FERTIMANURE

Deliverable

Project Acronym: FERTIMANURE

Project full name: Innovative nutrient recovery from secondary sources – Production of high-added value FERTIlisers from animal MANURE

Grant Agreement No. 862849

D8.6 – Final Data management plan

Project start date	January 1st, 2020
Duration in months	54
Deliverable due date	30/06/2024
Actual submission date	30/06/2024
Work package concerned	8
Author	Anna Rovira, Laia Llenas, Nagore Guerra.
Contributor	UVIC.

FERTIMANURE

Document History

Date	Author	Action	Status
01/06/2024	Anna Rovira	1st draft revision	Draft
15/6/2024	Nagore Guerra	2nd draft revision	Draft
15/6/2024	Anna Rovira	3th draft revision	Draft
30/6/2024	Laia Llenas	Approved by UVIC	Approved by the PC
18/10/2024	Anna Rovira	Revision after reviewer's comments	Reviewed version

Abbreviations

DMP Data management plan

GA Grant Agreement

WP Work Package

PMT Project management team

PTC Project Technical Committee

PMB Project Management Board

PC Project Coordinator (institution)

IPR Intellectual property rights

FERTIMANURE

Contents

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

1. Introduction

The Data Management Plan is a deliverable for project management, within the Project Management Work Package (8), and establishes procedures and plans for handling data generated through the FERTIMANURE project. Its intended is use is internal by the FERTIMANURE consortium, though it is in fact a public deliverable. Its first version is issued in M6, with subsequent releases in M16, M32, and M54.

2. Modifications to the Data Management Plan

This deliverable is the last updated version of the Data Management plan with the final procedures for handling data and the final data generated.

The following table (Table 1) contains the changes made to the Data Management Plan.

Table 1. Modifications to the Data Management Plan

Change	Description
1	The procedures for collecting the data, as well as the data ultimately collected in the project, have been established as facts, as previous versions anticipated them as a future action.
2	**4. Dataset types and description guidelines**. The table of deliverables has been updated in accordance with the amendments made to the project (some deliverables have been added, the level of dissemination for certain deliverables has been changed, and the type of data collected in the deliverables has been modified, ll in line with the amended deliverables).
3	**4.2. Pilot plant schematics, designs, and piping and instrumentation diagrams (P&IDs).** The sites where the data from the pilots have been presented have been added: on the website, in explanatory videos for 4 out of the 5 project pilots, and at several conferences.
4	**4.3.4. Data sets from the scientific publications** have been added.
5	**4.4. LCA and sustainability analysis data.** A key point for data collection in the sustainability assessment has been added: coordination among partners.
6	The 6. **Data Use and Sharing Guidelines** have been updated, as Microsoft Teams was ultimately used for internal data exchange instead of Google Drive. This way, it was not necessary for the coordinator to create Google Drive accounts for the staff from each institution working on the FERTIMANURE project; instead, Microsoft Teams was utilized with the existing user accounts of personnel from each institution.
7	**4.2. Pilot plant schematics, designs, and piping and instrumentation diagrams (P&IDs).** GreenWin has been the partner that has created infographics for each pilot, and they are available publicly.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

8	**4.5. Software tools.** The data used for the creation of the unplanned tools for the FERTIMANURE project has been added.

3. Objectives

The Data Management Plan (DMP) sets out the procedures and plans for handling data generated through the FERTIMANURE project, and is intended to be a manual for guiding and facilitating general data management and data storage needs for FERTIMANURE consortium members. This document also aims to clarify the obligations that beneficiaries have in terms of data standards, storage and protection, during the project and beyond with the objective of facilitating the exploitation of the results. It is intended to be a continuously evolving document, and hence can be adapted as the project progresses. This adaption will allow for any developments that have not been foreseen at the project start, and will be facilitated through review by the consortium members via the consortium meetings (Project Management Board).

The project has produced 5 types of data, which include:

1) Documents generated for project analyses or deliverables
2) Schematics and P&IDs of the different FERTIMANURE on-farm pilots
3) Experimental, including:
    a. Data collected on pilot operation and processes
    b. Data on the properties and quality of products obtained from the pilot plants
    c. Experimental data collected in the agronomic trials
4) Data collected for undertaking the LCA and sustainability analyses
5) Software tools

Due to the particular nature of these data types, the way each are generated, and the limitations for sharing and publication of each, the following sections outline the ways these data have been gathered, maintained, shared, and published.

