



# **D1.4 INTERMEDIATE DATA MANAGEMENT PLAN**

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

Acronym: ENVISION



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<b>Lead Beneficiary</b>	DRAXIS		
<b>Responsible Author</b>	Stavros Tekes (DRAXIS), Panagiota Syropoulou (DRAXIS)		
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## Executive Summary

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The purpose of the current is to present the second version of the Data Management Plan (DMP) of the ENVISION project.

This second version lists the various new datasets (wherever they are applicable) that have been produced by the project, the main data sharing and the major management principles the project has implemented around them. Therefore, the deliverable includes all the significant changes, such as changes in the consortium policies and any external factors that may have influenced data management in ENVISION. It is submitted on Month 18, as a intermediate review of the ENVISION DMP.

The deliverable is structured in the following chapters:

**Chapter 1: Introduction** – Includes an introduction to the deliverable

**Chapter 2: DMP Components in ENVISION** – Includes a description of the datasets along with the documented changes and additional information.



## 1 Introduction

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The Deliverable D1.4 Intermediate Data Management Plan represents the second version of the DMP of the ENVISION project. ENVISION is an Innovation Action project funded under the H2020 programme of the EC that will last 36 months.

The current deliverable follows the FAIR template and the various identified datasets are analysed, while answers are provided about how the data have been and will be managed within the project and also is described how it will be to provide as much open and re-usable data as possible from the execution with the purpose of facilitating to others the re-use of such data.

Each dataset is defined, modified and described and information is provided on to which extent it is standard compliant, and how the data are available, accessible, interoperable and re-usable, and corresponding procedures for the preservation and the data management.

The DMP is a living document which will be evolved during the whole lifespan of the project. The current document is the second of the three versions to be delivered throughout the ENVISION project. The final one (D1.6 Final Data Management Plan) is to be delivered on M32.

The Work Packages that have not occurred any changes are also included in this deliverable.



## 2 DMP Components in ENVISION

### 2.1 DMP Components in WP1 – Management (DRXS)

DMP Component	Deliverable Title
Data Summary	<p>Contact details of the project partners.</p> <p>Databases containing all the necessary information regarding the project partners.</p> <p>The project partners data are stored on a simple table (excel file) and it is stored on the ENVISION dropbox folder, with the following fields:</p> <ul style="list-style-type: none"> <li>• Organisation</li> <li>• Name</li> <li>• Email</li> </ul> <p>Furthermore, consortium meetings have been conducted remotely every month (first Tuesday of the month) in order to discuss the project progress and address any important issue. Most of the meetings have been conducted using Google Meet. Meetings have been prepared after each meeting and are stored on the ENVISION dropbox folder (docx. format). Furthermore, an excel file has been created (ENVISION_Actionlist), including the following fields:</p> <ul style="list-style-type: none"> <li>• Event/ Source</li> <li>• Relation to WP</li> <li>• Description</li> <li>• Owner</li> <li>• Contributor</li> <li>• Deadline</li> <li>• Status (Done, On Progress, Delayed)</li> <li>• Comments</li> <li>• History</li> </ul> <p>The expected size of the docx. is not applicable.</p> <p>Moreover, WP leaders have sent input on how they handle and process the data produced/generated and/ or collected during the project.</p> <p>Presentations, agenda and the participants list of each plenary meeting or review meeting have been collected and kept.</p> <p>Interviews with have been contacted with new Advisory Board (AB) members using Google Meet and the recordings have been kept.</p> <p>Lastly, two project events have been held; the first one was the kick-off meeting for the Lighthouse Customers (LHCs) of the project and other relevant stakeholders and the second one was the kick-off meeting for the AB members. The aim of these meetings was to inform them about the project status and progress, as well as to explore the LHCs' involvement and contribution into the project and during the business cases implementation. The meetings were held using Zoom (due to COVID-19 pandemic). The material of these meetings</p>

	(agenda, presentations, recordings) is stored on the project's dropbox folder.
Making data findable, including provisions for metadata	<p>The data with regards to the remote meetings as well as the plenary and review meetings are stored on DRXS server and in the ENVISION dropbox folder. The data are not directly accessible from outside. Moreover, these data will not be made available to third parties.</p> <p>However, input provided with regards to the data management, as well as LHCs and AB members are available through the respective deliverables (D1.3 Initial Data Management Plan, D1.4 Intermediate Data Management Plan, D1.5 Intermediate report on Lighthouse Customers and Advisory Board feedback and actions taken). The dissemination level of these deliverables is public and they are available in the project's website (<a href="https://envision-h2020.eu/">https://envision-h2020.eu/</a>), dropbox folder and in Zenodo<sup>1</sup> (<a href="https://zenodo.org/communities/envision/">https://zenodo.org/communities/envision/</a>) through the Digital Object Identifier (DOI):</p> <ul style="list-style-type: none"> <li>• D1.3 Initial Data Management Plan: DOI: <a href="https://doi.org/10.5281/zenodo.6121858">https://doi.org/10.5281/zenodo.6121858</a></li> <li>• D1.5 Intermediate report on Lighthouse Customers and Advisory Board feedback and actions taken: DOI: <a href="https://doi.org/10.5281/zenodo.6303595">https://doi.org/10.5281/zenodo.6303595</a></li> </ul> <p>The naming conventions used for these data are:</p> <ul style="list-style-type: none"> <li>• Data_WP1_1_Data_Management_Plan</li> <li>• Data_WP1_2_Lighthouse_Customers</li> <li>• Data_WP1_3_Advisory_Board_Members</li> </ul> <p>As part of any stored data, metadata will be generated which will include sufficient information with appropriate keywords to help external and internal users to locate data and related information.</p>
Making data openly accessible	<p>The datasets are not publicly available.</p> <p>All the data are publicly available as part of the aforementioned deliverables and through the ENVISION website, dropbox folder and Zenodo.</p>
Making data interoperable	N/A
Increase data re-use	Data are publicly available as part of the aforementioned deliverables and are accessed and re-used by third parties indefinitely without a license.
Allocation of resources	Resources have been allocated according to the project plan and WP1 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The data are collected for internal use in the project, and not intended for long-term preservation. No personal information will be kept after the end of the project. Furthermore, DRXS pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying

<sup>1</sup> <http://zenodo.org/>

	with the applicable national, European and international framework, and the European Union's General Data Protection Regulation (GDPR) 2016/679.
Ethical aspects	N/A
Other issues	N/A





## 2.2 DMP Components in WP2 – Commercial Service Requirements (URDG)

DMP Component	Deliverable Title
Data Summary	<p>WP2 gathers the user needs from Paying Agencies (PAs), Certification Bodies (CBs) and other end users of the ENVISION platform and services. This provides the developers with a set of prioritised needs which feed in the tasks described in WP3 and WP4. In addition, WP2 identifies potential problems that may hinder the adoption of ENVISION by PAs and CBs (internal to the organisation weaknesses, and external threats).</p> <p>WP2 also collects data regarding gender considerations integrating the gender dimension within the project by clearly articulating the gender relevance to all WPs, estimating how research findings apply to the specific needs of all sexes, ensuring data disaggregation on sex and gender related issues and considering all intersecting factors. It also tackles dissemination issues of the project and its results.</p> <p>To generate and record data within WP2 regarding the user needs, the online platform Miro has been used and information has been extracted in a pdf form whenever necessary. No sensitive information has ever been requested for any participant through this platform, particularly for attendees outside of the consortium (i.e., farm managers, advisory board members). The data have the form of “user stories” which provide information in respect to the characteristics of specific roles about of the end users (IT experts, administrator, coordinator, inspector, etc.), their needs associated to the services provided by the ENVISION platform and a description of why they need it. In addition, online workshops and co-production meetings taking place during tasks 2.2 and 2.3 of WP2 will be recorded.</p> <p>The recordings are stored initially on the Microsoft Streams service that is provided by the University of Reading and is accessible only by ENVISION – WP2 team members adhering to all data protection and ethical guidelines that the University of Reading’s policies propose. Then they are uploaded to the relevant ENVISION Dropbox folder (and removed from Microsoft Streams), where they will remain for the project lifetime before they will be removed entirely. The videos serve the purpose of the detailed capture of information and in addition these offer the chance to revisit the workshops and summarise the outcomes. The data are extracted from end-users participating in an online survey and to a series of online workshops and consultations and are summarised into several excel spreadsheets that contain information relating to the four business cases. The size of the video recording will be relevant to the duration of the meeting. These data are useful to software developers and researchers who wish to understand the “needs of key</p>



