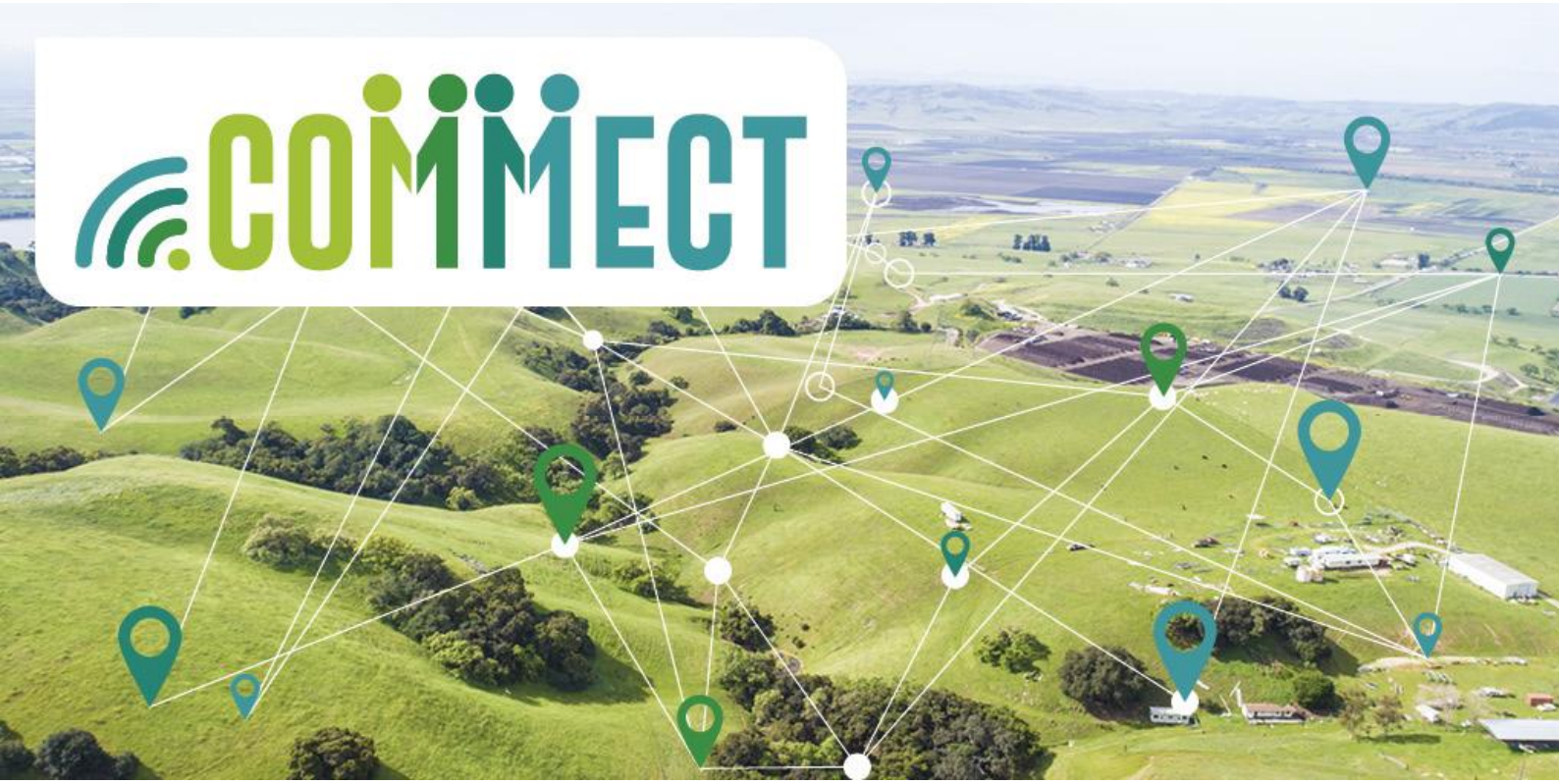
Bridging the digital divide and addressing the need of Rural Communities with Cost-effective and Environmental-Friendly Connectivity Solutions



Deliverable 7.4
Data Management Plan – Version 2

February 2024

PUBLIC

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COMMECT

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Data Management Plan – Version 2

WP7 Project Management

Deliverable ID	**D7.4**
Deliverable Name	**Data Management Plan – Version 2**
Lead Partner	Aalborg University (AAU)
Contributors	LIST, TNO, SeAMK, TNOR, DNET, TOB

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COMMECT Project Abstract

Over the last years, the importance and need for broadband and high-speed connectivity has constantly increased. The Covid-19 pandemic has even accelerated this process towards a more connected society. But this holds mainly true for urban communities. In Europe a 13% lack access persists, and mainly concerns the most rural and remote areas. Those are the most challenging to address since they are the least commercially attractive. COMMECT aims at **bridging the digital divide**, by providing quality, reliable, and secure access for all in rural and remote areas. The **goal of extending broadband connectivity in rural and remote areas** will be achieved by *integrating Non-Terrestrial Networks with terrestrial cellular XG networks, and low-cost Internet of Things (IoT). Artificial Intelligence, Edge and Network Automation will reduce energy consumption both at connectivity and computing level.*

Participatory approach with end-users and ICT experts working together on development challenges will be the key **for the digitalization of the sector**. To ensure the rich exchange of best-practice and technical knowledge among the actors of the agro-forest value chain, COMMECT will set up **five Living Labs across and outside Europe**, *where end-users "pain" and (connectivity) "gains" will be largely discussed, from different perspectives.*

COMMECT aims at contributing to a balanced territorial development of the EU's rural areas and their communities by making smart agriculture and forest services accessible to all. COMMECT will facilitate that, by developing a **decision-making support tool** able to advise on the best connectivity solution, according to technical, socio-economic, and environmental considerations. This tool, incorporating collaborative business models, will be a *key enabler for jobs, business, and investment in rural areas, as well as for improving the quality of life in areas such as healthcare, education, e-government, among others.*

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Document Approval

Version	Name	Role in the Project	Beneficiary	Date
1.1	M.R. Palattella	Project Coordinator	LIST	27.02.2024
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Executive Summary

The Data Management Plan (DMP) contains the measures that the Horizon Europe (HE) COMMECT project will take to follow the guidelines of the European Union (EU) for open access to scientific knowledge produced within the European funded projects [1]. The members of the COMMECT consortium will establish through this document mechanisms for allowing open access to the project results. These will be in the form of project deliverables, scientific publications, collected data from the five different Living Labs (LLs) and availability of open-source software contributions (e.g., Decision-making Support Tool).

The COMMECT DMP follows the structure of the Horizon Europe DMP template [2]. It includes the guidelines that will be followed along the project for quality assurance of all the collected data and generated documentation. It describes what data will be collected, processed, or generated, what methodologies and standards will be followed, whether and how this data will be shared and/or made open, and how it will be curated and preserved. It also ensures that the project complies with the applicable data protection regulations, including the European General Data Protection Regulation (GDPR). For data collected in the LLs, the DMP outlines data and metadata formats, storage, sharing, and data security methodologies.

The information included in this document provides an insight of how the COMMECT project will comply with the Findable, Accessible, Interoperable, and Reusable (FAIR) principles for Open Science established by the EU.

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Glossary of Terms

AI	Artificial Intelligence
API	Application Programming Interface
DMP	Data Management Plan
DOI	Digital Object Identifier
DST	Decision-making Support Tool
EC	European Commission
EO	Earth Observation
EU	European Union
FAIR	Findable, Accessible, Interoperable, and Reusable
GDPR	General Data Protection Regulation
HE	Horizon Europe
IoT	Internet of Things
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
LL	Living Lab
NTN	Non-Terrestrial Networks
OA	Open Access
RAN	Radio Access Network
R&D	Research & Development
URL	Uniform Resource Locator
WP	Work Package

1. Introduction

The COMMECT project aims at bridging the digital divide, by providing quality, reliable, and secure access for all in rural and remote areas. It will leverage existing and evolving access technologies: 2G/3G/4G/5G and Non-Terrestrial Networks (NTN) to ensure reachability everywhere. Access to fast broadband Internet will enable the mainstreaming of smart farming, forestry inventory and environmental changes, including small and big Internet of Things (IoT) data, Earth Observation (EO) data; and allow the processing of such data, with Artificial Intelligence (AI) algorithms to develop applications that can solve business and social issues for the rural communities.