4. Dataset types and description guidelines

The FERTIMANURE project has generated a number of different types and sets of data that have been classified into different categories by the project management team (PMT) and project technical committee (PTC). Data types are always associated with deliverables, and some deliverables are associated with different data types which have different data management, collection, and privacy procedures (sensitive data).

The data sources and types are summarized in the following table (Table 2), and the following sections provide a brief description of these data types. Data type abbreviations are as follows: Document (D), Schematics (S), Experimental (E), Sustainability data (LCA), or software (W).

Table 2. FERTIMANURE Deliverables and associated generated data.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Del. Num.	Deliverable description	Data type	Public
1.1	Report on the flow assessment, logistics and characterisation of animal manure and byproducts	D	
1.2	Report on the market landscape analysis and end-user preferences in the project participating EU states	D	X
1.3	Report on the BBF Regulatory Framework in the EU and CELAC countries	D	X
1.4	Report on the nutrient imbalances analysis	D	X
1.5	Report on capitalization of relevant projects results	D	X
2.1	Processes and technologies specification and set up to produce rawproducts/fertilizers from animal manure	D, S, E	
2.2	Raw fertilizers production and characterization vs. time (list, average composition and composition variability)	D, E	
2.3	Mass and energy balance of the on-farm pilots to WP5	D, E	
2.4	Extended version - BBFs production and characterization vs. time (list, average composition and composition variability)	D, E	
2.5	Final version - BBFs production and characterization vs. time (list, average composition and composition variability)	D, E	X
2.6	Final version - Mass and energy balance of the on-farm pilots to WP5	D, E	X
3.1	Processes and technologies specification and set up to produce On-farm TMFs from animal manure	D, S	
3.2	Product specification practical criteria to produce TMFs for selected crops	D, E	
3.3	Logistics aspects for BBFs and TMFs to supply regional markets	D, S	
3.4	Synthesis of FERTIMANURE contributions to standardisation procedures	D, W	X
3.5	Report on the suitability of the FERTIMANURE end-products for organic farming	D	X
3.6	Final - Processes and technologies specification and set up to produce On-farm TMFs from animal manure	D, S, E	
3.7	Final - Product specification practical criteria to produce TMFs for selected crops	D, W	
4.1	Report on agronomic performance of the obtained BBFs and TMFs	D, E	
4.2	Report on agronomic and environmental performance in field trial experiences	D, E	
4.3	8 Demo-days organized: 4 countries, twice per region	D	X
4.4	Homogenised procedures to assess agronomic performance in pot tests and field trials	D	

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.5	Final - Report on agronomic performance of the obtained BBFs and TMFs in laboratory setting	D, E	X
4.6	Final - Report on agronomic and environmental performance in field trial experiences	D, E	X
5.1	Sustainability reports for LCA, LCC and SCLA. **Potentially sensitive data*	D, LCA	
5.2	FERTIMANURE Decision Support System	D, W	
5.3	Data gathering formularies for sustainability assessment	D, LCA	
6.1	FERTIMANURE Plan for Exploitation and Dissemination of Results	D	X
6.2	Inventory of stakeholder groups relevant for BBFs and market uptake	D	
6.3	Inventory of stakeholder groups relevant for BBFs and market uptake	D	X
6.4	Initial - Business plans and business models	D	
6.5	Final - Business plans and business models	D	
6.6	Policy proposals and guidelines for successful market uptake	D	X
6.7	Report on FERTIMANURE replication potential in CELAC region	D	X
6.8	Final - FERTIMANURE Plan for Exploitation and Dissemination of Results	D	X
7.1	Dissemination and Communication plan (DCP)	D	X
7.2	Project website	D	X
7.3	Dissemination & communication material (brochures, posters, presentations, video, articles)	D	X
7.4	EIP Practice Abstracts	D	X
7.5	Dissemination reports	D	X
7.6	Final - Dissemination and Communication plan (DCP)	D	X
7.7	Second version - EIP Practice Abstracts	D	X
7.8	Third version - EIP Practice Abstracts	D	X
8.1	Consortium operating procedures	D	
8.2	Data Management Plan	D	X
8.3	Minutes of the project meetings	D	
8.4	Risk plan	D	
8.5	Risk and mitigation measures report	D	
8.6	Final - Data Management Plan	D	X
8.7	Final - Minutes of the project meetings	D	
8.8	Final - Risk and mitigation measures report	D	
9.1	POPD - Requirement No. 1	D	
9.2	H - Requirement No. 3	D	
9.3	EPQ - Requirement No. 4	D	
9.4	NEC - Requirement No. 5	D	

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.1 Documents

The majority of FERTIMANURE data sources comprises documents. Documents are generated from the large number of project deliverables over the project lifetime. Some of these may include parts or all of other specific data sets or types described below, but not in all cases. Documents also include scientific papers generated by project activities and data, which are available in open repositories as stipulated in the Grant Agreement.

