

PCP WISE

D 1.2 Data Management Plan

WP1 Project Management and Coordination
Slovak Environment Agency (SEA)



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Document abstract

This Data Management Plan (DMP) outlines the data handling strategy and procedures for PCP WISE project. Deliverable covers data collected, processed and /or generated in alignment with FAIR (Findable, Accessible, Interoperable, Reusable) principles and Horizon Europe Open Science requirements. The DMP ensures compliance with ethical, legal, and security standards while promoting data sharing and reuse to maximize the project's scientific and societal impact. DMP is a living document to be updated at least twice as the implementation of the project progresses and when significant changes occur (D1.3 Updated Data Management Plan (Mid-Term) in M17 (May 2026) and D1.4 Final Data Management Plan in M36 (December 2027)).

Keywords

Project data lifecycle, Data collection & generation, Data models, formats, policy & standards, data management, Data sharing & reuse, Metadata & documentation, Licensing & intellectual property rights (IPR), GDPR, Ethical compliance, FAIR, Open science.





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List of abbreviations

Abbreviation	Meaning
AI	Artificial intelligence
API	Application Programming Interface
CC	Creative Commons
CC 0	Creative Commons Zero
CC BY	Creative Commons Attribution license
CERN	Conseil Européen pour la Recherche Nucléaire (European Council for Nuclear Research)
CORDIS	Community Research and Development Information Service
DCAT-AP	Data Catalog Vocabulary – Application Profile
DMP	Data Management Plan
DoA	Description of the Action
DOI	Digital Object Identifier
DQ	Data Quality
EC	European Commission
ECMWF	European Centre for Medium-Range Weather Forecasts
EEAB	European Environment Advisory Board
EIF	European Interoperability Framework
EuroGEOSS	European Global Earth Observation System of Systems
FAIR	Findable, Accessible, Interoperable, Reusable
GA	Grant Agreement
GDPR	General Data Protection Regulation (EU) 2016/679
GeoDCAT-AP	Geospatial Data Catalog Application Profile
GeoJSON	Geographic JavaScript Object Notation
GEOSS	Global Earth Observation System of Systems
INSPIRE	Infrastructure for Spatial Information in the European Community





Abbreviation	Meaning
IPR	Intellectual Property Rights
ISO	International Organization for Standardization
JSON	JavaScript Object Notation
NetCDF	Network Common Data Form
OGC	Open Geospatial Consortium
ORCID	Open Researcher and Contributor ID
PCP	Pre Commercial Procurement
PPI	Public Procurement of Innovative Solutions
PSI	Public Sector Information directive
REA	Research Executive Agency
RESTful API	APIs that follow the principles of REST — Representational State Transfer
SDMX	Statistical Data and Metadata eXchange
SWVA	Soil-Water-Vegetation-Atmosphere
WISE	Water management Innovations from Space for European climate resilience
XML	eXtensible Markup Language



1. Executive summary

The PCP WISE project¹ **Data Management Plan (DMP)** outlines how data will be handled both during a research project and after it is completed. Its purpose is to ensure that the data is:

Organized and Accessible

- Documenting, how data will be collected, structured, and stored so that it can be easily accessed and understood by others.

Preserved for the Long Term

- Describes strategies for archiving data so it remains available and usable in the future, even after the project ends.

Shared and Reused

- Facilitates data sharing with other researchers, institutions, or the public (when appropriate), often a requirement for funding bodies and journals.

Secure and Compliant

- Ensures that sensitive or personal data is protected and that the project complies with legal and ethical standards (like GDPR).

Efficient and Transparent

- Helps project teams work more efficiently by setting clear standards for data handling and supports transparency and reproducibility in research.

The document aims to help the project consortium to make PCP WISE project research data **Findable, Accessible, Interoperable and Reusable (FAIR)**, whilst ensuring appropriate sound management. DMP activities are foreseen to be taken during the whole project (From 01/2025 – 12/2027). This **first Data Management Plan** describes starting conditions, the data management principles and strategies, data, tools and other research outputs, that will be produced as part of the project activities and that are relevant to be included in the DMP. The consortium will also aim at open access when publishing papers and articles.

The DMP is a living document to be updated as the implementation of the project progresses and when significant changes occur. The following related deliverables are planned to be prepared as follows:

- D1.3 Updated Data Management Plan (M17- May-2026)
- D1.4 Final Data Management Plan (M36 Dec- 2027)

The terms and provisions of the EU Grant Agreement (including its annexes) and the PCP WISE Consortium Agreement will prevail in the event of any inconsistencies with recommendations and guidelines defined in this deliverable D1.2 Data Management Plan.

¹ <https://pcp-wise.eu>



2. Introduction

2.1 Objectives and scope of the document

2.1.1. Objectives

Data Management Plans (DMPs) are a cornerstone for responsible management of research outputs, notably data and are mandatory in Horizon Europe for projects generating and/or reusing data².

DMPs are formal documents that outline from the start of the project all aspects of the research data lifecycle, which includes its organization and curation, and adequate provisions for its access, preservation, sharing, and eventual deletion, both during and after a project. The document follows the Horizon Europe DMP template³, whilst ensuring fulfillment of the FAIR principles making research data findable, accessible, interoperable and re-usable⁴. Furthermore, it is important to highlight that, even if this deliverable is not presented under the HE templates, it strictly follows its structure and complies with the research data management requirements under Article 17 of the Grant Agreement.

Thus, the main objective of the document is to provide an overview of the data management related activities executed during the initial phase of the PCP WISE project implementation and indicate further directions in this domain. This deliverable was developed under the *Task 1.5 Information security and critical information infrastructure management within the Work package (WP) 1 Project Management and Coordination*. Considering the main project aim (Figure 1) and data domain perspective, Task 1.5 and this deliverable has significant synergies with other work packages and Tasks (Figure 2), whilst reviewing the Data Management Plan, including data collection, storage, sharing, and security protocols remains with the *Task 1.1.1 Monitoring (technical & financial) and evaluation*.

