PLANNING LAND USE STRATEGIES: MEETING BIODIVERSITY, CLIMATE AND SOCIAL OBJECTIVES IN A CHANGING WORLD

D7.2 – DATA MANAGEMENT PLAN

WORK PACKAGE 7, TASK T7.4

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List of Abbreviations

Term	Description
DMP	Data Management Plan
FAIR	Findable, Accessible, Interoperable, Reusable
GDPR	General Data Protection Regulation
EU	European Union
IPR	Intellectual Property Rights
APC	Article Processing Charges
DOI	Digital object identifier
ODC-PDDL	Open Data Commons Public Domain Dedication and License
CC0	Creative Commons Zero
DoA	Description of Action

Executive Summary

As a research project funded under the Horizon Europe programme of the European Commission, PLUS Change will follow all rules on Open Science, Open Research Data and Research. When research data are well organised, well stored, and accessible, their validity can be monitored at all times and the result is high-quality, efficient research and cost savings. The PLUS Change consortium aims to contribute to open science policy and practices by guaranteeing that research data is made findable, accessible, interoperable, and reusable (FAIR). This will be achieved through a project-specific Data Management Plan (DMP), which will ensure that research data used and generated within PLUS Change will be managed in a resilient and transparent way.

The purpose of this DMP is to provide an analysis of the main elements of the data management policy that will be applied with regard to all the datasets to be generated in PLUS Change including the process, methodology and policy on data generation/collection, handling, archiving/ preservation and data application.

This data management plan (DMP) is a Deliverable as part of Task 7.2 within Work Package 7. The DMP has been developed in close collaboration with project partners who provided information on their planned usage and generation of research data, along with their institutional policies on data management. The DMP will be updated throughout the project, to reflect emerging data management needs. A final DMP is an additional Deliverable in Task 7.2, due at the end of the project.

The project consortium has defined the expected used and generated data types and their description based on a questionnaire filled out by partners in coordination with WP leaders. This process of defining data types serves also as a process of identifying data management challenges, overlaps in data needs, and possible synergies in data needs across the project. In particular, it serves to foster cooperation between the research and practice partners in the consortium to match together data needs and availability of datasets and material held by the practice partners from their previous and ongoing work.

1 Introduction

1.1 Purpose & Scope

The data management plan of PLUS Change aims to regulate data throughout the entire project lifetime and beyond by setting rules and recommendations on how data should be made available in a FAIR manner, processed and stored. The data management relates to both the generation of data within the research network of PLUS Change, as well as the acquisition and processing of primary and secondary data from outside the PLUS Change internal research network.

1.2 Document Structure

The DMP follows a clear structure, providing a Data summary, including the datasets that PLUS Change plans to use (secondary data) and generate (primary data), their purpose, format, origin, expected size, utility and curation (Chapter 2). The Data summary is followed by individual sections on how the project plans to make data findable, accessible, interoperable and reusable (FAIR, Chapter 3). The DMP will also describe the allocation of resources for FAIR data management within the consortium during and beyond the project lifetime (Chapter 4), as well as the data security practices which guarantee that the necessary provisions are in place to preserve and curate research data (Chapter 5). Chapter 6 considers the ethical aspects of data sharing, including GDPR-compliance when personal data is concerned.

The DMP ends with concluding remarks on the data management strategy adopted by the project, and it outlines future updates and additions to the plan which are going to be presented at a later stage of the project's development.

1.3 DMP as living document

This document builds upon the initial version of the data management outline presented in section 1.2.8 of the PLUS Change Grant Agreement Annex 1 (Description of the Action), and includes information on the datasets and data-sharing practices that will be used and generated within PLUS Change. Since this deliverable is submitted at an early stage of the project (M6), it answers data management questions in a matter appropriate to this project stage. As the project progresses, it is possible that some data management information might not be listed in sufficient detail. The DMP is therefore considered a living document. The plan will iterate with T1.3 (Ethics, equity and justice in project activities and results) and will be updated in every consortium meeting to reflect evolving understandings and project needs. In M48, a final version of the DMP will be submitted (D7.3) Final Data Management Plan, which will capture all changes and updates occurred during the project.