The project provides the basis of the connectivity solutions for rural areas and communities by carefully evaluating the heterogeneous needs of the end-users in various countries, regions, and sectors. Socio-economic and environmental factors are key in the design of the COMMECT connectivity platform to increase the sustainability, competitiveness, and resilience of those communities. Through the work performed in the different Work Packages (WPs) of the project, COMMECT is going to open new business opportunities and enhance the capability of rural communities to set-up innovative, collaboration- and service-focused business models.

To ensure the rich exchange of best practices and technical knowledge among the actors of the agro-forest value chain, COMMECT has set-up five Living Labs (LLs) across and outside Europe, where end-users “pain” and connectivity “gains” are discussed from different perspectives. User needs have been collected in WP1 and used to define a set of use cases. Using knowledge exchange (best-practice and technical) and lessons learned from LL activities in WP4, COMMECT has designed in WP2 solutions for meeting the needs of end users. Those solutions will be evaluated (from a technical, socio-economic, and environmental perspective) in WP3, and WP5. Additionally, COMMECT also develop in WP3 a Decision-making Support Tool (DST), supporting decision-making for several actors in the agricultural industries.

The activities abovementioned and the work performed during the project are expected to generate different results in the form of deliverables, scientific publications and experimental data collected during multiple measurement campaigns in the LLs. The consortium plans to make most of these results publicly available, following the Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon Europe [1], according to the strategy and plan outlined later in this document.

This document is the second version of the Data Management Plan (DMP), which outlines how data will be handled in the COMMECT project, both internally and externally. For internal data management, the document describes how data will be shared and stored among the COMMECT project partners. Externally, this document provides insights into how the partners intend to manage data to ensure compliance with the Findable, Accessible, Interoperable, and Reusable (FAIR) principles, thereby making the outcomes of the COMMECT project accessible to the scientific community.

2. Data Summary

During the first year, the COMMECT project has been collecting end-user needs and used the collected information to define end-user requirements, for a set of relevant use cases (see deliverable *D1.1 – Report on end-users' needs and relevant use cases* [3]). Afterwards, a set of connectivity solutions has been designed accordingly, as documented in deliverables *D4.1 – Setup and design of Living Labs* [4], and *D2.2 – IoT Edge Computing, and Deployment and operation of 5G Private networks, version 1* [5]. The performance of the proposed solutions is currently under investigation, from a technical perspective (see *D5.1 – Technical performance of COMMECT solutions, version 1* [6]), and also from a socio-economic and environmental point of view (see deliverable *D3.1 - Socio-economic impact and environmental sustainability assessment* [7]).Therefore, the COMMECT project involves the gathering and analysis of different data types. To address end-user requirements and assess the socio-economic impact of the proposed connectivity solutions, we collected and will collect personal data. While specific end-user names are not usually gathered, information such as age, gender, country of origin/residence, level of education, or socio-economic context may be requested. In all cases, including those where end-users' names are collected, privacy regulations were and will be followed, ensuring ethical and legal handling of the data. Transparent communication with end-users, obtaining informed consent, and implementing robust security measures are crucial to responsible data management. Thus, all information collected during the COMMECT project will be governed by standard research ethics principles. The project will conform to current EU legislation on the collection, storage, protection, retention, and destruction of personal data. In particular, compliance to Regulation (EU) 2016/679 of the European Parliament and of the Council 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 (General Data Protection Regulation) and the European Court of Justice ruling on the "Right to be forgotten" (May 2014) will be ensured. Compliance will also be maintained against individual national legislations of the countries of origin of the COMMECT partners. COMMECT does **not envisage collecting sensitive personal data or personal data of vulnerable data subjects**. But as a matter of course the project will treat all personal data with the highest degree of care. For personal data collection involving humans, COMMECT will implement informed decision procedures, giving a subject adequate information concerning the study, providing adequate opportunity for the subject to consider all options, responding to the subject's questions, ensuring that the subject has comprehended this information, obtaining the subject's voluntary agreement to participate and, continuing to provide information as the subject or situation requires. To that end, the project partners will share with the subjects participating in workshops organized by COMMECT an ethical information sheet and a privacy notice, which should be signed by all participants of the corresponding event. An example of the document provided to the end-users can be found in Appendix B – *Privacy Notice Document* –Luxembourg Living Lab.

Considering the abovementioned, the COMMECT project distinguishes between different types of data collected along the different phases of the project:

- **End-user Data:** Opinions, problems, and needs collected from different users during the user needs collection and use cases definition stage. This data was collected through surveys, workshops, interviews and/or meetings. As mentioned above, for the socio-economic impact assessment, personal information such as age, educational background or socio-economic context may be solicited to the end-users. All the collected personal data will be treated in compliance with the General Data Protection Regulation (GDPR). Prior to sharing with partners other than the data collectors, the information will be pseudonymized by separating the participants' names from the answers provided.

- **Agricultural Data:** Raw data generated by the different sensors and devices in the LLs. Examples of this are data collected in the fields (LLs in Luxembourg, Türkiye and Serbia), and in the forest (LL in Norway). For the connected livestock transport LL (in Denmark), collected data will not involve data from the truck loggers, and therefore we will only consider *technical, socio-economic, and environment* data types (see next items). Agricultural data will be used for developing the different applications for the LLs, as well as for the DST.
- **Technical Data:** Data gathered during the technical performance assessment of the connectivity solutions designed and implemented to overcome users' needs. Data will be collected in both a controlled environment and in the LLs. Some examples of technical data could be Radio Access Network (RAN) data, wireless performance data or use case-specific data (sensor or EO data, data for remote control of machinery, etc.). For technical data, data protection and/or copyright/license restrictions might apply (e.g. RAN data), and these will be verified for all collected data sets and might prevent opening them.
- **Socio-economic Data:** Qualitative data gathered to develop an understanding of the impact of connectivity on various parts of rural life. Several surveys were conducted and more will be done to measure how connectivity affects perceived quality of life, schooling and community building. Given the sensitive nature of this information, GDPR regulations will be followed by all partners collecting this data, which will be anonymized before being shared with other partners.
- **Environmental Data:** Environmental indicators such as energy consumption or CO2 emissions will be collected for each of the connectivity solutions. These indicators will be used to evaluate the environmental impact using a Life Cycle Assessment (LCA) framework, defined in deliverable D3.1 [7]. The gathered environmental data is not considered sensitive and can be useful for other researchers evaluating similar connectivity solutions from a sustainability perspective. Therefore, the consortium will follow an open data approach.

Additionally, a series of scientific publications in different conferences and journals, and a set of public deliverables will be generated along the project.

The data and documents produced during the COMMECT project are expected to be useful for research communities, decision-makers, rural communities and main actors in the agro-forest and transport industries. None of the COMMECT project partners are planning to reuse data from previous projects. However, it is not discarded that this may occur. In that case, the specific data and its origin will be explained in deliverable *D7.6 – Data Management Plan, version 3* [8], due in M36.

3. Data Management

3.1. Internal Data Management

It is important that proper storage plans are defined throughout and after project. Figure 1 presents a scheme summarizing the consortium plans to handle and store the data. The consortium distinguishes between two different groups:

- *COMMECT data collectors*: partners gathering the **raw data** from the end-users, in their own labs' facilities, and in the LLs. The data in this case will be internally stored at each of the partners' databases. The data format strongly depends on the type of data being collected and it is left to the criteria of the data collecting partner. Partners are required to store raw data in standardize data formats. This practice ensures enhanced reusability when sharing and making the data publicly available.

- *COMMECT data processors:* partners using the **post-processed and pseudonymized data** shared by the data collectors. It is recommended that post-processed data is shared with the same format in which it will be made publicly available, i.e., following the guidelines from Section 3.2 to provide open access to research data. Partners sharing data within a LL will agree on which is the most convenient database to share the data. They will also provide an API (Application Programming Interface) for the DST to access the mentioned database in a later stage of the project. Regarding data sharing among partners, it is important to note that no data will be exported from a European Union (EU) country to a non-EU country.

