the baseline and target values, we also focused on the estimated values for impact assessment and asked BC customers to assess the potential contribution of Envision data products and services to each indicator based on their knowledge and experience. This way, we have collected values that reflect Business Customer's perspectives without generating an unmanageable administration burden or disability to provide their response.
To ease the process, we developed a template (Table 8) for BC customers to use for value collection which

- provides clear description of the KPI
- links with relevant Data Product and Services
- shows related co-developed criteria and impact dimensions
- clearly defines baseline value and measurement units
- includes several options for selecting data sources and measurement methods (such as; Historical Data in use case / Compared to the baseline value; Generic Historical Data / Compared to baseline(standard) value; judgements by experts/ Survey, interview).

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

<table>
<tr><td colspan="6">Impact Indicators</td></tr>
<tr><td colspan="6">KPI Description:……</td></tr>
<tr><td colspan="6">Link to the Data Product and Services</td></tr>
<tr><td colspan="6">Link to the Impact Criteria: ……..</td></tr>
<tr><td colspan="6">Data sources/ and measurement methods</td></tr>
<tr><td colspan="6">Please Select the data sources and measurement methods and give a brief explanation of the reasons</td></tr>
<tr><td colspan="3">☐Historical Data from your Organisation / Compared to the baseline value
☐Generic Historical Data (Please indicate your data source) / Compared to baseline (standard) value</td><td colspan="3">☐judgements by experts/ Survey</td></tr>
<tr><td>Baseline value:</td><td>Target value</td><td>Measurement units</td><td colspan="3">Measurement units/ Estimated Value</td></tr>
<tr><td>Baseline Description</td><td>Decreased by…%</td><td>E.g. number/ per year; kg/ha…</td><td>Rating Scale (from 1 to 6):
Please indicate the value per each scale (E.g. low influence: Decrease between %5-%20)

<u>Estimated value for M25 (</u>Assuming you use Envision data products and services for the relevant monitoring/auditing activities to run your business)

Based on your knowledge and experience (considering current result of the products) Envision data product and services potential contribution;
☐1: negative impact
☐2: no influence
☐3: low influence (Number/ %)
☐4: uncertainty concerning the impact
☐5: favourable effect (Number/ %)
☐6: very favourable effect (Number/ %)</td><td>Comments
Please shortly explain the reason of your choice.</td></tr>
</table>

Table 8. Template for gathering Indicator values

Development of the Surveys

Using the specified framework (see section 2), we have developed the 2 questionnaires, which has been translated into a survey form. The questionnaire developed for evaluation of business value and acceptance, contained 40 closed questions on the Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) and 13 open end questions within 9 different field (Reduced time and effort; User-friendly; Accessibility; Added economic value-benefits; Flexibility and Scalability; Usefulness; Regulatory compliance; Quality; Completeness; Specialisation; Support service) (see ANNEX 6.2). For this questionnaire, we also ask BC customers to rate the " Uniqueness And Superiority " of the services as a way to express that Envision data products and services are unique or superior for the stated functions.

The survey developed for the performance usability and effectiveness of the Envision product and services contains 42 closed questions on the Likert scale of 1 to 6 (where, 1 is the lowest rate “Extremely weak performance/ product does not meet my needs”; 2 is “Poor performance, major improvement needed/ product partially meets my needs”; 3 is “At an acceptable or above

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

level/product partially meets my needs”; 4 is “Very favourable performance, but still needs improvement/ product fully meets my needs”; 5 is the highest rate “Clearly outstanding performance/ product fully meets my needs” and 6 is "Not relevant to our use case") and 1 open end question.

To make the survey easily accessible and user-friendly, we have transformed the questionnaire into an online survey tool and we have provided the survey link to the BC customers. The questionnaire has been developed in a user-friendly and easy-to-understand manner (see ANNEX 6.3).

Besides using questionnaires, we also conducted interviews for open-ended questions so that we could get more precise answers for a more clear understanding.

3.4 Data Analysis

After the extensive data collection phase, the next crucial step in our evaluation was to analyse the data. The collected data was carefully transferred to Excel and from there we developed tables for each Data Product to present the results in a structured and clear way. This step allowed us to better understand how each Data Product performed within its respective Business Case (BC).

Moreover, we transcribed and analysed the results of the interviews conducted during this evaluation process. This qualitative data was carefully examined to gain valuable insights. By merging these findings with the quantitative survey responses, we were able to construct a holistic and well-rounded picture of the impact, business value accaptance and ausability of the Data Products within the BC context.

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

4 Results And Discussions

4.1 Economic and social impact assessment

The template developed (see Section 3.4 and Annex 6.1) was used to collect the data and information required for the impact assessment of Envision products and services. During the process, in addition to the baseline and target values for each KPI, estimated values were collected due to the limitations outlined in section 2. For the estimated values, a question was asked regarding the potential contribution of Envision data products and services to each indicator.

The initial evaluation for the Cypriot and Lithuanian cases was conducted based on the latest results of the data products and services tested. We sought feedback from the Cypriot and Lithuanian BCs, considering the current performance of these products. However, for other Business cases, the evaluation was based on the required accuracy levels of their products, aiming to assess the products and services' potential contribution to the National SP and CAP monitoring system. This approach was considered necessary as the products and services were not yet at a level where a comprehensive assessment was feasible.

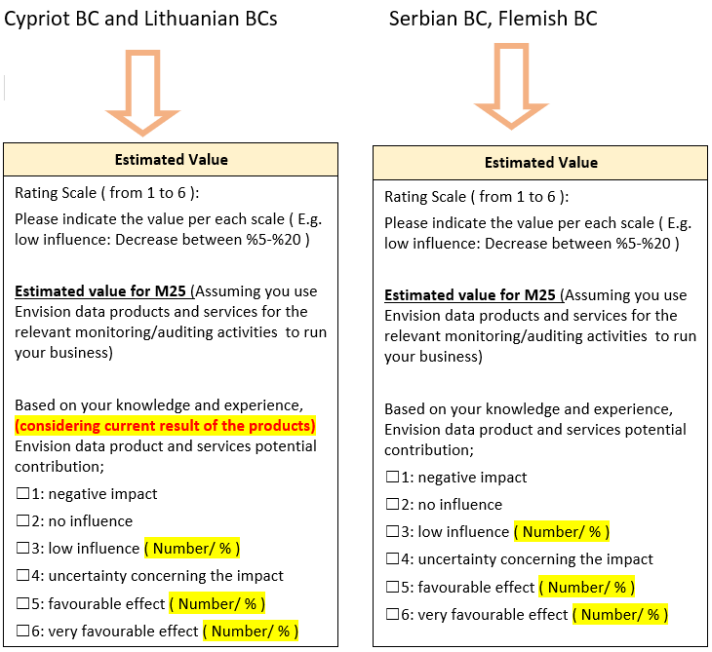

Figure 4. Impact assessment approach as per BCs

It is important to note that this approach resulted in certain indicator values in the initial report having a rather optimistic outlook. This was mainly because the product was evaluated with the prospect of the required high levels of accuracy. Therefore, this report, which evaluates actual product results, shows a lower value for the same indicator than the initial report.

Collected indicator values and comments are shown in Table 9 to Table 15.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Cyprus Business Case, DP1 (Analytics on Vegetation and Soil Index Time-series)

Collected indicator values and comments presented in table below.

<table>
<tr><td colspan="3">KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☐ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by...%</td><td>uncertainty concerning the impact</td><td>These GAECs were only check via a small sample of OTSC for cross compliance and the margin of error was near 0%. We believe that if the inspectors have the results of the services before they perform the check they will be more efficient</td></tr>
<tr><td colspan="3">KPI 2: % Decrease in number of farmer declaration mistakes</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech-Social); Increasing the farmer's income(Economic/Tech -Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by...%</td><td>uncertainty concerning the impact</td><td>CAPO only managed to inform applicants on Conditionality requirements in late September 2023 and only via an alphanumeric report If the information of the services is available to farmers on time surely the margin of error would be near 0%. If the information of the services is available to farmers on time surely the margin of error would be near 0%</td></tr>
<tr><td colspan="3">KPI 3: % Decrease in work time for monitoring and inspection activities</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Reduce time(Economic/Tech).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 40%</td><td>favourable effect (40%)</td><td>Envision can help monitor farming practices without needing on site visits therefore reducing days spent for on the spot checks.</td></tr>
<tr><td colspan="3">KPI 4: % Decrease in time spend for administration work</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Increasing the farmer's income(Economic/Tech -Social); reducing the administrative burden(Social); reducing the time(Economic/Tech)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 30%</td><td>no influence</td><td>Administration work is not expected to drop dramatically since the process of handling the applications is not really connected with how the checks are performed. The reduction in time can be mostly attributed to the reductions of objections to our findings since the expectation is to reduce mistakes in declarations</td></tr>
</table>

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC

Data product : Analytics on Vegetation and Soil Index Time-series

Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope

☒ Stubble burning identification on arable land

☒ Detection of illegal land clearing in Natura2000 protection areas

☒ Minimum soil cover for soil erosion

☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased …% of End users	favourable effect (25%)	Once we can fully use the services then an increase in use by the farmers is expected

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Analytics on Vegetation and Soil Index Time-series

Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope

☐ Stubble burning identification on arable land

☐ Detection of illegal land clearing in Natura2000 protection areas

☐ Minimum soil cover for soil erosion

☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Comments
Increased by 0%	no influence	CAPO is a Public Service Organization and does not have the ability to hire new employees unless a general policy decision is made from the Government. In general, new fields or new jobs stemming from Envision will be covered by further training and extending the knowledge of current staff.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Analytics on Vegetation and Soil Index Time-series

Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope

☒ Stubble burning identification on arable land

☒ Detection of illegal land clearing in Natura2000 protection areas

☒ Minimum soil cover for soil erosion

☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 50% of number or planed number of new products/services/processes by building on the ENVISION solution	favourable effect (50%)	Envision can enhance AMS by offering products adding to the GAEC checks and related activities

KPI 8: % Decrease in number of records farmers shall keep

Data product : Analytics on Vegetation and Soil Index Time-series

Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope

☐ Stubble burning identification on arable land

☐ Detection of illegal land clearing in Natura2000 protection areas

☐ Minimum soil cover for soil erosion

☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Reduce the administrative burden (Social)

Target value	Estimated Value	Comments
Decreased by...% No target can be defined	uncertainty concerning the impact	The number of records kept depends on the size of the farm. It won't be affected at least immediately from the use of technology

KPI 9: % Decrease in amount of used paper for monitoring and inspection activities

Data product : Analytics on Vegetation and Soil Index Time-series

Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope

☒ Stubble burning identification on arable land

☒ Detection of illegal land clearing in Natura2000 protection areas

☒ Minimum soil cover for soil erosion

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas		
Link to the Impact Criteria: Cost reduction (Economic/Tech); Natural Resource use efficiency (Social Impact-Economic/Tech Impact Impact);		
Target value	Estimated Value	Comments
Decreased by 80%	very favourable effect (50%)	Once most eligibility criteria are checked by Envision the number of on the spot checks will be reduced along with paper use
KPI 10: % Decrease in chemical fertiliser use		
Data product : Analytics on Vegetation and Soil Index Time-series **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☐ Stubble burning identification on arable land ☐ Detection of illegal land clearing in Natura2000 protection areas ☐ Minimum soil cover for soil erosion ☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas		
Link to the Impact Criteria: Environmental pollution(water-Soil) (Social): Cost reduction(Economic/Tech); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Decreased by10.%	uncertainty concerning the impact	CAPO has no control or checks over the use of fertilizers If Runoff risk assessment results are communicated to farmers in a systematic way we can safely assume that a decrease in the use of chemical fertilizers will take place
KPI 11: % Increase in biodiversity in farmland/grassland		
Data product : Analytics on Vegetation and Soil Index Time-series **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☐ Stubble burning identification on arable land ☒ Detection of illegal land clearing in Natura2000 protection areas ☐ Minimum soil cover for soil erosion ☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas		
Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by...%	favourable effect (10%)	Even without relevant data by early detecting illegal land clearing in Natura (and punishing it) there is a chance that this will act as a deterrent to farmers and eventually more land will be left undisturbed leading to an increase in biodiversity
KPI 12: % Increase in the use of environmental friendly agricultural practices (no-till farming, agroforestry, crop rotation etc.)		
Data product : Analytics on Vegetation and Soil Index Time-series **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☐ Stubble burning identification on arable land ☐ Detection of illegal land clearing in Natura2000 protection areas ☐ Minimum soil cover for soil erosion ☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas		
Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by...%	uncertainty concerning the impact	We believe that this KPI cannot be directly attributed to DP1. On the other hand all services of DP1 are considered as monitoring friendly agricultural practices.
KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection		
Data product : Analytics on Vegetation and Soil Index Time-series **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Stubble burning identification on arable land ☒ Detection of illegal land clearing in Natura2000 protection areas ☒ Minimum soil cover for soil erosion ☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas		
Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).		
Target value	Estimated Value	Comments
Decreased by...%	favourable effect (20%)	Once most eligibility criteria are checked by Envision the number of on-the-spot checks will be reduced along with vehicle movements
KPI 15: % Increase in number of publications and dissemination activities		
Data product : Analytics on Vegetation and Soil Index Time-series		

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

<table>
<tr><td colspan="3">Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by 10%</td><td>favourable effect (Number 2)</td><td>Envision results offer insights about farming practices and it will be beneficial for Administration and Policy Makers to be informed about it.</td></tr>
<tr><td colspan="3">KPI 16: % Decrease in number of fraud statement</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by...%</td><td>uncertainty concerning the impact</td><td>There’s no way to know if fraud will be deterred by Envision. Usually, fraud relates to land grabbing and that is not detected by technology but with administrative checks.</td></tr>
<tr><td colspan="3">KPI 17: % Increase in number of datasets to support the development of technologies that allow the continuous and systematic monitoring of agricultural practices through earth observation</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Creation of datasets for further scientific research (Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>increased 0% of used data</td><td>favourable effect (50%)</td><td>As well as other sources (shapefiles, csv) Envision is providing access to its Datacube where all data resides, and thus providing CAPO with the opportunity to query for new datasets needed to perform new operations.</td></tr>
<tr><td colspan="3">KPI 18: % Increase in number of relevant historical databases</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable area</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Creation of datasets for further scientific research (Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by...%</td><td>favourable effect (4)</td><td>We now have another season of declarations from farmers</td></tr>
<tr><td colspan="3">KPI 19: % Increase in number of farmers who benefit from CAP/EU agri-environmental National policies based direct payments</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Stubble burning identification on arable land
☒ Detection of illegal land clearing in Natura2000 protection areas
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Increasing the farmer's income (Economic/ Tech;Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by 10%</td><td>low influence (2)</td><td>A slight increased is noticed of 10% from the previous year but overall only 25% of the total applicants applied for CAP/EU agri-environmental National policies.</td></tr>
</table>

Table 9. Values and comments collected for Impact Indicators (Cyprus BC DP1)

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

The view of the expected impact of the Data Product 1 (Analytics on Vegetation and Soil Index Time-series), related to each KPI, based on the values and comments provided, can be summarised as follows,

- The use of DP1 **can reduce mistakes in on-site inspections**. However, it's essential to acknowledge the **uncertainty surrounding this KPI**, as the data was obtained from a small sample. If inspectors have access to service results beforehand, it may lead to increased efficiency.
- Providing information to farmers in a timely manner **can reduce declaration mistakes**. **The uncertainty** lies in the effectiveness of information dissemination. If the information is made available on time, the margin of error could be minimized.
- DP1's potential to monitor farming practices without on-site visits, **leads to a reduction in time spent on spot checks**. This value **indicates a 40% decrease** and aligns with the comments regarding the efficient monitoring.
- The expectation is that **administration work won't decrease dramatically** since it's not directly connected to inspection processes. The reduction is primarily attributed to fewer objections due to reduced declaration mistakes.
- The comments suggest that when Envision's services are fully utilized, an **increase in usage by farmers is expected**. The **estimated 25% increase** aligns with this expectation.
- CAPO, as a Public Service Organization, is unlikely to hire new employees unless there's a government policy decision. New fields or jobs arising from Envision will be managed through staff training, thus, **no influence for providing new jops.**
- Envision's potential to enhance AMS with **new products** for GAEC (checks aligns with the estimated **50% increase,** as stated in the comments.
- The number of records kept depends on farm size and may not be immediately affected by technology, which **introduces uncertainty in number of records farmers shall keep.**
- The comments highlight that as eligibility criteria are checked by Envision, on-the-spot checks will decrease, leading to **reduced paper use.**
- The **uncertainty** is tied to CAPO's limited control over **fertilizer use**, but a systematic communication of runoff risk assessment results **may lead to a decrease in chemical fertilizer use**.
- The comments indicate that early detection of illegal land clearing could deter farmers, potentially **increasing biodiversity**..
- While the direct impact on this KPI **(% Increase in the use of environmentally friendly agricultural practices**) is uncertain, all services of DP1 are considered as monitoring environmentally friendly agricultural practices, which **can indirectly lead to an increase in their use**.
- As Envision reduces on-the-spot checks through eligibility criteria checks, it is expected to lead to **a 20% decrease in vehicle movements**.
- Results of the Envision offer insights into farming practices, which can benefit administration and policy makers. The value provided for **number of puplications is "Number 2" implies that favourable effect.**
- Fraud, usually related to land grabbing, may not be entirely deterred by Envision. Administrative checks are essential, **introducing uncertainty regarding to decrease in fraud statement.**
- Envision provides access to its Datacube, which allows CAPO to query **new datasets**. The estimated **50% increase** aligns with the comments.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- With additional seasons of farmer declarations, there is a notable 4-fold **increase in relevant historical databases.**
- There's a **slight 10% increase in number of farmers who benefit from direct payments** from the previous year, but overall, only 25% of applicants apply for CAP/EU agri-environmental National policies. The expected **influence is low** due to limited participation.

Cyprus Business Case, DP2 (Cultivated crop type maps)

Collected indicator values and comments presented in table below.

<table>
<tr><td colspan="3">KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td></td></tr>
<tr><td>Decreased by20.%</td><td>uncertainty concerning the impact</td><td>On site inspections tend to find irregularities that are mostly not visible by earth observation and not the other way round. On 2023 though the OTSC are reduced due to the implemantation of AMS on BISS</td></tr>
<tr><td colspan="3">KPI 2: % Decrease in number of farmer declaration mistakes</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech-Social); Increasing the farmer's income(Economic/Tech -Social);</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by...%</td><td>very favourable effect (80%)</td><td>Intensive use of AMS along with the applicants wishes to apply for eco schemes led to better declarations</td></tr>
<tr><td colspan="3">KPI 3: % Decrease in work time for monitoring and inspection activities</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Reduce time(Economic/Tech).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by.40%</td><td>favourable effect (Number/40%)</td><td>Envision can help monitor farming practices without needing on site visits therefore reducing days spent for on the spot checks</td></tr>
<tr><td colspan="3">KPI 4: % Decrease in time spend for administration work</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Increasing the farmer's income(Economic/Tech -Social); reducing the administrative burden(Social); reducing the time(Economic/Tech)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by30%</td><td>uncertainty concerning the impact</td><td>Administration work is not expected to drop dramatically since the process of handling the applications is not really connected with how the checks are performed. The reduction in time can be mostly attributed to the reductions of objections to our findings since the expectation is to reduce mistakes in declarations (see KP8)</td></tr>
<tr><td colspan="3">KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC</td></tr>
</table>

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased …% of End users	favourable effect (Number/25%)	Once we can fully use the services then an increase in use by the farmers is expected

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Measurement units/ Estimated Value
Increased by 0 %	no influence	CAPO is a Public Service Organization and does not have the ability to hire new employees unless a general policy decision is made from the Government. In general, new fields or new jobs stemming from Envision will be covered by further training and extending the knowledge of current staff.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 50% of number or planed number of new products/services/processes by building on the ENVISION solution	favourable effect (Number/50%)	Envision can enhance AMS by offering products adding to the GAEC checks and related activities

KPI 8: % Decrease in number of records farmers shall keep

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Reduce the administrative burden (Social)

Target value	Estimated Value	Comments
Decreased by…% No target can be defined	uncertainty concerning the impact	The number of records kept depends on the size of the farm. It won't be affected at least immediately from the use of technology

KPI 9: % Decrease in amount of used paper for monitoring and inspection activities

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Cost reduction (Economic/Tech) ;Natural Resource use efficiency (Social Impact-Economic/Tech Impact Impact);

Target value	Estimated Value	Comments
Decreased by80%	very favourable effect (Number/50%)	Once most eligibility criteria are checked by Envision the number of on the spot checks will be reduced along with paper use

KPI 11: % Increase in biodiversity in farmland/grassland

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)

Target value	Estimated Value	Comments
Increased by...%	favourable effect (10%)	Lack of data Even without relevant data by detecting an intensive crop (cereals) in Natura there is a chance that this will act as a deterrent to farmers and eventually more land will be left undisturbed leading to an increase in biodiversity

KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).

Target value	Estimated Value	Comments
Decreased by...%	favourable effect (Number20%)	Once most eligibility criteria are checked by Envision the number of on-the-spot checks will be reduced along with vehicle movements

KPI 15: % Increase in number of publications and dissemination activities

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Social)

Target value	Estimated Value	Comments
Increased by 10%	favourable effect (Number 2)	Envision results offer insights about farming practices and it will be beneficial for Administration and Policy Makers to be informed about it.

KPI 16: % Decrease in number of fraud statement

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).

Target value	Estimated Value	Comments
Decreased by...%	uncertainty concerning the impact	There's no way to know if fraud will be deterred by Envision. Usually, fraud relates to land grabbing and that is not detected by technology but with administrative checks.

KPI 17: % Increase in number of datasets to support the development of technologies that allow the continuous and systematic monitoring of agricultural practices through earth observation

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Creation of datasets for further scientific research (Social)

Target value	Estimated Value	Comments
increased ..% of used data	favourable effect (Number 50%)	As well as other sources (shapefiles, csv) Envision is providing access to its Datacube where all data resides, and thus providing CAPO with the opportunity to query for new datasets needed to perform new operations.

KPI 18: % Increase in number of relevant historical databases

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

☐ Smart sampling for OTSC inspections ☐ Crops diversification compliance		
Link to the Impact Criteria: Creation of datasets for further scientific research (Social)		
Target value	Estimated Value	Measurement units/
Increased by...%	favourable effect (4)	We now have another season of declarations from farmers
KPI 19: % Increase in number of farmers who benefit from CAP/EU agri-environmental National policies based direct payments		
Data product : Cultivated crop type maps **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Confirmation of GSAA ☐ Smart sampling for OTSC inspections ☐ Crops diversification compliance		
Link to the Impact Criteria: Increasing the farmer's income (Economic/ Tech;Social)		
Target value	Estimated Value	Comments
Increased by 10%	low influence (2)	A slight increased is noticed of 10% from the previous year but overall only 25% of the total applicants applied for CAP/EU agri-environmental National policies

Table 10. Values and comments collected for Impact Indicators (Cyprus BC DP2)

The findings of Cyprus BC-Data Product 2 can be summarised as follows

- **Decreasing mistakes during on-site inspections** is highly dependent on the complex nature of these checks. The comments indicate that on-site inspections tend to reveal irregularities not visible through earth observation. While there is an expectation of improvement due to the implementation of AMS on BISS, **it remains uncertain how significant this will be**, as some irregularities may remain hidden.
- The favorable effect here can be attributed to the intensive use of AMS and the willingness of applicants to engage in eco schemes. This increased commitment to accurate declarations, is expected to **significantly reduce the number of farmer declaration mistakes**, improving the objectivity, transparency, and reliability of inspections.
- The **favorable effect expected for reducing work time for monitoring and inspection activities** is due to Envision's ability to eliminate the need for on-site visits. This means fewer days spent on the spot checks, resulting in improved efficiency in monitoring agricultural practices.
- The **uncertainty concerning this impact stems from the complexity of administration work**. The reduction in time is likely due to fewer objections to findings and a decrease in mistakes in declarations. However, the extent of this impact remains uncertain, as other factors can influence the time spent on administrative tasks.
- The anticipated **increase in the willingness of farmers and inspectors to use Envision's services is directly linked to the services' full utilization (favourable effect (Number/25%).** This aligns with the broader goal of improving awareness, knowledge, and opinion regarding environmentally friendly farming practices.
- The estimated **no influence on employment growth** is due to the nature of CAPO as a Public Service Organization. It cannot hire new employees independently but can expand into new fields through staff training and skill enhancement, without direct employment impact.
- The **favorable effect is expected for increase in new products and services built on the Envision solution**. Envision's potential to enhance AMS with new offerings aligns with the goal of providing better insights, expanding awareness, and improving environmental practices.
- Data Product effects, **on decreasing the records farmers keep is uncertain** as it depends on the size of the farm. The transition to technology may not immediately reduce the number of records, as it varies between different farms.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- The **very favorable effec**t is attributed to Envision's capability to reduce on-the-spot checks through eligibility criteria verification. This reduction can lead to a significant **decrease in paper usage**, promoting a more environmentally friendly and efficient approach.
- DP2 has potential to **increase biodiversity**. Early detection of intensive crop (cereals) in Natura may serve as a deterrent to farmers, possibly leading to more land being left undisturbed and ultimately increasing biodiversity.
- The **favorable effect of reducing travel with motor vehicles** is due to Envision's ability to check eligibility criteria, leading to fewer on-the-spot checks and consequently reduced vehicle movements.
- The **favorable effect** here is attributed to Envision's insights into farming practices. These insights are expected to benefit administration and policymakers, resulting in a greater **number of publications and dissemination activities.**
- The impact concerning the **decrease in fraud statements remains uncertain**. Fraud often relates to complex issues like land grabbing and may not be easily deterred by technology alone. Administrative checks play a significant role in addressing fraud.
- Envision's provision of access to its Datacube and the opportunity for CAPO to query **new datasets** aligns with the goal of supporting further scientific research and analysis, **indicating potantial favorable impact.**
- The **favorable effect** is due to the availability of another season of declarations from farmers, contributing to **increase relevant historical databases** which supports the creation of datasets for scientific research.
- The estimated value for the **increase in farmers who benefit from direct payments is low**. It reflects limited participation in CAP/EU agri-environmental National policies, despite a slight uptick in applications.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series)

Collected indicator values and comments presented in table below.