Project partners can request changes to anything in this DMP to reflect their evolving data needs, use and management. To do so, they should send an email to the project management team at CZECHGLOBE: Julia Leventon and Vendula Kubuskova. For corrections and minor amendments, we will make these as soon as possible. More substantive changes will be discussed at the soonest possible executive committee or general assembly meeting.

2 Data Summary

2.1 Data Types and their Roles

PLUS Change is a transdisciplinary project that use and generates many different types of data across the various research tasks. This data is summarised in Table 1 (data generated) and Table 2 (data used). This data can be categorised in multiple ways (e.g. by type, source, use). We categorise it based on the 'level' of the project to match the project design. By organising this way, it helps to be explicit about the scales of relevance of data, and its interoperability across different research tasks in the project. The three levels of data are:

1. **Data across Europe (and beyond) -** A number of research tasks in the project seek to generate broad scale understandings relating to land use change. These include European-scale mapping of land use change over time (WP2), media analyses of value change (WP3), meta-analyses of governance and behaviour change mechanisms (WP3, WP4) and randomised controlled trials of behaviour change (WP5). These activities will generate spatial data, quantitative data of behaviour change, and qualitative data in the form of narratives.
2. **Data within the practice cases** – A significant focus of PLUS Change is on transdisciplinary knowledge creation with and for the practice cases. At this level, we will be identifying how land use change in the practice cases has been shaped over history (WP2), future land use scenarios (WP3), identifying pathways for change (WP4), and trialling approaches to enact those pathways (WP5). Across all these, data from level 1 will be pulled into local scale, creating a need for secondary spatial data sets for local-level depictions of land use change. In addition, qualitative data, diagrams, and artistic representations will be created through workshop processes in the practice cases. To support these, further qualitative data will be collected through interviews, questionnaires and document reviews.
3. **Data within the consortium and project** – throughout WP1, researchers are collecting data on the integration processes and outcomes of the PLUS Change project. Such data will include qualitative and quantitative data, collected through interviews, surveys and ethnography. The purpose will be to inform understandings of how collaborative research happens, how project processes shape project outcomes, and to improve understandings of ethics and epistemic justice in land use change.

In addition, while working at project levels 1 and 2, PLUS Change will use a broad range of secondary data, particularly spatial data. At level 1, this is earth observation data (mainly copernicus), socio-economic, soil and terrain characteristics and climate data. At level 2, this will include a multilevel Open Land Use database managed by Plan4All containing Earth observation data from Copernicus, land use and land cover from Urban Atlas, CORINE, LPIS and cadastral data. In addition, from across the practice cases in Level 2, there is likely to be a broad range of data and material held by practice partners that is of potential relevance to the project.

These data types are brought together in a range of tools and modelling techniques, including CLUMONDO modelling, Agent Based Modelling (using NetLogo) and through policy simulation.

