Updated Data Management Plan

Deliverable 6.2

WP 6. Project coordination and management

Project title

D4AgEcol – Digitalisation for AgroEcology

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Deliverable Factsheet

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Version history	Version 1 was developed in collaboration with the entire consortium and uploaded on the 18.04.2024; Version 2 was rejected as part of the review process in order to include the update that was already being sought, in particular the information on the repository decided by the consortium (see 2 FAIR Data) and the format of the metadata standard that will be used for project data (see 2.1 Metadata template). Additions added by Friederike Schwierz, uploaded on the 18.07.2024

Dissemination level	
X	PU = Public
	SEN = Sensitive
	EU classified = EU-Restricted, EU-Confidential, EU-Secret

Partners’ short names

ATB – LEIBNIZ INSTITUTE OF AGRICULTURAL ENGINEERING AND BIOECONOMY E.V.

CETRI – CENTER FOR TECHNOLOGY RESEARCH & INNOVATION LTD

ZALF – LEIBNIZ CENTRE FOR AGRICULTURAL LANDSCAPE RESEARCH

AUA – AGRICULTURAL UNIVERSITY OF ATHENS

UCPH – UNIVERSITY OF COPENHAGEN

BOKU – UNIVERSITY OF NATURAL RESOURCES AND LIFE SCIENCES

LfL – BAVARIAN STATE RESEARCH CENTER FOR AGRICULTURE

PESSL – PESSL INSTRUMENTS GMBH

DLG – GERMAN AGRICULTURAL SOCIETY

LUKE – NATURAL RESOURCES INSTITUTE FINLAND

UNAC – UNIAO DA FLORESTA MEDITERRANICA

HAU – HARPER ADAMS UNIVERSITY

Abbreviations

ADOPT	Adoption & Diffusion Outcome Prediction Tool
CC	Creative Common license
CSA	Coordination and Support Action
DOI	Digital Object Identifier
EC	European Commission
DMP	Data management plan
HFH-LP	Hands Free Hectare Linear Programming model
WP	Work package

Publishable summary

This document contains the update of the data management plan (Deliverable 6.1) that was created in month 6 of the project. At this advanced stage of the project (M18), the consortium has a better overview of what type of data will be produced within the project, to what extent, and how it will ultimately be archived and made available to the public. This deliverable is part of task 6.1 of work package 6 - Project coordination and management.

Table 1 Main tasks of work package 6

WP6 - Project coordination and management
Task 6.1: Coordination
Task 6.2: Financial control
Task 6.3: Communication with the European Commission
Task 6.4: Quality assurance and risk management

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1 Data Summary

The data D4AgEcol will handle are mainly from other research projects, which are available to the project partners. Most of these data are publicly available, published in reports or scientific journals and articles, where the partners generally have access to. As a coordination and support action (CSA) the amount of generated data is comparably trifling. The following section provides an overview of the data processed in the work packages (WPs) and the expected outputs.

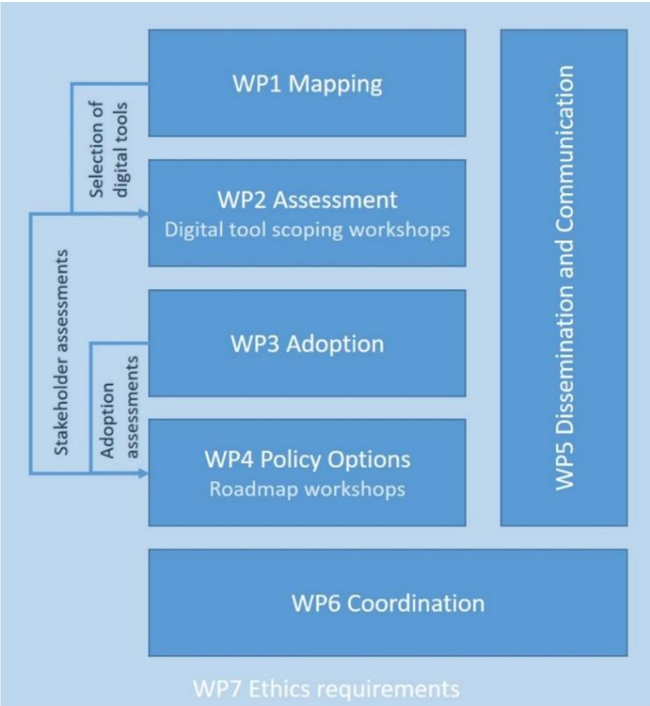

Figure 1 Structure of D4AgEcol

The main share of data generated within the project include assessments of tools within **WP1 Mapping of digital Tools**, based on expert opinions and literature (scientific publications, reports, tools description, commercial product websites, etc.). These data are published in open repositories and therefore are easily accessible. By using generally acknowledged identifiers and licenses, they are also easy to find and reuse.

