



This project has received funding from the European Union's Horizon 2022 Research & Innovation Actions – Project. 101086355 – HORIZON-CL6-2022-GOVERNANCE-01



Deliverable D5.3 PILOTING PLAN and EVALUATION METHODOLOGY, V2

December 2024



Author		
Name	Organization	Draft release date
Panagiota Louka	NP	01/12/2024
Tuna Coppens	EV ILVO	19/12/2024

Approval on behalf of the Executive Board		
Name	Organization	Date of approval
Isabelle Piccard	VITO	
Paolo Cosmo Silvestro	DEIMOS	

Revision records			
Version	Date	Changes	Authors
1.0		Original document	NP

Acronyms and Abbreviations

AI	Artificial Intelligence
AgroSTAC	global repository on key agronomy observations
ATB	Institut für angewandte Systemtechnik Bremen GmbH
BIOPAR	Biophysical Parameters
CA	Consortium Agreement
CAP	Common Agricultural Policy
CEADS	Common European Agricultural Data Space
CSV	Comma Separated Values
CSW	Catalogue Service for the Web
DES	Deimos Spain
DGA	Data Governance Act
DME	DEIMOS ENGENHARIA SA
DSS	Decision Support System
DSSC	Data Space Support Centre
EC	Electrical Conductivity
EnMAP	Environmental Mapping and Analysis Program
EO	Earth Observation
EOD	Earth Observation DATA
EOSC	European Open Science Cloud
ERP	Enterprise Resource Planning
ESA	European Space Agency
ET	EvapoTranspiration
ETa	Actual EvapoTranspiration
EU	European Union
EV ILVO	Eigen Vermogen van het Instituut voor Landbouw en Visserij Onderzoek
FAIR	Findable, Accessible, Interoperable, and Reusable
Fcover	Fraction of vegetation cover
fPAR	Fraction of Absorbed Photosynthetically Active Radiation
GA	Grant Agreement
GB	Giga Byte
GEOGLAM	Group on Earth Observations Global Agricultural Monitoring Initiative
GIS	Geographic Information Systems
fAPAR	fraction of Absorbed Photosynthetically Active Radiation
GDPR	General Data Protection Regulation
GeoJSON	Geospatial Java Script Object Notation
GeoTIFF	Geographic Tagged Image File Format

IA	Innovation Area
ICCS	Institute of Communications and Computer Systems
iCM	Integrated Crop Management
IoT	Internet of Things
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
LAI	Leaf Area Index
LAU	Local Administrative Unit
LUE	Light Use Efficiency
ML	Machine Learning
MSI	MultiSpectral Instrument
NDVI	Normalized Difference Vegetation Index
NDWI	Normalized Difference Water Index
NIR	Near Infra Red
NP	NeuroPublic
NPP	Net Primary Productivity
OAuth	Open Authorization protocol
OGC	Open Geospatial Consortium
OHB	OHB DIGITAL SERVICES GMBH
OpenAIRE	Open Access Infrastructure for Research in Europe
OpenDEI	Open Digitizing European Industry
PPP	Plant Protection Product
PSNC	Instytut Chemii Bioorganicznej Polskiej Akademii Nauk
RIA	Research and Innovation Action
R&D	Research and Development
R&I	Research and Innovation
RIL	Research and Innovation Lab
RS	Remote Sensing
SciHub	Scientific Hub
SITRA	Finnish innovation fund
SOC	Soil Organic Carbon
STAC	Spatio Temporal Assets Catalog
UAV	Unmanned Aerial Vehicle
VITO	Vlaamse Instelling voor Technologische Onderzoek
VNIR	Visible and Near Infra Red
VPO	Vlaams Planbureau voor Omgeving
WP	Work Package

Table of Contents

Executive Summary	10
1 Introduction.....	11
1.1 ScaleAgData Background	11
1.2 ScaleAgData Vision, Objectives and Innovations.....	11
1.3 ScaleAgData Concept, Activities and expected Results	12
1.4 WP5 Context	13
1.5 Scope of the document.....	14
1.6 Document structure.....	15
2 RILs Context and Presentation	16
2.1 Broader context of RILs.....	16
2.2 RILs presentation	17
2.2.1 RIL1 Water productivity	17
2.2.2 RIL2a Crop management – Agri-environmental monitoring for Policy Makers.....	18
2.2.3 RIL2b Crop management – Sustainability performance	20
2.2.4 RIL2c Crop management - Early Pest Detection	21
2.2.5 RIL3 Yield monitoring	22
2.2.6 RIL4 Soil health	23
2.2.7 RIL5 Grasslands	25
2.2.8 RIL6 Sustain Dairy.....	26
3 Procedures for Piloting, Reporting, Troubleshooting, Decision-making, Demonstrating and Evaluating.....	28
3.1 RILs Governance Structure, Roles and Decision-making	28
3.2 RILs Execution Plans and Timelines	30
3.2.1 Structure of the RILs Execution Plans.....	30
3.2.2 Main elements in the RILs Execution Plans.....	32
3.2.3 RILs Timelines	39
3.3 Monitoring and Reporting	40
3.3.1 Regular meetings for monitoring and troubleshooting	41
3.3.2 Meetings between (sub) RIL Leader and partners inside each RIL	42
3.3.3 Meeting Schedule.....	43
3.3.4 Meeting Documents.....	43
3.3.5 Progress reporting.....	43
3.4 KPIs Monitoring.....	45
3.5 Demonstration and Evaluation Methodology	45
3.5.1 Demonstration	45
3.5.2 Evaluation Methodology	49
3.6 Communication Channels.....	52

4	Upcoming activities.....	53
5	Conclusions	54
	Annexes.....	55
	Annex I: Template for RIL execution plan	56
	Annex II: Template for RIL progress report.....	57
	Annex III: Template for RIL meeting agenda & minutes.....	58
	Annex IV: Template for KPIs' monitoring.....	59