Table 1. Data generated

Level	WP	Task (s)	Dataset name	Responsible person	Generated via/used method.	Language /s of data	Type of data	Size	Sensitive/ personal data	Delivery	Users	Open Access	Interoperability
Data across Europe (and beyond)	1	1.4.	Toolkit	P4All: Tomas Mildorf	Modelling, spatial analysis	English	GIS data, thematic maps, map compositions	Tens of map compositions, multiple reference datasets, several GBs in size	No	M48	Spatial planners, landscape planners, public authorities, decision makers	Yes	Yes
	2		Geospatially related data and information	SU: Anders Wästfelt, Vincenza Ferrara	Modelling, spatial analysis, fieldwork, literature review, data collection	English + national languages	GIS data, map products, metadata, statistics	Several GBs	No		Scientists, stakeholders	Depending on licencing of input data	Yes
	2	2.2.	Literature-based meta-analysis of case studies (case survey)	LEUPHANA: Jens Newig	Quantitative and qualitative coding	English	Qualitative and quantitative	Several hundred cases with around 100 variables	No		Scientists	Yes	
	3	3.2.	Policy drivers for land use change	KNOWLEDGE SRL: Andrea Bassi, Marco Guzzetti, Georg Pallaske	Literature review	English	Qualitative data	A Word file with a summary of the literature review and a spreadsheet with an overview of policies. No larger than 20 MB.	No	M17	Regional/local/national authorities, state institutions, universities, scientists, decision makers, land use managers	Yes	Yes
	3	3.4.	Descriptive land use scenarios for 2050 for EU regions	UL: Tadej Bevk	Aggregation of practice level scenarios	English	Qualitative	Unknown, up to 10 pages per scenario	No	M23	Practice partners, decision makers	Yes	Yes
	3	3.4 and 3.5	Geospatial data on scenarios	STICHTING VU: Nynke Schulp	Modelling	English	GIS data, maps, metadata / documentation	Depends on number of scenarios, indicators that can be made operational, regional subdivision	No	M30-38	Scientists, stakeholders	Yes	Yes
	4	4.4.	Meta-analysis of behavioural change interventions	CZECHGLOBE: Jan Urban	Data will be extracted from primary studies and meta-analyses	English	Quantitative data on effect sizes	Unknown, will be determined based on the systematic lit. review.	No	M32	Scientists and practitioners interested in behavioural change.	Yes	Yes
	4	4.4	Factors and measures that support land use innovations	BSC: Elina Dace	Literature review	English	Qualitative, quantitative, reports	Unknown, will be determined based on the systematic lit. review	Probably no	M32	Scientists, decision makers	Yes	Yes

			among land managers										
Data within the practice cases	2	2.1.	Geospatial data on land use history	STICHTING VU: Nynke Schulp	Modelling, spatial analysis	English	GIS data, maps, metadata / documentation	<10 maps at 0.1 km to NUTS2 resolution, documentation of ~10 pages	No	M18	Scientists, stakeholders	Yes	Yes
	2	2.2.	Land-use governance in 12 practice cases	LEUPHANA: Jens Newig	Document review, interviews, questionnaires	English, potentially local languages	Mostly qualitative	12 qualitative case accounts; approx. 35 interviews	No		Scientists, stakeholders	Yes	
	3	3.2.	Causal Loop Diagrams (CLDs)	KNOWLEDGE SRL: Andrea Bassi, Marco Guzzetti, Georg Pallaske	Generated using System Dynamics / Systems Thinking	English	Qualitative data	Depends on the documentation of the diagrams, typically Word file with 3-10 pages, depending on the level of detail at which CLDs are documented.	No	M18 (depending on inputs from other WPs)	Regional/local/national authorities, state institutions, universities, scientists, decision makers, land use managers	Yes	Yes
	4	4.1.	Political economies of land use changes	UKF: Peter Mederly, Simeon Vano	Document review, interviews, questionnaires	English, local (Slovak)	Qualitative data; semi-quantitative data	Unknown, will be determined based on the systematic lit. review	Partly (data generated from interviews as name, surname, address, location data, contact information)	M22	Regional/local authorities, other public institutions, decision makers, land use managers, scientists	Yes	Yes
	4	4.2.	Practice cases system diagrams	CRS: Paolo Campo and Piotr Magnuszewski	Data processing of other partners' outputs, literature, and policy reviews	English	Qualitative; digital	tentatively 13 diagrams for each practice and multiplier case	No	M30		Yes	Yes
	4	4.2.	Pathways of Change workshop outputs and outcomes	CRS: Paolo Campo and Piotr Magnuszewski	Video/audio recording and transcription	Local, English	Qualitative; audiovisual, visual and/or audio, reports	Tentatively 13 video/audio recordings and transcriptions	Maybe (same reason as T5.2)	Between M14-M32	Regional/local/national authorities, state institutions, universities, scientists, decision makers, land use managers	Yes	Yes
	4	4.3	Model code and outputs on behavioural change in to-be-specified case studies	STICHTING VU: Nynke Schulp	modelling	English	Model code if relevant in R / NetLogo / BBN tools, GIS data, maps, documentation	Unknown	No	M33	Scientists, stakeholders	Yes	Yes