² https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

³ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/report/data-management-plan_he_en.docx

⁴ <https://www.nature.com/articles/sdata201618>



Project main aim

PCP-WISE is an innovative project aimed at **developing cutting-edge solutions (up to TRL 8) for water management and climate resilience** across Europe using the **Pre-Commercial Procurement (PCP) instrument**. **By leveraging space technology and Environmental observation data**, PCP-WISE seeks to address critical challenges related to **floods, fires, and infrastructure impacts both in rural and urban areas**. This collaborative effort brings together public buyers, research institutions, and industry experts to **create and implement advanced climate services** that will **enhance Europe's ability to adapt to and mitigate the effects of climate change**.

What?
How?
Why?

Figure 1: PCP WISE main project aim

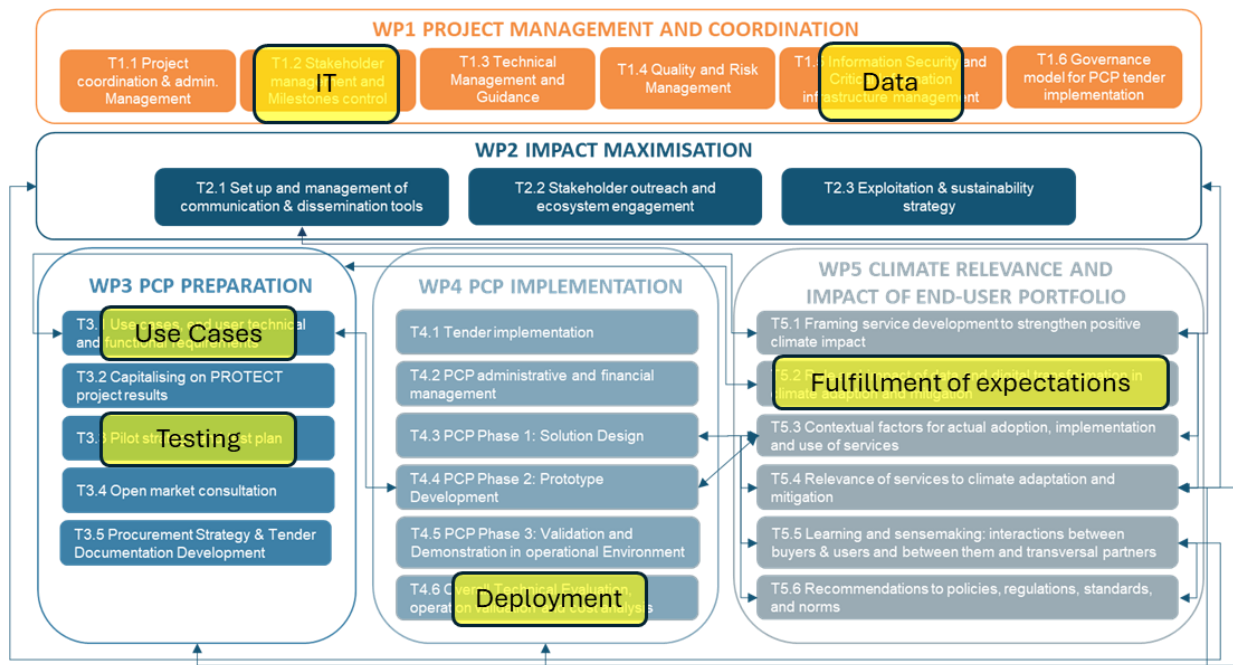


Figure 2: PCP Data related synergies

Despite the standard DMP template expectations, PCP WISE project team aims to drive the data management mainly from the user/buyer perspective to ensure the project results will fulfill expectations defined in Grant Agreement Project 101182917 — PCP WISE (GA) as well as those identified during the project implementation.

With that in mind, the following requirements and recommendations were taken into consideration:

Main requirement GA:

- Article 14 Ethics & Values
- Article 15 Data protection



- Article 16 Intellectual property rights (IPR)
- Article 17 Communication, dissemination & visibility
- Annex I Description of the action (DoA)
- Annex V Specific rules

Main recommendations:

- Horizon Europe Programme Guide⁵
- Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020⁶
- Horizon Europe DMP template⁷
- Communicated by EC/REA during PCP WISE Kick off meeting

2.1.2. Scope

The main scope of this deliverable is to support the Open science framework⁸ representing the approach to the scientific process based on open cooperative work, tools and diffusing knowledge, where Research Data Management (RDM) plays an important role.

With that in mind, the RDM aims to be:

Fully FAIR compliant:

- Data collected and generated during PCP-WISE will be managed according to **FAIR principles** (Findable, Accessible, Interoperable, Reusable).

Whilst at the same time:

- Include establishment of **Data Management Plan (DMP)**, including regular updates
- Support **data deposition** in **trusted repository** & ensure open access under open CC 0, CC BY or equivalent, following the principle '**as open as possible as closed as necessary**'
- Provide **information via the repository** about any research output/tools/instruments needed to re-use or validate the data
- Document data and information via **Metadata** under open license

⁵ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

⁶ https://erc.europa.eu/sites/default/files/ERC_Guidelines_Implementation_Open_Access.pdf

⁷ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/report/data-management-plan_he_en.docx

⁸ https://research-and-innovation.ec.europa.eu/strategy/strategy-research-and-innovation/our-digital-future/open-science_en



From the content point of view, DMP is covering:

Datasets

- (Input) Used in project
- (Output) Created / procured

Other data resource types

- Software
- Publication
- Presentation
- Poster
- Video/audio
- Model
- Workflow
- Image
- Other data resources

Metadata

2.2 Structure of the deliverable

The document is structured following the guideline of the Horizon Europe programme on FAIR Data Management in Horizon Europe including the following information:

- Data summary
- Description of FAIR DATA aspects
- Identification of other research outputs
- Allocation of relevant resources
- Data Security considerations
- Ethical Aspects
- Additional issues
- Further directions
- Conclusions

2.3 Approach

2.3.1. Methodology

In order to prepare the deliverable, simple methodology framework has been designed and implemented:

- Preparations
- Introduction of the approach
- PCP WISE DMP approach



- Planning phase
 - DMP Survey input collection
 - DMP Data Table initial population
 - Setting up Zenodo environment
- Data Collection & Generation
 - Input data (for service providers)
 - Output data (from service providers)
- Data Processing & Analysis
 - Testing and validation
- Data Sharing & Dissemination
 - Selection of repositories
 - Ensuring licensing and IPRs
- Long-Term Preservation & Compliance
 - Persistence
 - Sustainability
- Continuous Review & Updates
 - Yearly revisions via deliverables
 - Following up after project lifetime

The PCP WISE DMP will follow and support the overall project direction across all Work Packages and related tasks, to ensure provision of necessary synergies and fulfillment of project aim, targets, KPIs and expectations.