4.2 Pilot plant schematics, designs, and piping and instrumentation diagrams (P&IDs)

The design and demonstration of innovative pilot plants is a key activity of FERTIMANURE, and the proper documentation of these pilots is important for dissemination and propagation of the project concept and results. The type of documentation of the plants include records of the technical requirements for production of the pilot plants demonstrated during the FERTIMANURE project. They are graphics in PDF, JPEG or CAD format in each case and have been used on an internal basis by the consortium members. However, FERTIMANURE P&DIs of pilot plant operation are only available to consortium partners, thus the detailed P&DIs of the plants may or may not be made available publicly. However, simplified schematics have been made public in FERTIMANURE website, so that their operation can be understood by all. Additionally, explicatory videos of four of the five pilots were recorded and shared publicly. Findings and operational limitations found in the performance of FERTIMANURE on-farm pilots have been presented in several conferences and events, together with summarised mass and energy balances.

4.3 Experimental data

4.3.1. Pilot plant monitoring and operation data

On one hand, pilot plant monitoring and operation data are associated with the pilot plants, since their monitoring is key for both optimizing their operation, reaching conclusions about their functionality, and decision-making on their operation. This data have been gathered in a data sheet format. The data is mainly gathered in Tasks 2.2 and 2.3. The data have been collected individually by the partners in a coordinated and standardized manner. Part of this data have been included as part of the deliverables produced.

4.3.2. Fertilizer quality and characteristics

The bio-based fertilisers and tailor-made fertilisers created during the project have been thoroughly analysed for their chemical, physical, and biological properties, as well as contaminants. This information has been gathered and stored in data sheets. The data is mainly generated in Task 3.1 “Quality assessment of products generated.”

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.3.3. Agronomic experiment data

This data are derived from experimental activities of FERTIMANURE, including Tasks 4.1, 4.2, 4.3. The data have been collected individually by the partners in a coordinated and standardized manner.

4.3.4. Data sets from the scientific publications

The following table (Table 3) lists the data sets that have been produced alongside the scientific publications.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Table 3. FERTIMANURE Data sets from the scientific publications.

	Proposed by	Scientific journal name	Tentative article title	Author of the publication	Link	Dataset Link	Publication date
1	UGENT	Ecological Engineering	Evaluation of a new approach for swine wastewater valorisation and treatment: A combined system of ammonium recovery and aerated constructed wetland constructed wetland	Claudio Brienza, Natalia Donodo, Hongzhen Luo, Ruben Vingerhoets, Denis de Wilde, Dion van Oirschot, Ivona Sigurnjak, Jayanta Kuma, Evi Michels, Erik Meers	https://doi.org/10.1016/j.ecoleng.2023.106919	https://doi.org/10.5281/zenodo.13937010	April 2023
2	UGENT	Journal of Cleaner Production	Detailed nitrogen and phosphorus flow analysis, nutrient use efficiency and circularity in the agri- food system of a livestock-intensive Region	Ruben Vingerhoets, Marc Spiller, Joris De Backer, Anne Adriaens, Siegfried E. Vlaeminck, Erik Meers	https://doi.org/10.1016/j.jclepro.2023.137278	All the data within the paper or its supplementary materials.	April 2023
3	UGENT	Biocatalysis and Agricultural Biotechnology	Ammonia water as a biobased fertiliser: evaluating agronomic and environmental performance for Lactuca sativa compared to synthetic fertilisers	Vaibhav Shrivastava, Ivona Sigurnjak, Nimisha Edayilam, Erik Meers	https://doi.org/10.1016/j.bcab.2023.102907	https://doi.org/10.5281/zenodo.12705426	November 2023
4	UVIC	The International Journal of Life Cycle Assessment	Life cycle assessment of bio-based fertilizers production systems: where are we and where should we be heading?	D. Egas, S. Azarkamand, C. Casals, S. Ponsá, L. Llenas &J. Colón	https://doi.org/10.1007/s11367-023-02168-8	https://doi.org/10.1007/s11367-023-02168-8	may-23
5	LEITAT	Science of the Total Environment	Nutrient recovery and valorisation from pig slurry liquid fraction with membrane technologies	Rubén Rodríguez, Julia Zapata, Xialei You, Montserrat Pérez, Sonia Sanchis, Julia García	https://www.sciencedirect.com/science/article/pii/S004896972301164 6?via%3Dihub	https://doi.org/10.5281/zenodo.13383095	may-23