	5	5.1.	Data from experiments	CZECHGLOBE: Jan Urban	Behavioural experiments	English	Quantitative	Several thousand observations	No	M44	Scientists interested in behavioural change	Yes	Yes
	5	5.2.		BSC: Elina Dace	Field work: interviews	Local, English	Qualitative	Small – transcript documents	Maybe. It is not in our research interest to gather sensitive data, but they may emerge in respondents' answers (name, surname, address, location data, contact information)	M45	Scientists, authorities, decision makers, land use managers	To be confirmed	
Data within the consortium and project	1	1.1.	Reflexive mutual learning transdisciplinary (TD) work	KLI: Marina Knickel and Guido Caniglia. CZECHGLOBE: Julia Leventon	Online survey (possibly run 2-3 times with one year interval throughout the project to generate longitudinal data), semi-structured interviews	English	Semi-quantitative longitudinal data, qualitative data	50-60 responses to 25-30 survey questions	Possibly, partly from the interviews (coded; name, role in a partner institution) and surveys (anonymized; possibly age, gender, disciplinary background, career stage)	If we collect longitudinal data, the full dataset will be complete by the end of the project, roughly M42-44. The initial part of the dataset might be complete around M15-16. Interviews could be carried out around M18-24	Universities, individual scientists working on TD research, funders (e.g. EC) and decision makers (e.g. regarding the insights on key leverages for successful TD projects)	Yes	Yes
	1	1.2.	Integrative approach and processes	KLI: Marina Knickel and Guido Caniglia. PURPLE: Vincent O'Connell. CZECHGLOBE: Julia Leventon	Interviews, focus groups, participatory observation, maybe some kind of auto-ethnography	English	Qualitative data	Possibly interviews with research and practice partners from each case (24 interviewees perhaps)	Possibly, partly (data generated from interviews; name, role in a partner institution)	Over the course of the project, e.g. M12-40	Universities, individual scientists working on TD research on sustainable land use change practices and	Yes	Yes

											policies, EC funders, local and regional authorities, project managers, land use managers		
	1	1.3.	Ethics for capacity-building	KLI: Marina Knickel and Guido Caniglia	Interviews, focus group, participatory observation, maybe some kind of auto-ethnography	English	Qualitative data	Possibly interviews with research and practice partners from each case (24 interviewees perhaps)	Possibly, partly (data generated from interviews; name, role in a partner institution, possibly also age, gender, disciplinary background, career stage)	Over the course of the project, e.g. M6-40	Universities: individual scientists working on TD research especially interested in the aspects of ethics, equity and justice; EC funders, local and regional authorities, project managers, land use managers interested in building networks and collaborative initiatives related to sustainable land use change practices and policies and in the aspects of ethics, equity and justice	Yes	Yes

Table 2. Data used

Level	WP	Task (s)	Name of dataset	Short description	Responsible person	Language/s of data	Type of data	Ownership	Access	Current location	Licence	Reuse requirements
Data across Europe (and beyond)	1		Not specified yet	We will use academic article databases for literature review. Some articles might be linked to datasets of our interest. We might also use grey literature (e.g. reports, working papers, public speeches)	KLI: Marina Knickel, Guido Caniglia	English	Qualitative data	Various, open access	Open, upon request			
	2		Land use change data	Geospatial data on recent land use, land cover and management changes	STICHTING VU: Nynke Schulp	English	Quantitative and Qualitative	Open / VU	Available in published studies and repositories	Mainly through environment algeography.nl	Open	Citing of the reference will be necessary
	3	3.2.	Policy drivers for land use change	Data used for this task is sourced from papers and reports. The literature review will inform the other WPs.	KNOWLEDGE SRL: Andrea Bassi, Marco Guzzetti, Georg Pallaske	English	Qualitative data, semi-quantitative data	Various, open access reports	Open	Multiple published and unpublished studies		MS Word
	4	4.4.	Primary studies (will be identified)	Data from primary studies and existing meta-analyses on behavioural change of individuals related to land use.	CZECHGLOBE: Jan Urban	English	Quantitative	Various	Available in published and unpublished studies	Multiple (published and unpublished studies)	Various	Citing of the reference will be necessary
	4	4.4.	Not specified yet	We shall use academic article databases (like Scopus) for literature review. It is possible that some articles are linked to datasets that are of our interest.		English						
	5	5.1.	Meta-analyses of behavioural change.	We will use existing meta-analyses on behavioural change to (a) design behavioural experiments; (b) to set priors in our models.	CZECHGLOBE: Jan Urban	English	Quantitative	Various	Available in published studies and as a result of T4.4	Multiple published and unpublished studies and T4.4	Various	Citing of the reference will be necessary