<table>
<tr><td colspan="3">KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☐ Stubble burning identification on arable land
☐ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 5 %</td><td>low influence (5 %)</td><td>The "Harvest Events Detection" algorithm improves the precision of on-site inspections by minimizing mistakes, but it doesn't have a substantial impact on how efficiently the inspection process itself is carried out.</td></tr>
<tr><td colspan="3">KPI 3: % Decrease in work time for monitoring and inspection activities</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☒ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Reduce time(Economic/Tech).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
</table>

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 10%	favourable effect (10 %)	The “Harvest Events Detection”, “Minimum Soil Cover” and “Stubble Burning Identification” services make monitoring and inspections more straightforward by delivering timely alerts regarding activities like harvesting, black follow sowing or stubble burning.

KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☒ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased 5 % of End users	low influence (5 %)	These services aren't just tools, they serve as solutions that genuinely address the needs of farmers and inspectors in their daily tasks and decision-making, increasing the number of end-users using these services.

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☐ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Measurement units/
Decreased by 5 %	negative impact	The incorporation of these services into NPA operations has resulted in a reduction in the workforce required to physically travel to on-site inspections. This is because Envision's services now enable remote monitoring, eliminating the need for employees to be present at inspection locations.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☒ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 20 % of number or planed number of new products/services/processes by building on the ENVISION solution	favourable effect (20 %	Within the Envision project, the NPA seized the opportunity to assess a notably larger number of services that are closely aligned with the requirements of the CAP compared to services from previous projects.

KPI 9: % Decrease in amount of used paper for monitoring and inspection activities

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☒ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Cost reduction (Economic/Tech)

Target value	Estimated Value	Comments
Decreased by...%	no influence	Inspectors keep all information and do checks on the tablets. No need to use papers at the moment.

KPI 10: % Decrease in chemical fertiliser use

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Harvest events detection
☐ Stubble burning identification on arable land
☐ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Environmental pollution(water-Soil) (Social): Cost reduction(Economic/Tech); Less Soil/ Land degradation (Social)

Target value	Estimated Value	Comments
Decreased by 10%	favourable effect (10 %)	This service involves conducting detailed assessments to pinpoint specific regions with a heightened susceptibility to nitrate runoff, particularly focusing on agricultural areas at risk of water contamination, implementing policies that encourage the reduction of trace amounts of nitrates and safeguarding water quality.

KPI 13: % Increase in the soil organic matter

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Harvest events detection
☐ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Lower emissions (Social); Less Soil/ Land degradation (Social)

Target value	Estimated Value	Comments
Increased by 10 %	favourable effect (10 %)	Planting agricultural crops as part of the CAP GAEC06 requirement before October 1 each year in black fallow fields can be an effective strategy to increase soil organic matter. The “Minimum Soil Cover” service oversees adherence to this obligation.

KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☐ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).

Target value	Estimated Value	Comments
Decreased by 5 %	low influence (5 %)	Envision’s services reduce the number of on-the-spot checks.

KPI 15: % Increase in number of publications and dissemination activities

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☒ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☒ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Social).

Target value	Estimated Value	Comments
Increased by 5 %	low influence (5 %)	NPA took the initiative to arrange events with the primary goal of educating and increasing awareness among farmers about EO monitoring technologies, specifically those associated with Envision services. These gatherings also aimed to impart valuable information and understanding of how to implement environmentally sustainable farming practices. In essence, the main objective was to inform and inspire farmers to embrace eco-friendly farming methods.

KPI 16: % Decrease in number of fraud statement

Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☐ Harvest events detection
☒ Stubble burning identification on arable land
☐ Minimum soil cover for soil erosion

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

<table>
<tr><td colspan="3">☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 2 %</td><td>low influence (2 %)</td><td>The service's ability to spot variations in reported stubble burning practices can serve as an alert mechanism, leading to a closer investigation and a deeper look into potentially fraudulent claims.</td></tr>
<tr><td colspan="3">KPI 19: % Increase in number of farmers who benefit from CAP/EU agri-environmental National policies based direct payments</td></tr>
<tr><td colspan="3">Data product : Analytics on Vegetation and Soil Index Time-series
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Harvest events detection
☐ Stubble burning identification on arable land
☒ Minimum soil cover for soil erosion
☐ Runoff risk assessment for the reduction of water pollution in nitrate vulnerable areas</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Increasing the farmer's income (Economic/ Tech;Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by 5 %</td><td>low influence (5 %)</td><td>By automating the monitoring process and providing data-driven insights, these services help minimize mistakes and discrepancies about farming activities. This ensures that farmers receive their entitled direct payments without delays due to inaccuracies.</td></tr>
</table>

Table 11. Values and comments collected for Impact Indicators (Lithuanian BC DP1).

The view of the expected impact of the Data Product 1 ((Analytics on Vegetation and Soil Index Time-series), related to each KPI, based on the values and comments provided, can be summarised as follows,

- For the DP 1- "Harvest Events Detection" service. While it can improve precision and **decrease mistakes, the actual efficiency of the inspection process may not be significantly affected**. The **influence is low**, as the primary benefit is accuracy, but it doesn't directly impact the speed of inspections.
- The combination of "Harvest Events Detection," "Minimum Soil Cover," and "Stubble Burning Identification" significantly can decrease work time. These services deliver timely alerts on activities like harvesting and burning, simplifying monitoring and inspections. **This can has a favorable effect**, **reducing the time spent on these activities**.
- The services under consideration, including "Harvest Events Detection," "Minimum Soil Cover," and "Stubble Burning Identification," genuinely address the needs of farmers and inspectors. They aren't just tools but solutions that enhance daily tasks and decision-making, resulting in a low, but **positive, influence on the increase in the number of end-users**.
- The incorporation of these services, particularly "Harvest Events Detection" and "Minimum Soil Cover," has led to a reduction in the workforce required for on-site inspections. This is because Envision's services enable remote monitoring, eliminating the need for employees to be physically present at inspection locations. The impact is negative, resulting in a **decrease in employment**.
- The services mentioned are closely aligned with the CAP requirements. Envision's project provides the opportunity to assess a larger number of services compared to previous projects, can lead to a favorable effect with **a 20% increase in new products, services, and processes**.
- There is **no influence on paper use** because inspectors now perform checks on tablets, eliminating the need for paper. This is due to the efficiency and convenience of Envision's services, particularly "Harvest Events Detection."
- The service in focus identifies regions at risk of nitrate runoff and implements policies to reduce nitrates, which is essential for environmental protection. This results can have a **favorable effect with a 10% decrease in chemical fertilizer use**.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- The "Minimum Soil Cover" service oversees adherence to a requirement to plant agricultural crops before October 1 each year in black fallow fields, effectively increasing soil organic matter. This can lead to a **favorable effect with a 10% increase in soil organic matter**.
- Envision's services, particularly "Harvest Events Detection," **reduce the need for on-the-spot checks. However, the expected influence is low at 5%,** as it does not eliminate the need for travel entirely.
- NPA has initiated events to educate and increase awareness among farmers about EO monitoring technologies associated with Envision services. This aims to improve awareness and knowledge, resulting in **a 5% increase in publications and dissemination activities**.
- The ability of the service to spot variations in reported stubble burning practices serves as an alert mechanism, potentially leading to a closer investigation into fraudulent claims. However, the **influence is low at 2%, as fraud detection remains complex and multifaceted**.
- These services help minimize mistakes and discrepancies in farming activities, ensuring that farmers receive their entitled direct payments without delays. **The expected influence is low, resulting in a 5% increase in the number of beneficiaries.**

Lithuanian BC, DP2 (Cultivated crop type maps)

Collected indicator values and comments presented in table below.

<table>
<tr><td colspan="3">KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 20 %</td><td>favourable effect (20 %)</td><td>The “Confirmation of GSAA” service helps to lower the number of mistakes that occur during on-the-spot checks. It makes these on-site inspections more accurate.</td></tr>
<tr><td colspan="3">KPI 2: % Decrease in number of farmer declaration mistakes</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech-Social); Increasing the farmer's income(Economic/Tech -Social);</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 10%</td><td>favourable effect (10 %)</td><td>The “Confirmation of GSAA” service assists farmers in correctly declaring crop types and measuring parcel boundaries accurately.</td></tr>
<tr><td colspan="3">KPI 3: % Decrease in work time for monitoring and inspection activities</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☒ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Reduce time(Economic/Tech).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
</table>

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 20%	favourable effect (20 %)	"Confirmation of GSAA" and "Crops Diversification Compliance" services save time during monitoring and inspections by offering informative data on the most probable crop types, reducing the need for exhaustive, manual inspection of every field.

KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☒ Crops diversification compliance

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased 10% of End users	favourable effect (10 %)	By continuously improving and adapting Envision services to meet NPA needs, there is a significant chance of attracting more end-users and expanding the user base among farmers and inspectors.

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Comments
Decreased by 10 %	negative impact	The inclusion of this service in NPA activities has led to a noteworthy reduction in the workforce required required for on-site inspections. This decrease in employees is linked to the capability of Envision's service to conduct remote monitoring and crop type identification in fields.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☒ Crops diversification compliance

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 10 % of number or planed number of new products/services/processes by building on the ENVISION solution	favourable effect (10 %)	In previous projects, the NPA has come across services that focused on identifying specific crop types. However, with Envision, there is a clear emphasis on achieving substantially improved outcomes in terms of data accuracy, user-friendliness, and overall service performance compared to what has been experienced in the past.

KPI 12: % Increase in the use of environmental friendly agricultural practices (no-till farming, agroforestry, crop rotation etc.)

Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance

Link to the Impact Criteria: Environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)

Target value	Estimated Value	Comments
Increased by 30%	very favourable effect (30 %)	Farmers are motivated to embrace eco-conscious agricultural practices by implementing novel ecosystems as prescribed by the directives laid out in the Strategic Plan. The "Confirmation of GSAA" service helps identify which fields are incorporating these environmentally friendly practices in line with the Strategic Plan.

KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

<table>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 10%</td><td>favourable effect (10 %)</td><td>Envision's service cut down on the frequency of physical on-site inspections by enabling the remote evaluation of completed or ongoing activities.</td></tr>
<tr><td colspan="3">KPI 15: % Increase in number of publications and dissemination activities</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☒ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by 10 %</td><td>favourable effect (10 %)</td><td>During the international agricultural exhibition in 2023, farmers had the opportunity to gain deeper insights into EO monitoring technologies and understand the purpose, benefits, effectiveness and practical applications of these technologies and related services offered by Envision.</td></tr>
<tr><td colspan="3">KPI 16: % Decrease in number of fraud statement</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Decreased by 5%</td><td>low influence (5 %)</td><td>The “Confirmation of GSAA” service assists in early fraud detection by flagging inconsistencies or unexpected crop types in specific areas. This prompts closer examination and investigation into potential fraudulent claims.</td></tr>
<tr><td colspan="3">KPI 19: % Increase in number of farmers who benefit from CAP/EU agri-environmental National policies based direct payments</td></tr>
<tr><td colspan="3">Data product : Cultivated crop type maps
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Confirmation of GSAA
☐ Smart sampling for OTSC inspections
☐ Crops diversification compliance</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Increasing the farmer's income (Economic/ Tech;Social)</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
<tr><td>Increased by 10%</td><td>favourable effect (10 %)</td><td>The "Confirmation of GSAA" service can enhance the accuracy of declarations, promote policy compliance, reduce mistakes and expedite the processing of applications. This, in turn, contributes to an increased number of farmers who are eligible to receive direct payments under agricultural subsidy programs.</td></tr>
</table>

Table 12. Values and comments collected for Impact Indicators (Lithuanian BC DP2)

The findings of the provided KPI values and comments for Data Product 2, can be summurised as follows

- The "Confirmation of GSAA" service contributes significantly to **decreasing mistakes during on-site inspections**. It enhances the accuracy of these inspections, which has a **favorable effect on their reliability.**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- The same "Confirmation of GSAA" service helps farmers correctly declare crop types and measure parcel boundaries accurately. This can results in a **favorable effect by reducing mistakes in farmer declarations.**
- The "Confirmation of GSAA" and "Crops Diversification Compliance" services save time during **monitoring and inspections** by providing informative data on crop types. This reduces the need for exhaustive manual inspections and has a **favorable effect on time reduction**.
- Continuous improvement and adaptation of Envision services to meet NPA needs is expected to attract more end-users among farmers and inspectors. This will have a **favorable effect by increasing the number of users.**
- The inclusion of the "Confirmation of GSAA" service in NPA activities has led to a reduction in the workforce required for on-site inspections. **This decrease in employees** is linked to Envision's capability for remote monitoring. As a result, this KPI has a **negative impact on employment.**
- With Envision, there is a clear emphasis on achieving substantially improved outcomes in terms of data accuracy, user-friendliness, and overall service performance compared to what has been experienced in the past. This can lead to a favorable effect with a **10% increase in new products, services, and processes.**
- The "Confirmation of GSAA" service helps identify fields incorporating **environmentally friendly practices** in line with the Strategic Plan. This motivates farmers to embrace eco-conscious agricultural practices. The expected impact is very favorable, with **a 30% increase in the use of these practices.**
- Envision's service cuts down on the frequency of physical on-site inspections by enabling remote evaluation of activities. This can lead a **favorable effect with a 10% decrease in the need for travel.**
- Farmers gain deeper insights into EO monitoring technologies and the practical applications of these technologies and related services offered by Envision. This can lead to favorable **effect with a 10% increase in publications and dissemination activities.**
- The "Confirmation of GSAA" service assists in early fraud detection by flagging inconsistencies or unexpected crop types. This prompts **closer examination and investigation into potential fraudulent claims, leading to a low influence of 5%.**
- The "Confirmation of GSAA" service enhances the accuracy of declarations, promotes policy compliance, and reduces mistakes, thus expediting the processing of applications. This can lead to a **favorable effect with a 10% increase in the number of farmers benefiting from CAP/EU agri-environmental National policies.**

Lithuanian BC, DP3 (Grassland mowing events detection)

Collected indicator values and comments presented in table below.

KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).		
Target value	Estimated Value	Comments

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 40%	very favourable effect (40 %)	This data product significantly reduces the mistakes performed during on-the-spot checks by providing valuable information and insights that enhance the productivity and reliability of the inspection process.

KPI 3: % Decrease in work time for monitoring and inspection activities

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: Reduce time(Economic/Tech).

Target value	Estimated Value	Comments
Decreased by 30%	very favourable effect (30 %)	The "Grasslands Mowing Events Detection" data product plays a crucial role in streamlining monitoring and inspections by giving specific alerts about ongoing mowing activities. This simplifies the identification of applicants who haven't yet mowed their fields, making the process more efficient.

KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased 20% of End users	favourable effect (20 %)	The increase in the number of end-users using the "Grasslands Mowing Events Detection" data product is a result of its ability to address the needs of farmers and inspectors effectively and positive user experiences.

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Comments
Decreased by 10 %	negative impact	In essence, fewer employees are now necessary due to the Envision data product's capability to remotely monitor and identify the time signals of meadows mowing events.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies/ Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 10 % of number or planed number of new products/services/processes by building on the ENVISION solution	favourable effect (10 %)	Indeed, the NPA had prior experience with testing meadows mowing data product across various projects. However, the outcomes from Envision's testing were nothing short of astonishing as they achieved a remarkable 100% level of data product reliability, surpassing all prior expectations. This led to the NPA's decision to use these results at the operational level.

KPI 8: % Decrease in number of records farmers shall keep

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: Reduce the administrative burden (Social)

Target value	Estimated Value	Comments
Decreased by 10%	favourable effect (10 %)	Farmers do not have to keep the traditional grassland mowing records register as they can be detected via satellites.

KPI 10: % Decrease in chemical fertiliser use

Data product : Grassland mowing events detection
Services: Grassland activity monitoring and management

Link to the Impact Criteria: Environmental pollution(water-Soil) (Social): Cost reduction(Economic/Tech); Less Soil/ Land degradation (Social)

Target value	Estimated Value	Comments

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 2 %	low influence (2 %)	The “Grasslands Mowing Events Detection” data product may not directly reduce the use of chemical fertilizers, but it plays a role in promoting sustainable land management practices that can ultimately lead to a reduction in chemical fertilizer usage.
KPI 11: % Increase in biodiversity in farmland:grassland		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by 5%	low influence (5 %)	To protect declining wild bird populations, which are crucial for maintaining the natural environment and ecological balance, a strategic plan mandates mowing activities between June 20 and October 30 under the specific CAP measure named "For the protection of wild birds outside the Natura 2000 area." The "Grasslands Mowing Events Detection" algorithm offers a means to effectively monitor and ensure compliance with this rule.
KPI 13: % Increase in the soil organic matter		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Lower emissions (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by 5%	low influence (5 %)	This data product provide detailed alerts about ongoing mowing activities in grasslands. By ensuring that mowing occurs at the right time, it helps maintain the health of grasslands, which can lead to increased plant growth, root biomass and the return of organic matter to the soil after mowing.
KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).		
Target value	Estimated Value	Comments
Decreased by 20%	favourable effect (20 %)	The “Grasslands Mowing Events Detection” data product reduces the need for inspectors to be present at all inspection sites, as some assessments can be carried out from a distance.
KPI 15: % Increase in number of publications and dissemination activities		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social)		
Target value	Estimated Value	Comments
Increased by 10 %	favourable effect (10 %)	At the 2023 international agricultural exhibition, farmers had a valuable chance to enhance their understanding of EO monitoring technologies. They delved into the significance, advantages, efficiency and real-world uses of these technologies, particularly in relation to the "Grassland Mowing Events Detection" data product provided by Envision.
KPI 16: % Decrease in number of fraud statement		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech -Social).		
Target value	Estimated Value	Comments
Decreased by 10 %	favourable effect (10 %)	The "Grasslands Mowing Events Detection" data product reduces fraud claims by offering precise, data-supported information that aids in verifying land use practices and detecting inconsistencies in reported meadows mowing activities.
KPI 19: % Increase in number of farmers who benefit from CAP/EU agri-environmental National policies based direct payments		
Data product : Grassland mowing events detection **Services:** Grassland activity monitoring and management		
Link to the Impact Criteria: Increasing the farmer's income (Economic/ Tech;Social)		
Target value	Estimated Value	Comments

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

Increased by 5%	low influence (5 %)	This data product actively supports farmers in adhering to policies, promptly identifying mowing activities, minimizing mistakes, streamlining monitoring and ultimately increasing the number of farmers who qualify for direct payments as per agricultural policies.

Table 13. Values and comments collected for Impact Indicators (Lithuanian BC DP3)

The findings of the provided KPI values and comments for Data Product 2, can be summurised as follows

- The "Grassland Mowing Events Detection" data product has a **very favorable effect on decreasing mistakes during on-site inspections**. It significantly improves the reliability of inspections, thus enhancing the productivity of the inspection process.
- This data product has a **very favorable effect in decreasing work time for monitoring and inspection activities**. By providing specific alerts about ongoing mowing activities, it streamlines the identification of applicants who haven't mowed their fields, making the process more efficient.
- There is a **favorable effect on increasing the number of end-users willing to use the "Grassland Mowing Events Detection" data product.** It effectively addresses the needs of farmers and inspectors and provides positive user experiences, contributing to increased awareness and knowledge on environmentally friendly farming.
- The **impact is negative as there is a decrease in the number of new employments**. The Envision data product's capability to remotely monitor and identify mowing events reduces the need for additional employees.
- There is a **favorable effect in increasing the number of new products, services, and processes** by building on the ENVISION solution. The reliability and performance of the data product have led to its operational use, which has prompted the development of new products and services.
- The impact is **favorable, as the data product reduces the need for farmers to keep traditional grassland mowing records**. These records can now be detected via satellites, reducing the administrative burden.
- The data **product may not directly decrease chemical fertilizer use, but it promotes sustainable land management practices** that can ultimately lead to a reduction in chemical fertilizer usage. It can has a **low influence indirectly** on this KPI.
- The **effect is favorable,** as the "Grassland Mowing Events Detection" algorithm helps ensure compliance with rules for protecting wild birds. This, in turn, can contribute to **maintaining biodiversity** by safeguarding declining wild bird populations.
- The data product can have a **low influence** about **increasing the soil organic matter**. It provides alerts about ongoing mowing activities in grasslands, contributing to soil health and organic matter, but the impact is not substantial.
- The "Grasslands Mowing Events Detection" data product has a **favorable effect on decreasing the need for inspectors to travel to inspection sites**. This reduces emissions and costs.
- There is a **favorable effect on increasing the number of publications and dissemination activities**. The data product has enabled farmers to enhance their understanding of EO monitoring technologies, particularly in relation to grassland mowing events, at international agricultural exhibitions.
- The data product has a **favorable effect on decreasing fraud claims** by offering precise, data-supported information that aids in verifying land use practices and detecting inconsistencies in reported meadows mowing activities. This enhances the objectivity and reliability of inspections.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- There is only a slight increase in the **number of farmers benefiting from CAP/EU agri-environmental National policies, indicating a low influence**. The data product primarily supports farmers in adhering to policies, promptly identifying mowing activities, and streamlining monitoring, which may indirectly lead to more farmers qualifying for direct payments.

Flemish BC, DP4 (Soil condition monitoring)

Collected indicator values and comments presented in table below.

KPI 3: % Decrease in work time for monitoring and inspection activities		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Reduce time(Economic/Tech).		
Target value	Estimated Value	Measurement units/ Estimated Value
Decreased by...%	no influence	Cross compliance and in the new CAP conditionality checks are very elaborate and consist of many checks. Checking the soil analysis is only a very small part of such a farm visit. And for pH the check is still necessary. Further more, according to regulations, samples have to be analysed by labs.
KPI 4: % Decrease in time spend for administration work		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Increasing the farmer's income(Economic/Tech -Social); reducing the administrative burden(Social); reducing the time(Economic/Tech)		
Target value	Estimated Value	Measurement units/ Estimated Value
Decreased by...%	no influence	There is no influence as the farmer will still need to have soil analysis. In the new CAP under conditionality, farmers also have to be able to prove that they remediate a OC lab result below a threshold. LV could focus on those farms where there is no evident increase and so there will we less burden for farmers that have good results. Downside is that trends aren't always immediately visible after one year.
KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: improve awareness, knowledge, and opinion on environmentally friendly farming / Knowledge Sharing (Economic/Tech -Social).		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased …% of End users	favourable effect	We expect that information on SOC can have a positive influence on the number of farmers who are willing to use the service through Soil Pasport (visualisation of the SOC). It is however very difficult to put a number on this. Soil Pasport has just been released and isn't actively used by farmers yet.
KPI 6: % Increase in number of new employments for relevant work in your organization/company.		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased by … %	low influence (5 %)	There will be some work needed on the implementation in our processes, which in concreto will mean that an employee will spend some (5%) of his/her time on this.
KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, opinion on environmental friendly farming / Knowledge transfer (Economic/Tech; Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased … % of number or planed number of new products/services/processes by building on the ENVISION solution	uncertainty concerning the impact	Nothing is planned at this point, but it is possible that in future processes the soil conditions will be taken into account. The service can then be very useful as it gives information for the whole of Flanders.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

KPI 8: % Decrease in number of records farmers shall keep		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Reduce the administrative burden (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Decreased by...%	low influence	We expect some impact but this will be neglectable as soil analysis is also necessary for other parameters

KPI 20: % Decrease in pesticide/ herbicides use		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Food quality and safety(Social); Less environmental pollution(water-Soil) (Social); Cost reduction(Economic/Tech)		
Target value	Estimated Value	Measurement units/ Estimated Value
Decreased by...%	favourable effect	We hope that by giving information about the soil conditions like OC, farmers will learn and decide to work on improving the soil conditions for their crops and that way decrease the need for pesticide/ herbicidess. So the impact is indirect and therefore very hard to quantify.

KPI 10: % Decrease in chemical fertiliser use		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Environmental pollution(water-Soil) (Social): Cost reduction(Economic/Tech); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Decreased by...%	favourable effect	We hope that by giving information about the soil conditions like OC, farmers will learn and decide to work on improving the soil conditions for their crops and that way decrease the need for chemical fertilizers. So the impact is indirect and therefore very hard to quantify. If farmers can see the possibly nagative effect of the use of chemical fertilizers on soil health, they will change their fertilizing strategies.

KPI 11: % Increase in biodiversity in farmland		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased by...%	favourable effect	We hope that by giving information about the soil conditions like OC, farmers will learn and decide to work on improving the soil conditions for their crops and that way increase biodiversity. So the impact is indirect and therefore very hard to quantify.