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

6	UGENT	Chemical Engineering Journal	Ammonia stripping and scrubbing followed by nitrification and denitrification saves costs for manure treatment based on a calibrated model approach	Ruben Vingerhoets, Claudio Brienza, Ivona Sigurnjak, Jeroen Buysse, Siegfried E. Vlaminckc, Marc Spiller, Erik Meers	https://doi.org/10.1016/j.cej.2023.146984	All the data within the paper or its supplementary materials.	December 2023
7	UMIL	Scientific Reports	Effects of the application of microbiologically activated bio-based fertilizers derived from manures on tomato plants and their rhizospheric communities	Elisa Clagnan, Mirko Cucina, Patrizia De Nisi , Marta Dell'Orto, Giuliana D'Imporzano, Roberto Kron-Morelli, Laia Llenas-Argelaguet Fabrizio Adani	https://doi.org/10.1038/s41598-023-50166-5	All the data within the paper or its supplementary materials.	December 2023
8	FHR	Verband Deutscher Landwirtschaftlicher Untersuchungs- und Forschungsanstalten (VDLUFA Kongress)	Prüfung der Eignung von Biokohle aus Rindermist als Düngemittel zu Mais im Topfversuch	S. Schönfeld, C. Hartung, E. Westenthanner, T. Reiter, H. Heuwinkel	https://www.vdlufa.de/wp-content/uploads/2024/01/134.VDLUFA-Kongress_2023_Freising.pdf	https://doi.org/10.5281/zenodo.13940965	December 2023
10	UGENT	Journal of Environmental Management	Enhancing swine manure treatment: A full-scale techno-economic assessment of nitrogen recovery, pure oxygen aeration and effluent polishing	Ruben Vingerhoets, Ivona Sigurnjak, Marc Spiller, Siegfied E. Vlaeminck, Erik Meers	https://doi.org/10.1016/j.jenvman.2024.120646	All the data within the paper or its supplementary materials.	March 2024
11	UGENT/UVIC	Scientia Horticulturae	Evaluation of agronomic efficiency and stress resistance on Swiss chard via use of biostimulants	Vaibhav Shrivastava, Nimisha Edayilam, Berta Singla Just, Omar Castaño-	https://doi.org/10.1016/j.scienta.2024.113053	https://doi.org/10.5281/zenodo.12705602	April 2024

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

				Sanchez, Laura Díaz-Guerra, Erik Meers			
13	UVIC	Agronomy	Phosphorus release dynamics from ashes during a soil incubation study: effect of feedstock characteristics and combustion conditions	Berta Singla, Pablo Binder, Nagore Guerra, Laura Díaz, Rosa Vilaplana, Nicola Frison, Erik Meers, Laia Llenas and Ana Robles	https://doi.org/10.3390/agronomy14050935	All the data within the paper or its supplementary materials. https://www.mdpi.com/article/10.3390/agronomy14050935/s1	April 2024
14	UVIC	International Journal of Agricultural Sustainability	Biofertilization increases soil organic carbon concentrations: results of a meta-analysis	Berta Singla, Evan Marks, Laura Roquer Sergio Ponsá, Laia Llenas and Rosa Vilaplana	https://doi.org/10.1080/14735903.2024.2361578	https://doi.org/10.6084/m9.figshare.26029155.v1	June 2024
15	WUR	Applied studies	Environmental effects of using ammonium sulfate from animal manure scrubbing technology as fertilizer	René Rietra 1*, Kimo van Dijk1 , and Oscar Schoumans1	https://doi.org/10.3390/app14124998	All data (average values, statistical evaluation) are given in the paper	June 2024

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.4 LCA and sustainability analysis data

The LCA and sustainability analysis data comprises of a large variety of data encompassing environmental, economic, and social aspects of manure and fertilizer management. The data include environmental data (increases or decreases environmental contamination), data used to calculate the environmental footprint (e.g. CO_2 emitted by tractors), product prices, costs of production, etc., in order to arrive at a balance of costs and benefits generated in a wide variety of environmental and economic indicators. This data have been gathered among the consortium in a standardized and coordinated manner in which the coordination between partners and, particularly, WP leaders, have been crucial.