List of figures

Figure 1: ScaleAgData agile development approach.....	13
Figure 2: Presentation of the six RILs, with corresponding icons.....	17
Figure 3: Overview of the structure of RILs with subRILs.	29
Figure 4: Overview of the structure of RILs without subRILs.	29
Figure 5: Overview of structure of Execution Plan.....	31
Figure 6: First Section of Execution Plan	33
Figure 7: Sub-section of Execution Plan related to Sensor Data	33
Figure 8: Sub-section of Execution Plan related to EO Data	34
Figure 9: Sub-section of Execution Plan related to Other type of Input Data.....	34
Figure 10: Deployment of the RILs' Innovative Approaches	35
Figure 11: RILs User Stories.....	35
Figure 12: Section of Execution Plan related to the technical providers contributing to the RIL	36
Figure 13: General Requirements of the RILs	36
Figure 14: RILs Outputs	37
Figure 15: Demonstration.....	37
Figure 16: RILs KPIs.....	38
Figure 17. RILs' Timelines	40
Figure 18: Concept graph of the RIL follow-up meeting with Task Leader	41
Figure 19: Concept graph of the internal RIL meeting.....	42
Figure 20: Progress Report Template.....	44
Figure 21: Monitoring RILs modifications in Execution Plans	44
Figure 22. Needs assessment and Solution evaluation, together with Traceability and Monitoring, are Key Activities in Business Analysis. Source "The PMI Guide to Business Analysis".....	50
Figure 23. Key impact pathways.....	52

List of tables

Table 1: Thematic sections of the Execution Plan	31
Table 2: Coding system of the Execution Plans	38
Table 3: RIL meetings schedule.....	43
Table 4 Roles and responsibilities per demonstration step.....	47

Executive Summary

ScaleAgData is a response to the call HORIZON-CL6-2022-GOVERNANCE-01-11 Upscaling (real-time) sensor data for EU-wide monitoring of production and agri-environmental conditions. It is a four-year project, running from January 2023 until December 2026. The project's consortium is comprised of twenty-six partners from fourteen countries.

The purpose of Deliverable D5.3 "Piloting Plan and Evaluation Methodology, v2" is to outline the methodology for developing of the six so called Research and Innovation Labs (RILs) in the project's second iteration. Therefore, this document will provide generic guidelines and materials applicable to all RILs within ScaleAgData. Additionally, it offers a brief overview of the project's background, vision, objectives and expected results, along with the context of Work Package 5 (WP5). This deliverable is the third deliverable of WP5, which focuses on the deployment, demonstration, and evaluation of the RILs. This document will serve as a methodological guide for the second iteration, incorporating insights from the first iteration.

1 Introduction

1.1 ScaleAgData Background

Nowadays, the detailed monitoring of the agricultural production sites, as well as their surrounding environment, has become a critical tool for addressing challenges such as the growing global demand for agricultural productivity and escalating risks caused by an adversely changing climate. At the same time, the need to remedy the huge environmental impact of agricultural practices is very important.

Detailed monitoring requires more information to optimize the production process and to evaluate the environmental impact and effectiveness of this optimization. Several monitoring initiatives have been based on satellite data, yet often the level of detail or the information needed cannot be derived from them. Further advances in satellite or processing capacities could enhance the monitoring ability of the agri-environmental conditions, but still there is a need for reliable reference data.

In order to upscale the monitoring capacities of the agri-environmental conditions through EO data to a level of analysis of 10 m or beyond at the European scale, a tremendous amount of ground truth data would be required, which should be adequately geo-referenced and with a sufficient density.

At the same time, there is an enormous and underexplored potential of the sensors that are increasingly being deployed by farmers and advisory service providers. These sensors capture essential information, from very detailed proximal sensing of crop characteristics, over field-based mapping to more environmental conditions. Also, they have proven to be an added value in the early detection of possible issues in the production process, and to enable the steering of the production process.

The challenge of data scarcity to further scale the European agri-environmental monitoring capacities could be tackled by integrating sensors and EO data in existing and new monitoring capacities. To this end, two issues have been identified that should be overcome: on the one hand, the organization of the data streams and the onboarding of the different stakeholders and on the other hand, the adaptation that is required to optimally integrate the sensor data into the Earth Observation (EO) based monitoring tools.

Based on the above, the main vision of ScaleAgData was developed, and its main objectives were defined. These are both presented in the following section.

1.2 ScaleAgData Vision, Objectives and Innovations

The main vision of ScaleAgData is to obtain insights in how complex data streams, linked to sensors and Earth Observation (EO) data, should be governed and organized, as well as to develop the data technology (from data streaming, data analytics and artificial intelligence (AI) applications) needed to scale data collected at the farm level to regional datasets built for agri-environmental monitoring and the management of agricultural production.

Based on the vision of ScaleAgData, the following five main objectives of the project have been defined:

- i. Developing innovative approaches for collecting in-situ data and applying data technologies by actively involving stakeholders in the agricultural production process.
- ii. Enabling and promoting data sharing along the entire data value chain.
- iii. Demonstrating how the readily accessible, locally collected sensor data can be scaled to agri-environmental data products at the national, regional or European level.
- iv. Demonstrating the benefit of the improved monitoring capacities of the agri-environmental conditions in a precision farming context.
- v. Demonstrating the benefit of upscaled regional datasets for the agricultural sector in general.

To accomplish these objectives, a number of innovations have been identified that are needed, along the different aspects of the data stream from sensor to upscaled monitoring products. The innovation areas (IA) that are foreseen in ScaleAgData are the following:

- **IA1:** Innovative sensor technology
- **IA2:** Edge processing
- **IA3:** Data sharing architecture and data governance
- **IA4:** Satellite data augmentation
- **IA5:** From data assimilation to service development
- **IA6:** Privacy-preserving technology
- **IA7:** Data integration methodologies

1.3 ScaleAgData Concept, Activities and expected Results

Improving the capacities for monitoring the agri-environmental conditions at a European scale, through the integration of in-situ sensor and EO data, requires the participation and collaboration of different partners that are part of the involved data streams, in order to manage to organize these data streams to the benefit of all stakeholders.

In ScaleAgData, these stakeholders are brought together aiming at the identification and alignment of the different needs and concerns. Also, they analyze the methodological frameworks and solutions as well as the demonstration and evaluation of the usability and relevance of the outcomes.