All partners involved in COMMECT are regarded as controllers responsible for the

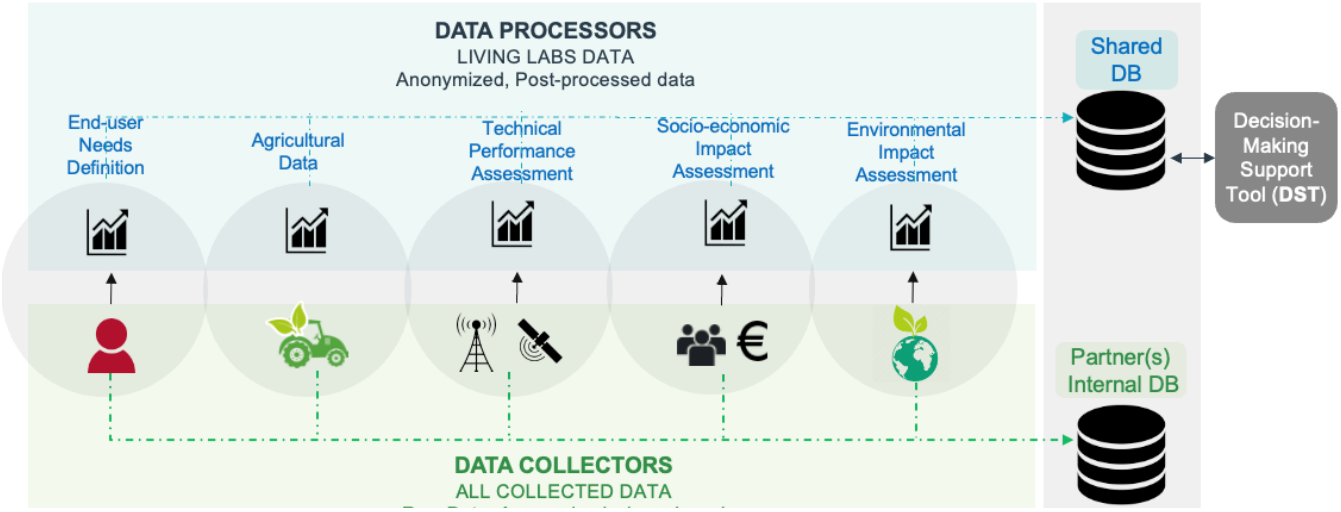

Figure 1. Data Flow Summary

collection and processing of data throughout the project's duration. Therefore, a *joint controllership agreement* has been established and signed to govern the collaborative relationship among all parties handling personal data (see Appendix C).

The first phase of the project consisted mainly in collecting end-user needs for the definition of use cases and requirements. This was done through multiple interviews, surveys, and workshops with the end users from the five different LLs. Data collectors in this case were the responsible partners for each LL, while data processors were the partners using the anonymized data to define the end-user requirements and use cases. Data collectors will always be responsible of meeting the European GDPR and

pseudonymizing data (if applicable) before sharing it with data processors. Before meeting with the end-users, data collectors prepared the *information sheet of the project, consent forms and privacy notice*, i.e., provided end-users with clear information and free choices in order to ensure that it is possible to use and share their inputs for any purpose such as promotion, distribution, exploitation or commercialization. As previously mentioned, an example of the privacy notice provided to the end-users is available in Appendix B – Privacy Notice Document –Luxembourg Living Lab.

At the current stage of the project most of the data being collected in the different LLs targets the technical performance assessment, the socio-economic impact assessment, and the environmental impact assessment. In the following we detail what type of data is expected to be collected in each LL, and how it will be managed.

3.1.1. Socio-economic and Environmental Data

Socio-economic and environmental data will be systematically gathered across all LLs to assess the impacts of the connectivity solutions developed for the identified use cases in the project's initial phase. For more comprehensive information on the assessment frameworks and the specific data collected for this purpose, please refer to the details outlined in deliverable D3.1 [7]. The socio-economic data will be collected by TNO and TNOR. These partners will securely store the collected data internally and will ensure anonymization before sharing it with other partners.

3.1.2. LL N. 1 - Luxembourg – Digitalisation of Viticulture

The viticulture LL will be mostly collecting end-user, technical and agricultural types of data. The main target of this LL is to support winegrowers in their daily activities and enhance viticulture resilience to climate change through the timely provision of relevant information. The emphasis is on data related to winegrowers' management practices, image data of vineyards, and weather information.

The objective is to provide an automated data transfer system, encompassing data processing, severity calculations, and potential alarms, thereby defining the data format, flow, and processing chain. In the initial phase of the project, each partner collected data independently, storing it locally at their facilities. Initially, the focus was on end-user needs identified through a survey, with IBLA collecting answers about users' needs. These surveys were not anonymous but are being stored internally and only conclusions of the end-users' needs have been shared with other partners, complying in this way with GDPR regulations.

Regarding technical data, satellite data (Sentinel-2) and UAV data will be downloaded and processed at LIST. Higher-level satellite data will be stored on the LIST fileserver, granting access to only LIST employees involved in the project. LXS will contribute to data collection by gathering UAV data and terrestrial panorama images, offering insights into the detailed status of the vine canopy. Sensor data, including temperature and leaf wetness, is collected by LIST using various communication technologies, ranging from terrestrial LoRaWAN to satellite backhauling. Data for technical performance assessment of the connectivity solutions will also be collected and processed by LIST and stored on the LIST fileserver.

3.1.3. LL N. 2 - Norway – Connected Forestry

The Norway LL will be collecting end-user and technical data to advance the forest industry. With a specific focus on improving logging activities—an intensive one to two-month phase in the 70–80-year tree lifecycle—the LL aims to address the identified challenges (mentioned in deliverable D1.1 [3]) and enhance operations. The connectivity solutions proposed and evaluated in this LL will cover decision support for

efficient logging, real-time situation awareness, and the implementation of remote machine steering using Augmented Reality (AR) / Virtual Reality (VR) tools. These efforts seek to optimize logging processes, prevent environmental impact, and tackle industry concerns such as reduced recruitment and operator injuries. Therefore, sensor data, and videos from the forestry will be collected, along with the technical performance that will allow for performance evaluation of the connectivity solutions.

KI and TNOR collected end-user data in order to understand the end-users' needs, and TNOR will be collecting technical data to evaluate the proposed connectivity solutions. All personal data (if applicable) will be securely stored and anonymized before being shared with other partners.

3.1.4. LL N. 3 - Denmark – Connected Livestock Transport

The LL in Denmark will mostly collect end-user and technical data throughout the project. This LL focuses on improving the connectivity experienced in the livestock transport sector. It will test connectivity solutions suitable for different operations (loading/unloading of animals or over-the-route transportation), adopting several communication technologies (e.g., public cellular networks or satellite). During the project, the partners involved will investigate over-the-route 5G coverage assessment, multi-connectivity solutions to overcome coverage holes, or deployment of on-demand local green broadband network with terrestrial or satellite backhaul, dedicated for the provisioning of on-demand coverage and/or capacity during the loading/unloading of animals.

The end-user data collected during the end-user needs definition phase is stored by AU, following GDPR when applicable. The rest of the partners only received an anonymized summary of the end-user needs. The LL will not collect specific information gathered by the trucks (sensor data – temperature, CO2 levels, etc. –, location), but will rather use the trucks to gather radio performance data along the main transport routes. Each partner is responsible for storing the data they collect on their respective servers. In instances where technical data sharing is necessary between partners (e.g., between AAU and VITECH), the COMMECT SharePoint platform will be used.

3.1.5. LL N. 4 - Türkiye – Smart Olive Tree Farming

The LL Türkiye aims to support the determination of the most effective control timing for diseases and pests by using early warning systems. TCELL's XG networks' connectivity will allow the close monitoring of soil and other conditions in olive farms, enabling irrigation optimization, disease risk management, frost risk management, and informed spraying decisions.

This LL will be collecting end-user, agricultural and technical data over the course of the project. Data collected from Living Lab Türkiye spans end-user, technical, and agricultural domains. End-user data was obtained through workshops and surveys, with a commitment to anonymize all such data for privacy. Technical data is sourced from TCELL XG's RAN networks, KPIs are use-case specific. Raw data will undergo processing based on the requirements of each use case, and the resulting processed data will be shared alongside analysis results. Agricultural data, stemming from the sensors in olive tree gardens, encompasses outputs from early warning systems, weather information, and soil analysis. The agricultural data API of Living Lab Türkiye follows the standards of RESTful services, ensuring straightforward implementation in any programming language.

