PYRAGRAF

D.1.2 Data Management Plan

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Lead Beneficiary: IPP

Date: December 2023

Document sheet

Project acronym	PYRAGRAF
Full title	Decentralized pyrolytic conversion of agriculture and forestry wastes towards local circular value chains and sustainability
Grant agreement number	101114608
Deliverable number	D1.2
Deliverable name	Data Management Plan
Lead beneficiary	IPP
WP	1
Related task(s)	T1.3
Type	Report
Delivery date	06.12.2023
Main author	Bruna Rijo (IPP), Catarina Nobre (IPP), Paulo Brito (IPP)
Dissemination level	PU

Document history

Version	Date	Changes	Reviewer/ contributor
V1 – first draft	13.11.2023	Document creation	Bruna Rijo/IPP
V1 – reviews	20.11.2023	Reviews	Paulo Brito/IPP
Final version	06.12.2023	Proof reading and editing	Catarina Nobre/IPP

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Executive summary

The management of data collected or produced in the "PYRAGRAF – Decentralized pyrolytic conversion of agriculture and forestry wastes towards local circular value chains and sustainability" project, will play a critical role in ensuring the effective storage and exchange of information among partners, as well as dissemination to the public domain. In this context, it is essential to create and implement a Data Management Plan (DMP) that outlines guidelines for managing, preserving, securing, and archiving project-related datasets, publications, and other general information. This DMP should also include strategies for metadata development and use, ensuring that information is easily accessible, interoperable, and reusable following the FAIR (Findable, Accessible, Interoperable, and Reusable) principles. As such, internal partners and external actors will be able to easily find, access, and use the information produced by the project.

This document presents how data will be handled in the context of PYRAGRAF with as much detail as possible at the start of the project. The DMP for PYRAGRAF is created using the template provided by the European Commission (EC) and will be periodically updated in alignment with project reporting and evaluation.

Table of Contents

1. Introduction

This deliverable (D1.2) describes the initial Data Management Plan (DMP) for project "PYRAGRAF – Decentralized pyrolytic conversion of agriculture and forestry wastes towards local circular value chains and sustainability", as defined in task T1.3 of work package (WP) 1 (Project coordination, management, and quality assurance). The DMP will be created and periodically reformulated as required, to define how the data produced and used by the project is identified, organized, exploited, stored, and disseminated, considering any restrictions regarding public use and protection by intellectual rights.

A data management strategy is essential for favorable communication and dissemination of project results among partners, external stakeholders, and the public. Therefore, this DMP will define a methodology based on the FAIR (findable, accessible, interoperable, and reusable) principle, which includes:

- The use of open-access data formats for the dissemination of results and other relevant information.

- The application of open-access licenses to make data accessible, conservation and preservation strategies to increase the lifespan of data, and ethical issues about data generation.

This document can be updated whenever necessary to include new practices during the progress of the project.

2. Data summary

The data produced in PYRAGRAF will be treated according to the FAIR principles (Findable, Accessible, Interoperable, and Reusable), and comply with the EU General Data Protection Regulation (GDPR). In line with these principles and regulations, the following topics will be covered and implemented in PYRAGRAF:

- Types of data and research outputs: numerical values, graphics and eventual text documents obtained from the experiments and process simulations will be provided. This information may include operational parameters and pertinent results obtained from the different processes.

- Findability of data and research outputs: certified repositories (e.g., https://zenodo.org/) will be used to deposit research data, with the generation of digital object identifiers to facilitate permanent access to them.

- Accessibility of data and research outputs: eligible information that is introduced in the repositories will be available for open access use, under the terms defined in applicable licenses.

- Partners may give access to data used for publications in peer-reviewed journals while taking into consideration the contractual obligations to their industrial partners and related licenses.

- Interoperability of data and research outputs: datasets will be provided in formats that can be visualized with free software, such as the open document format, portable document format, and conventional picture formats (e.g., JPG or PNG).

- Reusability of data and research outputs: open access to the data introduced in repositories will be ruled by the application of licenses such as those defined by Creative Commons (e.g., CC-BY) and Open Data Commons (e.g., ODC-BY), guaranteeing more liberating access.

A starting Intellectual Property Rights (IPR) strategy will be produced in line with the Consortium Agreement (CA). The partners will adopt a proactive policy pursuing all possible patents and licensing opportunities arising from PYRAGRAF.

3. FAIR data

The PYRAGRAF project will generate FAIR data, i.e., data that is findable, accessible, interoperable, and reusable for external purposes. FAIR data efforts will consider data privacy requirements, and personal data must be treated confidentially and in accordance with Regulation (EU) 2016/679 on general EU data protection.