2.3.2. Repositories

Repositories play an important role in data management, therefore in the scope of PCP WISE DMP, the following types of repositories have been identified:

- Project partners local data repositories
- Project data repository (SharePoint)⁹
- Funding & Tenders Portal (SYGMA)¹⁰
- Zenodo trusted repository¹¹
- Project website¹²
- CORDIS¹³

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<https://barrabesnext.sharepoint.com/sites/PCPWISEProject/Documentos%20compartidos/Forms/AllItems.aspx?FolderCTID=0x0120003496DCA83BEB594EB18CFB990037BA32&viewid=b0de502c%2D8852%2D40f2%2D9985%2Df8b065623695>

¹⁰ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/43108390/101182917>

¹¹ <https://zenodo.org/>

¹² <https://pcp-wise.eu/>

¹³ <https://cordis.europa.eu/project/id/101182917>



2.3.3. Tools

There has been a set of tools used with the aim of supporting overall data management and collecting information related to this deliverable:

- Data Management Plan Survey¹⁴
- Data Management Plan Table¹⁵
- Zenodo¹⁶

2.3.4. Summary of the actions

After the project Kick off Meeting in January 2025 and initial understanding of the consortium setup as well as project direction, Task 1.5 Kick off Meeting took place in February 2025 in order to propose and discuss the direction of data management support. After understanding the water management domain scoping and use cases clustering, together with clarification of the PCP process related expectations, above mentioned methodology was proposed.

The first activity (during March 2025) was preparation of the Data Management Plan Survey, with the aim to collect relevant information from the PCP WISE project consortium members, together with the Data Management Plan table focused on identification input and output data resources.

In connection with the establishment of trusted repository establishment, Zenodo platform has been selected, where PCP WISE community space has been created to support the project (Figure 3).

¹⁴ <https://forms.office.com/e/XLpturD1F5>

¹⁵ [https://barrabesnext.sharepoint.com/:x:/r/sites/PCPWISEProject/Documentos compartidos/WP1/T1.5 - Information Security and Critical Information infrastructure management/T1.5 Information Security and Critical Information infrastructure management/04 DataResourceTable/PCP WISE DMP Table v1.xlsx?d=w2273cd367e2b460e88604ce9445094ef&csf=1&web=1&e=s5sqd2](https://barrabesnext.sharepoint.com/:x:/r/sites/PCPWISEProject/Documentos%20compartidos/WP1/T1.5%20Information%20Security%20and%20Critical%20Information%20infrastructure%20management/T1.5%20Information%20Security%20and%20Critical%20Information%20infrastructure%20management/04%20DataResourceTable/PCP%20WISE%20DMP%20Table%20v1.xlsx?d=w2273cd367e2b460e88604ce9445094ef&csf=1&web=1&e=s5sqd2)

¹⁶ <https://zenodo.org/>

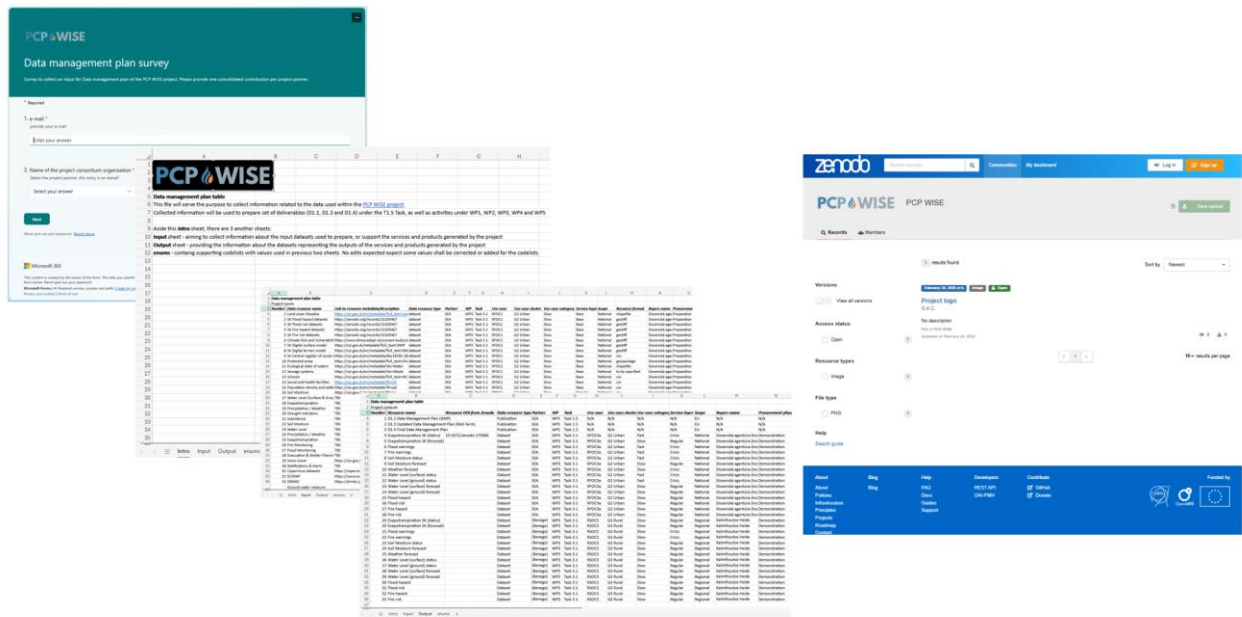


Figure 3: Tools to support PCP WISE project Data management

2.3.5. Survey

A Data Management Plan survey was prepared with the intention of getting initial feedback on data management related topics from the PCP WISE project consortium partners.

The survey structure followed the DMP template with modifications aiming to create connection to the data resources Table overview and consider some project specific aspects. Input received by the partners participating in the survey (Table 2) helped to collect initial input for the Task 1.5 and this deliverable but also showed the diversity in understanding and their interpretation of the related concepts, which will help to better shape the further activities and prepare better data management support for the project. As can be seen in the table below, unfortunately, not all project partners were able to provide feedback at this first stage of the Data Management Plan.