Data within the practice cases	1	1.4.	Map services and spatial data	Using existing open geospatial data such as OpenStreetMap, Open Land Use (OLU)	P4All: Tomas Mildorf	English	GIS Data	various	open	multiple	open licences such as ODbL, CC	given by the licence
	2		Geospatially related data & information	1) Primary geospatial data and information 2) Secondary geospatial data and information (e.g. published datasets) 3) Statistical data (both primary and secondary) 4) Geospatial related information (e.g. from literature review, metadata, other sources)	SU: Anders Wästfelt, Vincenza Ferrara	English + local languages of the countries covered by the case studies	Quantitative and Qualitative	Various	Available in published and unpublished studies, repositories, upon request.	Multiple	Various	Citing of the reference will be necessary
	4	4.1.	Maps and spatial data	Spatial information and data about the local case	UKF: Peter Mederly, Simeon Vano	English, local language (Slovak)	GIS Data, statistics	Various public bodies, research and other institutions	open, upon request	Involved practice cases (administration)	N/A	GIS tools
	4	4.1.	Stakehodler knowledge (experts, locals)	Information and data about land use changes, policies, etc.	UKF: Peter Mederly, Simeon Vano	English, local language (Slovak)	Qualitative data, semi-quantitative data	Stakeholders	N/A	N/A	N/A	MS word, MS excel
	4	4.1.	Publication, documents	Information and data about land use changes, policies, etc.	UKF: Peter Mederly, Simeon Vano	English, local language (Slovak)	Qualitative and quantitative data	Various public bodies	Open, upon request	Involved practice cases (administration)	N/A	MS word, MS excel
	4	4.2.	Geographic maps (to be specified)	Maps of countries, regions, or specific areas of interest. For grounding the narratives in the simulation	CRS: Łukasz Kowalski	English	GIS Data	Natural Earth; OpenStreetMap Foundation	Open	www.naturalearthdata.com ; openstreetmap.org	Natural Earth: CC0 (public domain) ; Open Street Map: Open Data Commons Open Database	

2.2 Key DMP Challenges in PLUS Change

The key challenges in DMP in PLUS Change relate to the integration between levels 1 and 2 of data within the project, particularly with regards to spatial data. At level 1, partners are modelling land use change at a European scale. But at level 2, partners need to explore more detailed, locally specific land use changes, while often drawing on similar data sources. This is therefore a challenge of matching the spatial, temporal, and thematic scale of spatial data, from multiple sources, and for multiple uses in the project. This challenge is being met by careful and comprehensive collection and registration of metadata for spatial data, and by cataloguing the sources and types of spatial data that we are using within the project. This is particularly relevant when building the PLUS Change toolkit (T1.4), and Plan4All are therefore undertaking this cataloguing process.

Further, while practice partners likely hold significant amounts of useful data from previous work, identifying who holds what, how it might fit to the project, how to access it, and how to work across multiple languages of such materials is a key challenge in PLUS Change. This challenge is being addressed through the ongoing, iterative integration in WP1 (Integration), and particularly in T1.2 (Integration INTO and FROM the practice cases). Here, the practice case lead (PURPLE) is coordinating closely with all practice cases and facilitating conversations with research partners to understand how their proposed data collection (as per table 1) matches to existing data, knowledge and materials of practice partners.