3.1.6. LL N. 5 - Serbia – Sustainable Agriculture and Preservation of Natural Environment

The LL in Serbia focuses on advancing sustainable and digitized agricultural practices with a focus on minimizing environmental impact and providing sustainable energy production for agricultural needs. The collected data in this Living Lab includes end-user, agricultural, and technical types. DNET's proprietary service, agroNET[1], will be used for data visualization and data analysis through the different expert modules in order to help end users in the decision-making process.

All data from the LL will be stored in the DNET database, facilitating easy access and management of information. By making the data available through an API, partners can easily retrieve and use the data in their own systems, without the need for manual data transfer. The data format used will be in accordance with "Smart Data Models"[2], a global program that establishes a standard for data formatting and management. This ensures that the data is organized and structured in a way that is easily understood and usable by all partners. To ensure the security of the data, access to the data for project purposes will be restricted to partners with appropriate credentials. This ensures that only authorized parties have access to the data and prevents unauthorized access or misuse. Overall, this approach allows for efficient data management and sharing among project partners, while also maintaining the security of the data.

3.1.7. Decision-making Support Tool

The DST will collect a processed version of all the above-described different types of data to be able to make informed suggestions and provide answers to end-users' requests. Detailed information about data architecture, data types, and data formats used for the DST is outlined in deliverables *D1.3 – COMMECT Solution Architecture, version 1* [9] and *D3.3 – Decision-making Support Tool, version 1* [10]. Given the diverse nature of the data that the DST will handle, it is important to establish a comprehensive strategy for gathering, organizing, and integrating the data. This plan will contribute to use the collected data to predict and recommend optimal solutions for end-users' issues. Deliverable D1.3 [9] describes the plan for storage, arrangement, integration, and utilization of data within the DST.

3.2. Open Access to Research Data

Outputs formally released by the consortium and not compromising any legitimate commercial or other exploitation interest, will be shared according to the open science requirements described in the Horizon Europe Programme Guide, for making research data Findable, Accessible, Interoperable, and Reusable (FAIR) [1]. In the COMMECT project this includes anonymized end-user data, technical data gathered in the experimental campaigns, as well as data regarding the socio-economic and sustainability aspects. Additionally, most of the project deliverables, and scientific publications, will be public. Data will be made publicly available through the Zenodo platform[3], a well-known repository under the European OpenAIRE program and operated by CERN, which allows researchers to upload and make openly available research datasets, publications, software and reports. As explained in Section 2, there are five types of collected data in the COMMECT project which can be shared in (anonymized) raw or postprocessed form.

[1] https://digitalfarming.eu/

[2] https://smartdatamodels.org/

[3] https://zenodo.org/

3.2.1. Findability

To make the COMMECT data consistently findable and citable, all collected data that can be made publicly available will be **identified by a Digital Object Identifier (DOI).** DOIs are persistent identifiers that will provide long-term findability of any digital object on the Internet. The URL of a certain object will be stored in the corresponding DOI and updated whenever the object's location is changed. For the COMMECT data:

- *Scientific publications:* Those publications accepted by academic publishers will be assigned with a DOI, which will be the same used for the open access registration on Zenodo. If a DOI is not available from the publisher, one will be generated upon the registration through Zenodo.
- *Datasets:* To make the collected and processed data publicly available, this will be uploaded to Zenodo, which will generate a DOI for the corresponding dataset.
- *Public deliverables:* Public deliverables will be stored in CORDIS[4].

Further, links to scientific publications, and copy of public deliverables will be included in the COMMECT website[5] and made available.

Rich metadata will be associated to all scientific publications, data sets, algorithms, and software tools – in general data - that will be made publicly available. Zenodo follows the FAIR principles[6] and is compliant with the DataCite Metadata Schema which is a de facto standard for a uniform and consistent description of and facts and figures about the data.

At the current stage of the project, the metadata description is fully developed for publications. For other data the description has been drafted but needs to be further developed based on first example datasets. Zenodo offers several standard fields, particularly for the use of the European Science Vocabulary (EuroSciVoc) [11]. For more information about the metadata descriptions, see Section 3.2.4 on reusability.

The deliverables submitted until M18, following the COMMECT workplan, will be posted on the COMMECT website upon approval from the European Commission (EC); further, they will be available in CORDIS. Scientific publications are linked from the website to Zenodo where open access is provided to metadata descriptions and preprint versions of the papers. All publications can be searched by entering 'COMMECT' in the Zenodo search tool. This will retrieve the following links (as of June 2024):

https://zenodo.org/records/12545998

https://zenodo.org/records/11942849

https://zenodo.org/records/12546900

https://zenodo.org/records/12071039

https://zenodo.org/records/12065792

https://zenodo.org/records/11952206

[4] https:/https://cordis.europa.eu/

[5] https://www.horizoneurope-commect.eu/dissemination-material

[6] https://about.zenodo.org/principles/

3.2.2. Accessibility

As previously mentioned in Section 3.2, the COMMECT project will use Zenodo to make data publicly available. Additionally, by providing DOIs for all uploaded data, Zenodo guarantees a lifetime of at least 20 years, and has a best-effort policy for migration of content in the case of closing operations [12]. This means that all COMMECT data will be kept in a trusted repository of open access research data that will be fully and permanently accessible.

The project partners express their commitment to the intention of making all collected data available, together with the algorithms and software tools needed to re-use or validate the data and generated results. However, there may be instances where certain data needs to be kept confidential. The specific details regarding which data will be treated as confidential are yet to be determined and will be further included in the final version of this document, deliverable D7.6 [8], due in August 2025.

The DST, one of the main COMMECT project outcomes may be exploited after the project lifetime. In that case, code will not be open source, and third parties may have to pay a (non-exclusive) license to use the tool. If this situation occurs, it will have to be discussed whether the members of the consortium get a free license to use the tool for a period of time. This can only be discussed in the final stage of the project and will be detailed in the final version of this document. Any other software being an outcome of the project activities (e.g., simulators, implemented algorithms, processing programs, etc.) will be evaluated with respect to exploitation and/or patentability, upon which it will be decided what can be made publicly available as open-source code.

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3.2.3. Interoperability

As of the current project stage, data collection has started for all LL, as well as for the socio-economic and environmental impact assessment. Similarly, end-user data are available, together with some technical data from controlled (lab) experiments. Different types of data formats will be used according to the data type under collection. While it is difficult to state the data format for each of the datasets being collected, the project partners will stick to common and solid data formats, promoting a higher level of interoperability. The partners are evaluating different options for data formats, but what appears to be prevalent are text-based datasets in comma-separated values (CSV) and JavaScript Object Notation (JSON) formats, both fulfilling the requirements for interpretation by humans and readability by machines. While the JSON format provides the most formal specification, already many datasets are available in CSV (or Excel) format. The final decision on the data formats will be described in version 3 of the DMP [8].

For metadata, Zenodo provides the EuroSciVoc vocabulary which is used specifically for publications. For other data, additional descriptions are necessary (cf. Section 3.2.4).

3.2.4. Reusability

For publications, the metadata description in Table 1 will complement the DOI information mentioned in Section 3.2.1 and ensure the reusability of the results and findings generated by COMMECT. The Metadata fields make direct reference to the corresponding fields in the Zenodo registration; fields not specifically mentioned are left blank or prefilled.

Table 1. Metadata specifications for publications

Metadata (Zenodo)	**Comments**
Files	Preprint or authors version of the paper in pdf format; the pdf must contain a footer mentioning preprint version. *Note*: the pdf file cannot be changed after the preprint is first published!
DOI	Original, or generated through Zenodo
Resource Type	Publication Journal or Conference
Title	Title of the paper (original language)
Publication date	The date when the publication was first published
Creators	The author of the paper, including their OrCID identification (if available)
Description	The paper abstract
Licenses	Creative Commons Attribution Share Alike 4.0 International (CC BY-SA)
Keywords and subjects	From the EuroSciVoc vocabulary
Languages	(English)
Dates	Same as publication date, but with specification of available where
Publisher	Zenodo (prefilled)
Alternate identifiers	Other identifiers for the publication (optional)
Grants	COMMECT (grant number)
Related works	Reference by DOI to other COMMECT publication (if relevant)
Publishing information (Journal)	Name of the journal Volume Issue ISSN
Publishing information (Conference)	Name of the conference name Acronym of the conference

	Place Conference Dates Conference Website

For collected, generated and postprocessed data (end-user, technical performance, socio-economic and environmental), the metadata description in Table 2 will complement the DOI information mentioned in Section 3.2.1. To optimise the reuse of data, the intention is to provide metadata that richly describes the context under which the data was generated so that they can be replicated and/or combined in different settings. The Metadata fields make direct reference to the corresponding fields in the Zenodo registration; fields not specifically mentioned are left blank or prefilled.