DMP Survey participants		
No.	PCP WISE participant full name	Abbreviation
1	Innova Next SL (Barrabés.biz)	Barrabés
2	Stichting Toegepast Onderzoek Waterbeheer	STOWA
3	Forum Virium Helsinki	FV-Helsinki
4	Ministerstvo vnútra Slovenskej republiky (Ministry of Interior Slovakia)	Mol
5	Institut d'Estudis Espacials de Catalunya	IEEC



DMP Survey participants		
No.	PCP WISE participant full name	Abbreviation
6	Bundesanstalt Technisches Hilfswerk	THW
7	Region of Central Macedonia	RCM
8	Belgisch Nederlands Grensoverleg	Grenspark
9	Institut Cartografic i Geologic de Catalunya	ICGC
10	City of Rotterdam	Gemeente Rotterdam
11	Slovenská agentúra životného prostredia (Slovak Environmental Agency)	SEA
12	Corvers Procurement Services BV	CORVERS
12.1 (AE) ¹⁷	Corvers Greece Monoprosopi I.K.E.	CORVERS GREECE
13	G.A.C. Group	GAC
14	Climate-KIC Holding BV	CKIC
15	Aerospace Valley	AV
16	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.	FRAUNHOFER
17	Universiteit Twente	UT-ITC
18	Inštitút Pre Medzinárodnú Bezpečnosť A Krízové Riadenie, N.O.	ISEMI
19	Evenflow	EVENFLOW
20	Fundació Privada i2CAT, Internet i Innovació Digital a Catalunya	CERCA-I2CAT

Table 1: DMP Survey participants

Specific outcomes of the survey are consulted in further relevant chapters.

¹⁷ AE stands for Affiliated Entity.



Data resource Table

Whole data management makes only sense if there are data resources clearly identified. With that in mind the data resource Table has been prepared to collect an initial overview of the data resources involved in the project.

For that reason, this Table was prepared in simple structure with initial overview “Intro” sheet explaining remaining structure composed from “Input” sheet, where project partners were asked to indicate datasets used to prepare, or support the services and products generated by the project. Initial input has been collected, but will still need to be updated, mainly in connection with the use cases clusters development.

For overview of the resulting data resources “Output” sheet has been prepared, where currently project deliverables and some use case clusters resources have been identified. Last sheet “Codelists” contains list of codelists used in previous two sheets.

Zenodo

The initial instance of PCP WISE Zenodo community has been prepared¹⁸, with introductory guidance. Relevant project outcomes will be made available as soon as they are prepared and approved.

During April 2025, data management related tasks were undertaken mainly in connection with the *WP3 PCP Preparation* (Use case funneling and clustering), as well as *WP5 Climate relevance and impact of end-user service portfolios*.

At the same time, collection of information via Survey and Table took place, together with processing the outcomes and preparation of this deliverable.

During the next period, further data identification will take place mainly in connection with the preparation of the technical specifications for the Open Market Consultation (OMC) and preparation of the tender documentation, including the support for testing and validations.

3. Data summary

The main aim of PCP WISE project DMP is to define and implement the approach for managing data collected and generated during the project to support its smooth implementation and strengthen access to and re-use of related data outcomes.

This section provides the context for data collection and generation motivation, strategy and principles in connection with its re-use.

¹⁸ https://zenodo.org/communities/pcp_wise/records?q=&l=list&p=1&s=10&sort=newest



Furthermore, it will address data types and formats, size and their sources, including the identification of stakeholders, benefiting from the data driven values.

3.1 Motivation and principles

3.1.1. Motivation

PCP WISE aims to challenge the market to develop innovative, beyond state-of-the-art solutions (up to TRL8) to enhance water management. The focus areas include **agriculture, nature, urban climate resilience and planning, climate risk management, and resilience to water-related natural disasters.** The goal is to provide intelligence and information on **rural and urban soil-water-vegetation (SWV) system** conditions and related risks for each sector.

Considering the above ambition, it is obvious that data will play an important role, therefore proper management and planning shall be ensured and documented also in this deliverable.

By leveraging and combining **satellite-based earth observation data, hydrological models, field data, and artificial intelligence, PCP WISE seeks to address critical challenges related to floods, droughts, heat stress, fires, and infrastructure impacts in both rural and urban areas.** The project aims to develop an integrated, real-time soil-water-vegetation water intelligence system. This system will provide comprehensive information through monitoring, decadal hindsight, prediction, of the Soil-Water-Vegetation-Atmosphere (SWVA) system for climate change adaptation. **The use of such data resources will help prevent and mitigate water-related crises.**

The **standardization of data collection and analysis processes** under PCP-WISE will **improve the ability of public authorities** to manage water resources more efficiently. It will also help them **respond proactively** to climate-related crises, including floods, droughts, heat stress, fires, and infrastructure impacts, thereby increasing **long-term climate resilience.**

For this purpose, **PCP WISE collects and generates data for internal use and further processing by the project partners** (e.g. for preparation of analysis, deliverables or events), **as well as for external usage** (such as the project deliverables, communication and dissemination activities and materials). No sensitive data will be collected. On another note, personal data collected will be stored within the consortium and will be used for the purposes of PCP WISE not being disclosed to third parties.

3.1.2. Principles

To achieve sufficient data management support for the PCP WISE project objectives achievement, the set of the following principles will be considered:

- **FAIR principles**, which are foundational guidelines for managing **scientific data and digital assets** to make them more useful and sustainable



Where **FAIR** stands for:

- **Findable** – Data should be easy to find for both humans and computers, with metadata that allows discovery.
- **Accessible** – Once found, data should be retrievable using standard protocols, with clear conditions for access.
- **Interoperable** – Data should be compatible with other data and tools, using standardized formats and vocabularies.
- **Reusable** – Data should be well-described so it can be replicated or combined in different settings.



Figure 4: The Turing Way project illustration by Scriberia. Used under a CC-BY 4.0 licence. DOI: The Turing Way Community & Scriberia (2024).

Further details about the FAIR principle's implementation are described in Chapter 4.

- **Open access to research data**, referring to the right to access and reuse digital research data under the terms and conditions set out in the Grant Agreement, following the Open access to research data and publication decision diagram in Figure 5 (Guidelines to the Rules on Open Access to Scientific publications and Open Access to Research Data in Horizon 2020¹⁹).