	<p>stakeholders” that form the core of the development process of platforms and tools for remote monitoring of environmental activities.</p> <p>The data regarding the task 2.5 will be collected by all partners using excel files. As these personal data will include sensitive information, attention will be given so that no persona might be identified once processed. Additionally, to safeguard the privacy of each partner within their organisations and consortium, this information will be sent directly to the responsible processor, who is the Project’s Ethic Manager and the Information Security Officer of her organisation. The data will be used to produce statistics and no other information will be included and the excel files will not be preserved.</p> <p>Finally, we will conduct a survey to investigate farmer awareness and engagement to coproduction activities. The survey will be constructed on Qualtrics XM, which will also be the main portal for distribution, through a secure link that will be provided to Paying Agencies (PAs) and Certification Bodies (CBs) across Europe. The PAs and CBs will then distribute the survey link to contacts (farmers) through their applicants/clients lists, following the same randomised approach. No sensitive and identifiable information will be requested through the survey and WP2 will not have access to the applicant/client list of contacts for any of the organisations involved. If necessary, PAs/CBs will be allowed to translate, and transpose and share the survey through other means (i.e. Google forms) but for any such step they will be required to provide a detailed description to WP2 of the methodological steps followed, people involved, and actions taken to ensure that the identity of participants is not compromised. The outcomes of this survey will be stored as Excel files and will be processed in SPSS and R. We have the ability to encrypt and password-protect any relevant file, although this will not be necessary since they will not contain any sensitive information for any of the parties involved.</p>
<p>Making data findable, including provisions for metadata</p>	<p>The data produced either via the online survey or the workshops with the end-users (video recordings included) will not be identifiable to the individual respondent. However, there will be metadata that will allow the institution to be identified. These data will be stored on URDG’s servers.</p> <p>Regarding the data for tasks 2.5, no information will be available to third parties directly and the provided excel files by the partners will be deleted after the process of the information that will be included in the respective deliverable.</p> <p>The outcome of the aforementioned information is available in D2.1 Review of current services provision, D2.2 Report of customer requirements from ENVISION services, D2.3 Gender Situation Analysis and Needs Assessment, D2.6 Draft_Report of co-production of ENVISION services and D2.7 Report of co-</p>

	<p>production of ENVISION services. The dissemination level of these deliverable is public and they are available in the project’s website, dropbox folder and in Zenodo through the DOI:</p> <ul style="list-style-type: none"> <li>• D2.1 Review of current service provision: DOI: <a href="https://doi.org/10.5281/zenodo.4564201">https://doi.org/10.5281/zenodo.4564201</a></li> <li>• D2.2 Report of customer requirements from ENVISION services: DOI: <a href="https://doi.org/10.5281/zenodo.4564653">https://doi.org/10.5281/zenodo.4564653</a></li> <li>• D2.3 Gender Situation Analysis and Needs Assessment: DOI: <a href="https://doi.org/10.5281/zenodo.4564344">https://doi.org/10.5281/zenodo.4564344</a></li> <li>• D2.4 Guidelines on legal and ethical issues: DOI: <a href="https://doi.org/10.5281/zenodo.6121934">https://doi.org/10.5281/zenodo.6121934</a></li> <li>• D2.5 Privacy Risk Assessment for ENVISION: DOI: <a href="https://doi.org/10.5281/zenodo.6122040">https://doi.org/10.5281/zenodo.6122040</a></li> </ul> <p>The naming conventions used for these data are:</p> <ul style="list-style-type: none"> <li>• Data_WP2_1_PA_survey</li> <li>• Data_WP2_2_User_needs</li> <li>• Data_WP2_3_Co-production</li> <li>• Data_WP2_4_Gender_Considerations</li> <li>• Data_WP2_5_Farmers_survey</li> </ul> <p>A thematic analysis will be conducted to identify suitable keywords that could allow future scenarios and metadata will include the date of data collection, the source (interview/workshop/video recording), the organisation and role of individual in the organisation, and contact information (whenever appropriate/ available i.e. in the case of ENVISION partners).</p>
Making data openly accessible	<p>The datasets will not be publicly available. All the data will be made publicly available as part of the aforementioned deliverables and through ENVISION website, dropbox folder and Zenodo. Furthermore, the data regarding user needs will be made available through scientific publications in a summarised form.</p>
Making data interoperable	<p>The data will be a series of user needs and statistics that will be analysed and reported in a format that will be easy to share between stakeholders and be interpreted by any party.</p>
Increase data re-use	<p>The data with regards to gender considerations will not be available for re-use. The data regarding the user needs will be available once the papers are published. Some of the initial data will be reported in an early publication relating to user needs (2021/11) and the co-production methodology will be made available in a publication after the end of the project (2022/23).</p> <p>Most of the data in WP2 is project-specific but the co-production methodology will be useable for other third parties after the end of the project and the data will remain re-usable as long as it is useful.</p>

	The questionnaires and workshops as well as the excel files regarding gender considerations task, will receive ethical clearance and the data will be double checked for prevention of errors.
Allocation of resources	Resources have been allocated according to the project plan and WP2 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The data will be collected for internal use in the project, and not intended for long-term preservation. No personal information will be kept after the end of the project. Furthermore, DRXS and ETAM pay special attention to security and respect the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679. More specifically data regarding gender considerations were collected in an anonymized manner. No crude data were presented in the deliverable, only the results of statistical analysis and as such cannot lead to the identification of a person. Lastly, ETAM has appointed a specific Information Security Officer and they implement an accredited Information Security Management System according to EN ISO 27001:2013.
Ethical aspects	The user need methodology has received ethical clearance from the School of Agriculture, Policy and Development (University of Reading) to ensure that the participants are protected. In addition, the collection of the gender and sex related issues has also received ethical clearance from ETAM and an Information Security Officer has been appointed since the data collected are considered sensitive data. Therefore, the data raise no legal issues.
Other issues	N/A

## 2.3 Earth Observation data products (NOA)

### 2.3.1 Task 3.2 Auxiliary data collection (Lead Partner: DRXS, Contributors: NOA, NPA, LV, CAPO, OCS, EV ILVO, INOS, AgroApps)

DMP Component	Deliverable Title
Data Summary	<p>The initial data that have been collected in WP3, cover the needs to implement/ develop and calibrate the initial desired products in all business cases.</p> <p>More data will be collected during the lifetime of the project in order to enhance the services' accuracy and validate the results.</p> <p>In order to collect the raw data from the business users (raster and vector format), an SFTP service was proposed ensuring end-to-end file transfer encryption, since it follows the SSH protocol.</p> <p>Moreover, data will be collected through the ENVISION platform, once the business cases' implementation will be initiated.</p> <p>The origin of the data for WP3, are from:</p> <ul style="list-style-type: none"> <li>• Planet commercial VHR satellite imagery,</li> <li>• Farmers' declarations, along with access to the Land Parcel Identification System (LPIS), and VHR imagery has been provided by the PAs</li> <li>• Farmers' declarations, along with access to the Geoserbjia has been provided by the CB</li> <li>• Auxiliary data concern farmers' personal and farm information and shapefiles containing farm location.</li> <li>• Laboratory results of soil.</li> </ul> <p>Data products assist to calibrate, validate and feed ENVISION's processing algorithms to attain the highest information quality possible for improved remote monitoring and decision-making services to PAs, CBs and other users.</p> <p>Auxiliary data include:</p> <ul style="list-style-type: none"> <li>• LPIS</li> <li>• Farmers' past declarations</li> <li>• Remote sensing results</li> <li>• Layers</li> <li>• Laboratory results</li> </ul> <p>Data gathered are approximately 20 GB.</p>
Making data findable, including provisions for metadata	<p>The auxiliary data are available to all technical partners.</p> <p>Data are stored in a file under the responsibility of the data controllers/ handlers/ processors (NOA, EV ILVO, AgroApps) and labelled with the work package, country of origin and the type of data.</p> <p>Commercial VHR satellite imagery will not be publicly available.</p> <p>The naming convention used will be:</p> <p>Data_WP3_1_Country_of_Origin_Type_of_data Data_WP3_2_VHR</p>