KPI 12: % Increase in the use of environmental friendly agricultural practices (no-till farming, agroforestry, crop rotation)		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased by...%	favourable effect	We hope that by giving information about the soil conditions like OC, farmers will learn and decide to work on improving the soil conditions for their crops and that way also embrace soil favorable and environmentally friendly practices. So the impact is indirect and therefore very hard to quantify.

KPI 13: % Increase in the soil organic matter		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Lower emissions (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased by...%	favourable effect	Giving information about SOC, will surely entice the farmers to improve the OC when levels are low. The impact is indirect however and therefore very hard to quantify.

KPI 17: % Increase in number of datasets to support the development of technologies that allow the continuous and systematic monitoring of agricultural practices through earth observation
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations
Link to the Impact Criteria: Creation of datasets for further scientific research (Social)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Target value	Estimated Value	Measurement units/ Estimated Value
increased ….% of used data	favourable effect	The dataproduct will be used to optimize local sampling strategies. (Steropes, SQAT, ScaleAgData,..). The workflow can be reused with new ground truth data to train better performing models, be expanded with new datasources (satellite, rainfall, DEM, soilmaps).
KPI 18: % Increase in number of relevant historical databases		
Data product : Soil condition monitoring **Services:** Top-soil qualitative soil organic carbon estimations		
Link to the Impact Criteria: Creation of datasets for further scientific research (Social)		
Target value	Estimated Value	Measurement units/ Estimated Value
Increased by...%	favourable effect	The SOC service will create a database for the soil in Flanders that will eventually show a trend in the SOC in Flanders and that way becomes a relevant historical dataset

Table 14. Values and comments collected for Impact Indicators (Flemish BC DP4).

The findings of the KPI values and comments provided can be summarised as follows

- Considering the impact on the **decrease in work time for monitoring and inspection activities**, **the services are expected to have no influence**. This is largely due to the intricate nature of conditionality checks in the new Common Agricultural Policy (CAP), which involves various checks beyond soil analysis. Moreover, pH checks remain necessary, and regulations require samples to be analyzed by labs. Consequently, the reduction in work time related to these services is unlikely to be significant.
- Similarly, in terms of **reducing time spent on administration work, the services are not expected to exert a strong influence.** Soil analysis is just one component of CAP conditionality, and farmers must be able to prove that they have remediated a soil organic carbon (OC) lab result below a certain threshold. Therefore, while there might be less burden for farmers with favorable results, the impact may not be immediately noticeable, as trends may take time to emerge.
- **On a more positive note, there's the potential to increase the number of farmers and inspectors willing to use these services .** This is attributed to the belief that providing information on soil organic carbon (SOC) levels can positively influence the adoption of the services through tools like Soil Pasport, which offers visualization of SOC. However, quantifying this increase is challenging, as the adoption of such tools by farmers is an evolving process, and their active utilization may take time to gain traction.
- **Considering the impact on new employments within the organization or company, it's estimated to be relatively low (around 5%).** Some work is required for the implementation of these services in organizational processes, but it doesn't represent a substantial proportion of employee time.
- **When assessing the potential impact of these services on the development of new products, services, or processes, there's an element of uncertainty**. While there are no specific plans at this point, the services could play a valuable role in future processes that consider soil conditions, especially in the context of Flanders. Therefore, their use for policy-making and other applications is anticipated, although the exact nature and extent of these future developments remain uncertain.
- The goal of **decreasing the number of records that farmers must keep is expected to have a low influence.** Despite the service's potential to simplify record-keeping, it's important to note that soil analysis remains necessary for other parameters, contributing to the persistence of record-keeping requirements.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- The data **product will positively contribute to the creation of datasets for scientific research and technology development**. It will enhance local sampling strategies and provide valuable data for a range of projects and models, thereby supporting further scientific research and innovation in various fields.
- **The Soil Organic Carbon (SOC) monitoring product will have a positive impact on the establishment of historical databases**. Over time, it will build a comprehensive database chronicling soil conditions in Flanders. This evolving database will reveal trends in SOC, evolving into a valuable historical resource for future reference and research.
- Moving on to the **reduction in pesticide/ herbicides use, the impact is expected to be favorable**. Providing information about soil conditions, such as organic carbon levels, is likely to encourage farmers to work on improving soil quality for their crops. As a result, the need for pesticides/ herbicidesmay decrease. However, it's important to recognize that these **impacts are indirect** and challenging to quantify.
- **A favorable effect is anticipated in terms of decreasing chemical fertilizer use**. By providing information about soil conditions, farmers may be inclined to modify their fertilization strategies, especially if they can see the potential negative effects of chemical fertilizers on soil health. However, as with pesticide/ herbicides use, these **impacts are indirect** and difficult to measure quantitatively.
- **The product may also positively (favourable effect) impact biodiversity in farmland**. The provision of information on soil conditions could motivate farmers to work on improving soil quality, which, in turn, can enhance biodiversity. Nevertheless, quantifying this impact remains challenging, as it depends on various factors and the specific responses of farmers to the information provided.
- **In the context of environmental-friendly agricultural practices** such as no-till farming, agroforestry, and crop rotation, **the services may encourage their adoption**. Information about soil conditions can guide farmers toward practices that are more favorable for soil health and the environment. However, similar to the other impacts, **the effect is favourable and indirect**, and challenging to quantify.
- Finally, **favourable effect for an increase in soil organic matter due to the services**. By providing information about soil organic carbon levels, farmers may be motivated to improve organic matter content in their soil. Nevertheless, quantifying this impact remains difficult, as it relies on individual farming practices and responses.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

Collected indicator values and comments presented in table below.

<table>
<tr><td colspan="3">KPI 1: % Decrease in mistakes performed during on-site inspections (by CB or PA)</td></tr>
<tr><td colspan="3">Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring</td></tr>
<tr><td colspan="3">Link to the Impact Criteria: Improve the objectivity- transparency, and reliability of the inspections (Economic/Tech-Social).</td></tr>
<tr><td>Target value</td><td>Estimated Value</td><td>Comments</td></tr>
</table>

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 10%	very favourable effect (over 20 %)	Envision service detected something which is very difficult to detect in on-site inspection by human and individual in inspection, because border lines of parcels in on-site inspection are imaginar (eg: trees or roads in the edge on parcel which is implicated that farmer didn`t declare parcels on the proper size on the parcel with declared crop). Decrase only for crop growth monitoring. No violations of organic principles were found among inspected farmers.

KPI 2: % Decrease in number of farmer declaration mistakes

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech-Social); Increasing the farmer's income(Economic/Tech -Social);

Target value	Estimated Value	Comments
Decreased by 20%	very favourable effect (over 20 %)	Envision service detected something which is very difficult to detect in on-site inspection by human and individual in inspection, because border lines of parcels in on-site inspection are imaginar (trees or roads in the edge on parcel which is implicated that farmer didn`t declare parcels on the proper size on the parcel with declared crop). Additionaly inspectors detected some farmer declaration mistakes on the spot and Envision service confirme these mistakes (eg: on some parcels corn was not sown and farmer declared it as sown). Decrase only for crop growth monitoring. No violations of organic principles were found among inspected farmers.

KPI 3: % Decrease in work time for monitoring and inspection activities

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Reduce time(Economic/Tech).

Target value	Estimated Value	
Decreased by20%	very favourable effect (over 20%)	Inspection and certification process in current regime is very time cost and any decrease is very valuable. Focus in inspection on problematic parcel identified by Envision service.

KPI 4: % Decrease in time spend for administration work

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Increasing the farmer's income(Economic/Tech -Social); reducing the administrative burden(Economic/Tech -Social); reducing the time(Economic/Tech)

Target value	Estimated Value	Comments
Decreased by 10%	no influence	There are no impact to administrative work. ENVISION service could have only decreased time for annual report, but if it all crops and all parcels included. In applications ENVISION service couldn't have any impact. Also, we still can't replace on spot inspection to remotely, because Organic Regulations still doesn't recognize remotely inspection.

KPI 5: % Increase in the number of farmers and Inspectors (end users) who are willing to use the services in your BC

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: improve awareness and knowledge on environmentally friendly farming / Knowledge transfer (Economic/Tech -Social).

Target value	Estimated Value	Comments
Increased 100% of End users	very favourable effect (more than 75%)	More end users provide bigger insight in functionality of service.

KPI 6: % Increase in number of new employments for relevant work in your organization/company.

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Providing new jobs (Economic/Tech -Social)

Target value	Estimated Value	Comments
Increased by 10%	favourable effect (0-10%)	Increasing in IT related job from 1.1.2023. – for ENVISION project (1 employee which). We want to have service with which we will keep current number of employees and increase number of clients with better efficience.

KPI 7: % Increase in number of new products/services/processes by building on the ENVISION solution.

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social); improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech; Social)

Target value	Estimated Value	Comments
Increased 1 of new products/services /processes by building on the ENVISION solution	favourable effect (1 new project)	We are continuing to use Envision service and we are also include in new project – THEROS that will create an integrated toolbox for improved verification and prevention of adulterations and non-compliances in organic and geographical indications food supply chain.

KPI 8: % Decrease in number of records farmers shall keep

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Reduce the administrative burden (Social)

Target value	Estimated Value	Comments
Decreased by 10%	no influence	It is very important for farmers satisfaction and happiness, because they are very frustrated with number of records they should keep and they often gets non-conformities for not updated records. There is still no influence, because farmers still need to keep same records. Farmers could use mobile application as farm book, but parcels need to be first upload to the platform. Control body uses platform and than farmer can upload pictures and comments on the field. Farmers only downloaded the application (about 40 farmers) and only farmers which parcels imported on the platform checked the functionality (13 farmers).

KPI 9: % Decrease in amount of used paper for monitoring and inspection activities

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Cost reduction (Economic/Tech); Natural Resource use efficiency (Social Impact- Economic/Tech Impact Impact);

Target value	Estimated Value	Comments
Decreased by 30%	very favourable effect (over 30%)	It is easier for remote work only with electronic data and also for environment protection and responsibility.

KPI 20: % Decrease in pesticide/ herbicides use

Data product : Crop growth Monitoring and identification of organic farming practices
Services: Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope.
☒ Distinction of organic farming practices
☒ Crop growth monitoring/ Crop phenology monitoring

Link to the Impact Criteria: Food quality and safety(Social); Less environmental pollution(water-Soil) (Social); Cost reduction(Economic/Tech)

Target value	Estimated Value	Comments

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Decreased by 10%	low influence (less then 5%)	Organic producers are obliged to primarily establish preventive measures and avoid the use of pesticide/ herbicidess. Detection of pesticide/ herbicides use, especially non permitted, is one of the key elements of organic production control. Envision service no influence for using of pesticide/ herbicides, but there is indirectly possible through crop growth and phenology monitoring services discover malpracticies using herbicides.
KPI 10: % Decrease in chemical fertiliser use		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Environmental pollution(water-Soil) (Social): Cost reduction(Economic/Tech); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Decreased by 10%	low influence (less then 5%)	Organic producers are obliged to primarily establish preventive measures and avoid the use of chemical fertilizers. Detection of use of chemical fertilizers is one of the key elements of organic production control. Envision service no influence for using of fertilizer, but there is indirectly possible through crop growth and phenology monitoring services discover malpracticies using mineral fertilazer (accelerated growth).
KPI 11: % Increase in biodiversity in farmland:grassland		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Less environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Decreased by 10%	very favourable effect (over 10%)	Contributing to a high level of biodiversity In particular using varieties suitable for organic production is one of the main objectives of organic farming. A successful, biodiverse farm is one that preserve biodiversity and conserve natural resources. Through the Envision service detected trees which is not declared from the farmer.
KPI 12: % Increase in the use of environmental friendly agricultural practices (no-till farming, agroforestry, crop rotation etc.)		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Environmental pollution(water-Soil) (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by 10%	favourable effect (5-10%)	Environmental friendly agricultural practices are very important for general compliance with organic standards, because in the long term they indirectly affect the reduction of the use of pesticide/ herbicidess, fertilizers, and biodiversity.
KPI 13: % Increase in the soil organic matter		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Lower emissions (Social); Less Soil/ Land degradation (Social)		
Target value	Estimated Value	Comments
Increased by 10%	no influence	Increase of SOC is indirectly indicator of good agricultural practices, the use of manure, plowing of green manure. Envision service no influence for SOC.
KPI 14: % Decrease in number of travelling with motor vehicles for on-site inspection		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Lower emissions (Social); Cost reduction (Economic/Tech).		

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Target value	Measurement units/ Estimated Value	Comments
Decreased by 20%	low influence (less then 10%)	Continuous monitoring reduces the need for additional visits to producers and help to reduce visits to those really needed, providing a helpful tool in risk assessment (eg: in case of one farmer, whose parcels validated with Envision service we decresed risk assessment as a consequence of provided results from Envision and there is no more need for additional annual inspection).
KPI 15: % Increase in number of publications and dissemination activities		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Social)		
Target value	Estimated Value	Comments
Increased by 10%	very favourable effect (over 10%)	OCS is very active in dissemination activities, these activities were carried out in accordance with the pre-planned
KPI 16: % Decrease in number of fraud statement		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Improve the objectivity- transparency and reliability of the inspections (Economic/Tech -Social).		
Target value	Estimated Value	Comments
Decreased by 20%	low influence (less then 10%)	Continious supervison, usefull additional tools for risk assessment could reduce possibility of frauds in agriculture. In organic frauds are in most significant number of cases related to use of non-permited techniques, mixing or commingling of organic products with conventional.
KPI 17: % Increase in number of datasets to support the development of technologies that allow the continuous and systematic monitoring of agricultural practices through earth observation		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Creation of datasets for further scientific research (Social)		
Target value	Estimated Value	Comments
Increased 50% of used data	very favourable effect (more than 50%)	535 parcels imported into the Envision platform - 306 organic parcels in August 2022 (crop 2022) and 229 parcels for crop 2023 from May to July in 2023.
KPI 18: % Increase in number of relevant historical databases		
Data product : Crop growth Monitoring and identification of organic farming practices **Services:** Please select the related service(s), if the defined indicator and criteria precisely related to the service(s) in scope. ☒ Distinction of organic farming practices ☒ Crop growth monitoring/ Crop phenology monitoring		
Link to the Impact Criteria: Creation of datasets for further scientific research (Social)		
Target value	Estimated Value	Comments
Increased by 10%	very favourable effect (more than 10%)	We started with importing parcel from M24 and historical data we got next year, from M33 (160 parcels imported into the platform for 2022 and 2023). Additionaly, the conversion for organic production is 2 or 3 years, depending on the plant species, but if in the last 3 years there was a meadow or pasture where no agrotechnical work was performed, the certification body can approve a recognition of previous implementation of organic rules. Envison service can help with this decision-making.

Table 15. Values and comments collected for Impact Indicators (Serbian BC-DP5)

The findings of the KPI values and comments provided can be summarised as follows

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

- The product has a **very favourable effect on reduce mistakes during on-site inspections and errors in farmer declarations**. Its ability to identify discrepancies in parcel boundaries and undeclared crops can greatly improve inspection accuracy and ensure compliance with organic standards.
- By focusing on problematic parcels, this poduct can streamline work time for **monitoring and inspection activities**. it can lead to more efficient inspections**, resulting in time savings**.
- The transition to electronic data not only facilitates remote work but also aligns with environmental responsibility by **reducing paper usage (very favourable effect (over 30%**), promoting sustainability in monitoring and inspection.
- It's important to note that the service does **not directly impact administrative tasks**, such as record-keeping and compliance management, as these are beyond the service's core functions. Additionally, regulatory frameworks do not recognize remote inspections as a substitute for on-site administrative work.
- **DP5 can have low influence on reducing pesticide/ herbicides and chemical fertilizer use**. Organic producers' commitment to preventive measures constrains the service's influence. While it can indirectly aid in detecting malpractices, it does not lead to substantial reductions.
- Notably, the service **has very favourable effect in increasing the willingness of farmers and inspectors to use its services**, underscoring its effectiveness and value within the community.
- **It can potentially(favourable effect)lead to an increase in IT-related job opportunities**, while maintaining the current number of employees while expanding the client base and enhancing organizational efficiency.
- **The service can play a favourable effect by contributing to the development of innovative projects** or promoting involvement in similar initiatives such as THEROS**.**
- **It has no influence for the number of records that farmers must keep**, despite the potential of mobile applications to simplify record-keeping. This limitation is due to factors like the need to upload parcels to the platform.
- **The service can make a substantial contribution (very favourable effect) to increasing biodiversity in farmland, particularly in grassland areas**. By detecting undeclared trees on farmers' land, it can promote biodiversity preservation and conservation of natural resources.
- **It can successfully encourage the adoption of environmentally friendly agricultural practices**, vital for compliance with organic standards. These practices can indirectly contribute to reducing pesticide/ herbicides and fertilizer use and enhancing biodiversity.
- While it may have a **low influence on reducing travel for on-site inspection**, it plays a significant role in risk assessment and can help eliminate unnecessary visits, improving overall inspection efficiency.
- **Very favourable effect in increase publications and dissemination activities,** aligning with planned goals and highlighting the organization's active role in promoting its services.
- **Through continuous supervision and risk assessment tools, the service can contribute to reducing fraud statements in agriculture**. Though the decrease may be marginal in percentage terms, the Envision service can address key aspects related to organic fraud prevention.
- **The service has very favourable effect to increase the availability of datasets**, supporting the development of technologies for continuous and systematic monitoring of agricultural practices

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

through earth observation. This rich dataset can contribute to advancements in agricultural technology.

- **It has very favourable effect in acquiring relevant historical databases**, which are essential for understanding and supporting organic conversion processes, furthering the development of organic farming practices and technology.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

4.2 Evaluation of the business value and acceptance

The results for business value and acceptance evaluation are presented below for each specific field.

4.2.1 Reduced time and effort

The "Reduced time and effort" assessment results of the Data products&Services per BCs are presented in Table 16 to 18.

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the close& open-ended questions and interview are summarized in the table below

Field: Reduced time and effort [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
Envision data products and services can help reduce the number of travel trips for on-site inspections	strongly agree	Agree
Envision data products and services can help to reduce the time spent on monitoring activities	Agree	Agree
Envision data products and services can reduce time spent on administration work	Neutral	Neutral
Envision data products and services can contribute to reducing effort and improving operational performance	Agree	Agree
Why you think Envision data products and services can/can't help to reduce the number of trips for on-site inspections	If we know from Envision results the state in the field it is likely that visits from insectors can be cut	If we know from Envision results the state in the field it is likely that visits from insectors can be reduced
Why you think Envision data products and services can/can't help to reduce the time spent on monitoring activities.	Envision can supplement additional monitoring activities which in effect will reduce them	Envision can supplement additional monitoring activities which in effect will reduce them
Why do you think Envision data products and services can/can't help reduce time spent on administrative work?	I don't believe that administrative work wil be reduced. I think it will remain the same regardelss of ENVISION use. The applications are still processed in a certain way and that won't change	I don't believe that administrative work wil be reduced. I think it will remain the same regardelss of ENVISION use. The applications are still processed in a certain way and that won't change
Why do you think Envision data products and services can/can't contribute to reducing effort and improving operational performance?	Using Envision products will imporve the quality of the applications we receive and this will lead to reducing effort and improving operational performance	If we improve the accuracy iof the declarations the accuracy of payments will be impoved and the error rate will fall. In that case CAPO will be less likely to be penalised or be in need to implement actions to reduce penalties to farmers.

Table 16. The survey results for Field; Reduced time and effort (Cyprus BC)

BC customers strongly agrees that DP1 has the potential to significantly reduce the need for on-site inspections, a sentiment backed by the comment that "if we know from Envision results the state in the field, visits from inspectors can be cut."

While not as strong as DP1, the agreement is evident for DP2 as well. The comment emphasizes the likelihood of reducing on-site inspections when informed by Envision results.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

For both DP1 and DP2, there is agreement that these data products can contribute to the reduction of time spent on monitoring activities. The comment underscores that Envision can supplement and enhance monitoring activities, ultimately reducing the time spent on them.

The respondents express a neutral stance regarding the effect of DP1 and DP2 on administrative work. The comments shows a belief that administrative work won't change with Envision product use as the applications are processed in a certain way. This highlights the need for further exploration to understand how these products could potentially streamline administrative tasks.

During the interview, it has been highlighted that regulatory compliance in agriculture often involves application and reporting rules and requirements set by governing authorities. These rules dictate what information must be reported, how often, and in what format. Administrative work in agriculture includes the collection, documentation, and submission of this data to ensure adherence to regulatory standards.And this rules are designed for traditional, on-site data collection methods. When remote monitoring is introduced, it doesn't necessarily reduce the amount of data that needs to be reported.

Respondents agree that DP1 can contribute to reducing effort and improving operational performance by enhancing the quality of received applications.

For DP2, it is emphasized that improved accuracy in declarations could lead to better payment accuracy and a reduced error rate, ultimately benefiting operational performance and minimizing penalties.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the close& open-ended questions and interview are summarized in the table below.

Field: Reduced time and effort [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
Envision data products and services can help reduce the number of travel trips for on-site inspections	Agree	I strongly agree	I strongly agree
Envision data products and services can help to reduce the time spent on monitoring activities	I strongly agree	I strongly agree	I strongly agree
Envision data products and services can reduce time spent on administration work	Disagree	Disagree	Disagree
Envision data products and services can contribute to reducing effort and improving operational performance	I strongly agree	I strongly agree	I strongly agree
Why you think Envision data products and services can/can't help to reduce the number of trips for on-site inspections	The data generated by Envision products are often highly accurate and precise. This accuracy can reduce the need for physical inspections.		
Why you think Envision data products and services can/can't help to reduce the time spent on monitoring activities.	Real-time or near-real-time information from Envisionâ€™s data products provides a clear picture of what is happening on the ground without incurring significant time costs.		
Why do you think Envision data products and services can/can't help reduce time spent on administrative work?	Envision data products leverage remote sensing technology to collect and provide data automatically. This eliminates the need for manual data collection, which can be time-consuming.		
Why do you think Envision data products and services can/can't	Envision data products can be configured to provide early alerts when specific events are detected. This enables proactive responses and helps prevent operational issues.		

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

contribute to reducing effort and improving operational performance?	

Table 17. The survey results for Field; Reduced time and effort (Lithuanian BC)

it's clear that all three Data Products (DP1, DP2, and DP3) are seen as effective in reducing the need for travel trips for on-site inspections. The respondents strongly agree that the data generated by these products is highly accurate and precise, which contributes to this reduction. This alignment of responses across all Data Products indicates a consensus regarding their potential in this aspect.

Once again, there is a strong consensus across all Data Products (DP1, DP2, and DP3). Respondents strongly agree that real-time or near-real-time information from these products provides a clear picture of on-ground conditions without incurring significant time costs. This indicates a high level of confidence in the time-saving capabilities of these products for monitoring activities.

Respondents disagree that all three data products (DP1, DP2 and DP3) can significantly reduce time spent on administrative work. The integrated comments suggest that, although these products use remote sensing technology to automatically collect and deliver data, there may be regulatory compliance challenges and the need to adapt reporting rules to support remote monitoring.

There is again strong agreement across all three Data Products (DP1, DP2, and DP3) that they can contribute to reducing effort and improving operational performance. The comments highlight their potential to provide early alerts and enable proactive responses, which in turn helps prevent operational issues.

Flemish BC, DP4 (SOC monitoring)

In the field of " Reduced time and effort," all four statements were not found relevant for this particular use case.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The following are the combined results of the open&close-ended questions and interview.

Field: Reduced time and effort [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
Envision data products and services can help reduce the number of travel trips for on-site inspections	Agree
Envision data products and services can help to reduce the time spent on monitoring activities	Agree
Envision data products and services can reduce time spent on administration work	Neutral
Envision data products and services can contribute to reducing effort and improving operational performance	Agree
Why you think Envision data products and services can/can't help to reduce the number of trips for on-site inspections	Reduce the need for additional visits to producers and help to reduce visits to those really needed enabling a helpful tool in risk assessment.
Why you think Envision data products and services can/can't help to reduce the time spent on monitoring activities.	Reduce the need for additional visits to producers and help to reduce visits to those really needed enabling a helpful tool in risk assessment.
Why do you think Envision data products and services can/can't help reduce time spent on administrative work?	ENVISION service could have only decreased time for annual report, but if it all crops and all parcels included. In applications ENVISION service couldn't have any impact. Also, we still can't replace on spot inspection to remotely, because Organic Regulations still doesn't recognize remotely inspection.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Why do you think Envision data products and services can/can't contribute to reducing effort and improving operational performance?	Regulations related to the organic farming still doesn't recognize remotely inspection. Envision data products can only improving operational performance through better risk assessmentcconsidering the problematic areas

Table 18. The survey results for Field; Reduced time and effort (Flemish BC)

The consensus here suggests that DP5 is seen as an effective tool for reducing travel trips for on-site inspections. The integrated comment underscores the belief that DP5 can serve as a valuable resource in risk assessment, reducing the need for additional physical visits to producers. This aligns with the survey response, indicating that DP5's capacity to minimize travel trips is recognized and valued.

DP5 is also showing a positive view for reducing time for monitoring activities.The comment provided for this question reinforces the positive agreement, indicating that DP5 can reduce the need for additional visits to producers and help in risk assessment, aligning with the belief in DP5's effectiveness for reducing monitoring time.