Another type of data collected is video and photo material, e.g. to document the Digital Tool Scoping Workshops (DTSW) that are part of **WP2 Farm level assessment of**

agroecology-relevant digitalization technologies. Data related to conduct surveys or interviews (personal data; data as survey results), as well as personal data, as e-mail addresses for dissemination purposes (newsletter) and to organize workshops or events will be handled according to national and EU legal frameworks.

As part of **WP3 Adoption of Digitalisation for agroecology** HAU will create an adapted version of the Hands Free Hectare Linear Programming (HFH-LP) model (seeThis standard is widely used, well defined and comes with a free creator that automatically creates an XML metadata file after specifying the information about the data to be published.

3 Other Research Outputs) which will also be published in open source format. WP3 is also responsible for the farmer discussion round in the DTSW on the adoption potential of the respective technologies (see 3 Other Research Outputs). Collected data from all DTSWs is stored centrally on the Sharepoint in digital form and evaluated by the LfL. Another activity in WP3 is the implementation of an online survey among stakeholders on knowledge about agroecology and assessments of the contribution of digital technologies to the elements of agroecology. The link to the anonymous survey will be distributed at various times in the project and via various media and contact points (GIl conference Germany 2023; D4AgEcol newsletter #1; Agrictechnica 2023; article DLG-Mitteilungen spring 2024). The online survey is hosted on the HU Berlin server. The results are stored centrally on the Sharepoint and evaluated by the LfL for internal project information and publications such as conference papers, newsletters (see D4AgEcol Newsletter #2) and specialist articles.

The results from WP1, 2 & 3, fully anonymised, are expected to be useful for project partners to support arguments in the **National and European roadmaps**, the two deliverables of **WP4 Policy options**.

Besides the results from the WP1, 2 &3 and information from publicly available literature and databases (e.g., scientific papers, European and National reports, etc.), WP4 will produce new data during two sets of workshops: one set of seven national workshops, and one European workshops with participants from the seven countries who held the national workshops. Different stakeholders will participate in the workshops, including academic staff, public servants and policymakers, representatives of stakeholders involved in agricultural production and supply chain, and representatives of civil society.

The information collected during such workshops, fully anonymised, will be included in the national and European policy roadmaps. The roadmaps will be made publicly available: they will be published in the project website, disseminated through the project' social media accounts (see below, in the WP5 section), as well as sent to the participants, and thereby can be utilized by policy makers, science, research & development, innovation hubs as well as the agricultural practice in general.

WP5 Dissemination, exploitation and communication is concerned with promoting project's activities through the project's social media accounts as well as with growing the network of stakeholders engaged to the D4AgEcol project. The D4AgEcol webpage, hosted at CETRI, contains the main share of the projects results along with information concerning the participation of project's partners in forthcoming events and conferences, the developed Newsletters and description about the DTSW both as a concept and as events conducted by the corresponding partners. Finally, it is aimed to link in the D4AgEcol website, the digital tools platform developed by AUA. D4AgEcol's social media accounts (Twitter, Facebook, LinkedIn, YouTube) are used to disseminate the results to a wider audience. An open repository in the form of a technology platform with information on available technologies in the agricultural sector is hosted by AUA in a virtual private server (VPS) managed by the team and will be available through a dedicated menu item will exist in the D4AgEcol webpage and will navigate users to the repository via any modern web browser.

All data handled in **WP6 Project coordination and Management** are related to organizational matters (e.g. financial information, reporting, coordination of meetings, etc.) and are mainly for internal use or respectively in exchange with the European Commission (EC).

All scientific (as all other) publications will be published as open access; corresponding fees were taken into account in the budget calculations. The publication of raw data in any form (e.g. survey responses) is not intended.

Data Responsibilities

The following table (**Table *2*** List of responsibilities and contact persons) contains the responsibilities for the data and documents used and created within the project. Reference is made to the responsible persons (or departments) in the corresponding contents of the data management plan.