Making data openly accessible	<p>The data will be kept closed until the end of the project due to handling of personal data and will not be allowed and disclosed to be used by any third party. Anonymised and summarised data will be available in any public deliverable (D3.2 Catalogue on auxiliary data and available repositories to be incorporated, D3.3 Data Products initial report, D3.4 Data products validation report) or through any other relevant publications relating to dissemination and exploitation purposes. The dissemination level of these deliverable is public and they are available in the project's website, dropbox folder and in Zenodo through the DOI:</p> <ul style="list-style-type: none"> <li>• D3.2 Catalogue on auxiliary data and available repositories to be incorporated: DOI: 10.5281/zenodo.6121987</li> <li>• D3.3 Data products initial report: DOI: <a href="https://doi.org/10.5281/zenodo.6303627">https://doi.org/10.5281/zenodo.6303627</a></li> <li>• D3.4 Data products validation report</li> </ul> <p>The raw data that are provided and will be, to the technical team will not be publicly available to third parties and will be provided under a confidentiality agreement (CA) between the involved partners.</p>
Making data interoperable	N/A
Increase data re-use	N/A
Allocation of resources	Resources will be allocated according to the project plan and WP3 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The data will be collected for internal use in the project, and not intended for long-term preservation. No personal information will be kept after the end of the project. Furthermore, NOA, EV ILVO, AgroApps pay special attention to security and respect the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.
Ethical aspects	N/A
Other issues	N/A

2.3.2 Task 3.3 Analytics on Vegetation and Soil Index Time-Series, Task 3.4 Cultivated crop type maps, Task 3.5 Grassland mowing events detection (Lead Partner: NOA)

DMP Component	Deliverable Title
Data Summary	<p>The products, which are generated during these tasks, cover the needs to implement and validate all the desired products in all the business cases.</p> <p>All collected data are available in raster and vector format. All generated data are used as input in WP4.</p> <p><b>EO data</b></p> <p>Multi-year time-series of Sentinel-1 and Sentinel-2 images for nationwide coverage of Lithuania and Cyprus, along with:</p>





- Optical Indices such as Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), Soil Adjusted Vegetation Index (SAVI) and Plant Senescence Reflectance Index (PSRI).
- SAR Backscatter and coherence estimation

#### Vector data

Multi-year LPIS data for Cyprus and Lithuania, provided by the respective PAs, project partners, and are used for training and validating the machine learning (ML) algorithms. They are available in a vector format (shapefile, .shp) as a collection of polygons depicting parcel boundaries.

#### Size of input data

The pre-process of Sentinel-2 images generated images from 10MB to 250 MB for each band, whereas the generation of Sentinel-1 backscatter and coherence gives birth to products with size from 1.1 - 3 GB. Assuming 2 business cases, the following estimation is provided over:

- For Lithuania:
  - Sentinel-1 (Backscatter): 2 orbits \* ~230 images per year \* 3 years \* ~1.1 GB per image ≈ 1,518 GB
  - Sentinel-1 (Coherence): 2 orbits \* ~160 images per year \* 3 years \* ~ 4 GB per image ≈ 3,840 GB
  - Sentinel-2: 13 tiles \* ~ 180 GB per tile (depending on the orbit) per year \* 3 years ≈ 7,020 GB
- For Cyprus:
  - Sentinel-1 (Backscatter): 1 orbit \* 5 images per month \* 12 months \* 3 years \* 1.1 GB ≈ 180 GB
  - Sentinel-1 (Coherence): No need for coherence products
  - Sentinel-2: 2 tiles \* ~ 175 GB per tile (depending on the orbit) per year \* 3 years ≈ 1,050 GB

VHR imagery is of the order of around 20GB in total. Vector data are a few hundred MBs in size depending on the number of features along with their attributes.

This is a gross estimation, presenting the worst-case scenario where 3 years are processed. The optical images in many occasions are covered by clouds. Clouds and other not useful parts of the images are cropped out so the real image size will be smaller.

#### Initial development

The data/products generated in these tasks provide Earth Observation (EO) products with key information about:

- Analytics on Vegetation and Soil Index Time-series by producing indicators for vegetation status and health, phenological metrics, soil condition and soil exposure.



	<ul style="list-style-type: none"> <li>• Cultivated crop type maps</li> <li>• Grassland mowing detection product</li> </ul> <p>The products are used in the pilot implementation. Data and products assist to calibrate, validate and feed ENVISION's processing algorithms to attain the highest information quality possible for improved remote monitoring and decision-making services to PAs, CBs, and other users.</p>
<p>Making data findable, including provisions for metadata</p>	<p>Training data are imported by the development team and are hosted at the ENVISION platform's server. Related metadata describe the data structure and methodology used to collect them. Once uploaded to the platform, only the development and technical teams have access to these data.</p> <p>Regarding the users' input data, those need to comply with the field requirements of the platform for a successful database query; vector multi-polygon files in .shp form with valid geometry and compatible projection system.</p> <p>Raw satellite data used for feature extraction are stored on the platform's operational database accompanied by the relevant metadata following the original name conventions. They are not available and accessible to partners and hence are not open for re-use.</p> <p>The output is accessible only to the registered partners who made the request and it will be available as layers via a Geoserver's web mapping service (WMS).</p> <p>INSPIRE metadata are created for all the EO-based geospatial products that will be generated in the lifetime of the project. All EO data, value added products; code and metadata are stored in web server and are available through RESTful API and WMS.</p> <p>Data is stored on the CreoDIAS servers and labelled with the work package, country of origin and the type of data.</p> <p>A unique identifier is assigned to each EO data. For the added value products, a unique identification separated by underscore (_) is appended to file name. Versioning identifier is also appended at the end of the name product starting by 0 (_v00, v01, ..., vnn).</p>
<p>Making data openly accessible</p>	<p>Only PAs that made the query (registered users) have access to the products.</p> <p>Collected imagery and the extracted features. The generated indices and the extracted features are not available to rest of the partners or users and only the development and technical teams have access.</p> <p>Regarding the user's input data, apart from the registered user, only the development and technical teams have access to these data.</p> <p>Only web browser and Internet access are needed for the registered users to access the output data. Data and products will be made accessible through an API on top a Postgres database (for parcel-based results) or on the top of the Data Cube (for pixel-based results) via a web framework such as</p>

	<p>Django.</p> <p>Spectral Indices and EO-based classification objects will be made available.</p> <p>No special software is needed in order to access the data. A user can create scripts to access and query the database and retrieve relevant datasets.</p> <p>The data and associated metadata are deposited in CreoDIAS Virtual Machines.</p>
Making data interoperable	<p>Interoperability can be enabled using widely-adopted geospatial standards. PostGIS, Geoserver and Open Data Cube open-source tools will be available for a widely accessible management of EO information.</p> <p>Specifically, regarding discovery/view services OGC WMS and WFS services will be implemented in order to leverage the tasks' results for access and visualization. Thus, output data will be available in GeoTIFF or JSON format with associated metadata and accessible either via the GeoServer or via a RESTful API or both.</p> <p>Moving to process services, the tasks rely on the ODC processing API blended with various other Python scripts to provide Analysis Ready Data.</p> <p>INSPIRE protocol provides typical standard for geospatial data and it will be used for metadata descriptors.</p>
Increase data re-use	<p>Appropriate licensing agreement will be required for data access after the project's conclusion, which will be defined through the business model during the course of the project.</p> <p>The EO-based products will be usable by third parties through RESTful API, but only for those parties who are part of the project and during the lifespan of the project.</p> <p>No particular data quality assurance process is followed, and no relevant warranties will be provided.</p>
Allocation of resources	<p>Resources have been allocated according to the project plan and WP3 allocated resources. No additional costs are foreseen for making this dataset FAIR.</p>
Data security	<p>CreoDIAS servers are managed by the IT department. They are regularly backed up and secured. All servers are hosted behind firewalls inspecting all incoming requests against known vulnerabilities such as SQL injection, cookie tampering and cross-site scripting. Finally, IP restriction enforces the secure storage of data.</p> <p>Furthermore, CreoDIAS pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.</p> <p>The CREODIAS Platform cloud security relies on OpenStack's centralized authentication and authorization model managed by the OpenStack Identity Service (Keystone). Keystone manages Tenants (Environments), Projects, Users, user Roles, service Catalogues and service access Policies. Every cloud</p>

	management operation (such as mounting a volume or accessing object storage) performed by a User or an application through the Dashboard or through the API must first be checked for validity with Keystone. The Keystone security model is further described in Keystone Architecture.
Ethical aspects	N/A
Other issues	N/A