¹⁹ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

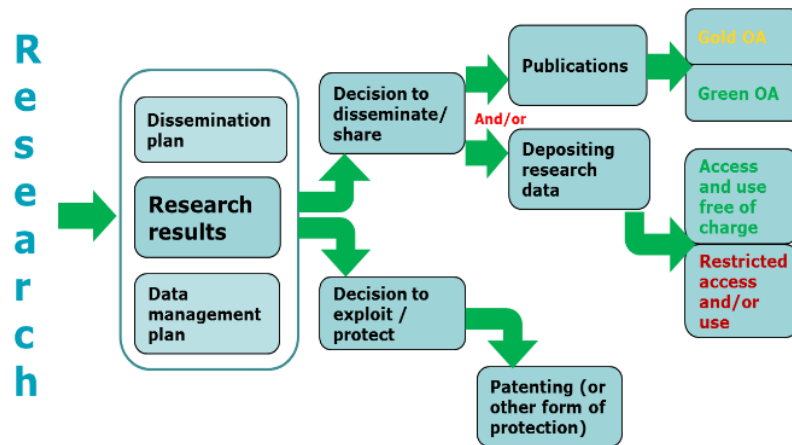


Figure 5: Open access to scientific publication and research data in the wider context of dissemination and exploitation.

3.2 Data re-use and generation purpose

During the **PCP WISE project implementation**, a strong focus on re-use of existing data resources will be applied, together with utilization of the **PROTECT project results**.

Preference to existing reliable data initiatives (e.g. Copernicus) providers (ECMWF²⁰), repositories (DRMKC - Risk Data Hub²¹) and infrastructures (INSPIRE²²) will be promoted and considered also in context of PCP preparation and execution.

In connection with the initial internal project consortium Survey, intended purpose project partners plan to use the data spans from overall project support to the use case clusters implementation, as well as support of the end user organizations. The most frequent answers were towards the direction data support of project and use cases (Figure 6).



Figure 6 Foreseen purpose of data use.

From the target stakeholder’s perspective, there has been identified a wide range of the subjects foreseen to benefit from the project:

Public Authorities

- Ministry of Environment of the Slovak Republic

²⁰ <https://www.ecmwf.int/>

²¹ <https://drmkc.irc.ec.europa.eu/risk-data-hub#/>

²² https://knowledge-base.inspire.ec.europa.eu/index_en



- Bratislava District Government Office
- Banská Bystrica Self-Governing Region
- Spišská Nová Ves, County Government Office
- Local governments, city councils

Water Management Entities

- Waterboards
- Buyers and decision makers involved in water management (local, regional, national)

Research and Academia

- Researchers and academic institutions

Civil Society and Public

- Civil society organizations
- The public

Innovation and Procurement Actors

- Stakeholders in Innovation Procurement projects
- EEAB and innovation actors
- Public buyers and stakeholders in procurement networks
- Authorities for PCP (Pre-Commercial Procurement) implementation
- Emergency management subjects (potential overlap with public safety)

Communication and Project-Specific Entities

- Stakeholders identified through the communication efforts of the project
- Internal stakeholders (e.g., Evenflow – not meant to receive certain data)
- Contacts useful for PCP WISE, PPI, or other procurement follow-ups

Environmental and Resource Management

- Forest management agencies
- Private agriculture

From the foreseen re-use of already existing input data resources, most of the partners expressed supportive attitude (Figure 7).



Figure 7: Will you re-use any already existing Input data for the project?



Similarly, the majority of the project partners expect the project will generate some output data resources.



Figure 8: Do you expect the project to generate some output data?

3.3 Data types and formats

From a general perspective, mainly for the project management and implementation part, standard document (*.docx, *.odt, *.pdf) and tabular (*.xlsx, *.ods, *.csv) data types and formats are foreseen to be used.

For the support of the use case clusters, input and output data resources related to the PCP process, have been identified by the project partners via DMP Data table. So far, there has been identified mainly vector and raster geospatial data resources (*.shapefile, *.geopackage, *.geotiff, *.netcdf, *.csv). In some cases, software code parts might occur (e.g. Jupiter notebooks *.ipynb).

Number	Data resource name	Link to resource metadata/description	Data resource type	Partner	WP	Task	Use case	Use case cluster	Use case category	Service layer	Scope	Resource format
1	Land cover Slovakia	https://rpi.gov.sk/en/metadata?full_text=Lan	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	shapefile
2	SK Flood hazard datasets	https://zenodo.org/records/15105467	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
3	SK Flood risk datasets	https://zenodo.org/records/15105467	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
4	SK Fire hazard datasets	https://zenodo.org/records/15105467	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
5	SK Fire risk datasets	https://zenodo.org/records/15105467	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
6	Climate Risk and Vulnerabilit	https://www.klima-adapt.sk/scenare-buduce	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
7	SK Digital surface model	https://rpi.gov.sk/en/metadata?full_text=DMP	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
8	SK Digital terrain model	https://rpi.gov.sk/en/metadata?full_text=DM	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geotiff
9	SK Central register of social s	https://rpi.gov.sk/en/metadata/6bc18781-28	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	csv
10	Protected areas	https://rpi.gov.sk/en/metadata?full_text=Chr	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	geopackage
11	Ecological state of waters	https://rpi.gov.sk/en/metadata?do=Water	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	shapefile
12	Sewage systems	https://rpi.gov.sk/en/metadata?do=Waste	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	to be specified
13	Schools	https://rpi.gov.sk/en/metadata?full_text=%C	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	csv
14	Social and health facilities	https://rpi.gov.sk/en/metadata?th=hh	dataset	SEA	WP3	Task 3.1	RFOC1	G2 Urban	Slow	Base	National	csv

Table 2: Example of data resource types and formats



Figure 9: Examples of input data resources



Figure 10: Examples of output data resources

3.4 Data resource size and origin

Standard documents and tabular and multimedia files used for the project implementation shall not require significant disc space and overall size might go towards the dozens of gigabytes.

In order to store the project's data, the primary data resource storage platform is the PCP WISE project SharePoint (through MS Teams) organized and supervised by the Project Coordinator, Barrabés. Project partners' specific data resources will be stored locally on their repositories. With respect to project deliverables, these will be made available via Funding & Tenders Portal via SYGMA by uploading them in their corresponding due dates.