3 FAIR DATA

3.1 PLUS Change approach to FAIR Data

The research data used and processed in the PLUS Change project should be 'FAIR', that is findable, accessible, interoperable and re-usable.

PLUS Change will manage the data and tools generated based on the core principles of the open science movement aiming towards openness and transparency of research and its results. PLUS Change will (i) preregister all empirical studies, such as randomised controlled trials; (ii) produce open data, open materials, and open analytical tools, including meta data, spatial data, modelling scripts, anonymised trial data, and interview transcripts (where in accordance with ethics and confidentiality policies) (iii) make all outputs available as open (open source, open access); (v) involve all relevant knowledge actors (citizen engagement) in the co-creation of R&I agendas, through the 12 practice cases and multiplier cluster; (vi) educate team members, collaborators, and stakeholders about open science as a key task in WP1.

PLUS Change makes sure all stages are met by using open science repository **Zenodo**. Zenodo is a general-purpose open repository developed under the European OpenAIRE program and operated by CERN. It allows researchers to deposit research papers, data sets, research software, reports, and any other research related digital artefacts. For each submission, a persistent digital object identifier (DOI) is minted, which makes the stored items easily citeable. It is also possible to upload files to Zenodo and set an embargo date. PLUS Change has formed a ‘community’ on Zenodo to maintain a space to upload and share project data and metadata, as well as related papers and other outputs.

3.2 Making data findable, including provisions for metadata

All generated data will be accompanied by metadata. Metadata are standardised and structured dataset characteristics that explain the origin, purpose, time, geographic location, creator, terms of access, and terms of use of a data collection, to name a few. Metadata is commonly used to locate resources and to provide searchable information that helps users easily find existing data, and also as a bibliographic citation record. PLUS Change will guarantee data findability through the usage of both descriptive and structural metadata. Widely supported descriptive metadata standards have the clear advantage of being easily findable. In generating metadata, the project would aim to follow the unified metadata description standard. The datasets will use standard keywords enabling the re-use.

An exemplary structure of the minimum characteristics of metadata is proposed below:

- Author(s)
- Year
- Dataset Title
- Data Repository or Archive
- Global Persistent Identifier
- Version, or Subset, and/or Access Date
- Language
- Metadata language
- Licence of use
- Date of metadata creation
- Hierarchy level
- Character encoding
- Format version
- Keywords (if possible)
- Digital Object Identifier (DOI) (provided via upload to Zenodo)

In addition, for spatial data sets, to allow interoperability between project levels, as well as use beyond the project, the following metadata is proposed:

- Spatial scale, resolution, extent
- Temporal extent
- Coordinate reference system
- Thematic description / legend

Naming documents in a standardized, logical, and intuitive way enables team members and collaborators to discover and manage project datasets when needed. PLUS Change supports the sharing of information consortium-wide and therefore suggests a uniform naming convention for all project-generated datasets.

Datasets processed within PLUS Change should follow the uniform naming convention: [PLUS Change_dataset name_version_creation date], whereby data format should be YYYYMMDD. Where names need to be shortened due to software restrictions, the data set name will be shortened.

Example: PLUS Change_Political economies of land use changes_v.01_20231201.doc

Metadata will be uploaded to Zenodo regardless of whether or not the data itself is stored in Zenodo. If the dataset is not in Zenodo, the metadata will include the location of the dataset, or the information that it is restricted/confidential (see also section 3.2).

3.3 Making data openly accessible

PLUS Change members will aim to ensure open access to peer-reviewed scientific publications and all underlying datasets related to the project results and funded or co-funded by the project. We will use the PLUS Change community on Zenodo to meet the aim. Both the research paper and the underlying data have to be made available in open access as soon as possible after the paper has been published and no later than the end of the reporting period during which the paper was published. Partners will comply with the rule to deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in Zenodo.