### 2.3.3 Task 3.6 Soil condition monitoring (Lead Partner: EV ILVO)

DMP Component	Deliverable Title
Data Summary	<p>EV ILVO created a Sentinel 2 image collection governing the region of Flanders. After we calculated vegetation and soil moisture indices, we applied cloud masking to create a cloudless bare soil collection. EV ILVO uses the cloudless bare soil collection to select soil sampling locations for the soil campaign. EV ILVO collected 171 soil samples within the 1 Quarter of 2021 and performed equal SOC lab measurements. After that, EV ILVO builds a SOC prediction model using bands reflection coming from the cloudless bare soil collection and the results of the SOC measurements as input and output data. EV ILVO applied this model to the cloudless bare soil collection and created a SOC layer (% of SOC) of the Flanders Region. EV ILVO delivers this layer in geotiff format, with a spatial resolution of 20m and the average top Soil Organic Carbon (% of SOC) for each agricultural parcel in Flanders for the declaration period of 2020. The agricultural parcels are coming from the LPIS data was provided by the Agricultural Department of Flanders (LV) and exist as open-source data. The same goes for the time series of Sentinel-2 data.</p> <p>For the whole process, we make use of the following data sets:</p> <ul style="list-style-type: none"> <li>• Soil associations in Flanders (Bodemassociaties dataset) <a href="https://www.geopunt.be/catalogus/datasetfolder/c4f51b28-51bf-4189-8e98-72b94ae8da13">https://www.geopunt.be/catalogus/datasetfolder/c4f51b28-51bf-4189-8e98-72b94ae8da13</a></li> <li>• Sentinel 2 L2 <sup>2</sup> with cloud masks <sup>3</sup> for the period of May 2018 until May 2021.</li> <li>• ESA world land cover 10m<sup>4</sup></li> <li>• Lab measurements result from 171 collected soil samples.</li> </ul> <p>And the outputs (SOC products) are:</p> <ul style="list-style-type: none"> <li>• A raster file (geotiff) with pixel spatial resolution of 20 m by 20 m contains top-soil Soil Organic Carbon estimations (% of SOC). This file is presented in the Envision Platform as a background layer map.</li> <li>• The metadata provide the accuracy of the SOC modelling by using the RMSE (Root Mean Square Errors)<sup>5</sup> together with the</li> </ul>

<sup>2</sup> [https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS\\_S2\\_SR#description](https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S2_SR#description)

<sup>3</sup> <https://sentinel.esa.int/web/sentinel/technical-guides/sentinel-2-msi/level-1c/cloud-masks>

<sup>4</sup> <https://esa-worldcover.org/en>

<sup>5</sup> Expected for the calibration RMSEC, cross-validation RMSECV and prediction set RMSEP. RPD and R2 are also used to evaluate the accuracy of the model.

	<p>sample point locations, the lab measurements results and the methodology/protocol we have to follow to collect the sample data and perform the lab measurements.</p> <ul style="list-style-type: none"> <li>• A vector file (shapefile) with the Flemish LPIS agricultural parcels and a field that contains the average value of the top-soil Soil Organic Carbon. The parcels aggregate the Top Soil Organic Carbon Information using the average value, including pixels coming from the raster file. The vector file will be published in the Envision platform as a vector layer.</li> </ul> <p>The SOC service will generate a SOC map of Flanders during the time of the project that will be probably updated once a year. The estimated total size of the SOC product is 100 MB.</p> <p>LV will test the SOC products product to monitor SOC level in the agricultural sector.</p>
Making data findable, including provisions for metadata	<p>EV ILVO delivers the SOC products at the ENVISION repository.</p> <ul style="list-style-type: none"> <li>• The raster file will following naming description: TopSoilSOCmap_Region_StartPeriod_EndPeriod_ModelDataSet.geotiff</li> <li>• The Metadata describes will exist in a pdf file and will contain the range of the S2 satellite data set, the model data set, the model accuracy, the methodology, the data owner and the usage rights.</li> <li>• A shapefile with agricultural parcels.</li> </ul> <p>The SOC products are explode through the ENVISION platform using web services.</p>
Making data openly accessible	<p>All the soil data collected in the project framework, the lab measurement results, and the SOC models belong to EV ILVO (intermediary products). However, it's under evaluation after the end of the project to expose the Lab measurements through the DjustConnect platform, giving the ability to the farmers to control their data, similar to the Collective application L&amp;V (Field information) <a href="https://djustconnect.be/nl/verzamelaanvraag-lv-perceelsinformatie">https://djustconnect.be/nl/verzamelaanvraag-lv-perceelsinformatie</a>.</p> <p>The EO product (GeoTIFF) produced in the context of the SOC service will be published at the ENVISION platform to be used by LV (final product). Another option is to publish the data at <a href="https://www.geopunt.be">https://www.geopunt.be</a> and an open data source, but that needs to come out as a joint decision of EV ILVO and LV.</p> <p>EV ILVO will include the info at the metadata as documentation to access the data. Access to the EO product (GeoTIFF, metadata pdf report) will be granted to the ENVISION registered users.</p>
Making data interoperable	<p>As explained, the SOC product will be exposed through the ENVISION platform. The ENVISION platform is using Geoserver, which means we can public the data using WMS and WFS services.</p>
Increase data re-use	<p>EV ILVO will give full permission to use and reuse the SOC products to LV.</p> <p>After arrangements, lab measurements of the SOC will be available to third parties.</p> <p>In terms of data quality assurance, there are processes that include the modelling process and lab measurements.</p>
Allocation of resources	<p>Resources have been allocated according to the project plan, and WP3</p>

	allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The ENVISION platform will store the versions of the SOC GeoTIFF, which means EV ILVO inherits the security level of the platform. EV ILVO will back up the SOC GeoTIFF, to ensure fast and safe recovery of the EO final products. Internal data management procedures will be applied to the intermediary products. Furthermore, EV ILVO pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework and the European Union's GDPR 2016/679.
Ethical aspects	N/A
Other issues	N/A

2.3.4 Task 3.7 Crop growth Monitoring and identification of organic farming practices (Lead Partner: AgroApps, Contributors: DRXS)

DMP Component	Issues to be addressed
<b>Data Summary</b>	<p><b>Task 3.7 Crop growth Monitoring and identification of organic farming practices</b>  <b>Lead Partner: AgroApps Contributors: DRXS</b></p> <p>Task 3.7 will deliver a fully-automated <b>Organic crop identification service</b>, which aims at identifying whether a particular crop type declared as organic is classified as such, <b>based on a traffic light system</b>. The service will exploit a number of EO derived indicators and tools to ensure effective monitoring of the crop condition variability and phenological stages, in both space and time. To ensure high temporal coverage of the data, the system will utilize data from different spaceborne remote sensors, namely the Sentinel-2 and Sentinel-1 missions.</p> <p>For the initial development phase of the service (algorithm training and validation) parcels geospatial data and metadata concerning agricultural practices and cropping information will be provided by the Organic Certification body of Serbia. Afterwards, EO data will be extracted for the agricultural parcels and processed to produce raster layers that will be used as predictors in Machine Learning (ML) Classifier algorithms necessary for farming practice identification. These raster layers will include valuable crop related information such as Vegetation Indices (VIs), crop biophysical parameters, texture analysis features and attributes, resulting after crop phenological analysis. Specifically:</p> <ul style="list-style-type: none"> <li>• Optical Vegetation Indices (VIs) such as Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), Plant Senescence Reflectance Index (PSRI) and REIP (Red Edge Inflection Point),</li> <li>• Radar Backscatter signal and VIs</li> <li>• Biophysical Parameters such as Leaf Area Index (LAI), Fraction of Green Vegetation (FCOVER) and Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)</li> </ul>



- Attributes of Phenological Analysis such as the Date of Maximum Positive Gradient, Length of Plateau, Senescence Slope

The algorithm development output will be stored in the core component of the service. In operational mode, the user defined input data (parcels of interest) will be stored in the platform's operational database and utilized for the EO data query from CreoDIAS. After appropriate processing, the output maps (organic or possibly non-organic flag-map) will be provided to the Certification Bodies on a WMS.

Task 3.7 will also develop a universal methodology for organic crop yield estimation with the use of EO data, for various types of crops. The methodology that will be followed is based on the assimilation of EO derived VIs into crop growth models that will calculate total crop biomass production and crop yield.