For DP5, the response is "Neutral," suggesting a cautious or ambivalent stance regarding the impact of DP5 on reducing time spent on administrative work. The integrated comments for this question highlight that while DP5 could potentially decrease the time for annual reports, it may not have a significant impact on applications related to organic farming due to regulatory constraints. DP5's ability to replace on-spot inspections with remote assessments is hindered by the fact that organic regulations do not recognize remote inspection. This regulatory constraint underscores the challenges in realizing administrative efficiency through Envision data products, particularly in contexts where existing regulations do not accommodate remote inspection practices, such as in organic farming.

For DP5, the response is "Agree," indicating a belief in DP5's potential to reduce effort and enhance operational performance. The integrated comments highlight that Envision data products can improve operational performance through better risk assessment, particularly in problematic areas. However, regulatory constraints related to organic farming and remote inspections are noted as limiting factors.

4.2.2 Ease of use

The main responses of each BC to the questions related to " ease of use" are presented in Table 19 to 22

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the close-ended questions and interviews are summarized below.

Field: Ease of use [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
The product and services are easy to install	Agree (5)	Agree (5)
The product and services are easy to use and understand by everyone working with it.	Agree (5)	Agree (5)
The use of the product and services needs particular (ICT) expertise.	Disagree (3)	Disagree (3)

Table 19. The survey results for Field; Ease of use (Cyprus BC)

For Cyprus BC both DP1 and DP2 are perceived positively in terms of ease of installation, ease of use and understanding, and the absence of a requirement for specific ICT expertise. This suggests that these products are designed to be user-friendly and accessible to a wide range of users, without the need for advanced technical skills. Understanding these perceptions is essential for product developers to ensure that these products align with user expectations and are user-friendly.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the close-ended questions and interviews are summarized below.

Field: Ease of use [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
The product and services are easy to install	I strongly agree	I strongly agree	I strongly agree
The product and services are easy to use and understand by everyone working with it.	I strongly agree	I strongly agree	I strongly agree
The use of the product and services needs particular (ICT) expertise.	Agree	Agree	Agree

Table 20. The survey results for Field; Ease of use (Lithuanian BC)

In summary, all three products, DP1, DP2, and DP3, are perceived positively in terms of ease of installation and use. While respondents agree that some level of specialized expertise is needed to use these products, their overall user-friendliness is evident, making them accessible to a wide range of users. Understanding these perceptions is essential for product developers to ensure that these products align with user expectations and remain.

Flemish BC, DP4 (SOC monitoring)

The combined results of the close-ended questions and interviews are summarized below.

Field: Ease of use [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP4 (SOC monitoring)**
The product and services are easy to install	Agree
The product and services are easy to use and understand by everyone working with it.	Agree
The use of the product and services needs particular (ICT) expertise.	Disagree

Table 21. The survey results for Field; Ease of use (Flemish BC)

Flemish BC also perceived positively in terms of ease of installation and use. It is seen as a user-friendly product that does not require specific ICT expertise.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the close-ended questions and interviews are summarized below.

Field: Ease of use [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
The product and services are easy to install	Strongly agree/ Unique/superior
User friendly/ Ease of use [The product and services are easy to use and understand by everyone working with it.]	Strongly agree/ Unique/superior
User friendly/ Ease of use [The use of the product and services needs particular (ICT) expertise.	Disagree/ Unique/superior

Table 22. The survey results for Field; Ease of use (Serbian BC)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

In summary, DP5 is perceived as an outstanding product with ease of installation, ease of use, and a lack of need for specific ICT expertise. The unique and superior qualities attributed to DP5 indicate that it is considered exceptional in these aspects.

4.2.3 Accessibility

Accessibility is important for end users/ BC customers to work with the Envision solution. To find out what conditions are important for end users/ BC customers to work with Envision services and what issues prevent them from accessing and/or using Envision services, this field focuses on possible conditions and barriers.

The "Accessibility" assessment results of the Data products&Services per BCs are presented in Table 23 to 26.

Cyprus BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Accessibility [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
The price and payment plan to acquire and integrate the Envision Product/ Services is reasonable.	Neutral	Neutral
The cost of operating and maintaining the Envision services is acceptable]	Neutral	Neutral
We (as a PA/ CB) have the necessary infrastructure to install and operate the services	Agree	I strongly agree
We (as PA/ CB) have the financial and technological capacity to collect and provide data for the ENVISION Services	Agree	I strongly agree
The required time is acceptable for the needed trainings of end-users	Agree	Agree
The required cost is reasonable for the needed training of end-users	Neutral	Neutral
Why do you think Envision data products and services can/can't contribute to reducing business operating costs?	Because they will take over work that is currently done in house and perform it in a better way	By using Envision products you save hours from your own resources devoloping and implementing similar products. On the other hand is not clear what will be the actual savings
Why do you think Envision data products and services can/can't contribute to increase the productivity of your organisation?	Envision products can help to perform work more efficiently and thus enabling us to re allocate recources	An integrated solution like Envision can contribute to the increase in productivity because our applicants will have a clearer picture of their claim applications and our time will be spent more productively rather that spend in assisting applicants
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to install and operate the Envision data product and services for your use case, If there are any:	The only issue is that we cannot simply buy Envision we need to go through procurement procedures	The main issue is financial since as a PA we are bound by the rules of procurement set out by the EU
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to collect and provide data for the Envision data product and services for your use case, If there are any:	none	I dont see any

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

What trainings you think are needed for end users to properly operate Envision products and services.	minimal	Minimal training

Table 23. The survey results for Field; Accessibility (Cyprus BC)

In evaluating both DP1 and DP2, respondents provided insights into their perceptions of these products. At the time of the survey, respondents took a neutral position on the price and payment plan for the acquisition and integration of DP1 and DP2, indicating uncertainty about its pricing structure and cost-effectiveness. This was due to the fact that they had not received detailed information on this aspect at the time of the survey.

Respondent confirmed about having the necessary infrastructure and resources for DP1, indicating a seamless fit within their existing capabilities. Training requirements for DP1 were perceived as acceptable. Importantly, respondents anticipated that DP1 expected to help optimize their processes and enhance organizational productivity and save resources. The main hurdle mentioned for DP1 was the need to go through procurement procedures, which could introduce administrative complexities.

Respondent strongly agreed on the compatibility of their infrastructure and data capabilities with DP2, suggesting that it aligns well with their current systems. While they found the required training time for DP2 acceptable, they expressed uncertainty regarding training costs. The main obstacle mentioned for DP2 was financial constraints related to EU procurement rules, which could cause complications.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps), DP3 (Grassland mowing events detection)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Accessibility [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
The price and payment plan to acquire and integrate the Envision Product/ Services is reasonable.	Agree	Agree	Agree
The cost of operating and maintaining the Envision services is acceptable	Agree	Agree	Agree
We (as a PA/ CB) have the necessary infrastructure to install and operate the services	I strongly agree	I strongly agree	I strongly agree
We (as PA/ CB) have the financial and technological capacity to collect and provide data for the ENVISION Services	I strongly agree	I strongly agree	I strongly agree
The required time is acceptable for the needed trainings of end-users	I strongly agree	Agree	Agree
The required cost is reasonable for the needed training of end-users	I strongly agree	Agree	Agree
Why do you think Envision data products and services can/can't contribute to reducing business operating costs?	With access to accurate and up-to-date data, NPA can allocate resources more efficiently. It can prioritize tasks, reducing wasted resources and effort.	With access to accurate and up-to-date data, business can allocate resources more efficiently. It can prioritize tasks, reducing wasted resources and effort.	With access to accurate and up-to-date data, business can allocate resources more efficiently. It can prioritize tasks, reducing wasted resources and effort.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Why do you think Envision data products and services can/can't contribute to increase the productivity of your organisation?	Envision data products enable remote monitoring of the implementation of the CAP SP requirements. This reduces the need for physical presence on-site, which can lead to time and cost savings.	Envision data products enable remote monitoring of the implementation of the CAP SP requirements. This reduces the need for physical presence on-site, which can lead to time and cost savings.	Envision data products enable remote monitoring of the implementation of the CAP SP requirements. This reduces the need for physical presence on-site, which can lead to time and cost savings.
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to install and operate the Envision data product and services for your use case, If there are any:	There are no issues hindering to install and operate the Envision data product and services.	There are no issues hindering to install and operate the Envision data product and services.	There are no issues hindering to install and operate the Envision data product and services.
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to collect and provide data for the Envision data product and services for your use case, If there are any:	There are no issues hindering to collect and provide data for the Envision data product and services.	There are no issues hindering to collect and provide data for the Envision data product and services.	There are no issues hindering to collect and provide data for the Envision data product and services.
What trainings you think are needed for end users to properly operate Envision products and services.	Basic Orientation Training (Overview of Envision products and services), Technical Training (In-depth understanding of the technical aspects of Envision data sources and technology), Data Interpretation Training (Interpretation of data provided by Envision products, Integration with Existing Systems (Training on how to integrate Envision products with the organization's existing systems, such as GIS or other software).	Basic Orientation Training (Overview of Envision products and services), Technical Training (In-depth understanding of the technical aspects of Envision data sources and technology), Data Interpretation Training (Interpretation of data provided by Envision products, Integration with Existing Systems (Training on how to integrate Envision products with the organization's existing systems, such as GIS or other software).	Basic Orientation Training (Overview of Envision products and services), Technical Training (In-depth understanding of the technical aspects of Envision data sources and technology), Data Interpretation Training (Interpretation of data provided by Envision products, Integration with Existing Systems (Training on how to integrate Envision products with the organization's existing systems, such as GIS or other software).

Table 24. The survey results for Field; Accessibility (Lithuanian BC)

For DP1, respondents generally find the price and payment plan reasonable, indicating a positive perception of its cost-effectiveness. They also consider the cost of operating and maintaining DP1 acceptable. Respondents express strong confidence in having the necessary infrastructure and resources for DP1. The required training for DP1 is seen as reasonable in terms of both time and cost. Respondents believe DP1 can lead to cost savings and improved productivity. No significant issues are reported for DP1's installation, operation, or data handling. A comprehensive training approach is considered necessary for effective DP1 utilization.

Respondents generally agree on the price and payment plan for DP2, suggesting a favorable view of its cost-effectiveness. They also find the cost of operating and maintaining DP2 acceptable. Their readiness and capabilities for DP2 adoption are strong. Training for DP2 is considered acceptable both in terms of time and cost. Respondents anticipate that DP2 can contribute to cost reduction and

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

increased productivity. No significant obstacles are reported for DP2's installation, operation, or data handling. A comprehensive training approach is seen as necessary for effective DP2 utilization.

For DP3, respondents agree that the price and payment plan is reasonable, implying a perception of cost-effectiveness. They also find the cost of operating and maintaining DP3 acceptable. Their readiness and capabilities for DP3 adoption are strong. Training time and cost for DP3 are considered acceptable. Respondents anticipate that DP3 can contribute to cost reduction and increased productivity. No significant issues are reported in terms of DP3's installation, operation, or data handling. A comprehensive training approach is seen as necessary for effective DP3 utilization.

Fmemish B,C DP4 (SOC monitoring)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Accessibility [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP4 (SOC monitoring)**
The price and payment plan to acquire and integrate the Envision Product/ Services is reasonable.	Neutral
The cost of operating and maintaining the Envision services is acceptable	Neutral
We (as a PA/ CB) have the necessary infrastructure to install and operate the services	Agree
We (as PA/ CB) have the financial and technological capacity to collect and provide data for the ENVISION Services	Agree
The required time is acceptable for the needed trainings of end-users	Neutral
The required cost is reasonable for the needed training of end-users	Neutral
Why do you think Envision data products and services can/can't contribute to reducing business operating costs?	it is not a product for reducing operating costs but for information for the farmer
Why do you think Envision data products and services can/can't contribute to increase the productivity of your organisation?	it is not a product for increasing productivity but information for the farmer
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to install and operate the Envision data product and services for your use case, If there are any:	none
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to collect and provide data for the Envision data product and services for your use case, If there are any:	none
What trainings you think are needed for end users to properly operate Envision products and services.	no training needed

Table 25. The survey results for Field; Accessibility (Flemish BC)

In summary, respondents have a neutral stance regarding the cost-related aspects of DP4, indicating a need for further evaluation or clarification. They view DP4 primarily as an information source for farmers rather than a tool for reducing organization operating costs or increasing productivity. The absence of hindrances in installation and data provision highlights a smooth adoption process. Additionally, the perception that no training is needed underscores the user-friendliness of DP4. Understanding these perceptions is essential for aligning DP4 with user expectations and needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Accessibility [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
The price and payment plan to acquire and integrate the Envision Product/ Services is reasonable.	Neutral
The cost of operating and maintaining the Envision services is acceptable	Neutral
We (as a PA/ CB) have the necessary infrastructure to install and operate the services	Strongly agree/ Unique/superior
We (as PA/ CB) have the financial and technological capacity to collect and provide data for the ENVISION Services	I strongly agree
The required time is acceptable for the needed trainings of end-users	I strongly agree
The required cost is reasonable for the needed training of end-users	Neutral
Why do you think Envision data products and services can/can't contribute to reducing business operating costs?	Decreasing in number of traveling with motor vehicles for on-site inspection on the way that continuous monitoring would reduce the need for additional visits to producers and help to reduce visits to those really needed.
Why do you think Envision data products and services can/can't contribute to increase the productivity of your organisation? Please indicate the issues (infrastructural, financial or technical, etc.) hindering to install and operate the Envision data product and services for your use case, If there are any:	Inspection and certification process in current regime is very time cost and any decrease is very valuable. Envision service increase the productivity providing a helpful tool in risk assessment, but Organic Regulations still doesn't recognize remotely inspection. As small certification body we don't have too much financial resources.
Please indicate the issues (infrastructural, financial or technical, etc.) hindering to collect and provide data for the Envision data product and services for your use case, If there are any:	There is no any issue regarding collecting and providing data.
What trainings you think are needed for end users to properly operate Envision products and services.	End users need to understand what they can get from Envision products and services.

Table 26. The survey results for Field; Accessibility (Serbian BC)

At the time of the survey, respondents took a neutral position on the price and payment plan for the acquisition and integration of DP5, indicating uncertainty about its pricing structure and cost-effectiveness. This was due to the fact that they had not received detailed information on this aspect at the time of the survey. Similarly, they hold a neutral view regarding the cost of operating and maintaining DP5, indicating the need for further clarification.

Respondents strongly agree that they have the necessary infrastructure to install and operate DP5, showing a high level of readiness in terms of infrastructure capabilities. For the financial and technological capacity to collect and provide data for DP5, respondents strongly agree that they have the necessary resources, demonstrating a high level of preparedness for managing DP5's data requirements. Respondents strongly agree that the required time for end-user training is acceptable, suggesting that they perceive the training needs for DP5 as minimal and well-aligned with their schedules.

They emphasize that the inspection and certification process in the current regime is time-consuming and costly. While DP5 can increase productivity by providing a helpful tool for risk assessment, it's noted that Organic Regulations do not yet recognize remote inspection. Respondents explain that the primary purpose of DP5 is to decrease the number of travel trips for on-site inspections. They believe

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

that continuous monitoring would reduce the need for additional visits to producers, thus decreasing travel.

Serbian BC mention that as a small certification body, they don't have extensive financial resources, which could be a consideration in their adoption of DP5. No issues are mentioned that hinder the installation and operation of DP5, indicating a smooth adoption process in terms of infrastructure and operational aspects.

Respondents also stress the importance of end users understanding what they can gain from Envision products and services.

4.2.4 Added economic value-benefits

The results of the " Added economic value-benefits " assessment of the Data products for each BC are presented in Table 27 and Table 30.

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the close-ended questions and interviews are summarized below.

Field: Added economic value-benefits [Scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
Envision data products and services deliver a positive value for the return on investment ratio (To calculate ROI, the return of an investment, the benefit is divided by the cost of the investment)	Neutral	Neutral
Envision data products and services can contribute to reducing business operating costs.	Agree	Agree
Envision data products and services can help to increase the productivity of farm/organisation	Agree	Agree
Envision data products and services can help prevent penalties and loss of funding by (proactively and automatically) alerting the beneficiary of possible non-compliances and enabling corrective actions through the web and mobile apps	strongly agree (Unique/superior)	strongly agree (Unique/superior)
The price /quality ratio of the Envision product/ services is fair.	Neutral	Neutral

Table 27. The survey results for Field; Added economic value-benefits (Cyprus BC)

In summary, both DP1 and DP2 are rated neutral in terms of ROI value, explaining that they have not yet received the offer or relevant information and thus cannot form an opinion at this stage. However, the products are rated positively because of their potential to reduce business operating costs, enhance productivity, and prevent penalties and loss of funding. The price/quality ratio of both products is met with neutrality, indicating a need for further evaluation or clarification in this aspect.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the close-ended questions and interviews are summarized below.

Field: Added economic value-benefits [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Envision data products and services deliver a positive value for the return on investment ratio (To calculate ROI, the return of an investment, the benefit is divided by the cost of the investment)	I strongly agree	I strongly agree	I strongly agree
Envision data products and services can contribute to reducing business operating costs.	I strongly agree	I strongly agree	I strongly agree
Envision data products and services can help to increase the productivity of farm/organisation]	I strongly agree	I strongly agree	I strongly agree
Envision data products and services can help prevent penalties and loss of funding by (proactively and automatically) alerting the beneficiary of possible non-compliances and enabling corrective actions through the **web and mobile apps**	I strongly agree	I strongly agree	I strongly agree
The price /quality ratio of the Envision product/ services is fair.	Agree	Agree	Agree

Table 28. The survey results for Field; Added economic value-benefits (Lithuanian BC)

For all three Envision data products, respondents express a strong vote of confidence in their value. They strongly agree that these products provide a positive return on investment, highlighting a high level of trust in their cost-effectiveness. Furthermore, they believe these products can reduce business operating costs, emphasizing their potential for cost savings. Respondents also express a that these products enhance productivity, underlining their efficiency-improving capabilities.

Moreover, they strongly agree that these products can help prevent penalties and the loss of funding by proactively alerting beneficiaries to possible non-compliances and enabling corrective actions through web and mobile apps.

In terms of the price-to-quality ratio, respondents agree that it is fair for all three Envision products, indicating a positive perception of the balance between the price and the quality of the products. This alignment underscores the notion that these products deliver value for the cost.

Fmemish BC, DP4 (SOC monitoring)

The combined results of the close-ended questions and interviews are summarized below.

Field: Added economic value-benefits [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP4 (SOC monitoring)**
Envision data products and services deliver a positive value for the return on investment ratio (To calculate ROI, the return of an investment, the benefit is divided by the cost of the investment)	Not relevant to our use case
Envision data products and services can contribute to reducing business operating costs.	Neutral
Envision data products and services can help to increase the productivity of farm/organisation	Neutral
Envision data products and services can help prevent penalties and loss of funding by (proactively and automatically) alerting the beneficiary of possible non-compliances and enabling corrective actions through the web and mobile apps	Not relevant to our use case
The price /quality ratio of the Envision product/ services is fair.	Neutral

Table 29. The survey results for Field; Added economic value-benefits (Flemish BC)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

In summary, the respondents for DP4 indicate that aspects related to ROI, cost reduction, productivity enhancement, and risk prevention may not be highly relevant to their specific use case. The neutrality in their responses suggests that these factors may not be central considerations for their context.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the close-ended questions and interviews are summarized below.

Field: Added economic value-benefits [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
Envision data products and services deliver a positive value for the return on investment ratio (To calculate ROI, the return of an investment, the benefit is divided by the cost of the investment)	Neutral
Envision data products and services can contribute to reducing business operating costs.	Agree (5)
Envision data products and services can help to increase the productivity of farm/organisation	I strongly agree (6)
Envision data products and services can help prevent penalties and loss of funding by (proactively and automatically) alerting the beneficiary of possible non-compliances and enabling corrective actions through the web and mobile apps	Agree (5)
The price /quality ratio of the Envision product/ services is fair.	Neutral

Table 30. The survey results for Field; Added economic value-benefits (Serbian BC)

In summary, DP5 is rated neutral in terms of ROI value, explaining that they have not yet received the offer or relevant information and thus cannot form an opinion at this stage. However, the products are rated positively because of their potential to reduce business operating costs, enhance productivity, and prevent penalties and loss of funding. The price/quality ratio of product is met with neutrality, indicating a need for further evaluation or clarification in this aspect.

4.2.5 Flexibility and Scalability

The results of the "Flexibility and Scalability " assessment of the BC and Data Products are presented in Table 31 to Table 34.

Cyprus BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the close-ended questions and interviews are summarized below.

Field: Flexibility and Scalability [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
Envision data products and services enable seamless integration and interoperability with the existing system	Agree	Neutral
The Envision data products and services ensure compatibility with the organisation's workflows and time constraints.	Agree	Agree
Envision data products and services can be easily expanded or upgraded to meet changing user demands.	Agree	Agree

Table 31. The survey results for the Field: Flexibility and Scalability (Cyprus BC)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

In summary, both DP1 and DP2 receive positive feedback regarding compatibility with organizational workflows and the ability to be easily expanded or upgraded to meet changing demands. However, DP1 receives stronger agreement for seamless integration and interoperability with existing systems, while DP2 encounters neutrality in this aspect; This suggests a number of issues need to be addressed for the adaptability of the products (see D5.6 Final Implementation report (Cyprus BC) .

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the close-ended questions and interviews are summarized below.

Field: Flexibility and Scalability [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
Envision data products and services enable seamless integration and interoperability with the existing system	Agree	I strongly agree	I strongly agree
The Envision data products and services ensure compatibility with the organisation's workflows and time constraints.	Agree	I strongly agree	I strongly agree
Envision data products and services can be easily expanded or upgraded to meet changing user demands.	Agree	I strongly agree	I strongly agree

Table 32. The survey results for the Field: Flexibility and Scalability (Lithuanian BC)

In summary, all three products (DP1, DP2, and DP3) receive positive feedback regarding seamless integration, compatibility with organizational workflows and time constraints, and the ease of expansion and upgrades to meet changing user demands. Respondents express a high level of confidence in the adaptability and compatibility of these products, making them well-suited for their specific use cases. Understanding these perceptions is crucial for product developers to ensure that the products align seamlessly with users' existing systems and workflows.

Flemish BC, DP4 (SOC monitoring)

The combined results of the close-ended questions and interviews are summarized below.

Field: Flexibility and Scalability [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP4(SOC monitoring)**
Envision data products and services enable seamless integration and interoperability with the existing system	Agree
The Envision data products and services ensure compatibility with the organisation's workflows and time constraints.	Agree
Envision data products and services can be easily expanded or upgraded to meet changing user demands.	Neutral

Table 33. The survey results for the Field: Flexibility and Scalability (Flemish BC)

In summary, DP4 respondents expressed favourable opinions about the product, especially regarding its seamless integration and compatibility with their current workflows and time constraints. However, their attitude towards the ease of extensions and upgrades is more impartial, suggesting that, while feasible, the degree of ease of these processes remains uncertain**.**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the close-ended questions and interviews are summarized below.

Field: Flexibility and Scalability [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
Envision data products and services enable seamless integration and interoperability with the existing system	Agree Comment: We dont have any similar IT system, but it was easy integrated in our existing buesiness system.
The Envision data products and services ensure compatibility with the organisation's workflows and time constraints.	Agree
Envision data products and services can be easily expanded or upgraded to meet changing user demands.	Agree

Table 34. The survey results for the Field: Flexibility and Scalability (Serbian BC)

In summary, respondents for DP5 perceive these products positively in terms of seamless integration, compatibility with existing workflows, and the potential for expansion and upgrades. They provide a comment indicating that they didn't have a similar IT system, but the integration into their existing business system was straightforward.

4.2.6 Usefulness

The results of the " Usefulness " assessment of the Data Product per BC are presented in Table 35 to Table 38.

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Usefulness [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
Envision data products and services can support or create more collaborative, transparent and accurate decision-making	strongly agree	Neutral
I believe the Envision data products and services can foster the further acceptance of Earth Observation technologies.	strongly agree	Agree
Why do you think Envision data products and services can/can't support or create more collaborative, transparent and accurate decision-making?	I think Envision products have the ability to offer quick and accurate results and that will lead to more collaborative and accurate decision-making	I am not sure that Envision products can and to what extent support or create accurate decision making. I just dont see it happening but I am also aware that if Envision is fully applied in a PA for sure change will take place
Why do you think Envision data products and services can/can't foster the further acceptance of Earth Observation technologies?	The ease of use Envision products offer will achieve this	Its a step forward to better undestantinf EO techology

Table 35. The survey results for the Field: Usefulness (Cyprus BC)

For DP1, respondents strongly agree that Envision data products and services have the potential to support or create more collaborative, transparent, and accurate decision-making. They attribute this positive impact to the products' ability to provide quick and accurate results, which they believe will lead to improved decision-making processes. Additionally, they strongly agree that these products can

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

foster the further acceptance of Earth Observation (EO) technologies, attributing it to the ease of use that Envision products offer.

