Project Number: 1567

Project Acronym: ISFERALDA

Project title: Improving Soil FERtility in Arid and semi-arid regions using Local organic DAte palm residues

D6-1 DATA MANAGEMENT PLAN

1. Data Summary

The ISFERALDA project aims to increase resilience of agroecosystems to climate change while ensuring comparable or higher incomes to local farmers in semi-arid and arid areas. This goal will be pursued by developing innovative farming systems that will generate income and create employment, having regard to environmental parameters (especially soil and water).

The project aims at valorising organic wastes by developing organic and mineral amendments based on local agriculture residues, more specifically date palm residues. Based on laboratory and field investigations, the influence of this amendment on environment, yield, and socio-economic development will be assessed.

To achieve these objectives, a lot of data will be collected and acquired throughout the duration of the project. Information relating to farms and agricultural practices will be collected in the form of agricultural surveys. The surveys require the interview of human beings, and in particular of farmers. Before each interview, participants should read and agree to an informed consent form and detailed information sheets written in Arabic. Each participant will be explained the objectives of the study, the methods used and the nature of their participation. They will have to be voluntary and will obviously have the possibility of not participating in the surveys. If they agree, they will have to sign the informed consent form and the information sheets. Analyses made from the data collected will be anonymous. The names of those interviewed will never be disclosed to the general public or in the project. The data analysis will be general, the goal is to know the major trends that will emerge.

Many data will be collected during laboratory and field experiments. These data will be data related to the organic amendments developed in this project and to the soils of the experimental sites studied. On organic amendments, characterization and quality control data will be gathered. On soils, chemical, physical and microbiological data will be collected. Agronomic data, such as yields, will also be collected.

All the data collected during the project can be reused if necessary if they can be useful for some other research projects or studies.

The data will be the property of the project throughout the duration of the project.

2. FAIR data

2. 1. Making data findable, including provisions for metadata

Produced data in ISFERALDA project will be stored in shared spaces accessible from the website, via an intranet.

The version numbers of each updated document will be clearly written. In the documents concerned, a table, called "History of changes", at the end of the file will indicate the date of update and the corresponding version number.

To our knowledge, there is no metadata naming conventions for environmental research. Therefore, a file with metadata, we will create, will have to be filled in before uploading the data into the shared space. The metadata will include: the data type (dataset, survey,…), the organization that owns the data, the contact person in this organization, the acquisition date, information about the

study site, which WP and tasks the data concerns, information on the study support (soil, organic amendment, people), a short description of the data present in the dataset, the method used to acquire this data, the units of measurements, the coordinate system in case of georeferenced data. This list will be supplemented as and when required.

A unique staff of the ISFERALDA project, whose mission will be to manage data, will integrate this metadata and upload the dataset in the shared space.

Keywords in the metadata will be provided to optimize possibilities to search and to reuse data.

2.2. Making data openly accessible

Almost all the data of ISFERALDA project will be shared. Somme information of the dataset will not be shared notably the personal information from agricultural surveys for legal restrictions.

The data will be stored and backed up on the project specific NAS (Networked Attached Storage). Some data may be temporarily stored on an external drive before ISFERALDA staff transfers the data to the ISFERALDA project NAS.

The data will be stored and backed up for 3 years after the end of the project (until 06/2027).

In addition, the metadata will be deposited, preserved and backed up, according to the configuration described in the DMP.

For reasons of convenience, the data will be deposited on an Office 365 Teams interface as soon as the data will be ready.

To access the data, a message to the person in charge of data management will be required. In connection with the PC, the verified data and their metadata can then be provided to the requester. The identity of the person making the request will be requested but cannot be verified. This identity will be based on trust.

2.3. Making data interoperable

The data produced in ISFERALDA project will be interoperable between researchers, institutions, organisations and countries thanks to the metadata we will ask for each data produced in the project. The metadata will allow the users to know all the information needed to analyse the dataset. The list of metadata will be updated whenever necessary throughout the project. If a metadata is missing, ISFERALDA staff will ask the owner of the dataset to fill in properly the metadata file. Thanks to this metadata, datasets of different origins can be used and compared with each other.

Data and metadata vocabularies, standards or methodologies will be harmonized among all project partners so that understanding of the data files is facilitated for all users.

As, to our knowledge, there is no metadata naming convention for environmental research, the choice of vocabulary that can be used will be present in a list that will be established at the beginning of the project. The metadata and datasets will have to be filled according to this list. To facilitate inter-disciplinary and interoperability, ISFERALDA staff will harmonize and validate metadata files and datasets before making them available to users.