The activities of the project involve data collection from local level, advanced sensor signal processing and regional monitoring platforms based on EO data, cumulated to final applications for stakeholders showcased in six Research and Innovation Labs (RILs). This sequential development process will be executed in four work-packages:

- WP2: Concept and co-design of innovative approaches
- WP3: Sensor selection, spatial and temporal processing design, data sharing and governance approaches

- WP4: Data integration in farming services as well as agri-environmental monitoring data products
- WP5: Demonstration of these concepts in six concrete applications related to agricultural production in general.

All these will be organized following an agile multi-step development approach. As presented in Figure 1, ScaleAgData follows an iterative approach comprised of two iteration rounds, each of which includes the four phases:

- Phase 1: Co-design and definition (WP2)
- Phase 2: Development of methodological frameworks and prototypes (WP3 and WP4)
- Phase 3: Technology implementation and validation in a testing environment (WP3 and WP4)
- Phase 4: Demonstration and evaluation in the RILs (WP5)

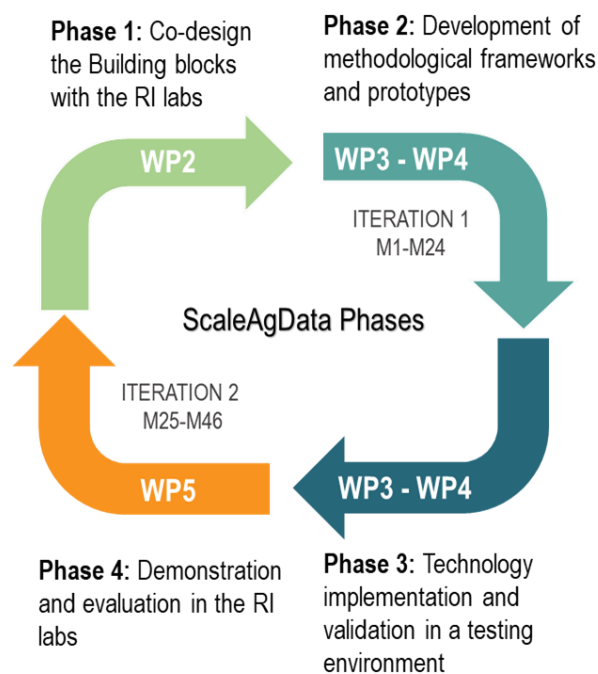


Figure 1: ScaleAgData agile development approach

1.4 WP5 Context

The overall goal of WP5 is to support the RILs to build on top of the outcomes of the co-design process in WP2 (Phase 1) and the outcomes of WP3 and WP4 (Phase 2 and 3). Specific objectives of WP5 are:

- To organize and facilitate the integration and deployment activities of the RILs.
- To coordinate and support the RILs in their demonstration activities.
- To monitor and evaluate the impact of the RILs' innovations.
- To share the resulting knowledge and creation of guidelines for replicating results across Europe.

Activities of WP5 are grouped into four tasks. In Task 5.1 the guidelines for the deployment,

demonstration, and evaluation of the RILs are provided (D5.1). Based on those guidelines, the first iteration of integration, deployment, and setup of the demonstrations as well as the coordination, monitoring and evaluation has been accomplished during Tasks 5.2 and 5.3 respectively. With the completion of the first iteration of the RILs, the methodological guidelines have been updated for the second iteration (D5.3), in December 2024, and the implemented demonstrations of the first iteration will be described in a short report (D5.2), in February 2025. The demonstrators of the second iteration will be deployed, integrated, coordinated, monitored, and evaluated according to the updated guidelines (T5.2 and T5.3) and they will be shortly described in D5.4 when the second iteration is completed, scheduled for October 2026. In Task 5.4, the approach for sharing the knowledge produced during the project, as well as the guidelines for replicating its results will be developed (D5.5) at the very end of the project (December 2026).

More analytically, the activities included in the tasks of WP 5 are the following.

- ❖ **Task 5.1** RIL deployment, demonstration and evaluation plan methodology M9-M24 (NP, all WP participants)

Within Task 5.1, the methodology that will be followed by the RILs will be specified and the plans for the iterative implementation will be co-designed by and for each RIL.

- ❖ **Task 5.2** Integration, deployment, and setup of demonstrators M14-M46 (NP, all WP participants):

In T5.2, the RILs will deploy and integrate the validated results of Phase 3 and develop end-user applications (demonstrators) running over the project's validated methodological frameworks and prototypes. The work will mainly focus on integrating the ScaleAgData services to existing applications and not entirely new applications for end users.

- ❖ **Task 5.3** Coordination, monitoring, evaluation and impact analysis M18-M46 (EV ILVO, all WP participants):

The focus of T5.3 is ensuring the smooth operation of the demonstration and evaluation process in Phase 4, demonstrating the validated methodological frameworks and prototypes of Phase 3. Also, the performance of the demonstrators, and the project results in general, will be analyzed, potential shortcomings, and drawbacks in demonstrators' operation will be identified. Furthermore, the applications' impact will be evaluated and the evaluation results of the first iteration process will be fed back into WP2, to feed the co-design phase.

- ❖ **Task 5.4** Knowledge sharing and replication guidelines M36-M48 (ATB, all WP participants):

Task 5.4 activities focus on the analysis of the initial plans of the RILs, the approach for sharing knowledge with a larger external target audience and the development of replication guidelines.

1.5 Scope of the document

Deliverable D5.3 Piloting Plan & Evaluation Methodology, v2 is the third deliverable of Work Package 5 (WP5), led by Neupublic. The objective of this document is to outline the methodology for developing the demonstrators and pilot trials of the RILs during the second iteration, building on insights gained from the first iteration. It provides generic guidelines and materials common to all RILs

included in the project.

The document begins with a brief overview of the ScaleAgData project's background, vision, objectives, and innovations, along with an explanation of WP5's role within the project. It then presents the different RILs, describing their context within ScaleAgData, the chosen application domains, and areas of innovation, incorporating updates made during the first iteration.

At the core of this document are the procedures for monitoring and managing of RILs, as well as the communication channels established to ensure agile and fluid interaction between all the agents. Additionally, the document outlines the organization of meetings at various levels, both within each RIL (RIL leader with partners) and between RIL leaders with Task Leader.