Table 2 List of responsibilities and contact persons

Partner	Name/Department	(Data-) Responsibility
ATB	Andreas Meyer-Aurich	Project coordination & management (WP6); SharePoint; EMDESK
ATB	Central IT & Research data management	Archiving of all project data after the end of the project
CETRI	Ioannis Aviziotis	Data Protection Officer D4AgEcol, D4AgEcol website management
ZALF	Alma Moroder	Data quality, GDPR and storage related to DTSW of ZALF; Data storage and backup; Data archiving
AUA	Evangelos Anastasiou	WP1 management; D4AgEcol Repository Management
UCPH	Søren Marcus Pedersen	Data capture, Data quality for WP4 Policy options
BOKU	Jochen Kantelhardt	Archiving indicator assessment (world café & survey) data from digital tool scoping workshops as well as the preliminary fact sheet forms
LfL	Andreas Gabriel	Archiving of ADOPT Workshop data / Data from Stakeholder online surveys after the end of the project (in consultation with the LfL data protection officer)
PESSL	Junia Rojic	Data quality, GDPR and storage related to DTSW of PESSL
DLG	Stephanie Timm	Data quality, GDPR and storage related to DTSW of DLG;
LUKE	Liisa Pesonen	Data quality, GDPR and storage related to DTSW of LUKE; Data quality, GDPR and storage related to National Workshop of Finland
UNAC	Cidália Vila Verde	Data quality, GDPR and storage related to DTSW of UNAC; Data quality, GDPR and storage related to National Workshop of

		Portugal
HAU	Karl Behrendt	Data storage and backup, Data archiving
HAU	Elias Maritan	Data capture, Metadata production, Data quality, Data storage and backup, Data sharing

Internal Data Transfer & Management

In order to enable easy data transfer, collaborative editing of documents and data storage for all partners involved, a designated place on a cloud has been set up for the project (within the scope of the project duration and at least 3 month additionally for reporting purposes). The ownCloud shared file folder known as SharePoint is accessible via the following link:

https://owncloud.atb-potsdam.de/owncloud/index.php/s/GdrnXkJmdbr7g5G

Partners and associates of the project can obtain the password from the coordinator Andreas Meyer-Aurich.

The structure of the SharePoint follows the project structure, i.e. all data and files are assigned to the work package according to their thematic content. The file *Home.docx* includes details about the D4AgEcol SharePoint, its content and usage. It also provides links to crucial administrative documents, the projects website as well as social media accounts, and information regarding significant reference projects.

To streamline the coordination and management of the project, EMDESK management software is employed. At the project's inception, an online platform was established through a subscription service, with unanimous agreement from all members to actively use the tool. Each consortium member has access through a minimum of two user accounts. Within the project management tool information on work progress, the use of funding and collaborative preparation of reports takes place. The data amount is limited to 1 GB per user but can be upgraded on request. As soon as the subscription ends, the account will move to a free plan and all data will be deleted after one (in case the account is remained inactive).

2 FAIR Data

All results of the project will be publicly available and equipped with a metadata record (template see 2.1 Metadata template). The provision of metadata in XML format will greatly simplify interoperable use by potential users. For scientific articles, the Digital Object Identifier (DOI) will be used including bibliographic metadata. All results of the project are going to be published with keywords and a Creative Commons license (CC) to facilitate further use. The publication of raw data in any form (e.g. survey responses) is not intended.

All relevant project data will be archived collectively by the central IT department of the ATB in accordance with the recommendations of the German Federal Office for Information Security (contact see **Table *2*** List of responsibilities and contact persons). The archiving of all project data in the publicly accessible repository zenodo. The open access repository emerged from the project OpenAIRE and is hosted by CERN. The D4AgEcol community established in June 2024 will be provided with all results and publications emerging from the project.

Table *3* provides an overview of the measures taken to achieve FAIR standards for the data and results published as part of the project.

Table 3 D4AgEcol implementation of FAIR standards

Data Type	FINDABLE	ACCESSIBLE	INTEROPERABLE	RE-USE
Publications	DOI; bibliographic metadata; keywords	Open Source	Common formats like .odf/.odc/.pdf/.ppt Metadata in XML	Creative Commons License
Reports	CORDIS; EU Identifier (GA ID); DOI	Open Source	Common formats like .odf/.odc/.pdf/.ppt	Creative Commons License
End-user material	Project homepage; EIP-AGRI website	Open Source	EIP common format (practice abstracts)	Creative Commons License
Website	www.d4agecol.eu	The webpage is available on the public from the 1st October 2022 and it will remain open 5 years after the end of the project.	The website is linked to the social media accounts (Twitter, Facebook, LinkedIn, YouTube). Furthermore, it shows live the Twitter news posted by the project. It uses also common formats like .pdf The website is linked to info@d4agecol.eu email address for the information concerning the subscribers to newsletters.	eCreative Common License