In contrast, for DP2, respondents express a more neutral stance regarding the product's ability to support or create more collaborative, transparent, and accurate decision-making. They appear uncertain about the extent to which Envision products can achieve this outcome, indicating some reservations. However, they still agree that these products can contribute to fostering the further acceptance of Earth Observation technologies, considering them as a step toward better understanding EO technology.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Usefulness [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1 (Analytics on Vegetation and Soil Index Time-series)**	**DP2 (Cultivated crop type maps)**	**DP3 (Grassland mowing events detection)**
Envision data products and services can support or create more collaborative, transparent and accurate decision-making	I strongly agree	I strongly agree	I strongly agree
I believe the Envision data products and services can foster the further acceptance of Earth Observation technologies.	I strongly agree	I strongly agree	I strongly agree
Why do you think Envision data products and services can/can't support or create more collaborative, transparent and accurate decision-making?	Envision data products can support compliance monitoring by providing transparent, objective and highly accurate records of agricultural activities.	Envision data products can support compliance monitoring by providing transparent, objective and highly accurate records of agricultural activities.	Envision data products can support compliance monitoring by providing transparent, objective and highly accurate records of agricultural activities.
Why do you think Envision data products and services can/can't foster the further acceptance of Earth Observation technologies?	By demonstrating the value of EO data in addressing AE-linked challenges and fostering transparency, Envision products contributes to the broader acceptance and utilization of EO technologies.	By demonstrating the value of EO data in addressing AE-linked challenges and fostering transparency, Envision products contributes to the broader acceptance and utilization of EO technologies.	By demonstrating the value of EO data in addressing AE-linked challenges and fostering transparency, Envision products contributes to the broader acceptance and utilization of EO technologies.

Table 36. The survey results for the Field: Usefulness (Lithuanian BC)

For all three Envision data products, respondents express strong agreement that these products support or create more collaborative, transparent, and accurate decision-making. They emphasize the contribution of these products to compliance monitoring by providing transparent, objective, and highly accurate records of agricultural activities. This is seen as a significant factor in enhancing decision-making processes.

Furthermore, respondents for all three products strongly agree that Envision data products and services foster the further acceptance of Earth Observation (EO) technologies. They believe these products demonstrate the value of EO data in addressing agricultural challenges, promoting transparency, and thereby contributing to the broader acceptance and utilization of EO technologies in the agricultural sector.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Flemish BC, DP4 (SOC monitoring)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Flexibility and Scalability [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP4 (SOC monitoring)**
Usefulness [Envision data products and services can support or create more collaborative, transparent and accurate decision-making]	Agree
Usefulness [I believe the Envision data products and services can foster the further acceptance of Earth Observation technologies.]	Agree
Why do you think Envision data products and services can/can't support or create more collaborative, transparent and accurate decision-making?	the service creates insight in the condition of the soil for the whole of Flanders, making it possible for the policy makers to react for example when a trend is noticed of decrease in soil condition over the years
Why do you think Envision data products and services can/can't foster the further acceptance of Earth Observation technologies?	to see the possibilities of EO technologies, only creates awareness of what is possible and that it also can be used for the advantage of the farmer, not only to check on what the farmer is doing (wrong)

Table 37. The survey results for the Field: Usefulness (Flemish BC)

Respondents for DP4 express agreement that Envision data products and services play a role in supporting or creating more collaborative, transparent, and accurate decision-making. They emphasize the product's ability to provide insights into the condition of the soil for the entire region of Flanders, enabling policymakers to react effectively to trends, such as declines in soil condition over the years. This illustrates that the product's data and insights contribute to well-informed decision-making in the agricultural sector.

They also agree that these products can foster the further acceptance of Earth Observation (EO) technologies. Respondents believe that the products help showcase the possibilities of EO technologies and raise awareness of their potential benefits for farmers beyond monitoring. This suggests that the product plays a significant role in promoting the positive uses of EO technology in agriculture, which, in turn, can contribute to its wider acceptance

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Usefulness [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
Usefulness [Envision data products and services can support or create more collaborative, transparent and accurate decision-making]	Agree
Usefulness [I believe the Envision data products and services can foster the further acceptance of Earth Observation technologies.]	Agree
Why do you think Envision data products and services can/can't support or create more collaborative, transparent and accurate decision-making?	For getting historical data for parcels which is not in our system (for new involve parcels) it will have very favorable effect, especially for cases of recognition of previous implementation of organic rules. The conversion for organic production is 2 or 3 years, depending on the plant species, but if in the last 3 years there was a meadow or pasture where no agrotechnical work was performed, the

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

	certification body can approve a recognition of previous implementation of organic rules (shortening of the conversion period). Envison service can help with this decision-making.
Why do you think Envision data products and services can/can't foster the further acceptance of Earth Observation technologies?	Envision data products and services can foster the further acceptance of Earth Observation technologies with better accurancy, that Goverment can be recognize EO technologies for improvement in control and certification of organic production and involve it in existing regulations, such as for CAP.

Table 38. The survey results for the Field: Usefulness (Serbian BC)

Respondents for DP5 agree that Envision data products and services are valuable for supporting or creating more collaborative, transparent, and accurate decision-making. They emphasize the importance of historical data, especially for new parcels, and its favorable impact. For instance, recognizing previous implementations of organic rules becomes more efficient with Envision's data, enabling certification bodies to approve the recognition of previous rule implementation, which shortens the conversion period. This highlights the product's role in providing data that supports transparent and accurate decision-making in agriculture.

Furthermore, they agree that these products contribute to fostering the further acceptance of Earth Observation (EO) technologies. Respondents stress that the product enhances the accuracy of EO technologies, making them suitable for government recognition and integration into existing regulations like the Common Agricultural Policy (CAP). This suggests that Envision plays a significant role in improving the trust and acceptance of EO technologies for agricultural control and certification, thus facilitating their integration into official agricultural policies.

4.2.7 Regulatory compliance

For the acceptance of the developed services, it is very important to assess whether the products are in line with the rules and regulations of the government of the pilot countries, and whether the proposed products and services can help improve compliance with national plans and agri-environmental regulations.

The results of the " Regulatory compliance " assessment for the Data products are presented in Table 39 and Table 42.

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the open/close-ended questions and interview are summarized in the table below.

Field: Regulatory compliance [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1 (Analytics on Vegetation and Soil Index Time-series)**	**DP2 (Cultivated crop type maps)**
Envision data products and services can contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations	Agree	Agree
The service will contribute to the direct monitoring of farmers' compliance with the respective regulations of pilot countries	I strongly agree	I strongly agree
Envision products and services can provide consistency with recent relevant legislation and policy developments such as the new CAP	Agree	Agree
Envision data products and services comply with current EU and national regulations /laws.	Agree	Agree

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Envision data products and services are compliant and ensure transparency and security in the context of intellectual property and GDPR	Agree	Agree
Envision data products and services can be used after the project lifetime, at least the duration of the new CAP (2023-2027)	Agree	Agree
Why do you think Envision data products and services can/can't contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations?	I think Envision products can achieve that because they provide tools to monitor and implement most of the requirements of the CAP that are related with the Area Monitoring System AMS can you explain	The current CAP requires a certain level of EO services which Envision contains. It also needs modifications in order to adapt to the PA needs with regard to the EU legal framework

Table 39. The survey results for the Field: Regulatory compliance (Cyprus BC)

In this survey, data products DP1 and DP2 were evaluated concerning their potential contributions to regulatory compliance, monitoring, and adaptability to evolving legislation. Respondents express confidence in both data products. They agree that DP1 and DP2 can provide continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations, aligning with regulatory requirements. Strong agreement is seen in their ability to directly monitor farmers' compliance with regulations, indicating a high level of trust in their monitoring capabilities. Both DP1 and DP2 are perceived to offer consistency with recent legislation and policy developments, complying with EU and national regulations while ensuring transparency and security, especially in terms of intellectual property and GDPR. They are also considered usable beyond the project's lifetime, reflecting their longevity and potential for extended utility. The comment's assessment of Envision's capacity to align with CAP requirements, particularly those linked to the Area Monitoring SystemMoreover. It is pointed out that Envision contains elements related to EO based services. This is significant because EO services are increasingly essential for monitoring and responding to various types of agricultural events. Integrating EO services into the CAP is crucial, as it allows for the acquisition of real-time data and imagery, which is vital for informed decision-making and response coordination.

Lithuanian B,C DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The following are the combined results of the interview and close& open-ended questions

Field: Regulatory compliance [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
Envision data products and services can contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations	I strongly agree	I strongly agree	I strongly agree
The service will contribute to the direct monitoring of farmers' compliance with the respective regulations of pilot countries	I strongly agree	I strongly agree	I strongly agree

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Envision products and services can provide consistency with recent relevant legislation and policy developments such as the new CAP	I strongly agree	I strongly agree	I strongly agree
Envision data products and services comply with current EU and national regulations /laws.	I strongly agree	I strongly agree	I strongly agree
Envision data products and services are compliant and ensure transparency and security in the context of intellectual property and GDPR	Agree	Agree	Agree
Envision data products and services can be used after the project lifetime, at least the duration of the new CAP (2023-2027)	I strongly agree	I strongly agree	I strongly agree
Why do you think Envision data products and services can/can't contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations?	Envision data products offer a valuable toolset for continuous monitoring and compliance assessment related to EU CAP and AE-linked regulations. By providing real-time insights, transparency, and predictive analytics, Envision contributes to enhanced confidence in compliance efforts and supports responsible agricultural practices.	Envision data products offer a valuable toolset for continuous monitoring and compliance assessment related to EU CAP and AE-linked regulations. By providing real-time insights, transparency, and predictive analytics, Envision contributes to enhanced confidence in compliance efforts and supports responsible agricultural practices.	Envision data products offer a valuable toolset for continuous monitoring and compliance assessment related to EU CAP and AE-linked regulations. By providing real-time insights, transparency, and predictive analytics, Envision contributes to enhanced confidence in compliance efforts and supports responsible agricultural practices.

Table 40. The survey results for the Field: Regulatory compliance (Lithuanian BC)

Envision's Data Products (DP1, DP2, DP3) have received support from respondents. There is high confidence in DP's ability to contribute to the continuous flow of information and associated confidence levels regarding compliance with the current EU CAP and agri-environmental linked regulations. This endorsement extends to direct monitoring of farmers' compliance with regional regulations, underlining DP's ability to meet the specific requirements of pilot countries. Further, there is strong agreement that Envision's DP remains in line with recent legislation and policy developments, including the new CAP, making it adaptable to changing regulatory environments. Importantly, respondents agree that DPs are fully compliant with current EU and national legislation, confirming their legal integrity. While there is agreement on DP's transparency, security and compliance with intellectual property rights and GDPR, these aspects could be improved. Finally, there is solid confidence in the sustainability of the DPs beyond the life of the project, especially during the term of the new CAP.

The comment highlights that these products provide a valuable toolset for real-time monitoring, providing immediate insights, transparency and predictive analytics. Envision's ability to deliver real-time data promotes proactive compliance assessment, enabling timely decision-making and adaptation to dynamic farming conditions. The transparency and accountability enabled by these tools

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

can build trust among stakeholders, while the predictive analytics help anticipate potential compliance issues and address them before they become critical. All this helps grow responsible farming practices, align with contemporary environmental and sustainability requirements.

Fmemish, BC DP4 (SOC monitoring)

The following are the combined results of the interview and close& open-ended questions

Field: Regulatory compliance [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP4 (SOC monitoring)**
Envision data products and services can contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations	Disagree
Envision data products and services can support to compliance with current EU CAP and agri-environmental regulations in a longer term.	Agree
The service will contribute to the direct monitoring of farmers' compliance with the respective regulations of pilot countries	not relevant
Envision data products and services comply with current EU and national regulations /laws.	Neutral
Envision data products and services are compliant and ensure transparency and security in the context of intellectual property and GDPR	Agree
Envision data products and services can be used after the project lifetime, at least the duration of the new CAP (2023-2027)	Agree
Why do you think Envision data products and services can/can't contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations?	the regulations are different from what the service offers

Table 41. The survey results for the Field: Regulatory compliance (Flemish BC)

While there is a disagreement regarding DP4's ability to provide continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations (rating at 3), there is an agreement that it can support compliance with these regulations in the longer term. However, the question about DP4's potential contribution to direct monitoring of farmers' compliance with regulations was deemed "not relevant" by the respondent.

During the interview, it was noted that their point of disagreement lies in the nature of the regulations. For the CAP in Flanders, cross compliance checks are very elaborate and consist of many checks. Checking soil analysis is only a very small part and regulations require samples to be analyzed by laboratories. Furthermore for specific annual complimentary checks, the focus is more on the actions to improve the OC balance with specific measures rather than on the results. Although the policy claims to be outcome-oriented, the primary emphasis seems to be on monitoring the execution of specific farming practices, like crop planning and the use of wood chips, rather than assessing the end results, such as soil organic carbon (SOC) results.

However, interviewee acknowledge that Envision data products can still play a supporting role in compliance with EU CAP requirements, albeit in the longer term. By providing insight into soil conditions across Flanders, these products can enable policymakers to respond to trends, such as declining soil conditions over the years. Moreover, they highlight the potential to inform farmers about the condition of their soils, which can facilitate more informed farm management decisions.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

In summary, it has been highlighted that while direct monitoring and comlience checking may not match the regulatory focus on practices, Envision's data product is still valuable to policymakers and farmers by providing insight into soil conditions and supporting a more informed and sustainable approach to decision making and farm management activities.

Moreover, there is an agreement that DP4 is compliant and ensures transparency and security, especially in the context of intellectual property and GDPR. Respondents also agree that DP4 can be used beyond the project's lifetime, at least during the duration of the new CAP (2023-2027).

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The following are the combined results of the interview and close& open-ended questions

Field: Regulatory compliance [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
The service will contribute to the direct monitoring of farmers' compliance with the respective regulations of pilot countries	Agree Comment: Some of regulations related to the organic farming confirmed with Envision service
Envision data products and services comply with current EU and national regulations /laws.	Agree Comment: Some of regulations related to the organic farming confirmed with Envision service
Envision data products and services comply with existing certification programs	Neutral
Envision services can be adapted and applied to the updates of certification standards.	Neutral
Envision data products and services are compliant and ensure transparency and security in the context of intellectual property and GDPR	Strongly Agree/ Unique/superior
Why do you think Envision data products and services can/can't contribute to providing continuous information and respective confidence levels regarding compliance with current EU CAP and agri-environmental regulations?	Contribute to transformation process, since the confidence level increase. Goverment can be recognize EO technologies for improvement in control and certification of organic production and involve it in existing regulations, such as for CAP.

Table 42. The survey results for the Field: Regulatory compliance (Serbian BC)

In the survey, respondents provided feedback on DP5 with a particular focus on its role in regulatory compliance, including its alignment with current EU CAP and agri-environmental regulations. Respondents expressed agreement that DP1 can contribute to the direct monitoring of farmers' compliance with the regulations of pilot countries, with the comment highlighting its confirmation of certain regulations, particularly those related to organic farming. Furthermore, respondents also agreed that DP1 complies with current EU and national regulations and laws, with similar confirmation related to organic farming regulations. However, respondents expressed neutrality regarding DP5's alignment with existing certification programs and its adaptability to updates in certification standards. DP5 received strong agreement (unique/superior) for being compliant and ensuring transparency and security, especially in the context of intellectual property and GDPR.

Moreover, respondents emphasized the role of DP5 in a transformation process that increases trust levels and suggested that the government could recognize Earth Observation (EO) technologies for improving control and certification of organic production, possibly by incorporating them into existing regulations such as for Common Agricultural Policy (CAP).

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

4.2.8 Quality, Completeness and Specialisation

The results of the " Quality, Completeness and Specialisation " assessment of the Data products for each BC are presented in Table 43 to Table 45.

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The combined results of the close-ended questions and interviews are summarized below.

Field: Quality, Completeness and Specialisation [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
Envision data products and services can provide a more robust and efficient monitoring method and services compared to the other alternatives (maturity, effectiveness) in the market	Neutral	Neutral
Envision data products and services are sufficient, covering all range of the necessary services. No additional services are necessary OR services missing are possible to build based on the add-on development tool of ENVISION	Neutral	Neutral
With a specific emphasis on monitoring sustainability rules, ENVISION is one step ahead in terms of readiness to address the upcoming needs of PAs and CBs.	Neutral	Neutral

Table 43. The survey results for the Field: Quality, Completeness and Specialisation (Cyprus BC)

In this survey, respondents provided feedback on Data Products DP1 and DP2, specifically evaluating their maturity, effectiveness, and readiness compared to other alternatives in the market. However, the recurring theme in their responses was neutrality, as they indicated a lack of knowledge about alternative solutions and limited experience and relevant information in this context. This neutral stance was observed across all three survey questions, highlighting the respondents' uncertainties regarding the competitive landscape and the capabilities of Envision data products relative to other alternatives. Their comments in the interview emphasized the need for more comprehensive information and hands-on experience to make informed assessments about the maturity and readiness of these data products in comparison to market alternatives.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

The combined results of the close-ended questions and interviews are summarized below..

Field: Quality, Completeness and Specialisation [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
Envision data products and services can provide a more robust and efficient monitoring method and services compared to the other alternatives (maturity, effectiveness) in the market	I strongly agree	I strongly agree	Strongly agree/ Unique/superior
Envision data products and services are sufficient, covering all range of the necessary services. No additional services are necessary OR services missing are possible to build based on	Agree	I strongly agree	I strongly agree

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

the add-on development tool of ENVISION			
With a specific emphasis on monitoring sustainability rules, ENVISION is one step ahead in terms of readiness to address the upcoming needs of PAs and CBs.	I strongly agree	I strongly agree	Strongly Agree/ Unique/superior

Table 44. The survey results for the Field: Quality, Completeness and Specialisation (Lithuanian BC)

In this survey, respondents expressed strong agreement and confidence in the capabilities of Data Products DP1, DP2, and DP3. They believe that Envision data products and services offer a more robust and efficient monitoring method compared to other alternatives in the market, with unanimous "strongly agree" or "Strongly Agree/Unique/superior" ratings across all three products. Moreover, respondents perceive Envision's data products as sufficient, covering a broad range of necessary services, with endorsements ranging from "Agree" to "strongly agree" and "Strongly Agree/Unique/superior." When focusing on monitoring sustainability rules and addressing the upcoming needs of Protected Areas (PAs), respondents once again exhibit strong agreement, emphasizing Envision's advanced readiness with "strongly agree" and "Strongly Agree/Unique/superior" ratings. These resounding and consistent positive responses underline the high level of trust in the capabilities and readiness of Envision data products and services, positioning them as compelling solutions to meet the demands of PAs in the context of monitoring and sustainability rules.

Flemish BC, DP4 (SOC monitoring)

In the field of "Quality, Completeness, and Specialization," all three statements were not found relevant for this particular use case.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the close-ended questions and interviews are summarized below.

Field: Quality, Completeness and Specialisation [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.) **]**	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
Envision data products and services can provide a more robust and efficient monitoring method and services compared to the other alternatives (maturity, effectiveness) in the market	I strongly agree **Comment:** There is no such product in market.
Envision data products and services are sufficient, covering all range of the necessary services. No additional services are necessary OR services missing are possible to build based on the add-on development tool of ENVISION	I strongly agree
With a specific emphasis on monitoring sustainability rules, ENVISION is one step ahead in terms of readiness to address the upcoming needs of PAs and CBs.	I strongly agree

Table 45. The survey results for the Field: Quality, Completeness and Specialisation (Serbian BC)

In this survey, the respondent expressed confidence in DP5. They strongly agreed that Envision data products and services can provide a more robust and efficient monitoring method compared to other alternatives, justifying this opinion by asserting that no such product exists in the market They also firmly agreed that these products are comprehensive, negating the need for additional services as they can be developed using ENVISION's add-on development tool. The respondent's strong agreement extended to Envision's readiness to address the needs of Certification Bodies (CBs), particularly in the context of sustainability rules.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

4.2.9 Support service

The results of the " Support service " assessment of the each Data product of BCs are presented in Table 46 to Table 48.

Cyprus BC DP1(Analytics on Vegetation and Soil Index Time-series), DP2(Cultivated crop type maps)

The combined results of the close-ended questions and interviews are summarized below.

Field: Support service [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1(Analytics on Vegetation and Soil Index Time-series)**	**DP2(Cultivated crop type maps)**
The proposed service level agreement is acceptable.	Neutral	Neutral
I had the necessary technical support to install, integrate, repair, use and maintain the product and services properly	Agree	Agree
I had training on data collection and use of the services.	Agree	Agree
After the project, necessary support will be provided which is the required number of yeas for after sale support	Neutral	Neutral

Table 46. The survey results for the Field: Support service(Cyprus BC)

In this survey, the respondent provided positive answer for having the necessary technical support for installation, integration, repair, use, and maintenance of the product and services. Furthermore, their agreement in relation to training on data collection and service utilization signified a positive experience and demonstrated their competence in these areas . They expressed neutrality regarding the acceptability of the proposed service level agreement and provision of after-sale support explaining that they hadn't received the offer or the content of the agreement yet and, as such, couldn't form an opinion at this stage.

Lithuanian BC DP1 (Analytics on Vegetation and Soil Index Time-series), DP2 (Cultivated crop type maps), DP3 (Grassland mowing events detection)

The combined results of the close-ended questions and interviews are summarized below.

Field: Support service [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP1 (Analytics on Vegetation and Soil Index Time-series)**	**DP2 (Cultivated crop type maps)**	**DP3 (Grassland mowing events detection)**
The proposed service level agreement is acceptable.	Agree	Agree	Agree
I had the necessary technical support to install, integrate, repair, use and maintain the product and services properly	I strongly agree	I strongly agree	I strongly agree
I had training on data collection and use of the services.	Agree	I strongly agree	I strongly agree
After the project, necessary support will be provided which is the required number of yeas for after sale support	Agree	I strongly agree	I strongly agree

Table 47. The survey results for the Field: Support service(Lithuanian BC)

In this survey, respondents displayed a consistent and high level of satisfaction with various aspects of Data Products DP1, DP2, and DP3. They expressed their agreement with the acceptability of the proposed service level agreement, signifying contentment with the terms and conditions.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Furthermore, respondents strongly agreed that they had received the necessary technical support for the installation, integration, repair, use, and maintenance of the products and services, showcasing their confidence in the technical assistance provided. Their positive experience extended to training on data collection and service utilization, where they either agreed or strongly agreed, indicating their overall satisfaction with the training received. Additionally, respondents expressed their contentment by agreeing or strongly agreeing that necessary support would be provided after the project, including the required number of years for after-sale support, reflecting their confidence in the anticipated support. These responses collectively highlight a seamless and well-supported user experience, underlining high levels of satisfaction with Data Products DP1, DP2, and DP3.

Flemish BC DP4 (SOC monitoring)

In the field of " Support service," all four statements were not found relevant for this particular use case.

Serbian BC DP5 (Crop growth Monitoring and identification of organic farming practices)

The combined results of the close-ended questions and interviews are summarized below.

Field: Support service [Likert scale of 1 to 6, (1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.)]	**DP5 (Crop growth Monitoring and identification of organic farming practices)**
The proposed service level agreement is acceptable.	Neutral Comment: They didn't get the service level agreement yet.
I had the necessary technical support to install, integrate, repair, use and maintain the product and services properly	Unique/superior
I had training on data collection and use of the services.	Unique/superior
After the project, necessary support will be provided which is the required number of yeas for after sale support	I strongly agree

Table 48. The survey results for the Field: Support service(Serbian BC)

In this survey, the respondent provided a generally positive perspective on Data Product 5. They expressed neutrality regarding the acceptability of the proposed service level agreement, explaining that they hadn't received the offer or the content of the agreement yet and, as such, couldn't form an opinion at this stage. However, their strong agreement with having received the necessary technical support for installation, integration, repair, use, and maintenance of the product and services revealed a high level of satisfaction and trust in the quality of the technical assistance provided. Furthermore, their strong agreement in relation to training on data collection and service utilization signified a positive experience and demonstrated their competence in these areas. Lastly, their strong agreement regarding the provision of necessary support, including the required number of years for after-sale support post-project, reflected their confidence in the continuity of support services. These responses collectively indicated a positive user experience with DP5, highlighting the effectiveness of technical support, training, and the anticipated post-project support while acknowledging the need for more information on the service level agreement.

4.2.10 Uniqueness And Superiority

For evaluation of the business value and acceptance, we also ask to rate " Uniqueness And Superiority " of the services as a way to express that Envision data products and services are unique or superior for the stated function.

The results of the " Uniqueness And Superiority" assessment of the BCs are presented in Table 26.