4.5 Software tools

FERTIMANURE includes the creation of one software tool, developed in WP5, consisting of a Decision Support System (DSS). The tool has been made for distribution to external users, as a product of the project for improvement in the management of manure resources. The DSS coding data will only be accessible and used by specific consortium members.

5. Reuse of existing data

5.1 Partner data

For some activities, deliverables, and products of FERTIMANURE, the consortium members have been asked to provide data from their activities and/or institutional experience to feed models, data-driven analysis, and software tools. Specifically, these activities are mainly related to tasks of Work Package 5, the Sustainability Assessment. In Task 5.1, an integrated data-gathering tool based on questionnaires and databases has been developed to ensure data quality collection for tasks 5.2, 5.3 and 5.4. In this way, the same set of data has been used in the three-fold assessment and it minimizes the required capacity of other WPs to collect and deliver data. To perform all the analyses of WP5 a huge amount of data is necessary, sometimes sensitive or even confidential data. The task leader has explored among all partners the willingness/possibility to provide data, and the involved participants have adapted their work to the data available.

During project execution, the partner responsible for collection of sensitive data has guaranteed the use of this data in a wholly confidential manner. Data feeding the DDS has remained totally anonymous once introduced into the software, preventing any manner of tracing to its source or identity of its owner. In the case that such data is provided and the owner wishes to assure legal confidentiality, bi-lateral non-disclosure agreements (NDA) has been signed between the data owner and the partner responsible for developing the project technical product.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Partner data is also used in the preparation of deliverables within WP1. Specifically, this data consist of laboratory analyses of animal manures, cartography generated by partners, or data from projects in which partners are associated. In all cases, the data sources have been duly cited.

5.2 Public data

FERTIMANURE does make some use of publicly-available data. For instance, this use of public data is foreseen in WP1 in the European and regional-scale analyses of stocks and flows of manures and nutrients. In this case, publicly-available European data and cartographic products are used. In all cases, the data sources have been duly noted and referenced in the text.

6. Data use and sharing guidelines

Two main platforms have been used for sharing data and information, either publicly (PU) or confidentially (CO, within the consortium). PU data have been shared on the project website in the Documentation Section for communication and dissemination purposes. On the other hand, all project documents, public and confidential, are hosted on the cloud server service used solely by the consortium (Microsoft Teams). Confidential data described in this document have been uploaded and organized appropriately on the server. The server is accessible to all consortium members provided by the Project Coordinating institution..

6.1 Documents

Project documents and deliverables

The FERTIMANURE deliverables, as shown in Table 1 above, include a large number of documents generated during the project. Many of these documents are public, intended for wide, open distribution. The level of dissemination is indicated in Table 1. The public deliverables has been published in the project website as well as on the Biorefine Cluster Europe (BCE wwww.biorefine.edu) website and partners are able to use them for dissemination purposes. Public deliverables have been advertised on project media channels. In case of non-public deliverables, they have only been available for project partners. Any communication/dissemination of the results available in non-public deliverables has been previously discussed among partners in the PTC and/or PMB.

Scientific publications

As stated in the FERTIMANURE consortium agreement, each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results, and will mentioned the project as a funding source. In particular, it must:

a) As soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications. Moreover, the beneficiary must aim

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.

b) Ensure open access to the deposited publication — via the repository — at the latest: (i) on publication, if an electronic version is available for free via the publisher, or (ii) within six months of publication (twelve months for publications in the social sciences and humanities) in any other case.

c) Ensure open access — via the repository — to the bibliographic metadata that identify the deposited publication.

The bibliographic metadata must be in a standard format and must include all of the following:

- the terms “European Union (EU)” and “Horizon 2020”;
- the name of the action, acronym and grant number;
- the publication date, and length of embargo period if applicable, and
- a persistent identifier.

6.2 Pilot plant schematics, designs, and P&ID

As discussed above, GreenWin has elaborated infographics of eachpilot plant in a simplified and visual format which that are available publicly. However, due to potential interest of intellectual property rights or proprietary information, it will not be necessary that detailed technical P&ID be made available either to the consortium or publicly, though if the partner wishes, these can be made available on the Microsoft Teams for consortium members.