2.4. Increase data re-use (through clarifying licences)

The data will not be open at first, the time for the owners to publish the results from this collected data. The time for this embargo is still not known, but data will be open as soon as possible to promote the re-use of this data.

the data produced in the project will be useable by third parties, after the end of the project.

All data processed and deposited must be kept for 3 years after the end of the project. The PC will be responsible for any action related to the data reservation. This reservation will be possible thanks to the maintenance of the data deposit tool developed at the start of the project and by updating the ISFERALDA DMP. ISFERALDA DMP will be updated whenever necessary.

The data will be kept on the research data repository.

The data quality assurance will be described in the experimental protocols (deliverable 5-1).

3. Allocation of resources

Costs for making data FAIR in ISFERALDA project are not yet fully known. They include a part of the monitoring of the website and part of the salary of a staff recruited in the project. Indeed, a staff recruited within the framework of the project will in particular be responsible for data management in ISFERALDA project. The costs foreseen on this date are included in the financial package of the project.

Resources for long term preservation are discussed. The recruited person will no longer be there at the end of the project or the data management will no longer correspond to his mission. At this date, after the end of the project, the project coordinator will manage data three years after the end of the project. This duration corresponds to the duration of the online publication of the project website (3 years of project + 3 years after the project). For the website, maintenance is planned and budgeted for a period of 6 years from the start of the project.

4. Data security

The servers on which the project data is located are located only in the URCA datacentres. There are two of them, redundant with each other, located on different geographical sites. There is a disaster recovery plan and an associated data continuity plan on these infrastructures. Data backups stored on these platforms are daily and make it possible to secure the data over a year. URCA data is protected by security systems and accessible only through passage through one or more firewalls. Transfers are encrypted between zones with different ranges. A VPN is made available for any connection or data transfer between the URCA and a workstation located outside the university network.

5. Ethical aspects

The agricultural surveys require the interview of human beings, and in particular of farmers. Before each interview, participants should read and agree to an informed consent form and detailed information sheets written in Arabic. Each participant will be explained the objectives of the study, the methods used and the nature of their participation. They will have to be voluntary and will obviously have the possibility of not participating in the surveys. If they agree, they will have to sign the informed consent form and the information sheets.

The shared papers will be anonymous. The names of those interviewed will never be disclosed, personal data will be deleted from shared inquiries.

The operators of the ISFERALDA website take the protection of personal data very seriously. Personal data are all data that can be related to someone personally, such as name, phone number, email address, address and user behaviour. When someone will contact us by electronic mail or via a

contact form, the personal data given will be stored by ISFERALDA staff in charge of data management to answer your questions. Personal data will be deleted as soon as storage is no longer necessary or as soon as the data processing is completed, if there are legal obligations for temporary storage. The data will be kept if legal obligations require it.

6. Other issues

No national/funder/sectorial/departmental procedures for data management will be used in ISFERALDA project.

7. Further support in developing your DMP

The development and updating of the DMP will be carried out during the project. The various existing tools and the experience of the first uses of the data will help to improve this first version.

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SUMMARY TABLE 1

FAIR Data Management at a glance: issues to cover in your Horizon 2020 DMP

This table provides a summary of the Data Management Plan (DMP) issues to be addressed, as outlined above.

DMP component	Issues to be addressed
1. Data summary	• State the purpose of the data collection/generation: increase resilience of agroecosystems to climate change while ensuring comparable or higher incomes to local farmers in semi-arid and arid areas • Explain the relation to the objectives of the project: developing innovative farming systems that will generate income and create employment, having regard to environmental parameters (especially soil and water) • Specify the types and formats of data generated/collected: Information relating to farms and agricultural practices will be collected in the form of agricultural surveys. Data collected during laboratory and field experiments. • Specify if existing data is being re-used (if any): no • Specify the origin of the data: Surveys and analyses • State the expected size of the data (if known): unknown for the moment • Outline the data utility: to whom will it be useful: stakeholders interested in the project
2. FAIR Data 2.1. Making data findable, including provisions for metadata	• Outline the identifiability of data and refer to standard identification mechanism. Do you make use of persistent and unique identifiers such as Digital Object Identifiers? No • Outline naming conventions used: To our knowledge, there is no metadata naming conventions for environmental research • Outline the approach towards search keyword: Keywords in the metadata will be provided to optimize possibilities to search and to reuse data • Outline the approach for clear versioning: The version numbers of each updated document will be clearly written. In the documents concerned, a table, called "History of changes", at the end of the file will indicate the date of update and the corresponding version number