Unique/superior: If you select 5 (agree) or 6 (strongly agree), you can also select "Unique/superior" as a way of expressing that	**Cyprus BC DP1, DP2**	**Lithuanian BC DP3**	**Serbian BC DP4**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Envision data product and services are unique or superior for the stated feature.			
Envision data products and services can help prevent penalties and loss of funding by (proactively and automatically) alerting the beneficiary of possible non-compliances and enabling corrective actions through the web and mobile apps	Strongly agree/ **Unique/superior**		
Quality [Envision data products and services can provide a more robust and efficient monitoring method and services compared to the other alternatives (maturity, effectiveness) in the market]		Strongly agree/ **Unique/superior**	
Quality [With a specific emphasis on monitoring sustainability rules, ENVISION is one step ahead in terms of readiness to address the upcoming needs of PAs and CBs.]		Strongly agree/ **Unique/superior**	
User friendly/ Ease of use [The product and services are easy to install]			Strongly agree/ **Unique/superior**
User friendly/ Ease of use [The product and services are easy to use and understand by everyone working with it.]			Strongly agree/ **Unique/superior**
User friendly/ Ease of use [The use of the product and services needs particular (ICT) expertise.]			Strongly agree/ **Unique/superior**
Accessibility [We (as a PA/ CB) have the necessary infrastructure to install and operate the services]			Strongly agree/ **Unique/superior**
Regulatory compliance [Envision data products and services are compliant and ensure transparency and security in the context of intellectual property and GDPR]			Strongly agree/ **Unique/superior**
Support service [I had the necessary technical support to install, integrate, repair, use and maintain the product and services properly]			Strongly agree/ **Unique/superior**
Support service [I had training on data collection and use of the services.]			Strongly agree/ **Unique/superior**

Table 49. The results of the "Uniqueness And Superiority "

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

4.3 Evaluation of the performance, usability and effectiveness of the product and services

The results of the " Performance, Usability And Effectiveness " assessment of the each Data Product and BCs are presented in Table 50 to Table 53

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series); DP2(Cultivated crop type maps)

The responses to the questionnaire for the performance, usability and effectiveness evaluation are summarized below.

Performance, usability and effectiveness of the product and services [Scale of 1-6, where, 1 is the lowest rate (Extremely weak performance/ product does not meet my needs), 5 is the highest rate (Clearly outstanding performance/ product fully meets my needs) and 6 is "Not relevant to this product and/or to the use case]	DP1(Analytics on Vegetation and Soil Index Time-series)	DP2(Cultivated crop type maps)
. [(1) Ability to receive data of crop type maps with two-week frequency from the mid- April to mid-September.]	Not relevant to this product / use case	Clearly outstanding performance / product fully meets my needs.
[(2) Ability to receive grassland mowing and grazing layers with two-week frequency from June till November.]	Not relevant to this product / use case	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(4) Data product of cultivated crop type maps and grassland mowing/ploughing provides at least 95% accuracy compared to in situ data]	Not relevant to this product / use case	At an acceptable or above level / product partially meets my needs.
[(5) Ability to receive vegetation status maps with a priority on EFA catch-crop fields and all fallow land fields.]	Not relevant to this product / use case	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(6) Ability to mask the layers based on the outputs of a Envision service.]	Clearly outstanding performance which is way above the norm/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(7)The masked layers could be visualised on the Envision platform]	Not relevant to this product / use case	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(8) Ability to identify and distinguish between organic and conventional crop.]	Not relevant to this product / use case	Extremely weak performance/ product does not meet my needs.
[(9) Ability to monitor the pesticide and herbicide use on the declared plots (malpractices more generally) indirectly through crop growth monitoring data product.]	Not relevant to this product / use case	Poor performance, major improvement needed/ product partially meets my needs.
[(10) Ability to receive information about the specific crop types even in very small and narrow parcels, or at least a coarser level of classification with a group of possible crop types]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Poor performance, major improvement needed/ product partially meets my needs.
[(11) Ability to get Envision outputs per parcel, especially for information on yield of organic crops.]	Not relevant to this product / use case	Poor performance, major improvement needed/ product partially meets my needs.
[(16) Ability to help to track events of illegal burning of crops.]	Clearly outstanding performance / product fully meets my needs.	Not relevant tothis product
[(17) The performance of the system (data processing) is fast and enable quick testing.]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(18) The system can provide with errors against legislation so that we can communicate to farmers.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(19) The ENVISION toolbox features as many standards as possible and the various outputs are downloadable or easy to share via APIs so that we can analyse them in our own existing systems. (potential to transfer/download data)]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(20) Envision data products and services enables seamless integration and interoperability with existing system.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(21) Relevant outputs and data can be stored in one place (the ENVISION database for the ENVISION lifetime).]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(22) Ability to download outputs (i.e., shapefiles, csv files etc.), share via APIs or access the data storage online.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(23) The services can process information about newly declared parcels in bulk and efficiently. So that we can receive outputs for new parcels]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(24) The specific methodology followed to estimate accuracy of measurements is documented on the platform.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(25) Accuracy is provided for the entire service outputs.]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(27) The services are/will be stable and functional for the ENVISION project lifetime]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(28) Possibility of using the services after the project ends (beyond project lifetime).]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(30) Ability to upload and provide information and in situ data from fields for the enhancement of Envision services]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(31) Envision services provides indications if the values for certain pixels or plots are "Not Available - N.A.". So I can warn the respective farmers that they need to provide the relevant information themselves]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(32) The results from ENVISION's remote monitoring services are reliable and verifiable on the spot.]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(33) Ability to receive outputs in different standard data formats (i.e., shapefiles, raster files, csv data tables/ time series of various indicators) through the ENVISION platforms, in order to study changes and emerging problems]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(34) Envision services can be featured on DIASes (the toolbox can be installed on DIASes, or that DIASes offer the tools as a service so it is preinstalled there, accessed and even maintained by the DIAS).]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
. [(35) The product and services are easy to install and use]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(36) The product and services meet security standards]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(37) Ability to receive data for declared parcels across the whole country and not only specific zones]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
. [(38) Envision data products and services ensure transparency and security in the context of intellectual property and GDPR.]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(39) Ability to visualise historic data and all relevant to a plot information on the platform as far back as relevant data is available (i.e., from 2015 onwards, due to availability of satellite images relevant to the ENVISION services)]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(40) Ability to receive ENVISION outputs from the time of submission and throughout the entire application period.]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(41) Ability to help applicants and explain possible implications of wrong declarations / ineligibility of plots, considering the eligibility criteria / rules for multiple agri-environmental schemes, with Envision product outputs.]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
[(42) Ability to see what is important to check for each plot, according to a farmer's declaration, through the ENVISION platform.]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(43) Envision Service helps to clarify why certain parcels needs to be checked according to the organisation's sample.]	Clearly outstanding performance / product fully meets my needs.	At an acceptable or above level / product partially meets my needs.
Please indicate the most crucial criteria that the products and services do not fulfil and share your relevant opinions and suggestions based on your experiences during the implementation and testing phases.	Envision products provide an almost comprehensive solution to a PA with regards to the requirements of the new CAP	As a small country with many small parcels we feel that the Envision product requires improvement in that respect. I do though understant that nothing can be improved without VHR or HR images

Table 50. The survey results for the Performance, usability and effectiveness evaluation (Cyprus BC)

DP1(Analytics on Vegetation and Soil Index Time-series)

The feedback from users reflects a highly positive outlook. Several key strengths of the product and services have emerged, indicating their effectiveness and alignment with user needs. First and foremost, the ability to mask layers based on Envision service outputs was a standout feature, with users expressing that it greatly exceeded their expectations. This functionality is essential for data customization and analysis, and its exceptional performance was widely recognized. The rapid data processing provided by the system was another prominent highlight. Users commended the system's efficiency in handling data, enabling quick testing and analysis. This feature is vital for users who rely on timely information for decision-making. The system's long-term stability and its potential for extended use beyond the project's lifetime were acknowledged as significant advantages. Users expressed confidence in the product's reliability and its ability to serve their needs not only during the project but also in the future. Furthermore, the strong emphasis on security, transparency, and GDPR compliance was well-received. Users appreciated the platform's commitment to data protection, which is crucial in sensitive applications like this one. The assurance of transparency and adherence to GDPR regulations added to the trustworthiness of the product and services.

While there were a few minor areas noted for improvement, such as the need for more detailed documentation of accuracy estimation, these issues were considered relatively minor in the grand scheme of things. They did not significantly detract from the overall positive feedback.

In summary, the evaluation of Envision's product and services underscores their effectiveness and value in meeting user needs. The strengths mentioned, including layer customization, fast data processing, long-term stability, and a commitment to security and transparency, make these services a robust solution that aligns well with the requirements of the new CAP.

DP2 (Cultivated crop type maps)

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

In the evaluation of DP2 "Cultivated crop type maps", several aspects stood out. First, the ability to receive data of crop type maps with a two-week frequency from mid-April to mid-September received the highest praise, with respondents noting that the product fully met their needs, representing clearly outstanding performance.

However, the survey also highlighted areas where significant improvements are necessary. Notably, the ability to identify and distinguish between organic and conventional crops was labeled as extremely weak, with the product failing to meet the users' needs in this regard. Additionally, the ability to monitor pesticide and herbicide use indirectly through crop growth monitoring data product, and the ability to receive information about specific crop types in small and narrow parcels, or at least a coarser level of classification, were both seen as performing poorly and in need of major improvement.

Among the positive aspects, the system's performance in terms of data processing speed and its ability to provide errors against legislation for communication with farmers were lauded, although some room for improvement was noted. Moreover, the ability to download outputs, share data via APIs, and store relevant outputs in one place received high praise, with respondents stating that the product fully met their needs in this regard.

Furthermore, the Envision data products and services demonstrated clear strengths in seamless integration and interoperability with existing systems, as well as the ability to upload and provide in situ data for the enhancement of Envision services. Both of these aspects received favorable ratings, although the need for further improvement was noted.

While the Envision product and services have shown outstanding performance in certain areas, particularly in data delivery frequency and the ability to process and communicate errors, there are crucial areas where they fall short, such as the identification of organic crops and monitoring pesticide use. To enhance the product's usability and effectiveness, addressing these weaknesses is imperative. The positive feedback on integration and data sharing highlights the potential for this product, and with continuous improvement, it can better serve the needs of users, particularly in smaller agricultural parcels.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps), DP3 (Grassland mowing events detection)

The responses to the questionnaire for the performance, usability and effectiveness evaluation are summarized below.

Performance, usability and effectiveness of the product and services: Please rate your experience with envision data product and services for each statement below from 1-6, where, 1 is the lowest rate (Extremely weak performance/ product does not meet my needs), 5 is the highest rate (Clearly outstanding performance/ product fully meets my needs) and 6 is "Not relevant to this product and/or to the use case"			
	DP1(Analytics on Vegetation and Soil Index Time-series)	**DP2(Cultivated crop type maps)**	**DP3(Grassland mowing events detection)**
[(1) Ability to receive data of crop type maps with two-week frequency from the mid- April to mid-September.]	Not relevant to this product / use case	Clearly outstanding performance / product fully meets my needs.	Not relevant to this product / use case
[(2) Ability to receive grassland mowing and grazing layers with two-week frequency from June till November.]	Not relevant to this product / use case	Not relevant to this product / use case	Clearly outstanding performance / product fully meets my needs.
[(3) Data product of Grassland mowing/ploughing provides more than 85% accuracy.]	Not relevant to this product / use case	Not relevant to this product / use case	Clearly outstanding performance / product fully meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(4) Data product of cultivated crop type maps and grassland mowing/ploughing provides at least 95% accuracy compared to in situ data]	Not relevant to this product / use case	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(5) Ability to receive vegetation status maps with a priority on EFA catch-crop fields and all fallow land fields.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Not relevant to this product / use case	Not relevant to this product / use case
[(6) Ability to mask the layers based on the outputs of a Envision service.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(7)The masked layers could be visualised on the Envision platform]	Clearly outstanding performance / product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(10) Ability to receive information about the specific crop types even in very small and narrow parcels, or at least a coarser level of classification with a group of possible crop types]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(14) Ability to track reductions in the number of plants through several times of the year.]	Clearly outstanding performance / product fully meets my needs.	Not relevant to this product / use case	Not relevant to this product / use case
[(16) Ability to help to track events of illegal burning of crops.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Not relevant to this product / use case	Not relevant to this product / use case
[(17) The performance of the system (data processing) is fast and enable quick testing.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(18) The system can provide with errors against legislation so that we can communicate to farmers.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(19) The ENVISION toolbox features as many standards as possible and the various outputs are downloadable or easy to share via APIs so that we can analyse them in our own existing systems. (potential to transfer/download data)]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(20) Envision data products and services enables seamless integration and interoperability with existing system.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(21) Relevant outputs and data can be stored in one place (the ENVISION database for the ENVISION lifetime).]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(22) Ability to download outputs (i.e., shapefiles, csv files etc.), share via APIs or access the data storage online.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(23) The services can process information about newly declared parcels in bulk and efficiently. So that we can receive outputs for new parcels]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(25) Accuracy is provided for the entire service outputs.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(27) The services are/will be stable and functional for the ENVISION project lifetime]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(28) Possibility of using the services after the project ends (beyond project lifetime).]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(29) ENVISION platform can monitor itself and notify me if there is a problem through selected method (email, web application, etc.).]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(30) Ability to upload and provide information and in situ data from fields for the enhancement of Envision services]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(31) Envision services provides indications if the values for certain pixels or plots are "Not Available - N.A.". So I can warn the respective farmers that they need to provide the relevant information themselves]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(32) The results from ENVISION's remote monitoring services are reliable and verifiable on the spot.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(33) Ability to receive outputs in different standard data formats (i.e., shapefiles, raster files, csv data tables/ time series of various indicators) through the ENVISION platforms, in order to study changes and emerging problems]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
. [(35) The product and services are easy to install and use]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(36) The product and services meet security standards]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(37) Ability to receive data for declared parcels across the whole country and not only specific zones]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
. [(38) Envision data products and services ensure transparency and security in the context of intellectual property and GDPR.]	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(40) Ability to receive ENVISION outputs from the time of submission and throughout the entire application period.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(41) Ability to help applicants and explain possible implications of wrong declarations / ineligibility of plots, considering the eligibility criteria / rules for multiple agri-environmental schemes, with Envision product outputs.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(42) Ability to see what is important to check for each plot, according to a farmer's declaration, through the ENVISION platform.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.
[(43) Envision Service helps to clarify why certain parcels needs to be checked according to the organisation's sample.]	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.	Clearly outstanding performance / product fully meets my needs.

Table 51. The survey results for the Performance, usability and effectiveness evaluation (Lithuanian BC)

DP1(Analytics on Vegetation and Soil Index Time-series)

For DP1 (Analytics on Vegetation and Soil Index Time-series), several aspects have been rated positively. The ability to receive vegetation status maps with a priority on EFA catch-crop fields and all fallow land fields has been well received, indicating a very favorable performance. Similarly, the ability to mask the layers based on the outputs of an Envision service and visualize these masked layers on the Envision platform are seen as clear strengths, with clearly outstanding performances. Additionally, the system's capacity to provide information about specific crop types, track reductions in the number of plants, and help monitor events like illegal burning of crops has received positive feedback, indicating that the product fully meets users' needs. The system's speed and ability to process data quickly, as well as its ability to detect errors against legislation and facilitate communication with farmers, have been deemed outstanding.

However, there are areas where improvements are needed. For instance, the ability to receive outputs in different standard data formats and ensuring the product meets security standards have been rated as very favorable but still in need of improvement. Ensuring transparency and security in the context of intellectual property and GDPR compliance is another aspect that can benefits from improvement.

It's worth noting that there are some areas where the product's performance falls short, the ability to help monitor self-notification of issues and the uploading of in-situ data for the enhancement of Envision services are aspects that have been favorably received but still need improvement.

In conclusion, the survey results indicate a generally positive response to the product and services provided by the ENVISION project, with several outstanding performances and very favorable feedback. However, there are few specific areas where improvements can be good to further enhance the usability and effectiveness of the system. Addressing these issues will be crucial for ensuring the product fully meets users' needs and maintains its high standard of performance.

DP2(Cultivated crop type maps)

In evaluating the DP2 (Cultivated crop type maps) product and services, several noteworthy strengths have emerged. The product's timely delivery of crop type maps at a bi-weekly frequency from mid-April to mid-September has been exceptional, meeting users' demands for up-to-date and relevant information crucial for agricultural planning and monitoring. Moreover, the product's accuracy in providing cultivated crop type maps data product, achieving at least 95% accuracy compared to in situ data, has significantly bolstered its reliability, making it a valuable resource for decision-making in the agricultural sector.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

The system's swift data processing performance stands out as a key advantage, facilitating rapid testing and enabling prompt decision-making processes. Its features, such as the ability to download outputs, share via APIs, and seamlessly integrate with existing systems, have been highly effective, meeting the users' standards and empowering them to conduct in-depth data analyses tailored to their specific needs.

Despite these strengths, there are areas identified for improvement. For instance, refining the platform's ability to mask layers and improve visualization on the Envision platform could enhance user experience and comprehension. Similarly, while the service outputs generally maintain good accuracy, there is room for improvement to ensure greater reliability in the data provided. Features related to notifications and security standards need further refinement to provide a more seamless and secure user experience.

In summary, the DP2 product and services have exhibited exceptional strengths in meeting user requirements. Nevertheless, firther improvements can be beneficial to refine user experience, enhance data accuracy, and streamline functionalities for improved efficiency and reliability.

DP3 (Grassland mowing events detection)

The evaluation of the product and services related to DP3 (Grassland mowing events detection) reveals a remarkably positive performance across multiple dimensions. Users have lauded the product for its ability to provide timely and accurate grassland mowing and grazing data, with a two-week frequency from June to November, which is considered a clear standout. The product's accuracy in the data product of cultivated crop type maps and grassland mowing/ploughing, along with its ability to mask and visualize layers, is highly commended. The system's speed in data processing, error identification, and the inclusion of multiple standards in the ENVISION toolbox have all been positively acknowledged. Furthermore, the product's seamless integration and interoperability with existing systems, coupled with its ability to efficiently process information for new parcels, are highly valued. Users have also appreciated the product's stability, self-monitoring capabilities, and the option to use it beyond the project's duration. The ability to upload in situ data for enhancement, the reliability of results, and the flexibility in data formats have received praise. Moreover, the product's user-friendliness and coverage of declared parcels across the entire country have been recognized as strengths.

However, security standards and transparency in the context of intellectual property and GDPR can be further improved. In conclusion, the DP3 product and services have demonstrated exceptional performance, with only a few areas in need of refinement, making them a valuable asset for the ENVISION project and its continued success.

Flemish BC, DP4 (SOC monitoring)

The responses to the questionnaire for the performance, usability and effectiveness evaluation are summarized below.

Performance, usability and effectiveness of the product and services: Please rate your experience with envision data product and services for each statement below from 1-6, where, 1 is the lowest rate (Extremely weak performance/ product does not meet my needs), 5 is the highest rate (Clearly outstanding performance/ product fully meets my needs) and 6 is "Not relevant to this product and/or to the use case "	**DP4(SOC monitoring)**
[(20) Envision data products and services enables seamless integration and interoperability with existing system.]	At an acceptable or above level / product partially meets my needs
[(22) Ability to download outputs (i.e., shapefiles, csv files etc.), share via APIs or access the data storage online.]	At an acceptable or above level / product partially meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(23) The services can process information about newly declared parcels in bulk and efficiently. So that we can receive outputs for new parcels	At an acceptable or above level / product partially meets my needs.
[(27) The services are/will be stable and functional for the ENVISION project lifetime	At an acceptable or above level / product partially meets my needs.
[(28) Possibility of using the services after the project ends (beyond project lifetime).	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(32) The results from ENVISION's remote monitoring services are reliable and verifiable on the spot.	Poor performance, major improvement needed/ product partially meets my needs.
[(33) Ability to receive outputs in different standard data formats (i.e., shapefiles, raster files, csv data tables/ time series of various indicators) in order to study changes and emerging problems	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(35) The product and services are easy to install and use]	At an acceptable or above level / product partially meets my needs.
[(36) The product and services meet security standards]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(37) Ability to receive data for declared parcels across the whole country and not only specific zones	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(38) Envision data products and services ensure transparency and security in the context of intellectual property and GDPR.	At an acceptable or above level / product partially meets my nee
[(40) Ability to receive ENVISION outputs from the time of submission and throughout the entire application period.	At an acceptable or above level / product partially meets my needs.

Table 52. The survey results for the Performance, usability and effectiveness evaluation (Flemish BC)

In evaluating the performance, usability, and effectiveness of DP4, we have gathered feedback on various aspects. Firstly, there are several positive aspects to highlight. Envision's ability to enable seamless integration and interoperability with existing systems was rated at an acceptable level, indicating that it partially meets the users' needs. Similarly, the ability to download outputs, share data via APIs, and access data storage online was also perceived as partially meeting users' requirements.

However, the survey results reveal areas that require improvement. The ability to process information about newly declared parcels in bulk and efficiently was rated as acceptable but fell short of fully meeting user needs. The results from ENVISION's remote monitoring services were rated as needing major improvement, signifying a significant deficiency in reliability and verifiability on the spot. Additionally, while the ability to receive outputs in different standard data formats displayed potential, it was rated as needing further improvement.

On a more positive note, Envision's performance shines in certain aspects. Users expressed satisfaction with the possibility of using the services beyond the project's lifetime, the ease of installation and usage, and compliance with security standards. Furthermore, the ability to receive data for declared parcels across the entire country and ensuring transparency and security in the context of intellectual property and GDPR received favorable ratings.

In summary, the evaluation of Envision Data Products and Services showcases a mix of positive aspects and areas in need of improvement.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

The responses to the questionnaire for the performance, usability and effectiveness evaluation are summarized below.

Performance, usability and effectiveness of the product and services: Please rate your experience with envision data product and services for each statement below from 1-6, where, 1 is the lowest rate (Extremely weak	**DP5 (Crop growth Monitoring and identification of organic farming practices)**

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

performance/ product does not meet my needs), 5 is the highest rate (Clearly outstanding performance/ product fully meets my needs) and 6 is "Not relevant to this product and/or to the use case"	
[(6) Ability to mask the layers based on the outputs of a Envision service.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(7)The masked layers could be visualised on the Envision platform	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(8) Ability to identify and distinguish between organic and conventional crop.	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(9) Ability to monitor the pesticide and herbicide use on the declared plots (malpractices more generally) indirectly through crop growth monitoring data product.	Poor performance, major improvement needed/ product partially meets my needs.
[(10) Ability to receive information about the specific crop types even in very small and narrow parcels, or at least a coarser level of classification with a group of possible crop types]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(11) Ability to get Envision outputs per parcel, especially for information on yield of organic crops.	Extremely weak performance/ product does not meet my needs.
[(12) Ability to get information once a year about the crops of neighbouring plots that are not involved in organic production.	At an acceptable or above level / product partially meets my needs.
[(13) Ability to get data once a year for the crop types of conventional plots that belong to the same farmers that are involved also in organic production.	At an acceptable or above level / product partially meets my needs.
[(14) Ability to track reductions in the number of plants through several times of the year.	At an acceptable or above level / product partially meets my needs.
[(15) Ability to see the colour of crops / plants on parts of parcels (i.e. borders) for several times of the year to monitor pesticide/herbicide use.	At an acceptable or above level / product partially meets my needs.
[(17) The performance of the system (data processing) is fast and enable quick testing.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(19) The ENVISION toolbox features as many standards as possible and the various outputs are downloadable or easy to share via APIs so that we can analyse them in our own existing systems. (potential to transfer/download data)]	At an acceptable or above level / product partially meets my needs.
[(20) Envision data products and services enables seamless integration and interoperability with existing system.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(21) Relevant outputs and data can be stored in one place (the ENVISION database for the ENVISION lifetime).]	Clearly outstanding performance which is way above the norm/ product fully meets my needs.
[(22) Ability to download outputs (i.e., shapefiles, csv files etc.), share via APIs or access the data storage online.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(23) The services can process information about newly declared parcels in bulk and efficiently. So that we can receive outputs for new parcels]	Clearly outstanding performance which is way above the norm/ product fully meets my needs.
[(24) The specific methodology followed to estimate accuracy of measurements is documented on the platform.]	Clearly outstanding performance which is way above the norm/ product fully meets my needs.
[(25) Accuracy is provided for the entire service outputs.]	At an acceptable or above level / product partially meets my needs.
[(26) Ability to receive notifications when the accuracy degrades throughout the cultivation period]	At an acceptable or above level / product partially meets my needs.
[(27) The services are/will be stable and functional for the ENVISION project lifetime]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(28) Possibility of using the services after the project ends (beyond project lifetime).]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(29) ENVISION platform can monitor itself and notify me if there is a problem through selected method (email, web application, etc.).]	At an acceptable or above level / product partially meets my needs.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

[(30) Ability to upload and provide information and in situ data from fields for the enhancement of Envision services]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(31) Envision services provides indications if the values for certain pixels or plots are "Not Available - N.A.". So I can warn the respective farmers that they need to provide the relevant information themselves]	At an acceptable or above level / product partially meets my needs.
[(32) The results from ENVISION's remote monitoring services are reliable and verifiable on the spot.]	Clearly outstanding performance which is way above the norm/ product fully meets my needs.
[(33) Ability to receive outputs in different standard data formats (i.e., shapefiles, raster files, csv data tables/ time series of various indicators) through the ENVISION platforms, in order to study changes and emerging problems]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(35) The product and services are easy to install and use]	Clearly outstanding performance / product fully meets my needs.
[(36) The product and services meet security standards]	Clearly outstanding performance / product fully meets my needs.
[(37) Ability to receive data for declared parcels across the whole country and not only specific zones]	At an acceptable or above level / product partially meets my needs.
[(38) Envision data products and services ensure transparency and security in the context of intellectual property and GDPR.]	Clearly outstanding performance / product fully meets my needs.
[(39) Ability to visualise historic data and all relevant to a plot information on the platform as far back as relevant data is available (i.e., from 2015 onwards, due to availability of satellite images relevant to the ENVISION services)]	Clearly outstanding performance / product fully meets my needs.
[(40) Ability to receive ENVISION outputs from the time of submission and throughout the entire application period.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(41) Ability to help applicants and explain possible implications of wrong declarations / ineligibility of plots, considering the eligibility criteria / rules for multiple agri-environmental schemes, with Envision product outputs.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(42) Ability to see what is important to check for each plot, according to a farmer's declaration, through the ENVISION platform.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
[(43) Envision Service helps to clarify why certain parcels needs to be checked according to the organisation's sample.]	Very favourable performance, but still needs improvement/ product fully meets my needs.
Please indicate the most crucial criteria that the products and services do not fulfil and share your relevant opinions and suggestions based on your experiences during the implementation and testing phases.	In our business case focus was on one region (Vojvodina), not on whole country, and only 4 crop types included. Regarding that there were not sufficient data for training algorithm and for testing the service. These data which checked had very great accuracy, but too much parcels excluded from testing, because different reasons.
Please indicate the number of statements and provide explanations where you deem necessary.	