Data related to the project implementation in connection with the support of use case clusters to be procured might require significantly larger disk space. For that purpose, the combination of the project SharePoint and Zenodo platform will be used to support preparation and execution of the PCP. Based on specific use case clusters requirement, some large data resources can be made available via infrastructure of the solution provider.

Where relevant for each data resource, information related to the provenance will be collected and documented to ensure transparency and respect relevant data sharing arrangements.

4. FAIR data

In today's data-driven research and innovation landscape, ensuring that data is properly managed, shared, and reused is critical to maximizing its value. The FAIR principles (**Findable, Accessible, Interoperable, and Reusable**) serve as a foundational framework for effective data stewardship. These guidelines are not specific to any discipline or technology but are designed to **enhance the quality, transparency, and longevity of data across all domains**. This chapter describes **how PCP WISE aims to address the FAIR principles, to support responsible data management and open science objectives**.



4.1 Making data findable, including provisions for metadata

Where possible, PCP WISE project will support searchability and findability of the most of its outcomes and partial data and information resources. Limitations will be applied only for data resources with data sharing restrictions, reflecting relevant legal requirements.

In order to increase the findability of data, resources standardized metadata will be created and maintained. Metadata is often described as “*data about data.*” It provides structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource. Metadata helps ensure that data is findable, accessible, and meaningful to both humans and machines²³.

Considering the above information, all deliverables with public dissemination level status will be made available together with all outcomes of the project without restrictions. They will also be documented by the metadata and made available via Zenodo platform. Zenodo supports unique and persistent identifiers (Figure 11) as well as a wide range of metadata exchange standards (Figure 12).

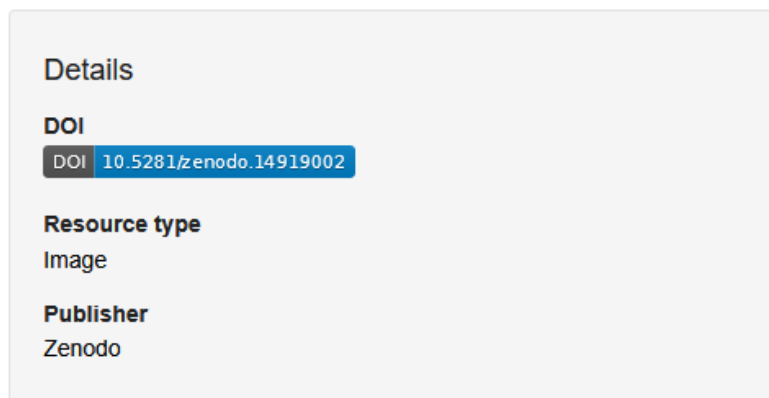


Figure 11: Example of the Zenodo DOI unique and persistent identifier

²³ National Information Standards Organization. (2004). *Understanding Metadata*. Bethesda, MD: NISO Press.

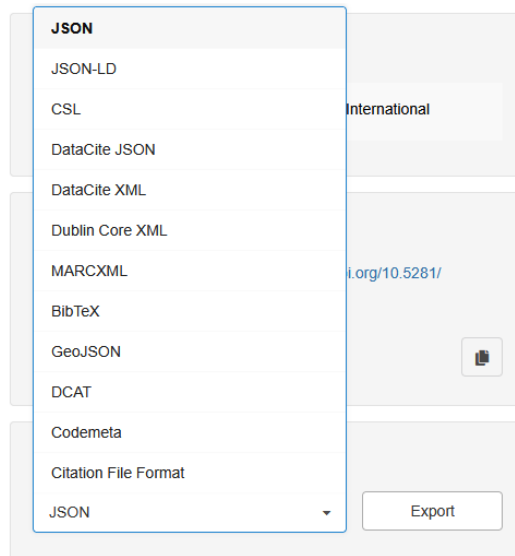


Figure 12: List of metadata standards by the Zenodo platform

For each metadata record, an appropriate set of keywords will be used to support the searchability and findability of the resource for the expected usage. Proper references of the data resource identifiers will increase their indexation via main web search engines. From the outcomes of the Data management plan survey, project partners indicated whether they are describing their data with metadata, what kind of metadata system they use.

10. Are you describing your data with metadata?

- Yes 7
- No 5
- I don't know 9

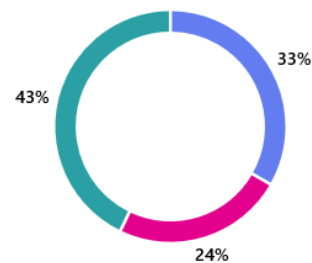


Figure 13: Documenting the resources by metadata within the PCP WISE partners

11. For metadata management you use

- Own metadata system 7
- External metadata system 1
- Other 10

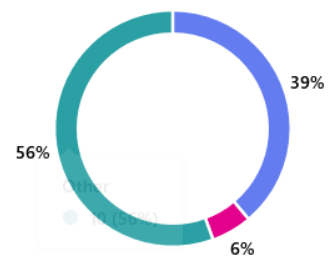


Figure 14: Approach of project partners to manage metadata



4.2 Making data accessible

4.2.1. Repository

In order to make PCP WISE project data resources publicly accessible, **three main accessibility channels** are foreseen:

- PCP WISE project website
- Zenodo
- CORDIS

Zenodo will be used as a main trusted repository, where persistent and unique identification can be ensured. Furthermore, Zenodo is considered a highly reliable and trustworthy platform for sharing research outputs. In order to offer a comprehensive view of the tool, the following presents a brief assessment of its reliability:

Backed by Trusted Institutions

- Operated by CERN (the European Organization for Nuclear Research).
- Funded and supported by the European Commission via initiatives like OpenAIRE.

Long-Term Preservation

- Zenodo commits to long-term preservation of uploaded content.
- Uses persistent identifiers (DOIs) for all uploads, ensuring citability and traceability.

Open Access & FAIR Principles

- Supports open science and align with FAIR principles (Findable, Accessible, Interoperable, Reusable).
- Accepts a wide range of file types and research outputs (datasets, publications, software, presentations).