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- Specify standards for metadata creation (if any). If there are no standards in your discipline describe what type of metadata will be created and how: The metadata will include: the data type (dataset, survey,…), the organization that owns the data, the contact person in this organization, the acquisition date, information about the study site, which WP and tasks the data concerns, information on the study support (soil, organic amendment, people), a short description of the data present in the dataset, the method used to acquire this data, the units of measurements, the coordinate system in case of georeferenced data. This list will be supplemented as and when required.

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<td>2.2 Making data openly accessible</td>
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- Specify which data will be made openly available? If some data is kept closed provide rationale for doing so: Almost all the data of ISFERALDA project will be shared. Somme information of the dataset will not be shared notably the personal information from agricultural surveys for legal restrictions

- Specify how the data will be made available: see below

- Specify what methods or software tools are needed to access the data? Is documentation about the software needed to access the data included? Is it possible to include the relevant software (e.g. in open source code)? the data will be deposited on an Office 365 Teams interface. To access the data, a message to the person in charge of data management will be required. In connection with the PC, the verified data and their metadata can then be provided to the requester. The identity of the person making the request will be requested but cannot be verified. This identity will be based on trust.

- Specify where the data and associated metadata, documentation and code are deposited: The data will be stored and backed up on the project specific NAS (Networked Attached Storage)

- Specify how access will be provided in case there are any restrictions: data won't be accessible if there are restrictions

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<td>2.3. Making data interoperable</td>
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- Assess the interoperability of your data. Specify what data and metadata vocabularies, standards or methodologies you will follow to facilitate interoperability. interoperability between researchers, institutions, organisations and countries thanks to the metadata we will ask for each data produced in the project. The metadata will allow the users to know all the information needed to analyse the dataset. The list of metadata will be updated whenever necessary throughout the project

- Specify whether you will be using standard vocabulary for all data types present in your data set, to allow inter-disciplinary interoperability? If not, will you provide mapping to more commonly used ontologies? Data and metadata vocabularies, standards or methodologies will be harmonized among all project

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	partners so that understanding of the data files is facilitated for all users
2.4. Increase data re-use (through clarifying licences)	• Specify how the data will be licenced to permit the widest reuse possible. The data will be open as soon as possible.
	• Specify when the data will be made available for re-use. If applicable, specify why and for what period a data embargo is needed. The data will not be open at first, the time for the owners to publish the results from this collected data. The time for this embargo is still not known, but data will be open as soon as possible to promote the re-use of this data
	• Specify whether the data produced and/or used in the project is useable by third parties, in particular after the end of the project? If the re-use of some data is restricted, explain why. All data processed and deposited must be kept for 3 years after the end of the project. The PC will be responsible for any action related to the data reservation.
	• Describe data quality assurance processes. The data quality assurance will be described in the experimental protocols
	• Specify the length of time for which the data will remain re-usable. 3 years
3. Allocation of resources	• Estimate the costs for making your data FAIR. Describe how you intend to cover these costs: not known yet
	• Clearly identify responsibilities for data management in your project: a staff recruited within the framework of the project will in particular be responsible for data management
	• Describe costs and potential value of long term preservation: The recruited person will no longer be there at the end of the project or the data management will no longer correspond to his mission. At this date, after the end of the project, the project coordinator will manage data three years after the end of the project. This duration corresponds to the duration of the online publication of the project website (3 years of project + 3 years after the project). For the website, maintenance is planned and budgeted for a period of 6 years from the start of the project.
4. Data security	• Address data recovery as well as secure storage and transfer of sensitive data: The servers on which the project data is located are located only in the URCA data centres. There are two of them, redundant with each other, located on different geographical sites. There is a disaster recovery plan and an associated data continuity plan on these infrastructures.
5. Ethical aspects	• To be covered in the context of the ethics review, ethics section of DoA and ethics deliverables. Include

	references and related technical aspects if not covered by the former:
6. Other	• Refer to other national/funder/sectorial/departmental procedures for data management that you are using (if any): No national/funder/sectorial/departmental procedures for data management will be used in ISFERALDA project

HISTORY OF CHANGES		
Version	**Publication date**	**Change**
1.0	09/06/2021	▪ Initial version