3.1 Making data findable, including provisions for metadata

In PYRAGRAF, metadata will be used to make the data findable. All consortium partners will provide relevant metadata and keywords so that their data is easily discoverable. Metadata of deposited data must be open under a Creative Common Public Domain Dedication (CC 0) or equivalent (to the extent legitimate interests or constraints are safeguarded), in line with the FAIR principles and provide information at least about the following: datasets (description, date of deposit, author(s), venue and embargo); Horizon Europe or Euratom funding; grant project name, acronym and number; licensing terms; persistent identifiers for the dataset, the authors involved in the action, and, if possible, for their organizations and the grant. Where applicable, the metadata must include persistent identifiers for related publications and other research outputs. Certified repositories (e.g., https://zenodo.org/) will be used to deposit research data, with the generation of digital object identifiers to facilitate permanent access to them.
PYRAGRAF will use an internal repository in MS Sharepoint as a fundamental tool for collecting, processing, sharing, and making all data available and accessible for all partners, such as meeting minutes, presentations or results.

3.2 Making data accessible

The public data produced in PYRAGRAF will be accessible through the EOSC, the European Open Science Cloud (www.eosc-portal.eu). Pertinent datasets eligible to be publicly available will be deposited in trusted repositories under an open access regime and submitted to liberated licenses such as those defined by Creative Commons (https://creativecommons.org/). Such datasets may be used to validate conclusions achieved in different scientific publications that will be written as outputs of the project.
The consortium partners will identify which data will be made openly available and which data cannot be shared (or should be shared with restrictions). Data that may be subjected to restricted access includes, for example, private information provided during any surveys of stakeholders and local communities, or scientific and technological results that fall within the realm of IP (patents).

3.3 Making data interoperable

Interoperability of data and research outputs will be provided in formats that can be visualized with free software, such as the open document format, portable document format, and conventional picture formats (e.g., JPG or PNG). Provisions will be made to make the data interoperable, facilitating their exchange and reuse between research institutions, organizations, and other entities. Furthermore, efforts will be made to keep the data produced by PYRAGRAF accessible to the public.

3.4 Increase data re-use

Open access to the data entered to the repositories will be governed by the application of licenses such as those defined by Creative Commons (e.g., CC-BY) and Open Data Commons (e.g., ODC-BY), guaranteeing a "freer" access to the reuse of data and research results.
The reproducibility of results presented in datasets (ZENODO, Creative Commons and Open Data Commons) could be ensured by providing the relevant conditions in which they were obtained, and by presenting additional statistical indicators (e.g., average, and standard deviation) to minimize the occurrence of significant errors.

4. Allocation of resources

The costs for data collection and storage fall within the activities covered by the current grant. Responsibility for managing the data underlying PYRAGRAF activities will lie with the partners leading the work packages and the authors of the individual research studies or deliverables. The ZENODO data repository is funded by the European Commission through the Open Aire projects and therefore does not bear the costs associated with long-term storage and preservation of data after the end of the project. Other repositories selected in the context of the project that require additional costs will be paid for using the budgets of the specific partners. All budgets will be used in accordance with the conditions of the grant agreement (GA)established for PYRAGRAF.

5. Data security

- During the implementation of PYRAGRAF, the partners will collect data in various forms, e.g., pen and paper, photos, videos, electronic documents. For project documentation this data will be stored individually by each partner and, as such, the respective organizational rules, and regulations of each partner with respect to data storage and security will apply.

- Personal contact data collected during the project activities will be kept internally within the consortium. Storing of personal data will only occur with explicit prior informed consent of subjects. Each partner is responsible to ensure that those data are safely and securely stored, in full compliance with EU's data protection laws. Any collected personal data will be deleted from the project's data storage five years after the end of the project.

- As far as ZENODO is concerned, its data centers are located on the premises of CERN and all access is restricted to a limited number of employees with appropriate training and who are granted access in accordance with their professional functions. Servers are managed in accordance with the CERN Security Base for Servers. CERN Security Team

runs host-based intrusion detection systems and network and monitors traffic flow, pattern and content to and from CERN networks for detect attacks. All access to zenodo.org takes place over HTTPS, except for static documentation pages that are hosted on GitHub pages. ZENODO stores user passwords using strong cryptographic algorithms. User access tokens to GitHub and ORCID are stored encrypted and can only be decrypted with the application's secret key.

6. Ethics

In PYRAGRAF, all members of the consortium will make sure that the data collected is stored and used efficiently and effectively throughout the project.

If inquiries are made of stakeholders and other local communities, for example, informed consent will be provided on the use of private information (if provided). All personal data collected in the context of PYRAGRAF (e.g., requests for information, dissemination activities and contact information) will be processed in accordance with the EU General Data Protection Regulation 2016/679 and other related national legislation that may exist (in non-EU country, in this case Turkey). IPP, as project coordinator, will ensure that data protection principles are properly followed and implemented.

7. Conclusions

This deliverable describes the initial data management procedures to be adopted in PYRAGRAF. Various topics related to the DMP have been covered, such as the types of data to be reused or collected, procedures to ensure compliance with the FAIR principles in the project, strategies for managing data security and privacy, and ethics. Actions will be implemented to give immediate open access, in repositories such as ZENODO, Creative Commons and Open Data Commons, to all the research results generated during the project that can be made public. The DMP is a document that is expected to be reformulated as progress is made and as specific issues related to data management evolve during the project.