#### **EO data**

The EO data will be collected by satellite constellations carrying optical and radar instruments; ESA Sentinel-2A/B mission will provide multispectral images with a 5-day revisit and radar data will be provided by ESA Sentinel-1A/B mission with a 6-day revisit time. Both optical and radar data will be acquired from the CreoDIAS platform. Atmospherically corrected Sentinel-2 Level-2A images are going to be retrieved and in cases where Level-2A images are not available, Level-1C would be retrieved and processed with sen2cor algorithm in order to become Level-2A products.

#### **Vector data**

The data defining the area of interest will be provided by the Certification Body of Serbia and will be used for training and validating the ML algorithms. For the initial assessment of the service, a number of pre-pilot data have been provided. The provided parcels were archived from 2016 until 2020. The parcel data included the following information; Municipality, Cadastral municipality, Cadastral Number, Area (ha), Crop category, Crop Variety, sowing date, harvesting date, Average yield (t/ha), Status of parcel, Status of crops, Cultivation Year.

Batches of excel sheets contained the required information originating from the Serbian CB, as presented in the following figure:

Municipality	Cadastral municipality	CADASTRAL No	Area (ha)	Crop category	Crop	Variety	Sowing date	Harvesting date	Average y	Status of parcel	Status of crops	Year
Zabalj	Curug	12768	62,3105	CEREALS	barley	NS Nonius	10-17.09.2015	June	4,0	organic	organic	2016
Zabalj	Curug	12768	34,17	CEREALS	barley	NS Nonius	15-19.10.2015	June	4,0	organic	organic	2016
Zabalj	Curug	9840	33,867	CEREALS	barley	Amorosa	September	June	4,5	organic	organic	2017
Zabalj	Curug	9840	33,867	CEREALS	barley	Amorosa	September	June	4,5	organic	organic	2017
BELA CRKVA	Bela Crkva	725	5,5426	CEREALS	barley	Sandra	17.10.2016.	June	4,0	organic	organic	2017
BELA CRKVA	Bela Crkva	725	10	CEREALS	barley	Sandra	17.10.2016.	June	1,8	organic	organic	2017
Zabalj	Gospodinci	5658/1	60,2269	CEREALS	barley	NS Nonius	September	June	5,0	organic	organic	2018
Zabalj	Gospodinci	5658/1	60,2269	CEREALS	barley	NS Nonius	September	June	5,0	organic	organic	2018
BELA CRKVA	DobriSevo	795/1	10,806	CEREALS	maize		3381 17-19.04.2016.	September	3,5	organic	organic	2016

By using the Municipality, Cadastral municipality and Cadastral Number the polygons in a vector format (shapefile, .shp) was retrieved from Geosrbija, the Serbian LPIS system. Access to Geosrbija was granted by the relative Serbian Ministry for the purpose of the ENVISION project. AgroApps developed the infrastructure to collect the polygons data depicting parcel boundaries from the Geosrbija, as follows;

OCS 2019 - CONVENTIONAL\_2020 - Georbijsa

CADASTRAL ID: 12768

Parcel Number: 12768

Municipality: Záhová

Cadastral Municipality: Čurug

Area: 0.0000

Status: VYKALOVÁ V ÚDRŽE

Actions: [Report]

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OCS 2019 - CONVENTIONAL\_2020 - New Field

Field Properties

Name: 80456812768000 (ČURUG)

Crop Type: [Dropdown] Expected Yield (t/ha): [Input]

Planting Date: [Input] Harvesting Date: [Input]

Insured Value (€): [Input]

Insured Parties: [Input]



Latitude: [Input] Longitude: [Input] [Go]

[Close] [Save]

A total so far of available parcels is;

- 1164 wheat (538 organic, 626 conventional)
- 1130 maize (148 organic, 982 conventional)
- 423 Soybean (211 organic, 212 conventional)
- 940 Sunflower (541 organic, 399 conventional)

A further pre-process of the initial data was applied due to the significant small area and elongated shape of the cultivated parcels. A unification process was performed to neighbouring parcels that have common borders – having always in mind to unify same crops, transition phase, status. The result was to form parcels of larger area that would provide a sufficient number of pixels and assist in achieving a fairly successful discrimination between Organic and Conventional crops. After this unification the total number of parcels was eventually reduced but the average parcel size increased;

- 542 wheat (162 organic, 380 conventional)
- 539 maize (56 organic, 483 conventional)
- 187 Soybean (63 organic, 124 conventional)
- 393 Sunflower (147 organic, 246 conventional)

**Size of input data:**

One Sentinel-2 MSI L1C/L2 raw image including all bands in .zip format is 600MB. One Sentinel-1 L1 IW GRDH: raw image including both polarizations and two satellites (S1A, S1B) data in .zip format is 1GB. Considering that the project’s pilot phase will last two years and that both summer (maize, sunflower, soybean) and winter (wheat) crops will be monitored, satellite imagery should be available for 24 months. For Sentinel-2 L2A, BOA: 600MB x 52 days x 8 tiles, equals 248 GB. For Sentinel-1 CGR: 1GB x 61 days (considering a mean 6-day revisit period) x 8 tiles, equals 420 GB. This is a gross estimation of the requirements during the pilots, presenting the worst-case scenario. The amount of data required for the initial assessment of the service, considering pre-pilot data from 2016, is 496 GB for Sentinel-2 and 840 GB for Sentinel-1.



	<p><b>Initial development</b></p> <p>TASK 3.7 aspires to use geospatial data and metadata of 600 parcels per crop type (maize, sunflower, soybean and winter wheat) per farming practice (organic, conventional) in order to achieve sufficient ML performance. Since two types of farming practices will be examined for four crops of interest, a total of 600 parcels x 4 crop types x 2 farming practices equals 4800 registries. So far 3703 registries have been collected, however reduced to 1661 to serve the purpose of ML training. The first version of the data product for use in the business case and possible limitations (due to polygon number and parcel size) has been delivered and discussed in <i>D3.2 Catalogue on auxiliary data and available repositories to be incorporated</i>. To support the creation of classification predictor layers, the service relies on a cloud-based processing framework of EO data in order to derive vegetation indices and phenology features, that subsequently feeds them as input to a trained classification algorithm. Cloud processing is achieved by the exploitation of the Copernicus Data Information Access Services (DIAS) infrastructure, and specifically the CREODIAS platform. The output form of the Organic crop identification product is a traffic light system with the cultivation method classification at parcel level (vector data). It is set up operationally on the ENVISION Platform to identify the cultivation practices by the end of the growing season. The traffic light system enables a smart sampling technique for the inspections.</p>
<p><b>Making data findable, including provisions for metadata</b></p>	<p>Training and validation pilot vector data will be imported by the development team and will be hosted at the platform's server. Related metadata will describe the data structure and methodology used to collect them. Once uploaded to the platform, only the development and technical teams will have access to these data.</p> <p>Regarding the users' input data, those need to comply with the field requirements of the platform for a successful database query; vector multi-polygon files in .shp format with valid geometry and compatible projection system.</p> <p>Raw satellite data that will be used for feature extraction will be stored on the platform's operational database accompanied by the relevant metadata following the original name conventions. They will not be available and accessible to partners and hence will not be open for reuse.</p> <p>The output will be accessible only to the registered partners who made the request and it will be available as two layers in a WMS; one layer presenting the flag-map and one layer presenting the yield estimations.</p> <p>INSPIRE metadata will be created for all the EO-based geospatial products that will be generated in the lifetime of the project.</p> <p>All data, associated metadata and documentation will be deposited into the web server and will be available through RESTful API and Geoserver's web mapping service (WMS).</p>
<p><b>Making data openly</b></p>	<p>Only Certification Bodies (CBs) that made the query (registered</p>

<b>accessible</b>	<p>users) will have access to the produced organic/non-organic flag-maps and parcel yield estimations.</p> <p>Collected imagery and the extracted features will not be available to rest of the partners or users and only the development and technical teams will have access.</p> <p>Regarding the user's input data, apart from the registered user, only the development and technical teams will have access to these data.</p> <p>Only web browser and Internet access are needed for the registered users to access the output data.</p>
<b>Making data interoperable</b>	<p>The output data will be available in GeoTiff or (Graph Modeling Language) GML format with associated metadata and accessible through GeoServer application, Map server application, PostGIS database and RESTful API. INSPIRE protocol provides typical standard for geospatial data and it will be used for metadata descriptors.</p>
<b>Increase data re-use</b>	<p>Appropriate licensing agreement will be required for data access after the project's conclusion, which will be defined through the business model during the course of the project.</p> <p>The EO-based products will be usable by third parties through RESTful API, but only for those parties who are part of the project and during the lifespan of the project.</p>
<b>Allocation of resources</b>	<p>Resources have been allocated according to the project plan and how the WP3 resources are allocated. No additional costs are foreseen for making this dataset FAIR.</p>
<b>Data security</b>	<p>All data will be stored on the platform's server and also on a separate storage server, both with backup procedures. These servers are managed by the AgroApps IT department. AgroApps fully complies with the applicable national, European and international framework, and the European Union's General Data Protection Regulation 2016/679.</p>
<b>Ethical aspects</b>	N/A
<b>Other issues</b>	N/A