Table 2. Metadata Specifications for collected, generated, and postprocessed data

Metadata (Zenodo)	**Comments**
Files	Provisionally CSV or JSON format of the data file (zipped). *Note*: the data file cannot be changed after the dataset is first published!
DOI	Generated through Zenodo
Resource Type	Dataset
Title	Descriptive title for the dataset
Publication date	The date when the data was first registered (uploaded).
Creators	Left blank; see domain specific fields
Description	Scope and purpose of the data: for what purpose was it generated/collected? • Mention any particularities or limitations about the data that other users should be aware of
Licenses	Creative Commons Attribution Share Alike 4.0 International (CC BY-SA)
Keywords and subjects	From the EuroSciVoc vocabulary (optional)
Languages	(English, if relevant)
Dates	Left blank; see domain specific fields

Version	Collected (raw), generated or postprocessed data, including version number
Publisher	Zenodo (prefilled)
Grants	COMMECT
Related works (publications)	Reference by DOI to COMMECT publications (if relevant) for one or several of the following:
Documents	
Is documented by	
Is referenced by	
Is described by	
Is published in	
Related works (datasets)	Reference by DOI to other COMMECT datasets (if relevant) for one or several of the following:
Is supplement to	
Is derived from	
Continues	
Is original form of	
Describes	
Domain specific fields (generic):	
Date	
Basis of record	The nature of the dataset (observation, experiment, simulation, end-user survey)
Country	Country where the data collection took place
Event date	The date for the data collection/generation/processing

Recorded by	Person of organization responsible for the data collection/generation/processing
Institution code	Institution or cooperation who did the data collection/generation/processing
Locality	Region of the country
Decimal latitude	Description of the physical position for the data collection
Decimal longitude	
Creator	Person registering the dataset
Physical setting	Description of the physical environment for the data collection
Capture device	Description of the devices used for data collection

For software/algorithms, Table 3 either substitutes or adds to the description for datasets above; the domain specific fields listed for datasets do not apply to software/algorithms.

Table 3. Metadata Specifications for software/algorithms

Metadata (Zenodo)	**Comments**
Files	Source or executable file. *Note*: the data file cannot be changed after the dataset is first published!
Resource Type	Software
Title	Descriptive title for the software/algorithm
Publication date	The date when the software/algorithm was first registered (uploaded).
Description	The purpose and use of the software, installation instructions
Version	Version number of the software/algorithm
Software	

Repository URL	Link to external repository (if relevant)
Programming language	
Development status	Unsupported

The metadata descriptions are subject to change, specifically for datasets and software/algorithms where they need to be further developed based on first example datasets. The final decision on the descriptions will be included in version 3 of the DMP [8].

Other specific open access material may be relevant besides what is specifically mentioned above, such as images, videos, and presentations. Specific metadata descriptions are available in Zenodo for such resources and can be combined with the relevant metadata from the previous tables.

Utilization of data from previous projects is not intended; however, it has not been ruled out entirely. If any data is reused from earlier projects, this will be explicitly disclosed in the final version of the DMP.

4. Data Security

4.1. Internal Data Security

For internal storage, partners collecting and storing the data are responsible of keeping version control and storing data in a safe location. Section 3.1 explained the storage plans that will be followed by the different LLs, ensuring a secure storage place. The partners act as joint controllers in handling and processing personal data, as stated in the joint controllership agreement (Appendix C).

4.2. External Data Security

For publicly available data, as it has been previously explained in Section 3.2, data will be stored in Zenodo. According to Zenodo, in the unlikely case that they would have to close operations, they have a best-effort policy for migrating all content to other suitable repositories. Thanks to the existing DOIs, that Zenodo itself provides, all uploaded data will not be affected. Zenodo also has a best-effort policy for data protection and security, and they explained the different methods they use for that in [13]. Their efforts focus on protecting their users accounts and the integrity of the datasets uploaded to their repository. Additionally, COMMECT has designated a data responsible for all collected and generated data or documents (see Table 4 of Appendix A). The responsible will be foreseeing that all collected data is stored safely in Zenodo with the corresponding metadata and DOIs.

5. Other Research Outputs

5.1. Deliverables

Public deliverables will be listed in the project website. A total of 32 deliverables, out of the 41 that will be generated during the project, will be publicly available from CORDIS following EC approval, and from the project website. According to the FAIR principles, explained in Section 3.2, these files are made available with the aim of disseminating the project results and bring context and further explanation to the data which are also shared by the project. It will make the project outcome available to the scientific community and any other community interested in consulting, reproducing, or reusing the results. A full list of the COMMECT deliverables can be found in deliverable *D7.1 – Project Handbook for Quality Assurance and Risk Management* [14].

5.2. Scientific Publications

All publications of the COMMECT project will be provided as Open Access (OA), such as the Open Research Europe platform[7]. This will be done either immediately with publishing or with an embargo of maximum 6 months. The publications will include all relevant research outputs, such as data, software, scientific knowledge, models, etc. For peer-reviewed publications, each Research & Development (R&D) partner reserved an allocated budget for open access publications in high-ranked journals and conferences. Access to non-peer-reviewed publications will be open and immediate. In both cases, the publications and related metadata will be shared via Zenodo and cross-linked with the project public website. Further to this the addendum to the publication agreement, provided by the European Commission, will be used.

Scientific publications already produced as an outcome of the project, up to M18, are listed in Deliverable D6.3 [15] and publicly available from Zenodo by searching the project acronym.

[7] https://open-research-europe.ec.europa.eu/

6. Allocation of Resources

No immediate costs are expected from making the HE COMMECT project results openly available and meeting the FAIR principles. Zenodo allows safe and free of charge data storage for the future in CERN's Data Centre for as long as CERN exists. In the case of unforeseen expenses for making the COMMECT project data publicly available, according to the Grant Agreement, these are eligible for reimbursement.

7. Data Management Responsible

The partner in charge of overseeing data management responsibilities within the COMMECT project is Aalborg University (AAU). AAU's primary role is to ensure that all project partners adhere to the Findable, Accessible, Interoperable, and Reusable (FAIR) principles. Additionally, AAU is tasked with making sure that publicly available data aligns with the agreements outlined in this document or subsequent versions.

7.1. Data Responsible

In order to establish a structured approach, a Data Responsible will be assigned for each set of collected or produced data, deliverable, or publication throughout the project. The Data Responsible plays a crucial role in supervising the accomplishment of the data management guidelines. This includes overseeing internal data storage, ensuring anonymization if required, confirming that all involved partners stick to agreed formats, and facilitating sharing of the data in the designated open-access platform (Zenodo).

For clarity, the responsible party for each data set is shown in Table 4 of Appendix A. This ensures a systematic and accountable approach to data management oversight.

8. Conclusion

This deliverable presents the second iteration of the Data Management Plan (DMP) within the COMMECT project. The collected data throughout the project encompasses different types, including end-user, technical, agricultural, socio-economic, and environmental data. Internally, data storage and management will adhere to the structure defined by each Living Lab (LL), as agreed upon by the partners involved in it.

Over the initial 18 months of the project, partners have defined the types of data to be collected and established internal storage protocols. The document also outlines the commitment of project partners to uphold the Findable, Accessible, Interoperable, and Reusable (FAIR) principles in externally handling the data.

Scientific publications are listed on the project website and accessible via the Zenodo platform. The deliverables from the first half of the project will be publicly available through CORDIS upon approval by the European Commission. Data has been collected through the project activities and will be shared via Zenodo once proper data formats have been defined. Listings and links to all data will be provided in an appendix to the final version of the DMP.

Ethical considerations, extensively discussed in a dedicated project deliverable (*D8.2 – Office of Ethics and Integrity, Requirement No.2* [16]), are not reiterated in this document.

It is important to note that the DMP is a living document that will include further updates and conclusions in *D7.6 – Data Management Plan, version 3*, scheduled for submission in August 2025 [8].

Appendix A – Data Responsible

Table 4. Data Responsible for all types of generated data during the COMMECT project.