Building on this structure, the document also provides guidance for conducting a successful demonstration, detailing key steps, roles, and responsibilities to ensure effective execution. Additionally, it offers a brief explanation of the evaluation methodology, providing insight into how the impact of the solutions and progress will be assessed.

Finally, the Annexes provide updated templates for the correct development and organization of the RILs. These include templates for meeting agendas & minutes, execution plans, progress reports and KPIs, designed to standardize methodologies and documentation that facilitate the monitoring and evaluation of milestone achievements .

1.6 Document structure

This document is structured as follows:

- Chapter 1 provides the background and the general objectives of the project including the objectives of WP5 (to which this deliverable is part of).
- Chapter 2 presents the Research and Innovation Labs (RILs) and their basic elements.
- Chapter 3 presents all the procedures and the documents necessary for piloting and reporting, as well as evaluation mechanisms of all RILs.
- Chapter 4 establishes specific guidelines for the communication channels around the project and sets the different levels and frequencies of the meetings.
- Chapter 5 describes the upcoming activities.
- Chapter 6 presents the main conclusions of the deliverable.
- Annexes I-IV include the various templates presented in this document.

2 RILs Context and Presentation

2.1 Broader context of RILs

In the context of ScaleAgData, a series of Research and Innovation Labs (RILs) have been launched. Each RIL has its own specification and thematic focus and will evaluate and monitor different data upscaling and integration models or approaches. Based on these integrated data sets, recommendations will be formulated which can be capitalized in the direction of strengthening the competitiveness and sustainability of European agriculture. The RILs will also help ensure that the recommendations produced are comprehensive, relevant for the agri-food sector in general, and scalable throughout Europe.

In total, six RILs have been defined, covering a variety of thematic areas with unique data streams, from locally collected sensor data to the upscaled regional monitoring capacities. They reflect a multiplicity of application domains, different biogeographical zones, various crops, diverse levels of maturity, a wide range of sensor technologies and data products, as summarized below:

- **Application domains:** Water productivity, Crop management, Yield monitoring, Soil Health, Grasslands and Dairy.
- **Biogeographical zones:** Pilot activities will take place in **five** different biogeographical zones (Boreal, Atlantic, Continental, Alpine and Mediterranean) in **eight** countries (Belgium, Germany, Greece, Israel, Italy, Latvia, Poland and Spain (see Figure 2)
- **Targeted crops:** peppermint, quinoa, potato, cotton, potatoes, tomato, wheat, rye, sugar beet, corn, prunus, annual crops and grasslands.
- **Maturity levels:** In terms of services to the farmers, available sensor technology, data products, and data governance.
- **Range of Technologies:** Satellites, drones, proximal sensors (incl. IoT devices), weather stations, etc.
- **Range of Data:** Across the different RILs, data streams will be integrated including weather and soil data, satellite data, crop model data, farm logs and historic planting data, etc.

In order to ensure a wider coverage of the sensor data, in some RILs there are several sub-RILs. This enables enhanced decision-making regarding the usability of the products and services in different agro-ecological conditions. Also, it enables the evaluation of the regional transferability of the results and outcomes. However, the subdivision into sub-RILs is purely thematic, with each sub-RIL operating independently in all processes outlined in this deliverable.

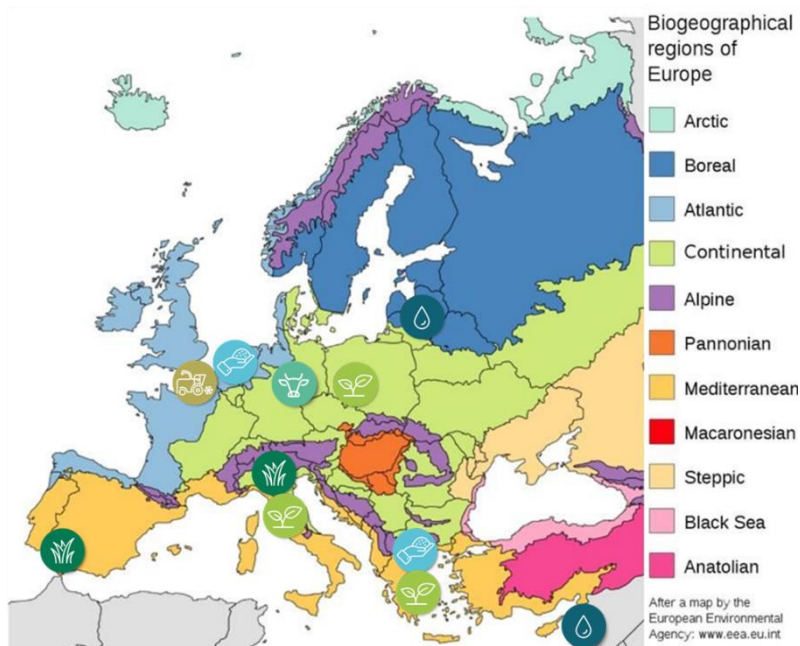


Figure 2: Presentation of the six RILs, with corresponding icons

2.2 RILs presentation

In the following sub-sections, the main elements of each RIL are presented, including their application domain, their innovation areas and their plan for the deployment of innovative approaches. Also, the area of interest, the targeted crops or products, the main inputs and outputs and the characteristics of the pilot fields of the first and second iteration are briefly described.