Technology Platform	Appropriate metadata will be defined and stored based on the technology models.	The platform will be openly available in the web and the users will be able to access all of its information. Accessable 5 years after the end of the project.	Use of well-known vocabularies and data formats will be defined later based on the specifications	Creative Commons License
adapted HFH-LP Model	CORDIS; DOI supplementary material section of scientific publications using the adapted HFH-LP model	Open Source	ASCII format (e.g. .csv-files), xlsx templates, parameter sets, model description and instructions will be available in common formats like .xlsx, .docx, and .pdf; the model will be coded in a .gms[1] file, but the model code will also be made available in .docx format	Creative Commons Licence as applicable to the publications making use of the model. If the adapted HFH-LP model is re-used, it is requested that the text in the footnote are preserved in the model code and abided with[2]. The model code will be made available in both .gms and .docx formats. The former is needed to re-run the model[1], while the latter is useful for code transfer (e.g., when attached to publications as supplementary material)

[1] can be used in the GAMS software downloadable at www.gams.com. To use the GAMS software, a user licence is required. GAMS offers a free 1-year demo licence for non-commercial purposes, which is also downloadable at www.gams.com.

[2] The origins of this model are from Preckel et al. (2019), and were modified by Lowenberg-DeBoer et al. (2019). This program may be distributed or further modified provided that this comment remains and is updated according to the future modifications and provided that any modified program continues to be freely distributed. Citations: (i) P. Preckel, C. Fontanilla, J. Lowenberg-DeBoer, J. Sanders, "Orinoquia agricultural linear programming model – documentation." (Colombia Purdue Partnership, Purdue University, https://www.purdue.edu/colombia/partnerships/orinoquia/docs/OrinoquiaLPDoc.pdf, 2019). (ii) Lowenberg-DeBoer, James, Karl Behrendt, Richard Godwin and Kit Franklin, "The Impact of Swarm Robotics on Arable Farm Size and Structure in the UK." – paper presented at the Agricultural Economics Society (AES) Conference, April 2019, Warwick, UK. (iii) Lowenberg-DeBoer, J., Franklin, K., Behrendt, K. and Godwin, R. 2021. Economics of autonomous equipment for arable farms. Precision Agriculture, 22, pp.1992-2006. https://doi.org/10.1007/s11119-021-09822-x (iv) Maritan, E., Lowenberg-DeBoer, J. and Behrendt, K. 2023. D4AgEcol Deliverable 3.1. Harper Adams University, Newport, UK

2.1 Metadata template

For all data and documents that will be made available to the public as open source during and after the end of the project, metadata records will be created in .xml format using the Dublin Core standard. This standard is widely used, well defined and comes with a free creator that automatically creates an XML metadata file after specifying the information about the data to be published.

3 Other Research Outputs

HFH-LP model

HAU's deliverables include the creation of an adapted version of the Hands Free Hectare Linear Programming (HFH-LP) model, which has been coded by Harper Adams University and it is Open Source. Some of the data included in the original HFH-LP model will be re-used from prior HAU work for the analytical purposes of D4AgEcol. Other existing data in the HFH-LP model will be either modified or discarded.

As far as the adapted HFH-LP model is concerned, the project will mainly generate three types of data: (i) templates and parameter sets in MS Excel format (.xlsx) which are used to run the model; (ii) the adapted model coded in a General Algebraic Modelling System (GAMS) format (.gms); and (iii) MS Word documents (.docx) or .pdf documents describing features of the HFH-LP model, storing the model code for user-friendly code exchange, and usage instructions for potential users. None of these data will contain personal information.

The adapted HFH-LP model will generate or re-use data in support of D4AgEcol's Specific Objective 3 and the overall D4AgEcol's objective. It will help investigate into the drivers, barriers, risks, and usability aspects of digital tools for enabling agroecological farming in several D4AgEcol's partner countries.

The expected size of the data to be generated or re-used by HAU should not exceed 50 MB. The data either generated or re-used by HAU will originate from any of the following three sources: (i) the original HFH-LP model (re-used); (ii) the HFH-LP model adapted for D4AgEcol purposes (generated); (iii) scientific and grey literature (re-used).

Outside of D4AgEcol, the data generated or re-used by HAU might be useful to farmers, academic researchers, agricultural equipment developers, manufacturers and traders, regulators, policymakers, agricultural product processors, consumers, and those who enjoy the rural landscape in general.