## 2.4 DMP Component in WP4 – ENVISION service (DRXS)

### 2.4.1 System Architecture

DMP Component	Deliverable Title
Data Summary	<p>Functional and non-functional aspects, technical capabilities, components descriptions and dependencies, Application Programming Interface (API) descriptions, information flow diagrams, internal and external interfaces, software and hardware requirements and testing procedures related data specified and validated among the ENVISION technical and business cases partners.</p> <p>Technical requirement reports have been created in order to describe the aforementioned procedures and requirements for all the business cases.</p> <p>These reports have the basis upon which the system will be developed and further modified.</p>
Making data findable, including provisions for metadata	<p>The reports have been stored in DRXS server and are not directly accessible from outside. However, these data are both discoverable and accessible to the public through the D4.1 Architecture and Services Specifications report, since its level of dissemination is public. The deliverable is accessible via the project's website, dropbox folder and Zenodo:</p> <ul style="list-style-type: none"> <li>• D4.1 Architecture and Services Specifications report: DOI: <a href="https://doi.org/10.5281/zenodo.6121914">https://doi.org/10.5281/zenodo.6121914</a></li> </ul> <p>The naming convention used is:</p> <ul style="list-style-type: none"> <li>• Data_WP4_1_System_architecture.</li> </ul> <p>As part of any stored data, metadata have been generated, which include sufficient information with appropriate keywords to help external and internal users to locate data.</p>
Making data openly accessible	All data are made publicly available as part of the D4.1 Architecture and Services Specifications report.
Making data interoperable	N/A
Increase data re-use	Data are made publicly available as part of the D4.1 Architecture and Services Specifications report and be re-used by third parties indefinitely without a license.
Allocation of resources	Resources have been allocated according to the project plan and WP4 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The data will be collected and stored for internal use in the project and not intended for long-term preservation. Furthermore, DRXS pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.
Ethical aspects	N/A
Other issues	N/A

## 2.4.2 ENVISION platform

DMP Component	Deliverable Title
Data Summary	<p>Various data, like farm information, shapefiles containing farm location, layers will be generated via the platform. All of these data will be useful in order the ENVISION services and products to function properly and provide accurate information. These data will be saved in the ENVISION central database.</p> <p>All user actions (login, logout, visits on specific parts of the platform, visualization of maps, etc.) will be logged and kept in the form of text file. This log will be useful for debugging purposes.</p> <p>Reports containing information on user devices (which browsers and mobile phones) as well as number of mobile downloads (taken from play store for android downloads and app store for mac downloads) are useful for marketing and exploitation purposes, as well as decisions regarding the supported browsers and operating systems.</p> <p>Furthermore, files will be exported and only the registered users will have access to them.</p>
Making data findable, including provisions for metadata	<p>The data will not be directly accessible from outside. An overview of the ENVISION platform's functionalities and preliminary results will be available, discoverable and accessible to third parties, since the dissemination level of the respective deliverables D4.2 Initial version of ENVISION platform, D4.3 Integrated and validated version of the ENVISION platform and D4.4 Final version of ENVISION platform is public. Furthermore, through these deliverables, architecture updates will be available to third parties.</p> <ul style="list-style-type: none"> <li>• D4.2 Initial version of ENVISION platform: DOI: <a href="https://doi.org/10.5281/zenodo.6122302">https://doi.org/10.5281/zenodo.6122302</a></li> <li>• D4.3 Integrated and validated version of the ENVISION platform: DOI: <a href="https://doi.org/10.5281/zenodo.6303613">https://doi.org/10.5281/zenodo.6303613</a></li> </ul> <p>The naming convention used is:</p> <ul style="list-style-type: none"> <li>• Data_WP4_2_ENVISION_platform</li> </ul> <p>Every action on the platform will produce meaningful metadata such as time and date of data creation or data amendments and will be saved along the services results to enhance the discoverability of the results.</p> <p>The database will not be discoverable to other network machines operating on the same LAN, VLAN with the database server or other networks. Therefore, only users with access to the server (ENVISION technical team members) will be able to discover the database.</p>
Making data openly accessible	<p>Only registered users and administrators will have access to the data. The data produced by the platform are personal data and will not be shared with others without user's permission. No open data will be created as part of ENVISION.</p>



	The database will only be accessible by the authorised technical team.
Making data interoperable	N/A
Increase data re-use	<p>ENVISION will be integrated with third parties' applications, currently being used by PAs and/ or CBs, in order to re-use information already inserted in those systems and to import the results of the ENVISION services into their own systems.</p> <p>The raw data will not be publicly available.</p> <p>Finally, the farmer RESTful API will be the backend system that will drive the Mobile client applications that will be used by the farmers.</p> <p>The ENVISION platform will be an open-source solution.</p>
Allocation of resources	Resources have been allocated according to the project plan and WP4 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	<p>All platform generated data will be saved on the ENVISION database server. Encryption will be used to protect personal user data like emails and passwords.</p> <p>The ENVISION platform offers a secured way to collect users data, providing a Graphical User Interface for uploading files via HTTPs calls that are additionally authorized by the OpenID Connect layer which is on top of the OAuth 2.0 protocol.</p> <p>If there is need for updates, the old data will be overwritten and all actions will be audited in detail and a log will be kept, containing the changed text for security reasons. The system will be weekly backed up and the backups will be kept for 3 days. All backups will be hosted on a remote server to avoid disaster scenarios.</p> <p>All servers will be hosted behind firewalls inspecting all incoming requests against known vulnerabilities such as SQL injection, cookie tampering and cross-site scripting. Finally, IP restriction will enforce the secure of data.</p> <p>The ENVISION platform will not keep personal data and other information after the end of the project.</p> <p>Furthermore, DRXS pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.</p>
Ethical aspects	N/A
Other issues	N/A

### 2.4.3 Maps produced by the EO data

DMP Component	Deliverable Title
Data Summary	<p>One of the main offerings of the ENVISION platform is the generation of maps, based on the produced EO services, that can assist the PAs and CBs to increase their efficiency.</p> <p>Specifically, layers will be presented on the top of the maps depicting the outcomes of the remote sensing as well as</p>

	<p>layers from other resources (Natura sites, etc.).</p> <p>The types of the maps might differ but some indicative types for vectors are ESRI, shapefiles, GeoJSON, GML, etc. and for raster is GeoTiff. Similarly, the size might also vary a lot, from 1KB to 10GB.</p>
Making data findable, including provisions for metadata	<p>All the registered users will have access to the maps. The users will be able to identify the maps by their distinctive name.</p> <p>Meaningful metadata will be produced as a result of every action (time and date of data creation or data amendments, actions that took place, service that produced map, crop type of depicted farm).</p> <p>The naming convention used is:</p> <ul style="list-style-type: none"> <li>• Data_WP4_3_Maps</li> </ul>
Making data openly accessible	<p>Maps that will be produced will not be openly accessible. Users should sign in in order to access the produced maps.</p> <p>The maps and the metadata will be made available for use by the ENVISION system through the secure API that will be created.</p> <p>The raw data, used for the generation of the maps' layers, that will be stored in the ENVISION database will be only accessible by the authorised technical team.</p>
Making data interoperable	<p>Maps will be saved in standard formats that are commonly used through OGC services.</p>
Increase data re-use	<p>Maps that will be produced during the project will be offered to anyone who requests them. After the completion of the project, these data will only be available to users who will buy the respective services.</p>
Allocation of resources	<p>Resources have been allocated according to the project plan and WP4 allocated resources. No additional costs are foreseen for making this dataset FAIR.</p>
Data security	<p>All data generated by the platform will be saved on the ENVISION server. DRXS pays special attention to security and respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.</p>
Ethical aspects	N/A
Other issues	N/A

#### 2.4.4 OCTOPUSH

DMP Component	Deliverable Title
Data Summary	<p>OCTOPUSH is an integrated satellite and weather derived agricultural software service, which collects earth observation, geospatial, weather, in-situ, and other-referenced data, and applies appropriate processing algorithms and responds with ready-to-use results. It accepts Web requests from gridded datasets that will be ingested into the storage layer of</p>