As seen in Table 1., the majority of partners indicated that they would publish datasets in open access. In the few cases where open access will not be provided, partners have given an explanation why this is not possible. In case of questionnaires and interviews, the data will be anonymized before publishing/storing.

PLUS Change makes a commitment to also make qualitative data open access, acknowledging that open access in qualitative social science is less established than in quantitative practices. We will follow the principle of **'as open as possible, as closed as necessary'.** In particular, where possible while protecting any promised anonymity of participants, we will pseudonymise data. This process will ensure that future data users will be able to understand the relevance of the data, and any structural aspects (such as location, type of organisation, etc.). We will therefore remove the identifiers of people, organisations and locations, and replace them with e.g. "location 1" to allow for secondary analysis. We will follow the four principles of pseudonymisation: (1) keeping the table isolated from the dataset, that is, in separate files and/or folders; (2) deleting the table from any insecure media such as memory storage and systems; (3) enforcing strong access control policies to prevent unauthorised entities to access the table and (4) if the table is stored on a computer, encrypting it and implementing a tight key management and storage policy for the encryption.

The general principles for handling Knowledge and Intellectual Property Rights (IPR) within PLUS Change have been settled in the Grant Agreement and Consortium Agreement (CA). These principles are in line with Horizon Europe IPR recommendations. Background and foreground (results) will be clearly identified in detail within the consortium agreement and when applicable, granting of access rights will be clearly specified.

3.4 Making data interoperable

PLUS Change will ensure interoperability of its research data by using standard vocabularies, metadata, common file formats and access without need of specific software. In the internal data file filled by partners, there is a link and specification where and how the used dataset is reachable for others.

When uploaded to the repository should only be stored in a preferred file format that conform the international standards (based on the KNAW-DANS Preferred Formats overview, November

2015) to ensure future compatibility. These are some types of formats for long-term preservation of research data that we recommend being used in PLUS Change.

- Document (.txt; .pdf; .doc; .docx; .odt)
- Spreadsheet (.csv; xls; .xlsx; .ods)
- GIS shapefile (.shp + tables)
- GIS raster data (.geotif; .img)
- Database (.csv; .sql; .mdb; .accdb)
- Picture (.jpg; .tif; .png)
- Audio (.wav; mp3)
- Video (.avi; .mp4; .mov)

This facilitates recombination of the data with other datasets from different origins. By using flat text data files (e.g. csv) linked to machine-readable metadata (e.g. EML) and hosted in repositories that provide programmatic access (e.g. DRYAD), we ensure that they can be queried and read by any programming language, and without use of proprietary software.

3.5 Increase data re-use (through clarifying licences)

Data produced within PLUS Change will be licensed using the Open Data Commons Attribution License ODC-By. If they want to publish data associated with a journal article under a license that is different from the Open Data Commons Attribution License (ODC-By), authors should explicitly inform the Project Coordinator.

Other open data licenses are Creative Commons CC0 (also cited as “CC-Zero” or “CC-zero”) and the Open Data Commons Public Domain Dedication and License (ODC-PDDL). According to the CC0 license, “the person who associated a work with this deed has dedicated the work to the public domain by waiving all of his or her rights to the work worldwide under copyright law, including all related and neighbouring rights, to the extent allowed by law. You can copy, modify, distribute, and perform the work, even for commercial purposes, all without asking permission.” Publication of data under a non-attribution waiver such as CC0 avoids potential problems of ”attribution stacking” when data from several sources are aggregated for re-use, particularly if this re-use is undertaken automatically. In such cases, while there is no legal requirement to provide attribution to the data creators, the norms of academic citation best practice for fair use still apply, and those who re-use the data should reference the data source, as they would reference other research articles.

4 Allocation of resources

Managing data in a FAIR way is associated with various types of costs. They can be grouped into two main categories: 1) article processing charges (APC) for publishing data in open access journals; 2) fees for depositing data in global data repositories.