Table 53. The survey results for the Performance, usability and effectiveness evaluation (Serbian BC)

Users' feedback on Data Product 5 (DP5) and their overall experience with Envision data products and services provide valuable insights.

DP5 showcases several strengths. It excels in masking layers based on Envision service outputs, enabling the visualization of masked layers on the platform. It effectively identifies and distinguishes between organic and conventional crops, and it offers a fast data processing system. The toolbox features are commendable, offering downloadable outputs and seamless integration with existing systems. Additionally, the ability to store relevant data in one place and the capability to download outputs are praiseworthy. The platform also boasts the ability to process information about newly declared parcels efficiently and provides accurate measurements, with documented methodologies.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Moreover, it promises stability for the Envision project's lifetime, with potential for use beyond the project's duration. The services are easy to install and use, meet security standards, ensure transparency, and allow users to visualize historic data.

Despite these strengths, there are areas that need improvement. Users note that some functionalities are still in need of enhancements, such as monitoring pesticide and herbicide use indirectly through crop growth data, obtaining Envision outputs per parcel for organic crops, and tracking reductions in plant numbers. In addition, the product should offer notifications when accuracy degrades over time. “The ability to receive data for declared parcels across the whole country and not only specific zone” is another area that can benefit from further improvment.

In summary, the Envision data product and services exhibit a range of strengths, and areas for development. Addressing these issues can be important for enhancing the overall performance, usability, and effectiveness of the product, ultimately leading to a more comprehensive and satisfying user experience.

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

5 Conclusions

The purpose of this report is to evaluate ENVISION products and services in terms of business value, acceptance, performance, usability and effectiveness, and impact at economic and social levels, to reveal key experiences and feedback for ENVISION solutions through BC implementation. Thus, the output of the report is to support the ENVISION data product and services to achieve the required maturity and meet specific customer needs and project commercialisation activities
This chapter concludes the main findings of the quantitative and qualitative survey and interview results.

5.1 Economic and social impact assessment

The main objective of this study is to assess the impacts that can be achieved by ENVISION products by analysing them within a framework of relevant indicators.

Although for some KPIs, it is too difficult to provide quantitative evidence of the impact generated by ENVISION Data Product, this study has gathered a significant amount of qualitative evidence, along with available documentation, interviews and survey results for the impacts of ENVISION.

In Summary, ENVISION Data Products and Services showcase promising results in various impact criteria, encompassing economic, social, and environmental aspects. While certain impacts may not be immediate or uniform, the overall potential for positive change is clear, suggesting that these data products can bring significant added value to the implementation of CAP needs.

The impact findings associated with Data Products for each BC can be summarized as follows:

Cyprus BC, DP1(Analytics on Vegetation and Soil Index Time-series)

Improving Objectivity, Transparency, and Reliability of the Inspection activities (Economic/Tech-Social): DP1 can play an important role in improving the objectivity, transparency and reliability of inspection activities. By reducing mistakes in on-site inspections and farmers' declarations, ENVISION DP1 demonstrates improved accuracy and fairness of assessments. This, in turn, contributes to better decision-making. But it is important to have access to timely information so that inspectors and farmers have more reliable data to work with, increasing the credibility of the whole process.

ENVISION intends to offer additional tools that customers can use to help farmers fulfil their obligations. In this regard, PAs will be able to provide farmers **(via a mobile app)** with information for detected inconsistencies in their declaration, alert them to actions they need to take and allow farmers to send confirmation or proof of actions they have taken.

Reduce time (Economic/Tech): One of the impact that can be achieved with Envision's DP1 is the reduction in the time required for monitoring and inspection activities. By providing the ability to monitor farming practices without the need for site visits, ENVISION optimises the use of time and resources. This time saving is not only convenient, but also cost-effective. It allows agricultural professionals to focus on other critical tasks, improving overall efficiency and productivity.

Increasing the farmer's income (Economic/Tech-Social): Even if the process shows a slight increase in the number of beneficiaries, effective communication of results not only can reduce the number of declaration errors but also can increase the likelihood of farmers meeting the eligibility criteria for direct payments. Reducing the rate of declaration errors and simplifying and speeding up the application process, are in line with the goal of increasing farmers' income and potentially improving farmers' financial well-being. In addition, the reduction in fertiliser use enabled by " Runoff risk

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

assessment" insights can have a indirect impact on farmers' income. By reducing fertiliser expenditure, farmers can improve their profit margins and income.

Reduce the administrative burden (Social): The results shows that the majority of administrative burdens comes from regulatory compliance obligations. This implies adapting regulatory compliance to new technologies. While the reduction in administrative work may not be as dramatic and may not have an immediate effect on all farms due to differences in size and processes, it is still a step towards simplifying administrative tasks, the data product can indirectly save time. This is mainly achieved by reducing the number of objections due to fewer errors in declarations, which eases the administrative burden and provides social benefits.

Natural Resource use efficiency (Social Impact- Economic/Tech Impact Impact); Once most of the Eligibility requirements are controlled by the Envision product, this will lead to a reduction in the amount of paper used for control and monitoring activities through fewer controls and more digital work. As less paper is used, there's a reduction in the resources required for paper production, promoting a more resource-efficient approach to these processes.

Cost reduction (Economic/Tech): DP1 can contribute to cost reduction by diminishing the necessity for paper in monitoring and inspection activities. This reduction in paper usage is attributed to the decreased need for on-the-spot checks. Envision DP1 illustrates that by reducing the demand for on-site inspections, it subsequently decreases the frequency of vehicle movements, ultimately resulting in cost savings.Furthermore, it's important to highlight the indirect effect on cost reduction. The insights from "Runoff risk assessment" can contribute to a decrease in fertilizer usage, thereby reducing fertilizer expenditure. This, in turn, can lead to improved cost efficiency for farmers.

Less environmental pollution (water-soil) (Social) and Less Soil/Land degradation (Social): The data product can indirectly lead to a reduction in fertiliser use, potentially reducing water and soil pollution and soil degradation. Systematic communication of runoff risk assessment results can help achieve this goal. Moreover, it aspires to contribute to the preservation of land by deterring illegal land clearing through early detection and punishment which can lead greater biodiversity.

Providing new jobs (Economic/Tech-Social): The impact of "providing new jobs" in the context of public service organizations is contingent on government policy decisions. Public service organizations, in general, do not possess the autonomy to independently hire new employees. Instead, the emphasis is placed on enhancing the capabilities of the existing workforce through additional training and knowledge extension

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): The increasing adoption of these services by farmers and inspectors is expected to enhance awareness, knowledge, and opinions related to environmentally friendly farming, fostering economic and social benefits through knowledge sharing. Additionally, the rise in publications and dissemination activities based on DP1's insights benefits policymakers, enabling informed decisions. Moreover, the expansion of new products and services stemming from the ENVISION solution enhances the Agricultural Management System (AMS), contributing to a more sustainable and eco-friendly approach in agriculture.

Lower emissions (Social): The data product aims to decrease the number of travels with motor vehicles for on-site inspections by reducing the need for on-the-spot checks. This aligns with the criteria to lower emissions.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Create datasets for further scientific research (Social): The continuous growth in the number of datasets aids in further scientific research and development of technologies that enable systematic monitoring of agricultural practices through earth observation. Envision's provision of access to its Datacube, housing a wealth of data, offers CAPO the opportunity to query for new datasets essential for advancing research and supporting innovative operations. In essence, the creation of these datasets serves as a foundational cornerstone for fostering innovation and progress By offering access to data that can be used for further research, Envision supports the scientific community and policymakers in making informed decisions. This aligns with the goal of advancing scientific knowledge and promoting evidence-based agricultural policies. ENVISION 's role in creating datasets contributes to broader societal objectives and helps bridge the gap between research and practice.

Cyprus BC, DP2 (Cultivated crop type maps)

Improving Objectivity, Transparency, and Reliability of the inspection activities (Economic/Tech-Social): DP2's impact on decreasing mistakes during on-site inspections remains dependent on the complex nature of these checks. While there's an expectation of improvement due to the implementation of AMS on BISS, the extent of this improvement is uncertain. It's expected to enhance the objectivity, transparency, and reliability of inspections, yet some irregularities may still remain hidden.

Reduce time (Economic/Tech): DP2 contributes favorably to reducing work time for monitoring and inspection activities. Envision's ability to eliminate the need for on-site visits translates into improved efficiency in monitoring agricultural practices, primarily attributed to the intensive use of AMS and applicants' commitment to eco schemes.

Increasing the farmer's income (Economic/Tech-Social): The impact is expected to lead to fewer declaration mistakes by farmers, which is in line with the goal of increasing farmers' income and possibly improving their financial well-being. The reduction in fertiliser use enabled by "Runoff risk assessment" insights further contributes to this goal by improving profit margins and income.

Moreover, although the estimated increase in the number of farmers benefiting from direct payments is low, it reflects limited participation in the CAP/EU agri-environment National policies. However, by contributing to the correction of mistakes in applications **(via mobile app),** it shows that DP2 can contribute to helping more farmers qualify for direct payments and thus increase their incomes.

Reduce the administrative burden (Social): The reduction in administrative work may not be dramatic but indirectly can save time by reducing objections and mistakes in declarations. This eases the administrative burden and provides social benefits, even though the extent of this impact may vary due to other influencing factors.

Natural Resource Use Efficiency (Social Impact-Economic/Tech Impact): DP2's anticipated reduction in paper usage, driven by eligibility criteria verification, promotes a resource-efficient approach. As less paper is used, fewer resources are required for paper production, aligning with environmental sustainability objectives.

Cost Reduction (Economic/Tech): DP2 contributes to cost reduction by diminishing the necessity for paper and on-the-spot inspections, resulting in cost savings. Insights from "Runoff risk assessment" also enhance cost efficiency for farmers by reducing fertilizer usage.

Less Environmental Pollution (Water-Soil) and Less Soil/Land Degradation (Social): DP2 indirectly can contribute to reducing water and soil pollution and soil degradation through its impact on fertiliser use

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

and early detection of intensive crop activities, which promote land preservation and greater biodiversity.

Providing New Jobs (Economic/Tech-Social): In the context of public service organizations, the impact of providing new jobs is influenced by government policy decisions. These organizations focus on workforce enhancement through training and skill development.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): DP2's impact is expected to foster greater awareness and knowledge regarding environmentally friendly farming practices, with potential economic and social benefits through knowledge sharing, further contributing to the expansion of the Agricultural Management System.

Lower Emissions (Social): The reduction in the number of travels with motor vehicles for on-site inspections aligns with emissions reduction goals, promoting a more sustainable approach.

Create Datasets for Further Scientific Research (Social): DP2's contribution to creating datasets for scientific research is favorable, supporting the scientific community and policymakers in making informed decisions and advancing agricultural research.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series)

Improving Objectivity, Transparency, and Reliability of inspection activities (Economic/Tech-Social): The data product can contribute to improving the objectivity, transparency, and reliability of inspections. For example, the "Harvest Events Detection" service minimizes mistakes during on-site inspections and enhances objectivity. Similarly, the "Stubble Burning Identification" services provide timely alerts, reducing the likelihood of errors and enhancing overall reliability.

Reduce time (Economic/Tech): The combination of services, including "Harvest Events Detection," "Minimum Soil Cover," and "Stubble Burning Identification," significantly reduces the time required for monitoring and inspection activities. These services provide timely alerts on activities such as harvesting and burning, simplifying the monitoring and inspection processes, and leading to substantial time savings.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): The services can significantly boost awareness and knowledge about eco-friendly farming and agriculture monitoring technologies. These services not only provide tools but also solutions that genuinely address the needs of farmers and inspectors, increasing the number of end-users. This aligns with the goal of knowledge sharing and raising awareness about eco-conscious agricultural practices.

In the ENVISION project, NPA assessed a greater number of CAP-aligned services, coupled with educational efforts to raise awareness among farmers about EO monitoring technologies, supporting sustainable farming practices. These services act as both tools and solutions, increasing end-users and promoting knowledge sharing for eco-conscious agriculture.

Providing new jobs (Economic/Tech-Social): While there is a reduction in the need for additional employment due to remote monitoring capabilities. The services streamline monitoring and inspections, reducing the workforce required for on-site inspections.

Soil/Land degradation (Social): The data product's services, particularly "Maintaining Minimum Soil Cover" and "Identifying Stubble Burning," indirectly can contribute to reducing soil and land

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

degradation through enhanced land management and the promotion of sustainable agricultural practices. By ensuring consistent soil cover and monitoring activities related to stubble burning, these services improve soil health and mitigate degradation. Additionally, the reduction in chemical fertilizer usage, closely linked to this goal, further supports efforts to combat soil and land degradation.

Cost reduction (Economic/Tech): The Data product and services can reduce the costs of on-site inspections and travel. ENVISION DP1 minimizes the need for on-site inspections, lowering travel expenses. Additionally, insights from "Runoff risk assessment" can cut fertilizer usage, enhancing cost efficiency for farmers.

Increasing the farmer's income (Economic/Tech-Social): These services minimise mistakes and inconsistencies, enabling more accurate declarations and rapid identification of agricultural activities. This increases the number of farmers eligible for direct payments and ensures that farmers receive the support they deserve, aligning it with both economic and social objectives.

Environmental Pollution (Water-Soil): In conclusion, DP1's services can play an indirect yet important role in mitigating environmental pollution by fostering sustainable land management practices. This results in a decrease in chemical fertilizer and pesticide/ herbicides usage, aligning with the objectives of reducing environmental pollution in water and soil. The "Harvest Events Detection" service, in particular, identifies areas susceptible to nitrate runoff and implements measures to lower nitrate levels, thereby enhancing environmental protection through the reduction of chemical fertilizer usage.

Lower Emissions (Social): In summary, DP1 can contribute to lower emissions by minimizing the need for travel during inspection activities, reducing vehicle movements and their associated emissions. Furthermore, it encourages agricultural practices that can lead to increased soil organic matter, which aligns with the goal of promoting environmentally sustainable farming. These combined efforts can support reduced emissions.

Lithuanian BC, DP2 (Cultivated crop type maps)

Impact Criteria-Improve the Objectivity, Transparency, and Reliability of Inspections activities : The data product significantly enhances the objectivity, transparency, and reliability of inspections by reducing mistakes in on-site inspections, it not only increases the accuracy of data but also ensures a more transparent and reliable assessment process. This, in turn, enhances the overall trustworthiness of the entire inspection.

Reduce time (Economic/Tech): Time reduction for monitoring and inspections is achieved by simplifying the identification of applicants who haven't completed necessary tasks. This streamlined approach saves valuable time by focusing efforts on the most critical areas, making the entire process more efficient and resource-effective.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): Continuous improvements and adaptations to the data product are driving a favorable effect by attracting more end-users and expanding the user base among farmers and inspectors. This not only enhances their awareness of environmentally friendly farming practices but also fosters knowledge sharing. It helps stakeholders gain a deeper understanding of how modern technology can be harnessed for sustainable agriculture, thereby promoting more responsible farming practices.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Providing new jobs (Economic/Tech-Social): A reduction in the workforce required for on-site inspections is observed, thanks to the data product's capability for remote monitoring and identification in fields. While this leads to a decrease in employment, it aligns with the efficiency and cost-effectiveness goals, as the product simplifies tasks, making them more manageable with fewer personnel.

Less Soil/Land degradation (Social): The data product motivates farmers to embrace eco-conscious agricultural practices, contributing to the mitigation of soil and land degradation. By enabling the identification of fields that adhere to environmentally friendly practices, it can play a significant role in preserving the quality of agricultural land and the surrounding environment.

Cost reduction (Economic/Tech): Significant cost reduction can be achieved by decreasing the need for on-site inspections, ensuring efficient resource allocation.

Increasing the farmer's income (Economic/Tech-Social): The data product enhances the accuracy of declarations, promotes policy compliance, reduces mistakes, and expedites the processing of applications. This can have a dual impact by improving the economic situation of farmers and ensuring that they receive the financial support they are entitled to under agricultural subsidy programs.

Environmental Pollution (Water-Soil): While the data product may not directly impact environmental pollution, but indirectly can contribute to reducing environmental pollution by promoting sustainable land management practices. Its role in encouraging eco-conscious farming practices can lead to support environmental goals aimed at preserving water and soil quality.

Lithuanian BC, DP3 (Grassland mowing events detection)

Improve the Objectivity, Transparency, and Reliability of Inspections activities (Economic/Technical - Social): In conclusion, DP1 significantly enhances the objectivity, transparency, and reliability of inspection activities. It achieves this by reducing errors in on-the-spot checks through the provision of valuable information and insights. The "Grasslands Mowing Events Detection" data product plays a pivotal role in this process, offering precise data that verifies land use practices and detects inconsistencies in reported meadows mowing activities, thereby reducing the occurrence of fraud claims. This substantial improvement in the quality and accuracy of inspections contributes to more reliable and transparent assessment processes, ultimately enhancing the objectivity and reliability of inspection activities.

Reduce Time (Economic/Technical): In summary, the "Grasslands Mowing Events Detection" data product plays a pivotal role in reducing the time required for monitoring and inspections. By providing specific alerts about ongoing mowing activities, it simplifies the identification of applicants who haven't yet mowed their fields, streamlining the entire process and making it significantly more efficient.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): The increase in the number of farmers and inspectors using the service, along with its utilization in new products and processes, positively effect fostering knowledge sharing and enhancing awareness of environmentally friendly farming. The favorable effect on the number of farmers and inspectors using the service is due to its ability to address their needs effectively, resulting in positive user experiences.

Providing New Jobs (Economic/Technical - Social): Despite a decrease in employment, this reduction stems from the data product's remote monitoring capabilities, which align with economic and

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

technical considerations. The product effectively streamlines monitoring and inspections, providing specific alerts about ongoing mowing activities, which simplifies the identification of applicants who haven't yet mowed their fields, leading to reduced work time for monitoring and inspection activities and consequently, a decrease in the need for additional employment.

Reduce the Administrative Burden (Social): The reduction in recording requirements for farmers can reduce the administrative burden. The reduction is due to the fact that farmers no longer need to maintain traditional grassland maize records because these activities can be detected via satellites.

Soil/Land Degradation (Social): In conclusion, the impact assessment of the "Grasslands Mowing Events Detection" data product highlights its indirect role in addressing soil and land degradation. While it may not directly reduce the use of chemical fertilizers, it actively promotes sustainable land management practices. By ensuring that mowing activities occur at the right time and comply with specific CAP measures for the protection of biodiversity, this data product can contribute to maintaining the health of grasslands. This, in turn, supports increased plant growth, root biomass, and the return of organic matter to the soil after mowing, ultimately aiding in the prevention of soil and land degradation.

Cost Reduction (Economic/Technical): The "Grasslands Mowing Events Detection" data product highlights its contribution to more efficient inspection operations. By reducing the need for inspectors to be physically present at all inspection sites and allowing some assessments to be carried out remotely, this data product can provide significant cost savings. While not directly reducing fertiliser use, it can play an important role in promoting sustainable land management. This indirect effect may ultimately lead to a reduction in fertiliser use, which is in line with cost-efficient and environmentally sustainable farming practices.

Increasing the Farmer's Income (Economic/Technical - Social): By actively supporting farmers in adhering to policies, promptly identifying mowing activities, minimizing mistakes, streamlining monitoring, and ultimately increasing the number of farmers who qualify for direct payments as per agricultural policies, this data product can contribute to the goal of improving farmers' income. It effectively addresses challenges that can lead to income losses.

Environmental Pollution (Water-Soil): In assessing "Environmental Pollution," the "Grasslands Mowing Events Detection" data product indirectly can promote sustainable land management practices, potentially reducing chemical fertilizer usage. It can also play a crucial role in protecting wild bird populations and maintaining ecological balance by monitoring and ensuring compliance with specific CAP measures. These efforts can contribute to environmental preservation and pollution reduction.Impact Criteria-Less

Lower Emissions (Social): The "Grasslands Mowing Events Detection" data product significantly reduces the need for inspectors to be present at all inspection sites, minimizing travel and associated emissions. Additionally, it can play a role in promoting sustainable land management practices, which, in turn, helps increase plant growth and the return of organic matter to the soil after mowing, contributing to lower emissions and environmental preservation.

Flemish BC, DP4 (SOC monitoring)

Reduce time (Economic/Tech); The reduction in work time for monitoring and inspection activities shows no influence. The elaborate nature of conditionality checks, which consist of various

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

components, makes soil analysis only a small part of the process. Moreover, pH checks are still required, and regulatory samples must be analyzed by labs. As a result, the reduction in work time related to soil condition monitoring is minimal.

Reducing the administrative burden (Social): The reduction in time spent on administration work also exhibits no significant influence. Soil analysis remains a necessary component, especially for demonstrating remediation of organic carbon levels. While there is a potential for LV to focus on farms with less evident improvements, immediate trends may not be visible. Therefore, the reduction in administrative work time is expected to be minimal.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social); Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social): The increase in the number of farmers and inspectors willing to use the services shows a favorable effect. Information on Soil Organic Carbon (SOC) can positively influence the adoption of the services, particularly through Soil Passport, which visualizes SOC data. It aligns with the goal of improving awareness and knowledge of environmentally friendly farming.

Providing new jobs (Economic/Tech -Social): The data product may result in a small increase in the number of jobs within the organization. These additional roles primarily revolve around implementing the data product. However, the impact on employment remains limited.

Provide better insight regarding Carbon stocks in soil, to the policy makers, farmers, public, scientist (Social): The increase in the number of new products or services shows an uncertainty concerning the impact. Currently, there are no plans for new products or services, but it is possible that in future processes, soil conditions may be considered. The service can then be very useful as it gives information for the whole of Flanders.

Environmental Pollution (Water-Soil): In conclusion, the data product's impact on environmental pollution is primarily indirect and challenging to quantify. By providing valuable information about soil conditions, such as organic carbon content, the product aims to encourage farmers to make informed decisions to enhance their soil quality, ultimately reducing the reliance on pesticides/ herbicides and chemical fertilizers. This positive environmental impact aligns with the broader goal of promoting sustainable and eco-friendly farming practices, contributing to the reduction of environmental pollution. However, the extent of this impact remains difficult to precisely measure.

Soil/Land Degradation (Social): The data product can indirectly contribute to addressing soil and land degradation. By providing farmers with information on soil conditions, with a particular focus on organic carbon (OC), it is expected that farmers will be inclined to take measures to improve soil quality for their crops. This, in turn, can reduce reliance on chemical fertilisers and promote biodiversity. Moreover, providing data on soil organic carbon (SOC) can motivate farmers to address low OC levels and thus promote the adoption of environmentally friendly soil practices. In this way, the data product plays an indirectly important role in reducing soil and land degradation. This indirect impact is challenging to quantify but holds promise.

Create datasets for further scientific research (Social): In summary, the data product creates datasets for scientific research. These datasets will be used to optimize local sampling strategies (Steropes, SQAT, ScaleAgData,..) and can be expanded with new data sources (satellite, rainfall, DEM, soilmaps). The SOC service builds a soil database for Flanders, showing trends in SOC over time, making it a valuable historical dataset.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Lower Emissions (Social): Providing information about Soil Organic Carbon (SOC) can be a compelling motivator for farmers, particularly when their SOC levels are low. This serves as a catalyst for enhancing soil health and reducing emissions. However, it's crucial to recognize that the impact, in this case, is indirect and not easily quantifiable.

Serbian BC, DP5 (Crop growth Monitoring and identification of organic farming practices)

Improve the Objectivity, Transparency, and Reliability of Inspections activities (Economic/Technical - Social): In summary, DP5 can enhance the objectivity, transparency, and reliability of inspection activities. These services excel in detecting issues that are challenging to identify during on-site inspections conducted by individuals, such as deviations in parcel boundaries and farmer declaration errors. This capability contributes to an increased level of accuracy and fairness in assessments, minimizing the likelihood of violations of organic principles and fraudulent activities in agriculture. Furthermore, the provision of continuous supervision and valuable additional tools for risk assessment can further bolsters the credibility of the inspection process.