Data Type	Description	Responsible Partner	Contact Person
Deliverables	Report on end-users' needs and relevant use cases	Responsible partner of the deliverable	Deliverable Leading Partner
Publication	Report on COMMECT requirements and KPIs	Main author	Main author
LL Luxembourg	End-User, Technical and Agricultural Data	LIST	Souhaima Stiri souhaima.stiri@list.lu
LL Norway	End-User, Technical and Agricultural Data	TNOR	Per Jonny Nesse per-jonny.nesse@telenor.com
LL Denmark	End-User and Technical Data	AAU	Troels B. Sørensen tbs@es.aau.dk
LL Türkiye	End-User, Technical and Agricultural Data	TOB	Serkan Kaptan serkan.kaptann@tarimorman.gov.tr
LL Serbia	End-User, Technical and Agricultural Data	DNET	Svjetlana Krco svjetlana.krco@dunavnet.eu
Socio-economic Data	End-User and Socio-economic Data	TNOR	Per Jonny Nesse per-jonny.nesse@telenor.com
Environmental Data	Environmental Data	SeAMK	Valtteri Manninen valtteri.manninen@seamk.fi

Appendix B – Privacy Notice Document –Luxembourg Living Lab

The following text represents an example of the privacy notice that must be provided to all participants across the different workshops carried out within the COMMECT project. The sections highlighted in green indicate the parts that should be modified in accordance with each LL.

1.1 Participant Information Sheet

This workshop is organised in the framework of the COMMECT project, "BRIDGING THE DIGITAL DIVIDE AND ADDRESSING THE NEED OF RURAL COMMUNITIES WITH COST-EFFECTIVE AND ENVIRONMENTAL-FRIENDLY CONNECTIVITY SOLUTIONS", funded by the European Commission (EC), under grant agreement n. 101060881.

COMMECT aims at bridging the digital divide, by providing quality, reliable, and secure access to Internet for all in rural and remote areas. The goal of extending broadband connectivity in rural and remote areas will be achieved by integrating different communication technologies, both terrestrial: cellular 2G/3G/4G/5G networks, and low-cost Internet of Things (IoT), with satellites and drones. Artificial Intelligence, Edge and Network Automation will reduce energy consumption both at connectivity and computing level.

Participatory approach with end-users and ICT experts working together on development challenges will be the key for the digitalization of the sector. To ensure the rich exchange of best-practice and technical knowledge among the actors of the agro-forest value chain, COMMECT will set up five Living Labs across and outside Europe, where end-users "pain" and (connectivity) "gains" will be largely discussed, from different perspectives.

COMMECT Living Labs are addressing different sectors of the agro-forest value chain: Digitalisation of viticulture in Luxembourg, connected forestry in Norway, connected livestock transport in Denmark, smart olive tree farming in Turkey, and sustainable agriculture and preservation of natural environment in Serbia.

The Living Lab in Luxembourg focuses on viticulture and aims to combine Remote Sensing (RS) data with Internet of Things (IoT) data (in-situ measurements), and investigates how different connectivity technologies (LoRaWAN, satellite) could help to provide winegrowers relevant decisional data supporting them in several activities (irrigation, fertilization, and pesticides management).

In this context, COMMECT is organising a workshop to discuss closely with winegrowers in the region the benefits of proposed digital solutions for crop monitoring and management in the vineyards. The workshop was opened to all the interested winegrower's associations in Luxembourg. They were informed about it through IVV and IBLA, which are participating actively in the work of the Living Lab Luxembourg. A small but relevant group of 10 winegrowers' association showed interest in the event. No selection was done, following special criteria, in the list of attendees.

The COMMECT project funded by the European Commission in the Horizon Europe programme, brings together 18 partners from EU and outside-EU. Below the full list of participants.
Consortium members:

- Luxembourg Insitute of Science and technology (LIST)
- University of Aarhus (DK)
- Aalborg Universitet (DK)
- Inland Norway University of Applied Sciences (NO)

- Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (NL)
- Seinäjoki University of Applied Sciences (FI)
- SES Techcom S.A. (LU)
- Telenor ASA (NO)
- Turkcell Teknoloji Araştırma ve Geliştirme Anonim Şirketi (TR)
- DunavNET doo (SRB)
- Huawei Technologies (Ireland) Co Limited (IRL)
- Luxsense (LU)
- Padborg Transportcenter F.m.b.a. (DK)
- Viveris Technologies (FR)

- Institut fir biologesch Landwirtschaft an Agrarkultur Luxemburg (LU)
- Klosser innovasjon (NO)
- Ministry of Agriculture and Forestry (TR)
- Zemljoradnicka zadruga Solar Agro (SRB)
- Huawei Technologies Duesseldorf GMBH (DE)

The partners involved in the Living Lab Luxembourg are: LIST, SES, LXS, IBLA

- Description of the participation:
  - The workshop is organized at: Domaine Cep D'Or, 15, route du Vin, L-5429 Hëttermillen on the 14th of November 2023 from 2p.m to 7 pm
  - During the workshop, the member of the project, in particular of the Living Lab Luxembourg, will present the project approach, the outcomes of previous discussion with end users, and the connectivity solutions designed in the project, for addressing their needs. In the second part of the workshop, an open discussion with the participating winegrowers and stakeholders will aim at collecting feedback to fine-tune the solutions, and define collaborative business models, showing the benefits, and business opportunities achievable with the project outcomes.
  - All the information about the project is available on the project website: www.horizoneurope-commect.eu.
  - A dedicated page about the workshop will be published on the website, following the event. While pictures may be included, there will be no identification of the participants, in the article and in the pictures.
  - The information collected through the open discussion with the workshop attendee will remain confidential in the project consortium, and be used only for research purposes, to further enhance the proposed connectivity solutions, and digital tools. A summary of the main outcomes will be made available on the project website. If they attendee would like to receive additional information, and explanation, they could contact the project coordination team at: commect-coordination@list.lu
- "Participation in this research project is voluntary. You can discontinue your participation in the COMMECT research project at any time without there being any negative consequences."

1.2 Ethical informed consent

□ *"By ticking this box, I certify that I am an adult and have been adequately informed about the research project and therefore consent to take part in this research."*

1.3 Privacy notice for research participants

Your personal data will be processed in this research project in compliance with the GDPR, that is, the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016. In this notice we provide you with the details about that.

Identity of the data controller

The data controller is the entity who determines the purposes and means of processing of your personal data. In the case of this research project the data controller is:
Luxembourg Institute of Science and Technology with offices located at 5, avenue des Hauts Fourneaux in L-4362 Esch-sur-Alzette, Luxembourg. The Data Protection Officer of LIST can be contacted via email: dpo@list.lu.
The Principal Investigator in charge of the project is: Maria Rita Palattella, mariarita.palattella@list.lu
Categories of personal data we collect:
Please find here below a list of personal data we will collect and process about you:

- Contact details (such as name, surname, address, e-mail address, telephone number, fax number...),
- Professional information (such as company/organisation, current role, professional e-mail...),
- Photos, videos, notes, survey responses…

Purpose and legal basis for processing
Your personal data will be processed for the following purposes:

Purpose	Details
Contact you for information and/or updates on the Project	If you provide your consent as required at the end of this document, we will process your personal data to deliver you updates on the project.
Sending LIST/Project's newsletter(s)	If you provide your consent as required at the end of this document, we will process your personal data to deliver the newsletter(s) you subscribed for.

The legal basis for such processing is:

Purpose	Legal basis
Contact you for information and/or updates on the Project	• Provision of consent by the data subject for being contacted, if provided.
Sending LIST/Project's newsletter(s)	• Provision of consent by the data subject for the subscription to LIST/Project's newsletter.

Ensuring personal data security and integrity
We have put in place appropriate technical and organisational measures to prevent or act upon any unauthorised and unlawful processing or disclosure, accidental loss, modification or destruction of your personal data. See below the measures implemented in this project:

- Data will be anonymised.
- Data will be pseudonymised, that is, direct identification data will be removed.
- Data will be analysed using direct identification data because [grounds for retaining direct identification data].
- Encryption of data in transit and at rest.
- The project has a data management plan that describes how data are managed during and after a project.
- Access controls are in place to ensure restriction of access to your personal data to the research team.
- The research team has received training on the GDPR and is under a responsibility of professional secrecy.
- The system has logging in place to establish who collects, modifies, and deletes personal data.