6.3 Experimental data

Experimental data is data which is gathered in pilot plant monitoring and operation (WP2), the analysis of bio-based fertilizer and tailor-made fertilizer properties and quality (WP3), and agronomic experiments (WP4). The gathering and organization of this data has been the responsibility of the WP leader in all cases. It has not been obligatory that this data be shared either between consortium members or publicly unless specifically required by a project deliverable. Partners or WP leaders do not have any special right to ask for data generated outside of the requirements for WP. Data sharing agreements among partners are not regulated on the project level, but of course cooperation and collaboration have been highly encouraged, both for the development of scientific publications in order to disseminate the FERTIMANURE results as widely as possible, and in the spirit of good cooperation and scientific advancement.

6.4 LCA and sustainability analysis data

LCA and sustainability analysis data-gathering is defined within WP5 and led by the coordinator of that work package. During the development of the WP, the different types of data to be gathered have been explored with the partners. As a general rule, this raw data is

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

wholly confidential, and have not been shared by the LCA task leader under any circumstances. The data have been used for the creation of modelling tools and numerical analyses which are the end result deliverables. This data has been sent directly in private correspondence to the task leader, and has not been made available on the cloud server.

6.5 Software tools

The Software tools developed in WP5, WP3 and WP6 have been created with data generated in related WPs. This data is confidential and not publicly available. However, the tool created will undergo a public distribution after the acceptance of the corresponding deliverable. These tools will be made available as a download from the FERTIMANURE website.

7. Methods for sharing within the consortium

Within the FERTIMANURE project, confidential data includes any data not explicitly required by the project deliverables. Distribution of any data gathered by partners to other parties or platforms is not allowed without the explicit consent of the partner responsible for gathering the data.

Regarding intellectual property, any confidential data will not be disclosed outside the consortium to avoid loss of IPR and damage to beneficiaries.

In terms of information sharing, the use of the Microsoft Teams online data server has facilitated effective communication and sharing of information and documentation between partners in each working group and across the consortium. The following information has been shared among partners using the online platforms. Some of the consortium-level documents available on the Teams include:

- Contractual documents, including the consortium Agreement and Grant Agreement, Description of Work.
- Administrative documents: financial reports, progress report.
- Technical documents: deliverables, reports.
- Other documents: dissemination material, templates, meeting minutes, contact details of all the participants.

As the project progresses, documents have been shared among all FERTIMANURE consortium partners via the online server. The project coordinator has provided access to the server to all partners The Microsoft Teams has been also be managed by partners, whereas all consortium members had reading and writing rights on this server. This way they can share new information, provide reviews, and upload project materials. Each Work Package leader has been responsible for uploading any relevant data/files to the Microsoft Teams. Once uploaded, only the Coordinator should delete obsolute files from the FERTIMANURE drive after having consulted the relevant Task or Work Package Leader.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

8. Data security

Access to the data stored on the FERTIMANURE Microsoft Teams server is restricted to invited participants only.

With regards to the data gathered for WP5, any sensitive data collected by the task leader will be stored on secure local devices only accessible by the team members specifically involved in treating and analysing the data.

9. Ethical aspects

For ethical issues, the project has dedicated work package (WP9) to ensure that ethical requirements are met for all research undertaken in the project, including data management aspects, in compliance with H2020 ethical standards.

10. Intellectual property rights

As regarding the intellectual property rights of consortium members, it is not expected that this aspect is affected by data management procedures, since it is not foreseen that any privileged information sharing is required in the elaboration of the project deliverables, or will be requested by one consortium member to another.

11. Data maintenance

As set out in article 18.1 of the Grant Agreement, the beneficiaries must — for a period of five years after the payment of the balance — keep records and other supporting documentation in order to prove the proper implementation of the action and the costs they declare as eligible. Therefore, in order to assure unequivocal and maximum alignment with the obligations of the grant agreement, all documentation and data will be kept on the FERTIMANURE internet server (Microsoft Teams) for a minimum of 5 years following project closure as described above. All other data generated during the project and not uploaded to the cloud server must be kept for the same period by each individual beneficially in an appropriate secure digital medium. For related matters and details, it is assumed that the beneficiaries respect all obligations specified in the Grant Agreement.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849