



D1.3 – Data Management Plan v1

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Deliverable leader	Marko Laine (FMI)
Contributing partners	Anca Hienola (FMI)
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List of Abbreviations and Acronyms

Abbreviation	Meaning
CC	Climate Change
CDA	Climate Data Store
DMP	Data Management Plan
EU	European Union
EUCI	EU Classified Information
FAIR	Findable, Accessible, Interoperable, Re-usable
GDPR	General Data Protection Regulation
LCA	Life Cycle Assessment
LCC	Life Cycle Cost
WP	Work Package

Executive Summary

The purpose of this document is to present the Data Management Plan (DMP) that will be followed during RISKADAPT project to make data FAIR (findable, accessible, interoperable, and reusable). It provides guidance to the RISKADAPT project beneficiaries with regards to the collection, protection, storage, transfer, and analysis of digital and physical personal data subject to European and national legislations, as well as General Data Protection Regulation (GDPR) [2]. This DMP is a living document that will be regularly updated whenever new or additional relevant data is generated or collected. Specifically, this deliverable describes the datasets that will be collected or generated and how they will be managed during the project and beyond its completion. Moreover, the document presents how the “Findable, Accessible, Interoperable, Re-usable” (FAIR) principles, data security, and ethical aspects are addressed in the project.

The DMP is a living document, which will be kept updated during the whole lifetime of the project, since data generation and collection, and therefore data management, will be active in RISKADAP for a considerable time after the submission of its initial version. The datasets may also be altered due to converging factors, such as project maturity, legislative changes, etc.

1. Introduction

This deliverable is the Data Management Plan of the RISKADAPT project. The document has been prepared considering the guidelines available at the template “Horizon Europe, Data Management Plan Template” [1]. This deliverable is related to task T1.6 “Data Management Plan” of WP1 “Project Management”, presents the Data Management Plan that should be followed by the RISKADAPT consortium partners, and specifies details on procedures for data collection, storage, protection, retention, and transfer, as well as for destruction or re-use of collected data. The described policy reflects the current state of consortium agreements regarding data management and is consistent with those referring to the exploitation and protection of results. This is the first version of living DMP.

2. Project Summary

RISKADAPT will provide, in close cooperation with the end-users/other stakeholders, a novel, integrated, modular, interoperable, public, and free, customizable user-friendly platform (PRISKADAPT), to support systemic, risk-informed decisions regarding adaptation to Climate Change induced compound events at the asset level, focusing on the structural system. PRISKADAPT will explicitly model dependencies between infrastructures, which, inter alia, will provide a better understanding of the nexus between climate hazards and social vulnerabilities and resilience. Moreover, this project will identify gaps in data and propose ways to overcome them and advance the state of the art of asset level modelling through advanced climate science to predict Climate Change forcing on the structure of interest, structural analyses, customized to the specific structure of interest, that consider all major Climate Change induced load effects in tandem with material deterioration, novel probabilistic environmental Life Cycle Assessment (LCA) and Life Cycle Cost (LCC) of structural adaptation measures and a new model to assess climate risk that will combine technical risk assessment with assessment of social risks.

PRISKADAPT will provide values to a set of indicators for each asset of interest, quantifying primary parameters and impacts, in the form of a Model Information System (MIS) that will provide all required information for adaptation decisions. PRISKADAPT will be implemented in the case studies in the pilots that involve specific assets, however, it will permit customization with local values of parameters and data, so it can be applicable throughout Europe for Climate Change adaptation decisions involving assets of similar function, exposed to multiple climate hazards.

3. Data Collection and Generation

Detailed information on data collection and generation will be collected using the OpenAIRE ARGOS platform¹. ARGOS is the joint effort of OpenAIRE and EUDAT to deliver an open platform for Data Management Planning that addresses FAIR and Open best practices and assumes no barriers for its use and adoption².

As the data identification and collection activities are ongoing, the initial DMP can currently only provide an incomplete picture of the datasets that will be generated and collected during RISKADAPT project. We will regularly review all the data used and created within the project and establish the necessary steps to manage it in a FAIR manner. As a first step, the RISKADAPT DMP has been started in Argos and edit access to the system was given for each work package and task leader. In Argos, the partners in charge of data must specify the principles of data management for each data set. The second version of this DMP will contain the data set descriptions stored in Argos.