Integration with Funding Bodies

- Compatible with Horizon 2020 and Horizon Europe open access mandates.
- Authors can link deposits to EC project grants and ORCID profiles.

Transparent Policies

- Clear terms of use, licensing options (e.g., Creative Commons), and community guidelines.



4.2.2. Data

Where appropriate, PCP WISE data resources will be made openly available under open data sharing arrangements. If certain datasets are under restricted access conditions, these will have to be identified and justified in connection with the Grant Agreement as well as other relevant legal or other conditions (e.g. IPR, GDPR). From the survey interaction, half of the participating project partners indicated their plans to make data openly available (Figure 15).

13. Are you planning to made data openly available?



Figure 15: Approach of project partners to manage metadata

Possible restrictions and conditions were also identified related to access and use:

Restrictions on Open Access

- Internal Use or Consortium-Only Data:
 - Some data (e.g. outreach databases) are strictly for consortium partners.
 - Certain inputs are intended only for internal use or expert interpretation.
- Legal and Ethical Constraints:
 - Sharing is not allowed due to GDPR.
 - Data not produced by the partner may not be sharable or verifiable.
- Sensitivity of Information:
 - Inputs may involve sensitive content tied to specific response actions.
 - Some partners do not plan to provide data directly.

Conditions Supporting Open Access

- EU/Project Policy Compliance:
 - Public sharing is planned, because it is requested by the European Commission.
 - Any publishable data will be made available via the project website.
 - Some deliverables will be public by design.



- Existing Open Data:
 - Some data is already under open regime and thus accessible.

Consent will be systematically requested by all subjects for collecting their personal information. The consent will detail the purpose of the data collection and storage, the retention period, as well as the contact details of the Data Protection Officer responsible. When specific access conditions will have to be consulted, appropriate consultation will be undertaken via project management and governance structure.

This directly relates to *D1.1 Project Management guidelines and inception meeting report*, where the whole project governance structure and its details are provided. According to the Grant Agreement, the Administrative Procurement Committee (APC) will deal with data management-related aspects and practices. This effort will also be tied into the Data Management Plan (DMP) for the project, which stipulates the data management principles that the consortium partners will adhere to in their work.

4.2.3. Metadata

Metadata will be made openly available and licensed under public domain dedication CC0 according to the Grant Agreement. The only exemption might take place for the data resources with limited data sharing conditions, if some are identified as the outcomes of the PCP process. Metadata and data will remain available during the project lifetime (until end of 2027) as well as at minimum, during the sustainability requirements for the project (until end of 2032). Where relevant, appropriate documentation requirements will be applied to ensure appropriate access to the data resources (including software requirements).

If procured solutions require software, preference will be given to the solutions with open-source code with unrestrictive licensing conditions. When specific access conditions will have to be consulted, appropriate consultation will be undertaken via project management and governance structure. This was confirmed also with the outcomes of the PCP WISE initial Data management survey, where project partners confirmed the types of licenses they are planning to apply for their data to support further re-use (Figure 16.).



Figure 16: Approach of project partners to manage metadata



4.3 Making data interoperable

Considering the domain scope of the PCP WISE project, the following interoperability standards are foreseen to be followed:

European Interoperability Framework (EIF)

- Provides a common approach to public service interoperability across EU Member States.
- Core pillars:
 - Strategies (The Digital Europe Programme, Data Union Strategy, AI Continent Action Plan, Apply AI Strategy)
 - Legal (GDPR, PSI Directive)
 - Organizational (clear governance)
 - Semantic (standard vocabularies, ontologies)
 - Technical (data formats, APIs, protocols)

INSPIRE Directive (2007/2/EC)

- Mandatory for projects using or generating spatial/geographic data.
- Requires standardized metadata, spatial data services, and harmonized formats for themes like hydrography, protected sites, and environmental monitoring.

Open Data and FAIR Principles

- Data must be Findable, Accessible, Interoperable, and Reusable (FAIR).
- Use of standard metadata schemas (e.g. DCAT-AP, GeoDCAT-AP for geospatial datasets).
- Encourage the use of open licenses (e.g., Creative Commons).

Relevant EU Platforms & Tools

- EU Open Data Portal / data.europa.eu
- Copernicus Services (for climate and environmental data)
- GEOSS / EuroGEOSS (for integrating earth observation data)
- e-Government Core Vocabularies (e.g., Person, Location, Service)

Technical Standards

- Prefer open and widely accepted standards, such as:
 - OGC (Open Geospatial Consortium): WMS, WFS, WCS, SensorThings
 - ISO 19100 series: Geospatial metadata and services
 - RESTful APIs, JSON/XML, GeoJSON, NetCDF (for climate data)
 - SDMX for statistical data exchange



Additional standards and initiatives might be included, based on the maturation of the PCP process. For the time being, there are not foreseen new standards or their profiles / extensions to be developed within the PCP WISE. If some will occur in a later phase, requirements for their re-use support will be applied.

4.4 Increase data re-use

To increase data re-use, metadata and data documentation and analysis requirements will be expressed across the whole project lifetime. Starting from preparation of PCP tender technical specification, through evaluation of offers, testing of delivered solution to the planning for further exploitation and support for operational regime.

Appropriate data quality measures will be identified and applied to ensure re-usability and maximum gain value for the public money investment.

Initial outcomes from PCP WISE Data management survey identified Data Quality (DQ) considerations expressed by some partners (Figure 17).

Considering the scope of the project, appropriate DQ requirements will have to be identified on data and software related project outcomes.



Figure 17: Data quality initial expectations for PCP WISE

5. Other research outputs

As indicated in *Chapter 2.1 Objectives and scope of the document*, **PCP WISE aims to support also other research related outputs share and re-use in line with FAIR principles.**

In addition to datasets, the project will generate various research outputs that contribute to its scientific and societal objectives. These include software tools, simulation models, algorithms, workflows, and documentation related to the ICT solutions developed for water management and climate resilience.

Where possible, these outputs will be made openly accessible through appropriate repositories (e.g. Zenodo, GitHub/Lab, or institutional platforms), with clear licensing terms and persistent identifiers. Metadata will comply with FAIR principles and relevant EU



interoperability standards to ensure discoverability, reusability, and alignment with Horizon Europe open science requirements.

Results of the Survey also indicated the types of outputs foreseen by the project partners (Figure 18).