2.2.1 RIL1 Water productivity

Partners:	VRI IES, MIGAL
Challenges and objectives:	Drought caused stress is a well-known issue across Europe, but it is gaining in importance in the Northern regions like Latvia. However, timely drought prediction remains challenging to allow for effective decision making on field management. The main objective of the Water productivity lab is thus the development and demonstration of a service prototype for the early prediction and early detection of drought stress, through the integration and fusion of information from sensors with high temporal (soil probes, weather stations) and high spatial resolution (remote sensing imagers) to address the above-mentioned challenges.
Innovation Areas:	<ul style="list-style-type: none"> • IA3: Data sharing architecture and data governance • IA4: Satellite data augmentation • IA5: From data assimilation to service development

Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Service prototype through the digital twin concept, combined with data fusion models from different data sources for early prediction and detection of drought caused stress in target crops. • Data sharing and model transferability between two distant regions (Latvia and Israel). • Combination of high spatial resolution data from airborne spectral/thermal imagers with available satellite data to improve temporal resolution.
Areas of interest:	<ul style="list-style-type: none"> • Vidzeme region in Latvia • Hula Valley, Northern Israel
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • Parcels with four different irrigation regimes in Latvia with an estimated total extend of 4 ha • “GADASH” experimental farm in Israel with an estimated total extend of 3.6 ha
Targeted crops / products:	<ul style="list-style-type: none"> • Peppermint (<i>Mentha × piperita</i>) • Quinoa (<i>Chenopodium quinoa</i>)
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • IoT meteorological stations measuring air temperature, moisture, precipitation, wind speed and direction, atmospheric pressure, irradiation • IoT soil moisture sensors measuring soil moisture, temperature • Airborne platforms with sensors capturing VNIR spectral and thermal image data
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Evapotranspiration and soil moisture data products estimating water availability status, prepared by DHI • Vegetation indices data products estimating vegetation health, prepared by VITO
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Yield assessment through measurement of peppermint and quinoa yields • Irrigation water supply estimation based on water meter data
Main outputs:	<ul style="list-style-type: none"> • field water status for target crops • satellite data-based field water status for target crops • predicted yield for target crops • satellite data-based predicted yield for target crops

2.2.2 RIL2a Crop management – Agri-environmental monitoring for Policy Makers

Partners:	NP
Challenges and objectives:	One of the most common types of Digital Agricultural solutions offered across Europe, are DSSs that combine weather and soil data from in situ sensors to support crop management. Typically, these DSSs are based on IoT Agrometeorological Stations and combine their data with a variety of other data (EO imagery, soil analysis, farm logs etc) to offer a range of Smart Farming (SF) services. The main

objective is to unlock the potential of these data for a) expanding SF services and b) enabling monitoring of sustainability performance for policy purposes, at a European level. There are numerous challenges: a) the IoT sensors are expensive and there is need for a way to maximize coverage with the least possible sensors; b) there is no established way for aggregating data from multiple sources to support agri-environmental policy monitoring apps; c) there is no way to collect needed data such as the use of pesticides in an automated way; d) there is lack of the needed data and AI algorithms to support services like the early detection of pest infestations in given regions

Innovation Areas:	<ul style="list-style-type: none"> • IA3: Data sharing architecture and data governance • IA5: From data assimilation to service development • IA6: Privacy-preserving technology • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • A mechanism and a governance plan will be created for collecting the IoT and farm log data at the farm level and aggregating them at a regional level to support policy makers in making decisions. • A new sensor for automatic pesticides detection will be used to collect data needed by policy makers to monitor Common Agricultural Policy (CAP) sustainability KPIs. • Data assimilation and data fusion will be used to maximize the reach of its IoT network while minimizing the number of sensors needed to support proper advice to farmers.
Areas of interest:	<ul style="list-style-type: none"> • Crete in Greece • Thessaly in Greece • Kilkis in Greece
Targeted crops / products:	<ul style="list-style-type: none"> • Potato • Tomato • Cotton • Wheat
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • 2 potato pilot fields in Crete with an estimated total extend of 0.5 ha • 3 tomato pilot fields in Thessaly with an estimated total extend of 30 ha • 3 cotton pilot fields in Thessaly with an estimated total extend of 15 ha • 2 wheat pilot fields in Kilkis with an estimated total extend of 4 ha
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • IoT Weather Stations recording temperature, soil moisture & salinity, rainfall, wind speed & direction. • Pesticide Sensor used for the detection of specific pesticides
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Sentinel-2 products acquired by ESA and processed by NP's earth insight Engine to produce indices: NDVI, EVI, LAI, NDWI. • Dynamic World V1 data acquired through Google Earth Engine and processed by NP's earth insight Engine. They contribute with land use change monitoring.
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Farm log data regarding cultivation practices (irrigation, fertilization, pest control, land management, harvest), phenological stages of plants, pest events
Main outputs:	<ul style="list-style-type: none"> • soil moisture aggregation at LAU / Commune Level • calculated indicators (aggregates) based only on the ground truth evidence • calculated indicators (LUKE) based on data assimilation mechanisms along with the respective annotations.

-
- aggregated pesticide use for policy makers
-

2.2.3 RIL2b Crop management – Sustainability performance

Partners:	HORTA SRL
Challenges and objectives:	One of the most common types of Digital Agricultural solutions offered across Europe is DSSs that combine weather and soil data from in situ sensors to support crop management. Typically, these DSSs are based on IoT Agrometeorological Stations and combine their data with a variety of other data (EO imagery, soil analysis, farm logs, etc) to offer a range of Smart Farming (SF) services. The main objective is to unlock the potential of these data for a) expanding SF services and b) enabling monitoring of sustainability performance . There are numerous challenges: a) the IoT sensors are expensive and there is need for a way to maximize coverage with the least possible sensors; b) there is no established way for aggregating data from multiple sources to support agri-environmental policy monitoring apps.
Innovation Areas:	<ul style="list-style-type: none"> • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Weather and soil data from in situ sensors will be combined with Sentinel2 data for better crop monitoring and more precise input for the DSS. • Using advanced modelling techniques and based on the farm log, the DSS will calculate the sustainability KPIs of the farms for the selected operations, offering guidance and proof.
Areas of interest:	<ul style="list-style-type: none"> • Northern Italy
Targeted crops / products:	<ul style="list-style-type: none"> • Wheat
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • 10 wheat pilot fields with an estimated total extend of 10 ha were selected for 1st iteration. As wheat is usually in rotation in North Italy, new parcels will be selected for the 2nd iteration, with similar characteristics to those of the f1st one (10 field for a total of 10ha, in North Italy).
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • Weather Stations temperature records, rain, relative humidity, leaf wetness data.
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Sentinel-2 products acquired by commercial provider and used for the production of the vegetation index NDVI.
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Farm log data, where all the operations carried out in field are registered • Soil data regarding soil texture from in situ analysis
Main outputs:	<ul style="list-style-type: none"> • Calculated sustainability indicators