	<p>GeoServer, which feeds the maps presented to the end user. In general, OCTOPUSH acts as a gateway to a plethora of agricultural services that enriches the geospatial visualization of the Service Providers results.</p> <p>The dataset provided by OCTOPUSH to ENVISION are:</p> <ul style="list-style-type: none"> <li>• Raster files of NDVI and Yield Estimation</li> <li>• Mean, stdev and median timeseries of NDVI and Yield Estimation</li> <li>• Classified raster with values 1=organic, 0=non-organic</li> </ul>
Making data findable, including provisions for metadata	The collected/ processed and generated data will not be publicly available and only the registered users will have access to the results served by the ENVISION platform.
Making data openly accessible	The datasets are not publicly available.
Making data interoperable	N/A
Increase data re-use	<p>Appropriate licensing agreement will be required for data access after the project's conclusion, which will be defined through the business model during the course of the project.</p> <p>The EO-based products will be usable by third parties through RESTful API, but only for those parties who are part of the project and during the lifespan of the project.</p>
Allocation of resources	Resources have been allocated according to the project plan and WP4 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	OCTOPUSH is service gateway that provides a Web API via HTTPS, which supports Transport Layer Security (TLS) encryption. This ensures that the data-transfer is end-to-end encrypted. On top of that it authorizes the HTTPS requests by validating the API token, a mandatory parameter on all the HTTPS calls, against the Authorization Server registry. This process verifies that the identity making the request, is authorized to receive the particular set of data.
Ethical aspects	N/A
Other issues	N/A

#### 2.4.5 DataCube

DMP Component	Deliverable Title
Data Summary	<p>ENVISION DataCube exploits the Open Data Cube (ODC) software aiming at managing massive amount of geospatial data by allowing the full control of Analysis Ready Data. It comes with a Python Application Programming Interface (API) enabling querying and extraction of indexed data. ENVISION DataCube makes usage of Python XArray library for efficient calculations and analysis. ENVISION back-end services are built on top of the DataCube as the latter can be used to provide:</p> <ul style="list-style-type: none"> <li>• Cloud optimized GeoTIFFs in any time, space and band dimension</li> <li>• Results, which are directly stored in ENVISION</li> </ul>



	database
Making data findable, including provisions for metadata	The collected/ processed and generated data will not be publicly available and only the registered users will have access to the results served by the ENVISION platform.
Making data openly accessible	The datasets are not publicly available.
Making data interoperable	N/A
Increase data re-use	Appropriate licensing agreement will be required for data access after the project's conclusion, which will be defined through the business model during the course of the project. The EO-based products will be usable by third parties through RESTful API, but only for those parties who are part of the project and during the lifespan of the project.
Allocation of resources	Resources have been allocated according to the project plan and WP4 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	DataCube exploits a PostgreSQL/PostGIS database. The latter comes with a built-in user permissions system designed around the concept of roles. Thus, any user is assigned to a role with a login attribute. The external users will be assigned to specific roles that do not update the database except from the possible posting of requests to it for retrieving data from the DataCube
Ethical aspects	N/A
Other issues	N/A

## 2.5 DMP Components in WP5 – Business cases implementation and evaluation (EV ILVO)

DMP Component	Deliverable Title
Data Summary	<p>The aim of this WP is to deploy and evaluate the ENVISION data products and services by testing them under different conditions and according to each PA's and CB's specifications and requirements. The performance, usability, and effectiveness of these products and services, and their impact at an economic, environmental and societal level will be evaluated during the project period.</p> <p>Detailed implementation guidelines have been produced in order to assure the smooth and uniform implementation across the business cases and outline common features and practices along with tailored information for each of the business cases.</p> <p>Furthermore, a comprehensive business cases action plan have been implemented providing in detail all the operations that should be performed such as data resources and data providers , business stakeholders, suggested potential actors and their role, potential ENVISION products and services users, dates of the beginning and end of demonstration, and calendar of performance evaluation and feedback reporting, responsibilities and tasks of the platform and the providers.</p> <p>In addition, the evaluation criteria will be defined in order to measure the success and the impact of the delivered solutions and reports will be generated illustrating the results of the business cases' implementation phases.</p> <p>Lastly, a concrete and detailed report will be produced that will demonstrate the impact of the performed activities and how the provided solutions could increase the capacity of companies and organisations that offer commercial products, to develop new and improved products and services by building up-on the ENVISION solutions.</p> <p>Mainly and if it is possible, it will be used online and/or electronic archives. The main documents and formats that will be used in order to collect and generate the necessary data will be templates agreed in the D5.1 Implementation Guidelines.</p> <p>Semi-structured interviews with participants will be collected and stored using digital recording, only if it is allowed by the interviewees. In case of denial, interview notes will be kept with regards to agreed formats and standards.</p> <p>All data will be in doc./ docx. and pdf format.</p>
Making data findable, including provisions for metadata	<p>The raw data that will be collected in WP5 will not be made publicly available as it might include confidential and personal data.</p> <p>The results will be available through the respective deliverables, since their dissemination level is public.</p> <ul style="list-style-type: none"> <li>• D5.1 Implementation Guidelines: DOI: <a href="https://doi.org/10.5281/zenodo.6122511">https://doi.org/10.5281/zenodo.6122511</a></li> </ul>

	<ul style="list-style-type: none"> <li>• D5.2 Business cases action plan: DOI: <a href="https://doi.org/10.5281/zenodo.6310554">https://doi.org/10.5281/zenodo.6310554</a></li> </ul> <p>The naming conventions used are:</p> <ul style="list-style-type: none"> <li>• Data_WP5_1_Guidelines</li> <li>• Data_WP5_2_Action_Plan</li> <li>• Data_WP5_3_Evaluation_Criteria</li> <li>• Data_WP5_4_Reports</li> </ul>
Making data openly accessible	<p>The raw data that will be collected in WP5 will not be made publicly available as it might include confidential and personal data.</p> <p>However, the results will be available to third parties through the public deliverables.</p>
Making data interoperable	N/A
Increase data re-use	The data that have been and will be collected and processed during this WP will be exclusively for analytical and statistical purposes and will not be re-used.
Allocation of resources	Resources have been allocated according to the project plan and WP5 allocated resources. No additional costs are foreseen for making this dataset FAIR.
Data security	The data that will be collected for internal use in the project and not intended for long-term preservation. The data will be stored on EV ILVO servers. EV ILVO fully complies with the applicable national, European and international framework, and the European Union's General Data Protection Regulation 2016/679.
Ethical aspects	CA document will be prepared specifying the main purpose of the data collected and/ or generated within WP5, i.e., these data will be neither available to third parties nor discoverable and accessible to the public, since the parties disclosed to each other information and documentation, which is proprietary and confidential or otherwise generally not available to the public.
Other issues	N/A

## 2.6 DMP Components in WP6 – Commercialisation and exploitation (ETAM)

DMP Component	Deliverable Title
Data Summary	<p>The purpose of the data collection in WP6 is to support commercialization and exploitation of the ENVISION products and platform, to define the business models for sustainable growth and to satisfy the needs for the collaboration with other EU projects.</p> <p>Several meetings with relevant EU projects have been performed in order to establish communication and explore possible ways of fruitful collaboration. The meetings were held with the Microsoft Teams Suite. The relevant material (emails, agenda, presentations, recordings) has been generated and collected.</p> <p>The data that will be collected and/ or generated within WP6</p>