¹ <https://argos.openaire.eu/home>

² <https://argos.openaire.eu/splash/about/how-it-works.html>

As an example, we consider work package WP3 "Climate Data, CC Forcing, Multi-Hazard Modelling", and its task T3.1 "Climate data for hydrological analyses, wind and rain forcing and material degradation". Here the target of the study will be extreme value distributions of the relevant climatic variables and parameters that have been identified in WP2 "User Requirements, Architecture". For the present climate, the ERA5 reanalysis data and E-OBS in-situ data, both available from the Copernicus Climate Data Store (CDS), are extensively used. For reproducible and reusable results, full computer program scripts that are used to download and process Copernicus data are documented and stored in code repository with version control. Code releases are tagged and released using Zenodo and the code and document releases will have linkable DOI identifiers. The generated data sets that are delivered as products of the RISKADAPT project will be documented by the Argos system as a part of RISKADAPT DMP. Similarly, all project partners that deal with data will have to fill in detailed information on each data set, the relevant metadata and the repositories used for data storage. The information is validated before accepted into the DMP.

4. Making Data FAIR

The European Commission has produced guidelines to ensure that data created through research activities is Findable, Accessible, Interoperable and Reused referred to as FAIR data management. The following Sections will describe the general methodologies that the project will follow to ensure that data will be managed according to the recommended FAIR practices [5].

4.1 Making data findable

According to RISKADAPT's Grant Agreement 101093939 Sections 1.3, open science practices will be employed in RISKADAPT. All scientific papers will be published as "open access" papers following the "Gold" or the "Green" model. In addition, all publications (e.g. posters, newsletter, etc) and deliverables that are intended for the general public will be stored in the website and made searchable. When necessary, preprints of the accepted scientific articles will be made available. In addition, all publications and deliverables that are intended for the general public will be stored in the website and made searchable. Moreover, a Zenodo.org community will be setup for openly sharing project data, including research outputs, such as datasets for allowing others to build on our work.

4.2 Making data openly accessible

According to FAIR principles, data should be as open as possible and as closed as necessary; open to enable re-usability and to accelerate research, but at the same time closed as needed to protect privacy and confidentiality of the involved individuals and parties.

Publications and public deliverables will be made openly accessible through dissemination and communication activities. At the time of writing, the channels identified for making scientific publications openly are the following: (a) RISKADAPT website; (b) social media and professional networks; (c) promotional material; (d) videos; (e) press releases and announcements; (f) events (physical and virtual); (g) traditional media and (h) other channels.

More specifically, the project deliverables will be accessible to the authorised partners through the project common online collaborative tool. Moreover, the deliverables that have a public dissemination level, once approved by the European Commission, will be publicly accessible on <https://cordis.europa.eu/projects/> and on the RISKADAPT website.

4.3 Making data interoperable

According to FAIR principles, data produced in the project should be interoperable, to allow data exchange and re-use. In accordance with this principle, the interoperability of all datasets that will be created during the project will be ensured by using an open-standard file format, such as JSON.

More specifically, by depositing the project datasets in a data repository compliant with the appropriate interoperability guidelines and by providing a sufficient metadata description of datasets, RISKADAPT will ensure that the research data produced during the project meet the required interoperability standards. Especially as regards the datasets that will be openly available at Zenodo, their interoperability will be achieved using Zenodo's metadata format, i.e., JSON-format according to a defined JSON schema (<https://about.zenodo.org/policies/>).

4.4 Making data re-usable

Re-usability is related to the ease of using data for legitimate scientific research by one or more communities of research (consumer communities) that is produced by other communities of research (producer communities). Data re-usability allows the reanalysis of evidence, reproduction, and verification of results, minimizing duplication of effort, and building on the work of others. It has four main dimensions: policy, legal, economic, and technological. The decision of potential open sharing the data and metadata used/produced by RISKADAPT is going to be defined later-on during the project when the overall system architecture is close to be finalized. The latter is going to be reported within the updated Data Management Plan report.

5. Data Security

Data Security characteristics relevant to the project can be managed in accordance with the security procedures identified by the European Commission and related authorities at European and National levels. The RISKADAPT project will not use as background input to produce as a result 'EU classified information' (EUCI).

Each Partner must ensure the proper handling of data including data collection, processing, storage, transfer, destruction, and re-use. This part also includes ensuring that informed consent(s) have been obtained, when human participants are involved, and that the transfer of data is subject to appropriate safeguards. Partners will ensure that any electronic storage of material is at least password protected. Moreover, the protection of personal data will be ensured by the implementation of appropriate pseudonymisation and anonymisation techniques when necessary.