- DSS model outputs (fertilization rate, disease risks, crop yield and quality, soil moisture)
- Vegetation indices, crop nutrient status

2.2.4 RIL2c Crop management - Early Pest Detection

Partners:	WODR – PSNC
Challenges and objectives:	One of the most common types of Digital Agricultural solutions offered across Europe, are Decision Support Systems (DSSs) that combine weather and soil data from in situ sensors to support crop management. Typically, these DSSs are based on Internet of Things (IoT) Agrometeorological Stations and combine their data with a variety of other data (EO imagery, soil analysis, farm logs etc) to offer a range of Smart Farming (SF) services. The main objective is to unlock the potential of these data for a) expanding SF services and b) enabling monitoring of sustainability performance for policy purposes, at a European level. There are numerous challenges: a) the IoT sensors are expensive and there is need for a way to maximize coverage with the least possible sensors; b) there is no way to collect needed data such as the use of pesticides in an automated way; c) there is lack of the needed data and AI algorithms to support services like the early detection of pest infestations in given regions
Innovation Areas:	<ul style="list-style-type: none"> • IA2: Edge processing • IA3: Data sharing architecture and data governance • IA5: From data assimilation to service development • IA6: Privacy-preserving technology • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Data coming from phenological observation stations will be combined with, weather stations, soil sensors and machinery. • AI algorithms and data fusion/integration will be implemented to: <ul style="list-style-type: none"> ○ estimate the probability of occurrence ○ identify pests on the fields • integration into a national Pest Signaling System to enable early detection of pest infestation in given regions
Areas of interest:	<ul style="list-style-type: none"> • Poland
Targeted crops / products:	<ul style="list-style-type: none"> • Rye • Sugarbeet • Corn
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • Poland
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • Observation stations • Meteo sensors
Main Inputs: ii. EO data to	<ul style="list-style-type: none"> - Sentinel-2 products (NDVI, NDRE)

be exploited:	
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Field observations regarding pest infestations
Main outputs:	<ul style="list-style-type: none"> • statistical data on the accuracy of observations of the occurrence of agrophages • improved predicted agrophage occurrence data based on geolocation • predicted overall level of agrophage occurrence risk for the selected region

2.2.5 RIL3 Yield monitoring

Partners:	VITO, UGent, AVR, BVBA, CNH
Challenges and objectives:	<p>Harvesters are an invaluable source of information on crop productivity, given the detailed information on the actual yields they record, as well as the extensive coverage at which they are already operational throughout the EU. The main objective is to unlock the potential of these data for European-wide yield monitoring. To this end, two key issues will be addressed, namely (1) enabling the access to these often very scattered data, while respecting the privacy of the owners of these data (farmers), and (2) translating these data in a yield monitoring tool at different scales throughout the EU, taking into account the different growing conditions. This will enable the monitoring of crop productivity over larger scales, providing essential information on food availability and enabling benchmarking the productivity over regions and between years</p>
Innovation Areas:	<ul style="list-style-type: none"> • IA3: Data sharing architecture and data governance • IA5: From data assimilation to service development • IA6: Privacy-preserving technology • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Enable the accessibility to harvester data [CNH, AVR] through a data sharing architecture with a sound data governance plan • Turning yield variability data into essential information on where growth conditions were suboptimal, to the benefit of the farmers, using the Digital Twin concept [UGent, LUKE] • Setting up a flexible ML-based yield estimation model [VITO], trained with harvester data from past seasons, that makes use of EO products (veg indices, SOC, etc), weather and harvester data from the current growing season • Privacy preserving AI-technologies will be used as the base model depending on the architecture that will be technically feasible
Areas of interest:	<ul style="list-style-type: none"> • Belgium • Upscaling to surrounding countries (France, the Netherlands) • Finland (only in the first iteration, for setting up the Digital Twin)
Targeted crops / products:	<ul style="list-style-type: none"> • Wheat • Potatoes

Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • First iteration and second iteration, for model training: ~ 100 wheat pilot parcels in Belgium with an estimated total extent of 500 ha ~ 200 potato pilot parcels in Belgium with an estimated total extent of 1,000 ha Wheat pilot parcels in Finland (few experimental fields) • Second iteration, for testing / validation the upscaling methodology: ~ 100 potato parcels in the Netherlands and France ~ 50 wheat parcels in France
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • AVR harvester yield sensor recording potato yield • AVR harvester recording machine parameters (traction, fuel usage,...) • CNH harvester yield sensor recording wheat yield • CNH harvester recording machine parameters • weather stations recording weather data (Smart Farm sensor) • soil scanner measuring soil data (EC, soil sample analysis: pH, EC, T°, RH, NPK) • crop scanner measuring crop data (CNH CropScanner, Raven/Augmenta)
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Sentinel-2 products (NDVI, LAI, fAPAR, Fcover, RGB) providing input for crop yield estimation acquired by ESA SCIHUB and processed by VITO • Sentinel-1 - Sentinel-2 products (CropSAR Fapar) providing input for crop yield estimation acquired by ESA SCIHUB and processed by VITO • Terrascope Phenology data providing information on start, peak, end of season. Acquired by ESA SCIHUB and processed by VITO. • Terrascope Phenology data providing information on emergence. Acquired by ESA SCIHUB and processed by VITO. • Terrascope Phenology data providing information on harvest. Acquired by ESA SCIHUB and processed by VITO. • Evapotranspiration data, providing input for crop yield estimation acquired by DHI. • Soil moisture data, providing input for crop yield estimation acquired by DHI.
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Soil texture data acquired by public data layers • Soil type data acquired by public data layers • Crop cultivar acquired by farmers via WatchITgrow • Planting density acquired by farmers via WatchITgrow • Usage of pesticides and fertilizers acquired by farmers via WatchITgrow • Weather data from KMI and AgERA5
Main outputs:	<ul style="list-style-type: none"> • Yield variability maps (pixel-based) for potatoes and wheat • Field level yield estimates for potatoes and wheat • Regional yield estimates for potatoes and wheat • Provide methods to use harvester data to improve potato and wheat yield estimates (Digital Twins and ML). • Provide method to use harvester camera and soil moisture data to improve potato tare yield estimates • AVR yields from harvesters • CNH yields from harvesters