ADOPT model results

The DTSW includes content from discussion rounds with farmers on the acceptance of the respective technologies by the respective target group. This includes the storage of consensus responses from the groups in the ADOPT modeling software. A user license is required for the software from the Australian model software provider (CSIRO), which allows password-protected access. The aggregated model results can be printed out in pdf format. In addition, the core discussion points are recorded in writing. Furthermore, each participant (farmer) also fills out a paper questionnaire anonymously, which is collected and digitized. All digital outcomes are collected on the project sharepoint and analysed and processed centrally by the LfL. The purpose of the data processing is the creation of project reports, as well as publications such as (open access) journal articles or conference papers on the adoption potential of the respective technologies under consideration in the LLS of the project. The participants of the farmer discussion groups have agreed in writing in a declaration of consent that the workshop outcome data will be processed for the purposes mentioned.

4 Allocation of Resources

The data management of the D4AgEcol project is the task of WP6 project coordination and management and is therefore the responsibility of ATB. Nonetheless, all partners are equally committed and required to comply with all applicable data privacy and security laws (national & EU). The consortium stated in the grant agreement that partners have the necessary critical infrastructure to carry out the project at their disposal. The table below (**Table *4*** Allocation of resources per partner for data management) presents a summary of the resources utilized by each partner for processing, preparing, storing, etc., for all project data.

Table 4 Allocation of resources per partner for data management

Partner	Effort	Resources
ATB	Preparation of DMP & Preparation of updated DMP Archiving Setup & maintenance of SharePoint	3 Person Month
CETRI	Project related data management Website management	1 Person Month 2 Person Months
ZALF	Storage and archiving of data	Less than 1 Person Month
AUA	Project related data management Repository development & data management	2 Person Months 12 Person Months
UCPH	Storage & archiving of data of the digital tool scoping workshop & national policy workshop	Less than 1 Person Month
BOKU	Storing & archiving digital tool scoping workshop data Preparation of ethics application for workshops, including the planning of data management & the related consent forms	1 Person Month
LfL	Storage and archiving of data, online survey design	Less than 1 Person Month
PESSL	Preparation of DMP & updated DMP Archiving of the company's & project's digital copies on project folder and original files or hard-printed copies in the designated project binder Setup & maintenance of internal company digital storing folder, which includes: Data capture, Data quality, Data storage and backup, Data archiving, and Data sharing.	Between 2 and 3 full working days in total
DLG	Storage & archiving of digital tool scoping workshop data	Less than 1 Person Month
LUKE	Storage & archiving of data of the digital tool scoping workshop & national policy workshop	Less than 1 Person Month
UNAC	Storage & archiving of data of digital tool scoping workshop data & national policy workshop	Less than 1 Person Month
HAU	Data capture Metadata production Data quality Data storage and backup Data archiving Data sharing	6 person months

5 Data Security

All partner institutions of D4AgEcol are held responsible for the secure storage of data, especially in terms of personal data. Any data exchange is realized via secure transfer options. Joint access to general project data takes place via a secure project SharePoint on ownCloud or the project management tool EMDESK (see Internal Data Transfer & Management). Both companies have their main place of business in the EU (Germany) and are therefore subject to the correspondingly high legal framework with regard to data sovereignty and security.

Repository

The D4AgEcol platform repository contains the information collected on Research Articles, Research Projects and Commercial Products in the scope of the project. This information is securely stored in a MariaDB database on the VPS provided by the Agricultural University of Athens. This information is not considered sensitive, as it is made publically available on the web by the creators. Personal user information, such as the password, are heavily encrypted to make sure that even if security mechanisms are breached, no sensitive information will be leaked. Firewall rules have been configured on the server hosting the platform to prevent known attacks, where, periodical backups ensure no data loss can be experienced.

Newsletter Subscriptions

The personal data of each subscriber to the newsletter of D4AgEcol via the project's webpage are stored in the database of the server which hosts the website and they are received by the email address info@d4agecol.eu (managed by CETRI in the context of WP5) which has been created together with the homepage for communication reasons.

6 Ethics

D4AgEcol has appointed Joshua Bronson as its ethical advisor who critically examines ethically relevant aspects, e.g. involvement of animals, participation of non-EU countries, artificial intelligence etc. Furthermore, the advisor is tasked with assessing and offering guidance on the management of data security, as well as the collection and subsequent processing of personal data, e.g. in relation to surveys and workshops.