- Independent audits regularly evaluate the efficiency of the technical and organisational measures put in place by the controller.
- The publication of your personal data when disseminating research results (e.g. expert interviews) will be performed with your prior consent.

Data retention periods

Below are the details regarding the time for which we keep your personal data:

Purpose	Retention period
Scientific research	19 years from the end of the Project to comply with audit obligations from funding authorities
Reuse of data	19 years from the end of the Project to comply with audit obligations from funding authorities

After the end of the mentioned retention period:

- Research materials containing personal data will be anonymised for archiving and further reuse.
- Your rights and how to exercise them.

With regards to your personal data collected and processed, you may exercise at any time the following rights:

- Right to access: You have the right to receive confirmation about whether or not your personal data is being processed. If that is the case, you have the right to know what data is being collected and processed and to obtain of copy of it;
- Right to rectification: If the personal data we hold about you is inaccurate or incomplete, you have the right to request to have it rectified;
- Right to erasure: Subject to certain conditions specified in art. 17 of the GDPR, you have the right to have your personal data deleted;
- Right to restriction of processing: Subject to certain conditions specified in art. 18 of the GDPR, you have the right to obtain restriction of the processing of your personal data performed;
- Right to data portability: Subject to certain conditions specified in art. 20 of the GDPR, you have the right to obtain a copy of the personal data you provided in in a structured, commonly used and machine-readable format and to request the transfer of these data to another data controller;
- Right to object: You have the right to object the processing of your personal data when the conditions set out in art. 21 of the GDPR apply;
- Right to withdraw consent: If processing your personal data is based on your consent, you have the right to withdraw that consent at any time. The withdrawal of such consent shall not affect the lawfulness of processing based on consent before its withdrawal.
- Right to lodge a complaint with a supervisory authority: You have the right to lodge a complaint with the Commission Nationale pour la Protection des Données (CNPD). More information on how to lodge a complaint are available on CNPD's website: https://cnpd.public.lu.

You may exercise any of these rights by contacting our Data Protection Officer (DPO) by filling the online form available at LIST's website.

Please kindly note that your rights are not absolute, and they may be withheld in accordance with applicable data protection laws. In such event, LIST will provide you with the reasons for not complying with your request. In such case, you may lodge a complaint with the CNPD and seek a judicial remedy against such decision.

For any further questions and concerns, you can contact the Principal Investigator of the project.

- By ticking this box, I confirm I give my consent to the reuse of my data, as further explained in this privacy notice;
- By ticking this box, I confirm that I want to be recontacted by LIST to receive information and/or updates on the Project;
- By ticking this box, I confirm that I want to subscribe to LIST/Project's newsletter(s).

Date:
Name:
Signature:

Appendix C – Joint Controllership Agreement

JOINT CONTROLLERSHIP AGREEMENT

Horizon Europe – COMMECT Project

This Joint Controllership Agreement (hereinafter the "**Agreement**") is concluded with effect from September 1st 2022 (hereinafter the "**Effective Date**") and made between:

Luxembourg Institute of Science and Technology, a public establishment having its head office at 5, avenue des Hauts Fourneaux in L-4362 Esch-sur-Alzette, Luxembourg, hereinafter referred to as **"LIST"**

and

AARHUS UNIVERSITET (AU), Department of Electrical and Computer Engineering, with legal address at NORDRE RINGGADE 1, AARHUS C, 8000 DENMARK, VAT number 31119103

and

AALBORG UNIVERSITET (AAU), with legal address at FREDRIK BAJERS VEJ 7K, AALBORG, 9220 DENMARK, VAT number 29102384

and

HOGSKOLEN I INNLANDET (INN), with legal address at HAMARVEGEN 112, ELVERUM, 2418 NORWAY, VAT number 918108467

and

NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO (TNO), with legal address at ANNA VAN BUERENPLEIN 1, DEN HAAG, 2595 DA NETHERLANDS, VAT number NL002875718B01

and

SEINAJOEN AMMATTIKORKEAKOULU OY (SeAMK), with legal address at KAMPUSRANTA 11 FRAMI F, SEINAJOKI, 60320 FINLAND, VAT number FI25397673

and

SES TECHCOM SA (SES), with legal address at CHATEAU DE BETZDORF, BETZDORF, 6815 LUXEMBOURG, VAT number LU 20415780

and

TELENOR ASA (TNOR), with legal address at SNAROYVEIEN 30, FORNEBU, 1331 NORWAY, VAT number NO 982463718

and

TURKCELL TEKNOLOJI ARASTIRMA VE GELISTIRME ANONIM SIRKETI (TURKCELL), with legal address at TURKCELL KUCUKYALI PLAZA AYDINEVLER MAH, INONU CAD, NO:36 MALTEPE/ISTANBUL, 34854 TURKEY, VAT number 4780187048

and

DRUSTVO ZA KONSALTING, RAZVOJ I IMPLEMENTACIJU INFORMACIONIH I KOMUNIKACIONIH TEHNOLOGIJA DUNAVNET DOO NOVI SAD (DNET), with legal address at BULEVAR OSLOBODENJA 133 2, NOVI SAD, 21000 SERBIA, VAT number 104769297

and

HUAWEI TECHNOLOGIES (IRELAND) CO LIMITED (HWIE), with legal address at MESPIL COURT, MESPIL ROAD, DUBLIN 4 IRELAND, VAT number IE 6419362W

and

LUXSENSE GEODATA (LXS), with legal address at 4, RUE ALBERT SIMON, CONTERN 5315 LUXEMBOURG, VAT number LU28207433

and

PADBORG TRANSPORTCENTER FMBA (PTC), with legal address at TOLDBODVEJ 2, PADBORG, 6330 DENMARK, VAT number DK 37683140

and

VIVERIS TECHNOLOGIES SA (VITECH), with legal address at RUE D'ARCUEIL 54-56, BP 20327, RUNGIS CEDEX, 94150 FRANCE, VAT number 50160076100107

and

INSTITUT FIR BIOLOGESCH LANDWIRTSCHAFT AN AGRARKULTUR LUXEMBURG ASBL (IBLA), with legal address at 27, OP DER SCHANZ, ALTRIER, 6225 LUXEMBOURG

and

KLOSSER INNOVASJON AS (KI), with legal address at HOLSETGATA 22, HAMAR, 2317 NORWAY, VAT number NO982009219MVA

and

MINISTRY OF AGRICULTURE AND FORESTRY (TOB), with legal address at ESKIŞEHIR YOLU 9. Km, ANKARA, 06000 TURKEY, VAT number TR8240079388

and

ZEMLJORADNICKA ZADRUGA SOLAR AGRO (ZZSA), with legal address at ZIVOJINA MISICA, 53, GOSPODJINCI, 21237 SERBIA, VAT number 100648039

hereinafter Individually referred to as a "**Party**" or "**Joint Controller**" or collectively referred to as the "**Parties**" or "**Joint Controllers**".

PREAMBLE

WHEREAS the Parties have entered into a Consortium Agreement (the "**Main Agreement**"), effective as of September 1st 2022, to collaborate in a research project entitled "BRIDGING THE DIGITAL DIVIDE AND ADDRESSING THE NEED OF RURAL COMMUNITIES WITH COST-EFFECTIVE AND ENVIRONMENTAL-FRIENDLY CONNECTIVITY SOLUTIONS – COMMECT (the "**Project**").

WHEREAS the Parties will process personal data in the framework of the Project and jointly determine the purposes and means of the processing of such personal data.

WHEREAS the Parties now wish to set out the framework for the processing of personal data under the Project, as Joint Controllers.

The Parties have agreed as follows:

Article 1. Purpose of the Agreement

The purpose of this Agreement is to define the conditions in which the Parties undertake to carry out the personal data processing under the Main Agreement in accordance with Article 26 of the General Data Protection Regulation ((EU) 2016/679, "**GDPR**"), in accordance with the clause 4.5 of the Main Agreement.

As part of their contractual relations, the Parties shall comply with the applicable national and European data protection regulations, i.e., the General Data Protection Regulation ((EU) 2016/679, "GDPR" and any applicable

national implementing laws, regulations and secondary legislation, as amended or updated from time to time (hereafter the "**Applicable Legislation**").

"Joint Controller", "Data Protection Impact Assessment (DPIA)", "DPO", "Processor" or "Data Processor", "Controller" or "Data Controller", "Sub-processor", "Supervisory Authority", "Data Subject", "Consent", "Personal Data", "Personal Data Breach", "Special categories of data", "Process", "Processed", or "Processing" shall each have the meaning defined in the GDPR.