2.2.6 RIL4 Soil health

Partners: EV ILVO, AUTH

Challenges and objectives:	Productive soils are the foundation of almost any farming system and their protection is of paramount importance for achieving a climate-neutral EU by 2050 (F2F strategy and EU Soil mission). Despite the progress achieved in soil monitoring applications, the adoption of ICT solutions in support of variable rate fertilization (VRF) is still not optimal. This is partly because delays due to transmission link and computation are often not considered when deciding to proceed with an off-loading process. The adoption of the technology has been further hindered by a lack of trust (e.g., poor performance of existing systems) due to an insufficient spectral and spatial resolution. In this context, Soil Health RIL aims to deliver EO-based products on soil health assessment, and edge-driven services in support of automating decision support for soil-related management applications.
Innovation Areas:	<ul style="list-style-type: none"> • IA1: Innovative sensor technology • IA2: Edge processing • IA3: Data sharing architecture and data governance • IA6: Privacy-preserving technology • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Mount hyperspectral sensors on different platforms (tractors, UAVs, robotics) to increase the mapping ability on different soil parameters. • Application of edge computing to ensure high data quality while at the same time minimizing the size of information transmitted to the cloud by different platforms or farmers (handheld sensors), enabling more real-time feedback. • Use of Federated AI to topsoil Soil Organic Carbon (SOC) model building at regional and national level. • Combine sensor data with satellite images to produce an optimal estimate of soil parameters. • Apply innovative standardization processes in the development of soil health products that rely on satellite data to increase interoperability, data sharing and reuse.
Areas of interest:	<ul style="list-style-type: none"> • Flanders (Belgium) • Central Macedonia (Greece)
Targeted crops / products:	<ul style="list-style-type: none"> • Potato • Prunus • Annual crops
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • 20 potato pilot fields in Belgium with an estimated total extend of 30 ha • 20 pilot fields in Greece (Prunus & annual crops) with an estimated total extend of 40 ha.
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • Hyperspectral sensors recording absorbance values of surface for hyperspectral bands
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Hyperspectral data recording reflectance values of surface for hyperspectral bands, acquired by Hyperfield from KUVA. • Copernicus Sentinel-2 data recording reflectance values of surface, acquired by Conventional Data Access Hubs
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Soil data related to soil Texture and soil Associations • Soil measurements (in situ): laboratory analysis data on soil properties
Main outputs:	<ul style="list-style-type: none"> • EO based regional Soil Organic Carbon maps • Soil health indicator estimates at field level.

- Methodology on federated AI and IoT sensor data for EO-based product development.
- Recommendations on the use of federated AI
- Validated methodologies that support further the standardisation in the development of soil health products that rely on satellite data

2.2.7 RIL5 Grasslands

Partners:	IFAPA, EURAC, DMS
Challenges and objectives:	Regular monitoring of grasslands productivity is important for a sustainable use of their resources and understanding how ongoing and predicted extreme events impact their productivity and the adaptations needed in their management. The overall objective of this Lab is to develop biomass products specifically tailored to grassland ecosystems, using ground sensors and state-of-the-art data fusion technologies to make the most out of optical and radar satellite data for the derivation of grassland biophysical parameters. In addition, this Lab will collect spatially distributed ground sensor observations of grassland quantitative traits, which are seldom available, for the validation and/or calibration of biomass and biophysical parameters. The output will be used to provide technical recommendations to farmers to make better management decisions, and will inform index-based drought insurance, letting farmers protect their income from yield losses, avoiding land abandonment and the related consequences on landscape conservation, soil quality, and biodiversity.
Innovation Areas:	<ul style="list-style-type: none"> • IA3: Data sharing architecture and data governance • IA4: Satellite data augmentation • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Fuse optical and radar data to improve the temporal resolution of grassland biophysical parameters (Biopars, fPAR and LAI) derived from Sentinel-2 • Optimize the Biopar- data products to the local growing conditions by integrating local sensor data • Estimate Gross Primary Productivity (GPP) through the integration of eddy covariance data, Sentinel-2, and Sentinel-1 using machine learning algorithms • Estimate grasslands NPP with a biophysically based LUE model for grasslands using previously calibrated Biopars and meteorology
Areas of interest:	<ul style="list-style-type: none"> • Southern Spain • European Alps in the NE of Italy
Targeted crops / products:	<ul style="list-style-type: none"> • Mediterranean grasslands • Alpine grasslands
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • 10 sites of Mediterranean grasslands in Spain with an estimated total extend of 7.9 ha. • 8 sites of Alpine grasslands in Italy with an estimated total extend of 6 ha
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • Flux towers providing continuous CO₂/H₂O measurements • Weather stations recording meteorological variables (Ta, u, win dir, Radiation) • Soil probes measuring soil moisture, soil heat flux (Soil probe HydroSense II)

	<ul style="list-style-type: none"> • Sensors measuring Biomass, fPAR, LAI (Jenquip EC20 Platemeter, Accupar Ceptometer, Grasmaster Pro, LAI 2200, SPAD)
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Sentinel-2 MSI L2A reflectance acquired by ESA scihub and processed by EURAC. They will provide information regarding the estimation of grassland biophysical parameters. • Sentinel-1 backscattering acquired by ESA scihub and processed by EURAC. They will be used for the development of a data fusion algorithm between Sentinel-1 and Sentinel-2. • Sentinel-2 NDVI acquired by ESA scihub and processed by IFAPA. They will provide information regarding Grassland Gross primary Production. • Sentinel-2 and Sentinel-1 products acquired by ESA scihub and processed by DMS. They will provide information regarding Grassland Net primary Production.
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • In situ measurements of grassland biomass (separated green and dry), fPAR, green LAI, height, by IFAPA. • In situ measurements of Chlorophyll content, soil moisture, height, weight: in the field, dry, lodging, date, and number of mowing events, by EURAC • LUE model output estimating grasslands biomass, by IFAPA •
Main outputs:	<ul style="list-style-type: none"> • EO based complete regional LAI time-series for alpine grassland. • EO based regional NPP and GPP estimates form Mediterranean grassland..