6. Ethical Aspects

All the personal data collected in the project will be processed under the EU's Data Protection laws, where the main legislation is the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC, also known as the 'General Data Protection Regulation' (GDPR), which entered into force on 25 May 2018. The consortium partners have revised the Data Management Plan to ensure compliance with the General Data Protection Regulation (GDPR) that came into effect in May 2018. Article 5 of the GDPR defines the main principles relating to processing of personal data as follows: (a) lawfulness, fairness, and transparency; (b) purpose limitation; (c) data minimisation; (d) accuracy; (e) storage limitation; (f) integrity and confidentiality and; (g) accountability.

In compliance with the above GDPR principles, personal data are processed in a lawful, fair and transparent manner in relation to the involved subjects. Data subjects will receive detailed information in an easy-to-understand way regarding their personal data that will be processed, the purposes of this processing, and the envisaged period for which they will be stored. Moreover, personal data will

be collected only for specified, explicit and legitimate purposes, i.e. research and statistical, and will not be processed further in a way incompatible with those purposes. In accordance with the ‘data minimisation’ principle, collected personal data will be adequate, relevant, and limited only to what is necessary in relation to the purposes for which they are processed, as described in Section 3.2.

In accordance with Article 6 of the GDPR regarding the lawfulness of processing, data subjects will be asked to give consent to the processing of their personal data for the purposes that will be clearly explained to them.

Article 7 of the GDPR defines the conditions for consent and states that the data subject has the right to withdraw his/her consent at any time, and that this should be as easy as to give consent. Participants will be informed before giving their consent about their right to opt out at any time and information about how they can revoke their consent will also be written in the consent form.

In compliance with Article 12 of the GDPR, participants will be provided with all necessary information relating to their personal data that will be processed in a concise, transparent, intelligible, and easily accessible form, using clear and plain language. The information will be provided in writing, or by other means, including, where appropriate, by electronic means. When requested by the participant, the information may be provided orally, provided that the identity of the data subject is proven by other means.

Article 15 of the GDPR defines the right of access by the data subject. Participants will be informed about their right to access their personal data that are processed.

In compliance with Article 17 of the GDPR regarding the “right to be forgotten”, participants will be informed about their right to obtain the erasure of their personal data without undue delay, and upon any participant’s request, the respective content will be erased from the system within up to five working days.

Article 32 of the GDPR defines the requirements regarding security of processing of personal data, including among others pseudonymisation and encryption of personal data, confidentiality, integrity, availability, and resilience of the system.

As explained, the DMP is a living document that will be kept updated during the whole lifetime of the project, since data generation and collection, and therefore data management, will be active in RISKADAPT for a considerable time after the submission of the initial version of the Data Management Plan. Whenever necessary this part of the deliverable will be updated accordingly.

7. Conclusions

This deliverable describes RISKADAPT’s Data Management Plan and specifies the datasets that are collected or generated and how they are managed during the project and after its completion. The document also describes how the FAIR principles are applied to the project and presents how data security requirements and ethical principles are met, referring also to how the compliance with the GDPR is achieved. The Data Management Plan is a living document and will be updated during the project’s lifetime.

References

- [1] Horizon Europe, Data Management Plan Template, Version 1.0, 05 May 2021 [Online] [Cited: 2023-02-27] <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/reference-documents;programCode=HORIZON>
- [2] European Parliament. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC . *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC*. [Online] 2016. [Cited: 2023-03-29.] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R0679-20160504&qid=1532348683434>.
- [3] Open Aire Research Data Management Briefing paper: Open Aire; 2017 [Available from: <https://www.openaire.eu/briefpaper-rdm-infonoads>
- [4] E. Papadopoulou, A. Bardi, G. Kakaletis, D. Tziotziou, P. Manghi, and N. Manola. Data management plans and linked open data: exploiting machine actionable data management plans through open science graphs. In Workshop on Research Data Management for Linked Open Science, 2022. doi: 10.4126/FRL01- 006423283. <https://repository.publisso.de/resource/frl:6423283>
- [5] Wilkinson, M., Dumontier, M., Aalbersberg, I., et al.: The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data*. 3, 2016, Vol. 160018. doi: 10.1038/sdata.2016.18.