In the PLUS Change project, we have chosen Zenodo as our data repository, which is free of charge to authors to upload their data. In case of some costs created in the context of making data FAIR, each partner of PLUS Change will use their budget responsibly and prioritise open access publications. In case of uncleared cost by common generated data, the responsibility and costs will be discussed in the Executive or General meeting.

For APCs for publishing in open access journals, all collaborators acknowledge that project funds can only be used if the journal is fully open access. All partners commit to this principle, or to using other funding sources (e.g. overheads budgets), or to making use of the Open Access Europe platform for publishing.

In addition, sufficient resources have been allocated to WP7 leaders responsible for the Data Management Plan, so that updates of the deliverable are performed at least each year by the General meeting.

5 Data security

Data security is of high priority in PLUS Change, which is why partners replied to a series of questions concerning (i) data storage location, (ii) server location, (iii) back up procedures, (iv) data protection practices. Partners' replies can be summarised in the following way.

- The majority of partners store research data on their institutional servers, also using services such as Google Drive, and Teams/OneDrive.
- Two partners have servers that are based outside of the EU (in GB and CH). These partners have data security rules that are aligned to the EU.
- Partner have established back up procedures, with a frequency between once a day and once a month.
- Data protection is ensured in all partner institutions either via two-factor authentication method, password protection, local network access or folder encryption.

Overall, data security practices within the consortium are satisfactory. To maximise data security, the following recommendations are in place:

- Data will be stored and processed on each partner's own harddrives.
- To share data, partners will use trusted cloud services such as OneDrive with password protection.
- Partners are encouraged to have rigorous daily back up procedures in place.
- No personal or identifying data will be stored with response data. Such personal/identifying data will be kept in a separate, password protected location with access only for authorised members of the project team. It will not be shared between partners. Management will comply with GDPR.

6 Ethical aspects

The PLUS Change project involves human participants, as interviews, group discussions, workshops and focus group engagement are important part of the project and will be carried out throughout the project. In general, ethical standards and guidelines will be strictly applied. As pointed in the Ethics Review and DoA, PLUS Change is committed to good scientific conduct, governance and to valid legislation. We will follow the guidelines issued by the ALLEA, the European Code of Conduct for Research Integrity. There is a specific section of the project handbook (D7.1) on ethics, which outlines that CZECHGLOBE will obtain umbrella ethics clearance for the project as a whole, while all partners are expected to gain ethics clearance from their own review boards for their own work within the project.

When generating and processing personal data, all project partners follow the research practices and ethical guidelines applicable to the data concerned, in particular the EU GDPR. The starting point for data management practices is to safeguard the rights of research subjects.

All human participants in PLUS Change will receive information about the research (e.g., objectives, content, risks, benefits) prior to their participation and will be able to make an informed decision whether or not to participate in studies. A consent form and information sheet will be prepared for this purpose, relevant to the activity, and in the appropriate language for participants. The consent form will include information about the project, how the data will be used (only for research purposes), and a checklist indicating the types and/or uses of consented material.
This applies to:

- data retrieval
- data processing
- data storage
- data sharing

Where the data is intended to be open access, participants will be made aware of this fact, including the planned processes of anonymisation/pseudonymisation, and any potential risks to their identification. Ethics consent forms will be retained centrally by the project.

In all activities, data will be stored and managed in accordance with GDPR and taking additional account of any case-specific requirements. All recordings made in the project will be transcribed and the associated word document will be stored on a secure server (of the institution of the data collecting partner). Audio recordings will be stored for six months after the end of the project on a secure institution-level servers. Written outputs will be scanned in and stored on a secure institution-level servers and the original output will be destroyed.

PLUS Change consortium partners will ensure that the following requirements are met:

- Confirmation that data will be collected on a need to know basis only
- The guarantee of withdrawal rights and oblivion rights as made compulsory by the European court of justice in 2014
- Avoidance of merging data sets in order to prevent any unforeseen personal information disclosure
- Provision of detailed information on the procedures that will be implemented for data collection, processing, storage, protection, retention and destruction and confirmation that they comply with national and EU legislation.