	<p>will represent the foreground knowledge, derived from the experienced based on the project implementation and the intangible data and results of the project, such as: business modeling information, outcomes, know-how, etc.</p> <p>The expected size of the data is not applicable, as the size is not a meaningful measure.</p>
Making data findable, including provisions for metadata	<p>The data with regards to the Business models will be stored on ETAM servers and will not be directly accessible from outside. Moreover, these data will be neither available to third parties nor discoverable and accessible to the public, since the dissemination level of the respective deliverables is confidential. Similarly, the data with regards to business plan and exploitation strategy.</p> <p>The dataset derived from the meetings with the relevant EU projects is not directly accessible by third parties. However, the main information and the outcomes of these meetings will be presented in the respective deliverables and will be accessible through the project's website and Zenodo:</p> <ul style="list-style-type: none"> <li>• D6.1 Collaboration with EU projects and initiatives (1): DOI: <a href="https://doi.org/10.5281/zenodo.6122094">https://doi.org/10.5281/zenodo.6122094</a></li> </ul> <p>Moreover, the data collected for the Market analysis will be available through the public deliverables:</p> <ul style="list-style-type: none"> <li>• D6.2 Market Outlook Analysis: DOI: <a href="https://doi.org/10.5281/zenodo.6122356">https://doi.org/10.5281/zenodo.6122356</a></li> </ul> <p>Regarding the data generated/ collected for the roadmap for the incorporation of EO-based monitoring in environmental assurance standards as well as for the incorporation of ENVISION in LEAF Marque will be publicly available since the dissemination level of the respective deliverables is public and they will be accessible either through the project's website or Zenodo.</p> <p>The naming conventions used are:</p> <ul style="list-style-type: none"> <li>• Data_WP6_1_Business_Plan</li> <li>• Data_WP6_2_Business_Models</li> <li>• Data_WP6_3_Exploitation</li> <li>• Data_WP6_4_Collaboration_with_EU_projects</li> <li>• Data_WP6_5_Market_Analysis</li> <li>• Data_WP6_6_LEAF_Marque</li> </ul>
Making data openly accessible	<p>Data will be publicly available as part of public deliverables and through the ENVISION website, dropbox folder and Zenodo.</p> <p>The other datasets will not be publicly available.</p>
Making data interoperable	N/A
Increase data re-use	Data that will be publicly available through public deliverables will be accessed and re-used by third parties indefinitely without a license.
Allocation of resources	Resources have been allocated according to the project plan and WP6 allocated resources. No additional costs are foreseen for making this dataset FAIR.

Data security	ETAM has established and is successfully implementing an information security management system (ISMS) in accordance with the requirements of the international standard ISO/IEC 27001:2013. Information security policies (including access control, secure storage and recovery) and an information security risk assessment process are in place. Furthermore, ETAM respects the privacy and confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.
Ethical aspects	N/A
Other issues	N/A



## 2.7 DMP Components in WP7 – Dissemination and Communication (ITC)

DMP Component	Deliverable Title
Data Summary	<p>The aim of the data collected and/ or generated within WP7 is to develop and implement an effective dissemination and communication strategy.</p> <p>The data that will be collected will be statistics related to the project website, social media like LinkedIn, twitter, etc. for tracking the progress and improve the communication and dissemination activities.</p> <p>Reports will be collected from the partners regarding their performed dissemination activities. Furthermore, personal data of newsletter subscribers will be collected (i.e. emails) and contact data of relevant project stakeholders.</p> <p>The expected size of the data is not applicable, as the size is not a meaningful measure.</p> <p>The data will be only available to the project partners.</p>
Making data findable, including provisions for metadata	<p>The data with regards to the dissemination and communication strategy and activities will be publicly available and accessible by third parties, since the dissemination level of the respective deliverables is public. These deliverables will be accessible through the project’s website, and Zenodo:</p> <ul style="list-style-type: none"> <li>• D7.1 Dissemination and Communication Plan: DOI: <a href="https://doi.org/10.5281/zenodo.4564222">https://doi.org/10.5281/zenodo.4564222</a></li> <li>• D7.2 Intermediate report on dissemination activities: DOI: <a href="https://doi.org/10.5281/zenodo.6303599">https://doi.org/10.5281/zenodo.6303599</a></li> </ul> <p>The naming convention used is:</p> <ul style="list-style-type: none"> <li>• Data_WP7_1_Activities</li> </ul> <p>Regarding the personal data derived from newsletters or other sources, such as webinars, clustering events, they will not be publicly available and only project partners will have access to them after request to the responsible controller.</p> <p>The naming convention used will be:</p> <ul style="list-style-type: none"> <li>• Data_WP7_2_Personal_data</li> </ul> <p>No metadata will be generated.</p>
Making data openly accessible	<p>The dissemination and communication activity data will be publicly available through the public deliverables and can be accessed and re-used by third parties indefinitely without any restrictions.</p>
Making data interoperable	N/A
Increase data re-use	<p>The dissemination and communication activity data will be publicly available through the public deliverables and can be accessed and re-used by third parties indefinitely without any restrictions.</p>
Allocation of resources	<p>Resources have been allocated according to the project plan and WP7 allocated resources. No additional costs are foreseen for making this dataset FAIR.</p>
Data security	<p>All data will be stored on ITC servers. Furthermore, ITC pays special attention to security and respects the privacy and</p>

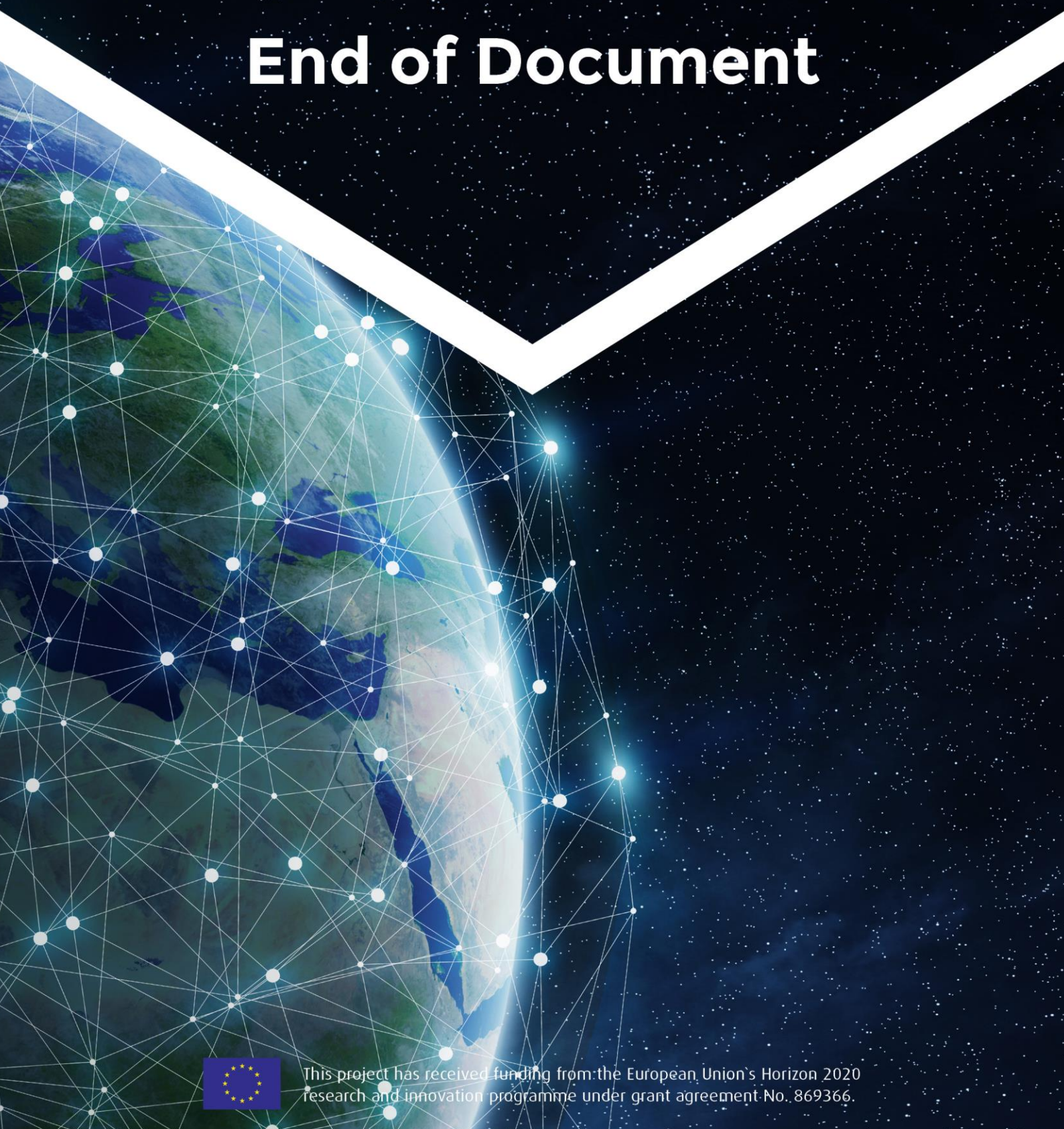
	confidentiality of the users' personal data by fully complying with the applicable national, European and international framework, and the European Union's GDPR 2016/679.
Ethical aspects	N/A
Other issues	N/A







# End of Document



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