Reduce time (Economic/Tech): In conclusion, the reduction in time is a valuable achievement in the context of the inspection and certification process. The current regime is time-intensive, making any decrease in time a significant improvement. By focusing on inspections for problematic parcels identified by ENVISION services, time savings can be realized. However, it's important to note that there are no impacts on administrative work, and the ENVISION service may only decrease time for the annual report when all crops and parcels are included. It's worth mentioning that the ENVISION service doesn't have any impact on applications, and remote inspections cannot replace on-site inspections due to the Organic Regulations that do not yet recognize remote inspection.

improve awareness, knowledge, on environmentally friendly farming and agriculture monitoring technologies / Knowledge transfer (Economic/Tech-Social): In summary, the impact assessment shows that awareness and knowledge of environmentally friendly agriculture and advanced agricultural monitoring technologies can significantly improve. The increased involvement of end users, continued use of services and participation in new projects such as THEROS underline the positive impact. OCS's active role in dissemination activities further improves awareness and knowledge in these areas.

Providing new jobs (Economic/Tech-Social): DP5 and similar monitoring tools have the potential to generate new employment opportunities, particularly within IT-related functions. However, the organization's primary goal is to keep its existing workforce while improving operational efficiency to serve a larger customer base.

Create datasets for further scientific research (Social): In summary, Data Product 5 has a notable impact on increasing datasets and databases, thereby enhancing the availability of agricultural information. It also aids in the decision-making process for organic production conversion, promoting more sustainable agricultural practices.

Reducing Administrative Burden

The impact assessment for Data Product 5 indicates that it does not influence the reduction of administrative burden for farmers or the time spent on administrative work. The service of ENVISION's DP5 does not directly address the decrease in the number of records that farmers are required to maintain. Despite the potential for the mobile application to serve as a digital farm book, farmers still

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

need to upload their parcels to the platform, which hasn't translated into a reduction in the administrative workload.

The platform's usage for administrative purposes, particularly for uploading pictures and comments on the field, has limited uptake. Only about 40 farmers downloaded the application, and functionality checks were conducted by a small subset of these farmers, resulting in a minimal impact on overall administrative tasks.

Moreover, Data Product 5 does not impact the time spent on administrative work as anticipated. Although it was assumed that ENVISION's service might decrease the time needed for annual reporting, this is limited to scenarios where all crops and parcels are included in the application. In practice, the application's impact is minimal due to the inability to replace on-spot inspections remotely, as Organic Regulations do not yet recognize remote inspections.

Cost reduction (Economic/Tech): Data Product 5 (DP5) can offer substantial cost reduction benefits. It significantly decreases the need for paper in monitoring and inspection activities, promoting electronic data usage, which is not only more efficient but also environmentally responsible. This shift towards electronic records simplifies the process and reduces the costs associated with paper usage.

Additionally, DP5 has a low but favorable impact on reducing the number of on-site inspections. Continuous monitoring minimizes the need for frequent site visits, which in turn decreases the costs related to travel and on-site inspections. This efficient approach optimizes resource allocation and leads to cost savings.

Furthermore, while DP5 doesn't directly influence the use of pesticides/ herbicidesand chemical fertilizers, it indirectly aids in responsible usage by early detection of potential misuse through DP5 crop growth and phenology monitoring services. This indirect effect contributes to cost reduction for farmers by avoiding excessive or inappropriate chemical treatments.

Environmental Pollution (Water-Soil): Data Product 5 (DP5) can contribute to a reduction in environmental pollution, specifically in terms of decreasing pesticide/ herbicides and chemical fertilizer use, while fostering environmentally friendly agricultural practices and biodiversity. DP5's indirect influence lies in its capacity to uncover malpractices related to herbicide and mineral fertilizer use through crop growth and phenology monitoring services. By doing so, it indirectly aids in mitigating the environmental pollution caused by these substances. Additionally, DP5 promotes biodiversity in farmland, particularly grasslands, and encourages the adoption of varieties suitable for organic production. This emphasis on biodiversity and environmentally friendly agricultural practices aligns with the long-term goal of reducing the use of pesticides/ herbicidess and fertilizers, indirectly contributing to a more sustainable and eco-friendly approach to agriculture, ultimately lessening the impact of environmental pollution.

Soil/Land Degradation (Social): DP5 can contribute to mitigate soil and land degradation through playing role in decreasing chemical fertilizer use and promoting environmentally friendly practices in agriculture. By indirectly influencing the reduction of chemical fertilizer usage and encouraging sustainable farming methods, DP5 can support the preservation of soil health and biodiversity. These efforts collectively contribute to lessening soil degradation.

Lower Emissions (Social): Data Product 5 (DP5) can have low impact on decreasing the number of travels with motor vehicles for on-site inspections, mainly achieved through continuous monitoring

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

and risk assessment, which optimizes the need for physical inspections. This contributes to lower emissions by reducing unnecessary travel.

Food quality and safety(Social); DP5 can have a relatively low indirect impact on reducing pesticide/ herbicide use. However, there is a link to the improvement of food quality and safety, especially within the context of organic production. Organic producers are required to prioritize preventive measures and minimize pesticide/ herbicides use. While DP5 isn't focused on pesticide/ herbicides reduction, it plays a central role in monitoring crop growth and phenology. This indirectly contributes to food safety by detecting misuse of herbicides and pesticides. DP5 identifies irregularities that may indicate improper herbicides and pesticides use, ensuring compliance with organic production standards and reducing harmful pesticide/ herbicide residues in food products, ultimately improving food quality and safety.

5.2 Evaluation of the business value and acceptance

The business value and acceptance of the Envision product and services were evaluated in the following fields.

- User friendly.
- Reduced time and effort,
- Added economic value-benefits,
- Usefulness
- Regulatory compliance.
- Accessibility,
- Flexibility and Scalability,
- Quality, Completeness and Specialisation,
- Support service availability

The key findings of the business value and acceptance evaluations are summarized below.

Cyprus BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps)

User-Friendliness and Accessibility: Both DP1 and DP2 have received favorable reviews for user-friendliness, ease of installation, and operation. Users have expressed confidence in these products being accessible to a wide range of users without requiring advanced technical expertise.

Reduced Time and Effort: The respondents acknowledge the potential of DP1 and DP2 to reduce the need for on-site inspections, leading to streamlined monitoring activities. However, it's essential to note that a neutral perspective exists concerning the reduction of time spent on administrative work. The results reveal that the majority of administrative burdens stem from regulatory compliance obligations. This underscores the necessity for deeper investigation into how these products can streamline administrative tasks, *thereby addressing regulatory compliance challenges with new technologies.*

Added Economic Value-Benefits: While the ROI value assessment remains neutral due to a lack of detailed information at the time of survey, both DP1 and DP2 are perceived positively for their potential to reduce business operating costs, enhance productivity, and prevent penalties.

Usefulness: DP1 is strongly praised for its potential to support collaborative, transparent, and accurate decision-making, attributed to its ability to provide quick and accurate results. *However, for DP2, respondents express a more neutral stance on its usefullness, suggesting some reservations. These*

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

hesitations are usually related to the accuracy of the product. they expressed their desire for the accuracy of the product to be improved.

Regulatory Compliance: The respondents express confidence in both DP1 and DP2 regarding their ability to ensure compliance with current EU CAP and agri-environmental regulations. They also highlight their alignment with regulatory requirements and transparency. This indicates trust in their monitoring capabilities, but it's essential to monitor their long-term compliance.

Flexibility and Scalability: Both DP1 and DP2 receive positive feedback for their compatibility with organizational workflows and the potential for easy expansion. DP1, in particular, stands out for its seamless integration with existing systems, *while DP2 encounters neutrality in this aspect, suggesting the need for improvements.*

Quality, Completeness, and Specialisation: Respondents express neutrality in evaluating DP1 and DP2 against market alternatives, citing a lack of knowledge and experience. It's clear that *more comprehensive information and hands-on experience are needed to make informed assessments about the maturity and readiness of these data products compared to what exists in the market*.

Support Service Availability: Users are generally positive about having the necessary technical support and training for installation, integration, and maintenance. However, neutrality regarding the acceptability of proposed service level agreements indicates a need for more detailed information in this area in coming days.

In conclusion, the evaluation of DP1 and DP2 indicates their potential to bring positive changes to the Cyprus BC. However, it's important to address the limitations and challenges, including the need for more information on pricing, the uncertainty regarding administrative tasks, and the reservations about DP2's usefulness. Recommendations include providing comprehensive information, improving the scalability of DP2 to maximize the benefits of these data products.

Lithuanian BC, DP1 (Analytics on Vegetation and Soil Index Time-series); DP2 (Cultivated crop type maps); DP3 (Grassland mowing events detection)

User-Friendliness: Respondents generally find all three data products, DP1, DP2, and DP3, to be user-friendly. *While specialized expertise is acknowledged as necessary*, the overall user-friendliness is evident, making them accessible to a wide range of users.

Reduced Time and Effort: There is a strong consensus across all Data Products that they effectively reduce the need for on-site inspections and provide real-time or near-real-time information, saving time and effort. *However, it's important to acknowledge that respondents disagree that these products significantly reduce time spent on administrative work due to regulatory compliance challenges and the necessity to adapt reporting rules. These factors might impact the time-saving benefits these products offer for administrative tasks.*

Added Economic Value-Benefits: Respondents express strong confidence in the value of these products, highlighting their positive return on investment and cost-effectiveness. They believe the products can reduce business operating costs and enhance productivity. Additionally, the products are seen as tools that can help prevent penalties and the loss of funding through proactive alerting and corrective actions (mobile app).

Usefulness: Respondents strongly agree that these products support collaborative, transparent, and accurate decision-making, especially in compliance monitoring. They also believe these products foster the acceptance of Earth Observation (EO) technologies. However, it's important to further emphasize their utility in addressing AE-linked challenges and promoting transparency.

Regulatory Compliance: Envision's Data Products have received support from respondents, with high confidence in their ability to comply with EU CAP and agri-environmental regulations. *However,*

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

improvements can be made in terms of transparency, security, and compliance with intellectual property rights and GDPR.

Accessibility: Respondents generally find the price and payment plans reasonable for all three products, indicating a positive perception of cost-effectiveness. They also consider the costs of operating and maintaining these products acceptable. *A comprehensive training approach is seen as necessary for effective utilization.*

Flexibility and Scalability: All three products receive positive feedback regarding seamless integration, compatibility with organizational workflows, and adaptability to meet changing user demands. This adaptability and compatibility make them well-suited for specific use cases. Understanding user perceptions is crucial to ensure seamless alignment with existing systems and workflows.

Quality, Completeness, and Specialization: Respondents express strong agreement and confidence in the capabilities of Data Products DP1, DP2, and DP3, positioning them as compelling solutions to meet the demands of PA in the context of monitoring sustainability rules. In particular, *DP3 has unique and superior qualities in the context of maturity, effectiveness and monitoring sustainability rules and addressing the needs of PAs.*

Support Service Availability: Respondents are highly satisfied with various aspects of support services for all three products, indicating a well-supported user experience. They are content with the service level agreement, technical support, training, and anticipated support after the project.

In conclusion, Envision's Data Products offer substantial benefits, with strong positive responses from Business Case customers. The key challenges related to administrative work and certain aspects of regulatory compliance and user training should be addressed to further enhance their utility. These products show strong potential for improving efficiency, reducing costs

Flemish BC DP4 (SOC monitoring)

User-Friendly: Respondents generally find DP4 to be user-friendly, with no significant concerns.

Accessibility: DP4 was primarily viewed as an information source for farmers, with less emphasis on reducing organizational operating costs or enhancing productivity. However, the absence of hindrances in installation and data provision highlighted a smooth adoption process, and the perception that no training is needed underscored its user-friendliness.

Flexibility and scalability: Respondents expressed favorable opinions, especially concerning the product's seamless integration and compatibility with their current workflows and time constraints. *However, their attitude towards the ease of extensions and upgrades was neutral, suggesting it differs according to different requirements and conditions in these processes*.

Usefulness: BC custumer agree that Envision data products contribute to collaborative, transparent, and accurate decision-making by providing insights into Flanders' soil conditions, aiding policymakers in responding to trends, including declining soil quality. This showcases the product's role in informed agricultural decision-making.

Regulatory compliance: *While there is a disagreement regarding DP4's ability to provide continuous information and confidence levels for compliance with current EU CAP and agri-environmental regulations*, there is an agreement that it can support compliance with these regulations in the longer term. *The disagreement primarily revolved around the nature of the regulations in Flanders*, where cross-compliance checks are intricate and involve numerous checks. BC Custumer noted that the focus is often on monitoring specific farming practices rather than assessing end OC results. Despite this, they acknowledged that Envision's data products could still play a supporting role in compliance with EU CAP requirements by providing insights into soil conditions and facilitating more informed farm management decisions.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Respondents also agreed that DP4 could be used beyond the project's lifetime, at least during the duration of the new CAP (2023-2027).

In summary, the survey results present a multifaceted view of DP4, with a mix of positive and neutral perspectives, highlighting the product's value in supporting informed decision-making and sustainable farm management practices.

Serbian BV DP5 (Crop growth Monitoring and identification of organic farming practices)

User-Friendly: DP5 has received unanimous praise for its user-friendliness. Customers find it exceptionally easy to install and operate, without requiring specific ICT expertise. This positive response underscores the product's usability, making it a strong point of satisfaction.

Reduced Time and Effort:. DP5 is notably perceived as an effective tool for reducing travel trips for on-site inspections, aligning with the belief that it can serve as a valuable resource in risk assessment, ultimately diminishing the need for physical visits to producers. This is a positive aspect of DP5. It also finds a positive view for reducing time spent on monitoring activities, particularly in problematic areas

While DP5 is recognized as effective in reducing travel trips for on-site inspections and improving monitoring efficiency, *concerns were raised about the potential limitations on time saved for administrative tasks due to regulatory constraints in the context of organic farming. The primary limitation here is that organic regulations do not currently acknowledge remote inspection*.

Added Economic Value-Benefits: DP5's potential to reduce business operating costs and enhance productivity is acknowledged positively.

Usefulness: DP5 has value in supporting transparent and accurate decision-making, especially in terms of historical data for recognizing previous rule implementations. It also contributes to the acceptance of Earth Observation (EO) technologies, making them suitable for government recognition and integration into official agricultural policies. These positive responses reflect DP5's significant role in the field.

Regulatory Compliance: DP5 receives strong agreement for compliance and ensuring transparency and security, particularly in terms of intellectual property and GDPR. However, there is a level of neutrality regarding its alignment with existing certification programs and adaptability to updates in certification standards. To enhance regulatory compliance, continuous communication and alignment with certification standards and updates are recommended.

Accessibility: BC Custumers remain neutral concerning the price and payment plan for DP5. This neutrality is due to a lack of detailed information at the time of the survey (waiting for offer). And they exhibit strong confidence in their infrastructure, resources, and find the end-user training time acceptable for DP5.

Flexibility and Scalability: Customers perceive DP5 positively in terms of seamless integration, compatibility with existing workflows, and potential for expansion and upgrades. The integration process is straightforward, indicating a smooth adoption process.

Quality, Completeness, and Specialization: DP5 instills confidence among respondents, who strongly agree that it can provides a robust and efficient monitoring method compared to other alternatives, justifying this opinion by asserting that “no such product exists in the market yet”. Additionally, they emphasize the product's comprehensiveness, reducing the need for additional services. This marks DP5 as a valuable tool for Certification Bodies (CBs), particularly in the context of sustainability rules.

Support Service Availability: The survey reflects a generally positive perspective on DP5's support services, from technical support to training and demonstrate high levels of satisfaction and trust in the quality of the technical assistance provided. *However, they express neutrality regarding the after service level agreement, which they hadn't received the information at the survey time (waiting offer).*

The ENVISION project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 869366

In conclusion, while DP5 stands as a promising product with several strengths, particularly in terms of user-friendliness, reduced time and effort, and added economic value, it faces some limitation related to regulatory constraints. Overall, DP5 is well-positioned to offer significant benefits to Business Case customers.

5.3 Evaluation of the performance, usability and effectiveness of the product and services

The main insights from the performance, usability and effectiveness evaluation is briefly given below for each BC Data Product. In more detailed analysis of these criterian, in the form of user requirements, can be found in D2.7.

Cyprus BC DP1(Analytics on Vegetation and Soil Index Time-series)

In conclusion, the evaluation of "Performance, usability, and effectiveness" category paints a highly positive picture for DP1. Users overwhelmingly find the system to be effective and efficient, with standout features including its accuracy, user-friendliness, and value in handling declared parcels across the country, data processing speed, ability to mask layers, and long-term stability. The product's commitment to security, transparency, and compliance with standards and GDPR is appreciated. While minor areas for improvement were noted, the overall sentiment is one of satisfaction and recognition of Envision's value in meeting user needs effectively.

Cyprus BC (Cultivated crop type maps):

In conclusion, DP2"Cultivated crop type maps" reveals mostly strengths and some weaknesses. While some aspects, such as data delivery frequency and the system's ability to process and communicate errors, received high praise and performed favorably, there are clear areas in need of significant improvement. Notably, the inability to identify organic crops and the poor performance in monitoring pesticide use and classifying specific crop types in small parcels are critical issues that require improvment.

However, the positive feedback regarding data integration, sharing, and the ability to upload in situ data underscores the product's potential. With further refinement and enhancement, the Envision product and services can better meet the diverse needs of its users, especially settings for smaller agricultural parcels.

Lithuania BC DP1 (Analytics on Vegetation and Soil Index Time-series)

In summary, the evaluation of DP1 (Analytics on Vegetation and Soil Index Time-series) shows a generally positive response to the ENVISION project's product and services. Notable strengths include the ability to prioritize vegetation status maps for specific fields and the quick processing of data. Additionally, the system's capacity to provide information about crop types and monitor crop-related events is highly rated.

However, minor improvements are needed in areas like data format outputs and security standards. It's also important to enhance the self-notification system and data uploading process.

Addressing these areas for improvement is essential to maintain the product's high standard and ensure it fully meets users' needs.

Lithuanian BC DP2 (Cultivated crop type maps)

In summary, the DP2 product and services have displayed strengths in timely data delivery, accuracy, and fast data processing. The ability to download outputs, share data, and integrate with existing systems is highly effective. However, areas for minor improvement include enhancing data visualization, refining data accuracy, and optimizing notifications and security features for a more seamless user experience.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

DP3 (Grassland mowing events detection)

In conclusion, the evaluation of DP3 (Grassland mowing events detection) product and services demonstrates exceptional performance, with users praising its accuracy, speed, and user-friendliness. While it excels in multiple dimensions and offers stability for long-term use, there is room for improvement in security standards and transparency.Overall, DP3 has proven to be a resounding success within the ENVISION project.

DP4 (SOC monitoring)

In conclusion, the evaluation of DP4 highlights both positive aspects and areas in need of improvement for Envision Data Products and Services. While Envision excels in seamless integration and user satisfaction regarding extended usability, installation ease, and security compliance, there are careas requiring attention, particularly the reliability and verifiability of product results on the spot. This balanced feedback serves as a valuable guide for Envision to enhance the overall performance and user experience.

DP5 (Crop growth Monitoring and identification of organic farming practices)

In conclusion, DP5, the ENVISION data product and services, boasts significant strengths in masking layers and distinguishing between organic and conventional crops, along with efficient data processing. The toolbox features, integration capabilities, and data storage options are commendable. However, notable areas for improvement include monitoring pesticide and herbicide use, obtaining organic crop yield information, and enhancing notifications for accuracy degradation.

Addressing these concerns will be pivotal in improving the overall performance and usability of the product and services.

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

6 Annex

6.1 Template for Impact Indicator

Note: Direct/estimated values will be collected two times during the project lifetime September 2022 and May 2023

Please fill in all yellow coloured areas.

<table>
<tr><td colspan="6">Impact Indicators</td></tr>
<tr><td colspan="6">KPI Description:……</td></tr>
<tr><td colspan="6">Link to the Data Product and Services:……</td></tr>
<tr><td colspan="6">Link to the Impact Criteria: ……</td></tr>
<tr><td colspan="6">Data sources/ and measurement methods</td></tr>
<tr><td colspan="6">Please Select the data sources and measurement methods and give a brief explanation of the reasons</td></tr>
<tr><td colspan="3">☐Historical Data from your Organisation / Compared to the baseline value
☐Generic Historical Data (Please indicate your data source) / Compared to baseline (standard) value</td><td colspan="3">☐judgements by experts/ Survey</td></tr>
<tr><td>Baseline value:</td><td>Target value</td><td>Measurement units</td><td colspan="3">Measurement units/ Estimated Value</td></tr>
<tr><td rowspan="2">Baseline Description</td><td rowspan="2">Decreased by...%</td><td rowspan="2">E.g. number/ per year; kg/ha…</td><td>Rating Scale (from 1 to 6):
Please indicate the value per each scale (E.g. low influence: Decrease between %5-%20)

<u>Estimated value for M25 (</u>Assuming you use Envision data products and services for the relevant monitoring/auditing activities to run your business)

Based on your knowledge and experience, (considering current result of the products) Envision data product and services potential contribution;
☐1: negative impact
☐2: no influence
☐3: low influence (Number/ %)
☐4: uncertainty concerning the impact
☐5: favourable effect (Number/ %)
☐6: very favourable effect (Number/ %)</td><td>Comments</td></tr>
<tr><td>Please shortly explain the reason of your choice.</td></tr>
</table>

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

6.2 Evaluation Surveys

Evaluation of Envision Data Products and Services

Please state your organization name *

Your answer

Please state your name *

Your answer

Which Business Case are you part of *

Your answer

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Evaluation of the business value and acceptance

Please select the scale which most accurately reflects your opinion for each statement. On a scale 1 to 6, 1) Not relevant to our use case; 2) I strongly disagree; 3) Disagree; 4) Neutral; 5) Agree; 6) I strongly agree.

Unique/superior: If you select 5 (agree) or 6 (strongly agree), you can also select "Unique/superior" as a way of expressing that Envision data product and services are unique or superior for the stated feature.

Reduced time and effort *

	Not relevant to our use case (1)	I strongly disagree (2)	Disagree (3)	Neutral (4)	Agree (5)	I strongly agree (6)	Unique/superior
Envision data products and services can help reduce the number of travel trips for on-site inspections	☐	☐	☐	☐	☐	☐	☐
Envision data products and services can help to reduce the time spent on monitoring activities	☐	☐	☐	☐	☐	☐	☐
Envision data products and services can reduce time spent on administration work	☐	☐	☐	☐	☐	☐	☐

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Envision data products and services can reduce time spent on administration work	☐	☐	☐	☐	☐	☐	☐
Envision data products and services can contribute to reducing effort and improving operational performance	☐	☐	☐	☐	☐	☐	☐

Why you think Envision data products and services can/can't help to reduce the number of trips for on-site inspections *

Your answer

Why you think Envision data products and services can/can't help to reduce the time spent on monitoring activities. *

Your answer

Why do you think Envision data products and services can/can't help reduce time spent on administrative work? *

Your answer

Why do you think Envision data products and services can/can't contribute to reducing effort and improving operational performance? *

Your answer

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Flexibility and Scalability *

	Not relevant to our use case (1)	I strongly disagree (2)	Disagree (3)	Neutral (4)	Agree (5)	I strongly agree (6)	Unique/superior
Envision data products and services enable seamless integration and interoperability with the existing system	☐	☐	☐	☐	☐	☐	☐
The Envision data products and services ensure compatibility with the organisation's workflows and time constraints.	☐	☐	☐	☐	☐	☐	☐
Envision data products and services can be easily expanded or upgraded to meet changing user demands.	☐	☐	☐	☐	☐	☐	☐

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Usefulness *

	Not relevant to our use case (1)	I strongly disagree (2)	Disagree (3)	Neutral (4)	Agree (5)	I strongly agree (6)	Unique/superior
Envision data products and services can support or create more collaborative, transparent and accurate decision-making	☐	☐	☐	☐	☐	☐	☐
I believe the Envision data products and services can foster the further acceptance of Earth Observation technologies.	☐	☐	☐	☐	☐	☐	☐

Why do you think Envision data products and services can/can't support or create more collaborative, transparent and accurate decision-making? *

Your answer

Why do you think Envision data products and services can/can't foster the further acceptance of Earth Observation technologies? *

Your answer

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

Evaluation of Performance, Usability And Effectiveness

Please rate your experience with envision data product and services for each statement below from 1-6, where , 1 is the lowest rate (Extremely weak performance/ product does not meet my needs), 5 is the highest rate (Clearly outstanding performance/ product fully meets my needs) and 6 is "Not relevant to our use case". *

	Extremely weak performance/ product does not meet my needs. (1)	Poor performance, major improvement needed/ product partially meets my needs. (2)	At an acceptable or above level / product partially meets my needs. (3)	Very favourable performance, but still needs improvement/ product fully meets my needs. (4)	Clearly outstandin performanc which is wa above the norm/ product full meets my needs. (5)
(1) Ability to receive data of crop type maps with two-week frequency from the mid- April to mid-September.	○	○	○	○	○
(2) Ability to receive grassland mowing and grazing layers with two-week frequency from June till November.	○	○	○	○	○
(3) Data product of Grassland mowing/ploughing provides more than 85% accuracy.	○	○	○	○	○
(4) Data product of cultivated crop type maps and grassland mowing/ploughing provides at least 95% accuracy compared to in situ data	○	○	○	○	○

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

(42) Ability to see what is important to check for each plot, according to a farmer's declaration, through the ENVISION platform.	○	○	○	○	○
(43) Envision Service helps to clarify why certain parcels needs to be checked according to the organisation's sample.	○	○	○	○	○

Please indicate the number of statements and provide explanations where you deem necessary.

Your answer

The ENVISION project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869366

envision

End of Document

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 869366.