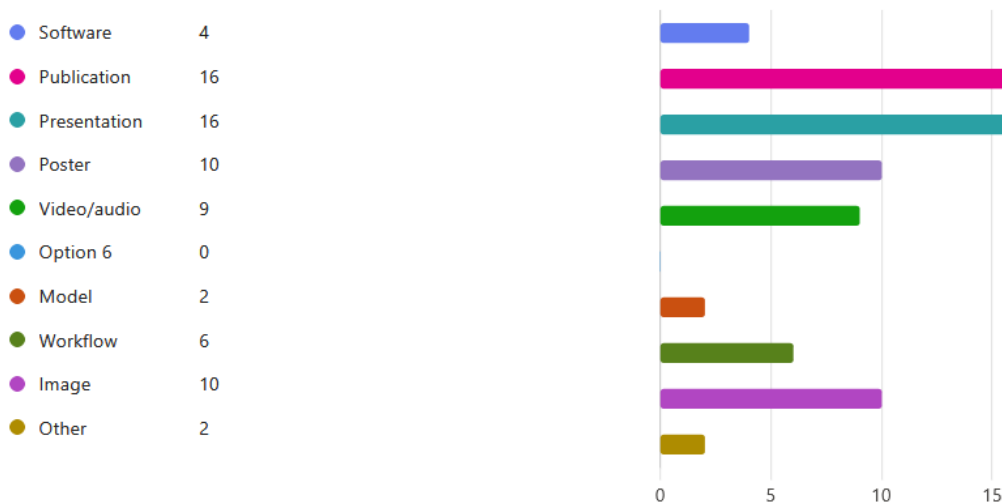


Figure 18: What kind of other research outputs are you planning to share as an outcome of the project?

6. Allocation of resources

Resources for data management shall be considered by the whole consortium, considering the nature and domain focus of the PCP WISE project, particularly under tasks related to data collection, processing, storage, and dissemination.

Personnel costs cover the effort required for data analysis, metadata creation / update, adherence to FAIR and open access principles, and compliance with relevant EU standards such as EIF, INSPIRE, etc.

To the extent possible, project partners will utilize existing institutional infrastructure and trusted repositories (e.g. Zenodo) to ensure sustainable data storage and sharing. Additional budget consideration shall be taken for long-term data preservation and the implementation of data governance tools.

Outcomes of PCP WISE DMP survey indicate this situation, which confirms the need to increase the awareness of project consortium about the need for allocation of appropriate resources form data management activities (Figures 19 and 20).



- Yes 8
- No 13

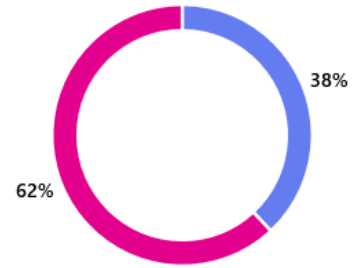


Figure 19: Do you have dedicated capacity (person/expert) for data management?

- Yes 4
- No 17

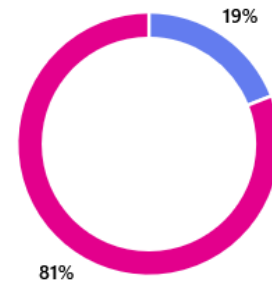


Figure 20: Do you expect some costs for making data and other outputs available from the project?

7. Data security

The PCP WISE project will implement appropriate technical (Data encryption, access control, and secured data storage) and organizational measures (partners agreements, access governance and DMP updates) to ensure the security of all data throughout its lifecycle.

Sensitive or personal data (stakeholders contact details, survey, interview responses) will be handled in compliance with the GDPR and institutional data protection policies. Access to internal datasets will be restricted through role-based permissions, secure servers, and encrypted communications where necessary. Regular backups and version control systems will be used to prevent data loss or unauthorized modifications. Public shared data will be reviewed to ensure that no confidential or personal information is disclosed, with the usage of anonymization techniques. Outcomes of DMP initial Survey show diversity of the security measures foreseen by the participating project consortium partners (Figure 21).



Figure 21: What kind of data security measures do you expect shall be ensured by the outcomes of the project?



9. Other issues

No significant legal, contractual, or technical barriers to data sharing have been identified at this stage.

However, the project will continue to monitor any emerging issues related to data ownership, (intellectual property rights), licensing, or third-party rights, especially in the context of integrating external datasets.

Coordination among consortium partners will ensure alignment on data responsibilities and access rights. Any updates or changes to data management procedures will be documented in future versions of the DMP as the project evolves.

Whenever feasible, the PCP WISE project will make use of other national/funder/sectorial/departmental procedures for data management, like alignment with eGovernment, INSPIRE, Open Data and other data related initiatives.

After initial collection of related information across the consortium via DMP Survey, it is obvious data management measures are not fully established within the partners' infrastructures (Figure 24).



Figure 24: Do you have some data management established in your organisation?

At the same time it is promising, most of participating project partners are considering to establish data management within their organisations in future (Figure 25).

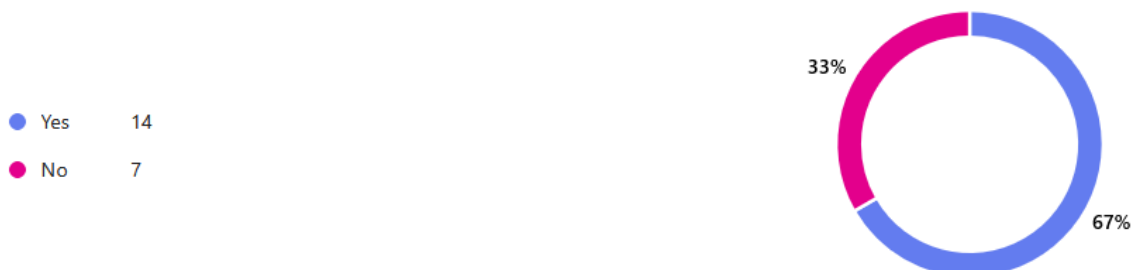


Figure 25: Will you consider having some data management established in future?



Final open request to participating project partners asking their recommendations and suggestions demonstrates the wide range of the topics to be addressed in the upcoming period.



Figure 26: Will you consider having some data management established in future?