Article 2. Description of the processing activity

The personal data to be processed by the Parties as Joint Controller, in accordance with article 26 of the GDPR, is detailed under Appendix 1 "Joint Processing Activities".

Article 3. Duration of the Agreement

This Agreement enters into force on the date of signature of the Main Agreement and for its entire duration, including any extension.

Article 4. Parties' obligations

The Parties as Joint Controllers undertake the following:

- the Data are processed in accordance with the Applicable Legislation;
- the Data are processed in accordance with the terms of this Agreement for the sole purposes of the Project, as described in Appendix 1 ("Joint Processing Terms");
- to implement appropriate technical and organizational security measures to protect the integrity and confidentiality of the Data in accordance with Applicable Legislation and as detailed in Appendix 1 ("Joint Processing Terms"), namely, to ensure that the Data will: (i) only contain Pseudonymized Data and no direct identifiable Personal Data, when made available to the other Parties and (ii) be shared through secure channels as agreed between the Parties. The Joint Controllers further undertake to refrain from attempting to identify any Data Subject to whom the Data pertains either by external matching of the Personal Data or by any other means.
- to process all Data in a strictly confidential manner and ensure that any third party it authorizes to have access to the Data, including (Sub)-Processors, will respect and maintain the confidentiality and security of the Data;
- to only transfer Personal Data to a country outside the EU/EEA ("third country") or international organization provided that compliance with Chapter V of the GDPR is ensured.
- to use their best efforts and cooperate fully in order to enable the exercise of rights by Data Subjects in a timely manner as foreseen under the GDPR.
- the Party receiving data subject request shall inform the other Party without undue delay;
- in case a DPIA is required in accordance with article 35 GDPR, the Parties shall support each other;
- to cooperate for the purposes of maintaining records of the Joint Processing in accordance with Article 30 GDPR;
- assist each other in case of investigation, proceedings or information requests by a Supervisory Authority concerning the Joint Processing (except for if not permitted by applicable laws), namely but not limited to, by providing all necessary information and documents in its possession;
- to inform the other Party in the event of a data breach of the personal data processed under the Project within 48 (forty-eight) hours from the moment in which it becomes aware of such breach and to cooperate in case of communication to a Supervisory Authority and the data subjects. For the avoidance of any doubt, each Party is responsible independently from the other Party for reporting a breach to the Supervisory Authority and data subjects.

Article 5. Parties' responsibilities

In the scope of the obligations listed under Article 4 (“Obligations of the Parties”) the Parties agree to allocate the responsibilities undertaken as provided for in Appendix 2 (“Allocation of Responsibilities and Tasks”).

Article 6. Liability

The Parties agree that, for any willful or negligent violation of Data Protection Legislation by a Party and as between the Parties, such Party shall be liable to the Data Subject to the extent permitted by law.

Article 7. Modifications

Any modifications to this Agreement shall be made through an amendment signed by the Parties.

Article 8. Assignment

This Agreement may not be assigned or transferred for any reason and for any purpose whatsoever without the express written consent of the other Party.

Article 9. Applicable law and jurisdiction

This Agreement shall be governed by Belgian law.

In case of disputes, the Parties shall do their utmost to come to an amicable agreement.

In the absence of an amicable agreement between the Parties, any disputes related in any way to this Agreement shall be subject to the exclusive jurisdiction of the courts of Brussels.

ARTICLE 10 – APPENDICES

Attached to this Agreement:

- Appendix 1: Joint processing terms
- Appendix 2: Allocation of responsibilities and tasks

This Agreement may be signed in counterparts, each of which will be deemed to be an original. The Parties agree that this Agreement may be executed by digital signatures (e-signature including a digital certificate for independent identity validation) (e.g. Adobe Sign, DocuSign or similar electronic signature technology) which shall be considered as an original signature for all purposes and shall have the same force and effect as an original signature.

Executed by the duly authorized representative of each Party.

Appendix C.1: Joint Processing Activities

Title and date of Main Agreement	Consortium Agreement dated September 1st 2022
Subject matter of the Main Agreement:	Consortium Agreement to specify with respect to the Project the relationship among the Parties, in particular concerning the organisation of the work between the Parties, the management of the Project and the rights and obligations of the Parties concerning inter alia liability, Access Rights and dispute resolution.
Joint processing activities under the project:	Collection, storage, pseudonymisation, anonymization, analysis, access, transfer among Project partners, archiving.
Duration of the processing:	During the Project
The purpose(s) of the processing:	**1.** To conduct a survey on socio-economic impact (task performed by INN, TNO); **2.** To conduct a survey on business modes (task performed by TNOR) Raw data from the surveys will be stored by TNO and TNOR **3.** To organise and animate the Living Labs (LLs) which include interviews, workshops and surveys with relevant stakeholders. Individually by each partner as follows: • For the LL in Luxembourg: LIST, IBLA will collect, process and store the data • For the LL in Norway: TNOR and KI will collect, process and store the data • For the LL in Denmark: AU, PTC, TNO and TNOR will collect, process and store the data • For the LL in Turkey: TOB will collect, process and store the data • For the LL in Serbia: DNET will collect, process and store the data. **4.** To organise and conduct trainings (task performed by TOB)
Personal data processed:	Common personal data, opinions, email addresses, profession, company details (year of foundation, approximate number of employees and female employees, turnover in 2022)
Categories of data subject:	Research participants: farmers, foresters and farm companies' employees
Special categories of personal data processed (if applicable):	N/A
Lawful basis of the Joint Processing:	**For LIST:** Legitimate interest and consent under art. 6 the GDPR **For the other partners**: consent under art. 6 of the GDPR

Location(s) of the Joint Processing:	Every partner will process data in their own country. Collection of socio-economic data will be performed in the corresponding LL country and will be processed by EU partners (TNO and TNOR) in their countries.
Transfer channels:	Through LIST's SharePoint
Security Measures:	Each partner will decide the storage method/tool of internal data and will be responsible for a safe and secure storage. Only pseudonymised data will be shared among the partners.
Third parties or (Sub)Processors processing the Data:	N/A
Third countries to which Personal Data are transferred and safeguards implemented:	No personal data will be transferred to or be accessible by the Turkish and Serbian partners. If this changes, all transfers will be made based on the Commission's Standard Contractual Clauses

Appendix C.2: Allocation of responsibilities

TASK	RESPONSIBLE PARTY																	DETAILS
	LIST	AU	AAU	INN	TNO	SeAMK	SES	TNOR	TURKCELL	DNET	HWIE	LXS	PTC	VITECH	IBLA	KI	TOB	ZZSA	
Information to data subjects (art. 13-14 GDPR)	√	√		√	√			√		√			√		√	√	√		As a general principle within this Project, the Parties already agree that each Partner shall be responsible to comply with the obligations listed in this table for the data collected and processed in each Living Lab.
Management of consent of data subjects	√	√		√	√			√		√			√		√	√	√		Each Partner will be responsible for identifying when consent is an appropriate legal basis and for its management.
Primary point of contact for data subjects	√	√		√	√			√		√			√		√	√	√		Each Partner will be the point of contact for the individuals

																		whose data have been collected within each Living Lab.
Exercise of data subjects' rights	√	√		√	√			√		√			√		√	√	√		Each Partner will be responsible for the exercise of data subjects' rights in relation to the Living Lab.
Performance of DPIA	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	If it is concluded that a DPIA assessment has to be conducted, the Parties undertake to commit to a collaborative effort for the performance of this assessment,
Notification of data breach to supervisory authority	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Depending on the specific case, each Party may be required to notify a data breach to the competent national data protection authority. As a general principle, the Parties will make their best efforts to agree on a common

																			approach to avoid that the information transmitted is contradictory or erroneous.
DPO contact details	dpo@list.lu	dpo@au.dk	Dpo@aau.dk	Bard.tronvoll@inn.no	Remy.vandenboom@tno.nl	dpo@seamk.fi	Dataprotection-officer@ses.com	webmaster@telenor.com	etikbildirim@turkcell.com.tr	info@duvanet.eu	Perter.carberry@huawei.com	rgpd@lsc-group.lu	info@padborgtransportcenter.dk	Aude.MERCIER@viveris.fr	info@ibla.lu	post@klosser.no	Etiket@turktob.org.tr		

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