2.2.8 RIL6 Sustain Dairy

Partners:	ATB, DMK, OHB DS
Challenges and objectives:	<p>All milk that is delivered to the dairy cooperative is analyzed by taking samples from every milk delivery of each farmer. This is generally done for product safety as well as for determining the specific milk parameters that are also defining the revenue of farmers. The milk samples are taken at the farm when the milk is put into the milk transporter. Specific laboratories are used to perform the related analysis. Therefore, several milk samples per week are taken for each of more than 4,000 farmers in the overall area covered by the dairy cooperative in Germany, Italy and the Netherlands.</p> <p>In the first phase of the project, the dairy lab was investigating the available EO data, which was analyzed for understanding the development of the vegetation in the area of interest (using the NDVI and NDMI) over the year. This work also analyzed the amount of data available (i.e. revisit frequency and resolution).</p> <p>The in-situ data measured during harvest on the field was further analyzed to provide details about e.g. harvested grass or maize. The yield per hectare and the percentage of dry matter were measured. This was used to analyze the amount of available feed over time in specific geographical areas.</p> <p>Hence, the dairy RIL specifically aimed at collecting aggregated data that can be accessed via data intermediaries that are anonymizing the data, thus avoiding the need for detailed interaction with individual farmers. A key challenge is to develop a valid correlation analysis, concerning available aggregated parameters and milk-related data. In the second phase of the ScaleAgData project, the objective is to further analyze how to consider additional parameters from reference farms that could be used for further validation of the results that are identified, based on the</p>

	analysis of the aggregated data, aiming to minimize the burden for farmers accordingly.
Innovation Areas:	<ul style="list-style-type: none"> • IA3: Data sharing architecture and data governance • IA4: Satellite data augmentation • IA5: From data assimilation to service development • IA6: Privacy-preserving technology • IA7: Data integration methodologies
Deployment of Innovative Approaches:	<ul style="list-style-type: none"> • Data sets at hand (i.e. specifically milk quality and quantity data) are analyzed and correlated with indicators that could be used to forecast the performance of dairy farms. Measuring performance using Earth Observation Data (EOD) based on regional in-situ data correlation. • Adopting models facilitating forecasting and simulation, making use of Machine Learning (ML), facilitating model adaptation for different optimality criteria and for scaling towards extended usage of EO data in other regions. The RIL aims at combining data from dairy farmers, arable/crop, and dairy sales projections. • EnMAP data was analyzed for being tailored and processed, facilitating access and adaptation to related data-based services, investigating potential synergies with services from the OHB data platform as a blueprint for further development.
Areas of interest:	<ul style="list-style-type: none"> • North & Northeast Germany • Regions in the Netherlands
Targeted crops / products:	<ul style="list-style-type: none"> • Dairy farms specifically with grass land, producing milk
Pilot fields of 1st & 2nd iteration	<ul style="list-style-type: none"> • N/A (data is aggregated over whole regions, individual fields are not yet observed) • Dairy performance (i.e. milk quality and quantity) at farms is the main perspective.
Main Inputs: i. Sensor data	<ul style="list-style-type: none"> • Grass yield data, like harvested amount and dry matter percentage (data from forage harvesters, aggregated over geographical regions) • Laboratory data from milk samples taken at the farm.
Main Inputs: ii. EO data to be exploited:	<ul style="list-style-type: none"> • Sentinel 2 data acquired by ESA SciHub, providing information on the development of available Biomass on dairy farmers fields, specifically grass land. • Hyperspectral data acquired by EnMAP Portal, providing information on the development of available Biomass on dairy farmers fields, specifically grass land. • Historical data of parameters such as precipitation or temperature are collected from ECMWF ERA5 to be used in the correlation analysis.
Main Inputs: iii. In-situ, and other data	<ul style="list-style-type: none"> • Milk quantity & quality data derived from laboratory analysis data and milk delivery details
Main outputs:	<ul style="list-style-type: none"> • Expected deviation of milk quality & quantity • Regional productivity of dairy farms • Yield estimates at regional level

3 Procedures for Piloting, Reporting, Troubleshooting, Decision-making, Demonstrating and Evaluating

During the first iteration, clear and efficient procedures were established to ensure the successful implementation and maximize the impact of the six Research & Innovation Labs (RILs). These procedures focused on monitoring, reporting and evaluating progress across the RILs.

In the second iteration, the focus will be on refining these procedures and building on insights from the first iteration to promote continuous improvement and achieve greater impact. Updates have been made where necessary to better align the procedures with the specific needs of each RIL, ensuring enhanced effectiveness and responsiveness.

Key updates in this deliverable, compared to Deliverable D5.1, include the addition of methodology guidelines for the demonstration and evaluation of the RILs. Correspondingly, a demonstration section has been incorporated into the RILs execution plan template (see Section 3.5). These additions were made to ensure that the demonstration phase is systematically planned and executed, allowing for clearer evaluation of results and smoother integration of innovations into end-user applications. Additionally, the template for RILs meeting agendas and minutes has been streamlined to better meet project needs while minimizing administrative effort (see Annex III). This change reduces the workload for partners while maintaining a clear and effective communication structure.

The parts that have been updated in this deliverable compared to the Deliverable D5.1 concern mainly the addition of methodology guidelines for the demonstration and evaluation of the RILs and the respective addition of a demonstration section in the RILs execution plan template (See Section 3.5). Also, the template of the RILs meeting agenda and minutes has been simplified in order to fit best the needs of the project without adding unnecessary work (See Annex III).

Several documents have been prepared to detail these procedures and provide practical guidelines. The following sections offer an overview of the processes involved, along with descriptions of the relevant documentation.

3.1 RILs Governance Structure, Roles and Decision-making

In order to establish clear decision-making and to facilitate communication with each RIL, a clear structure has been established for each RIL of the ScaleAgData project. This common structure is presented in the following figures: Figure 3 corresponds to RILs with subRILs and Figure 4 to RILs without subRILs. The number of participating members may vary depending on each RIL.

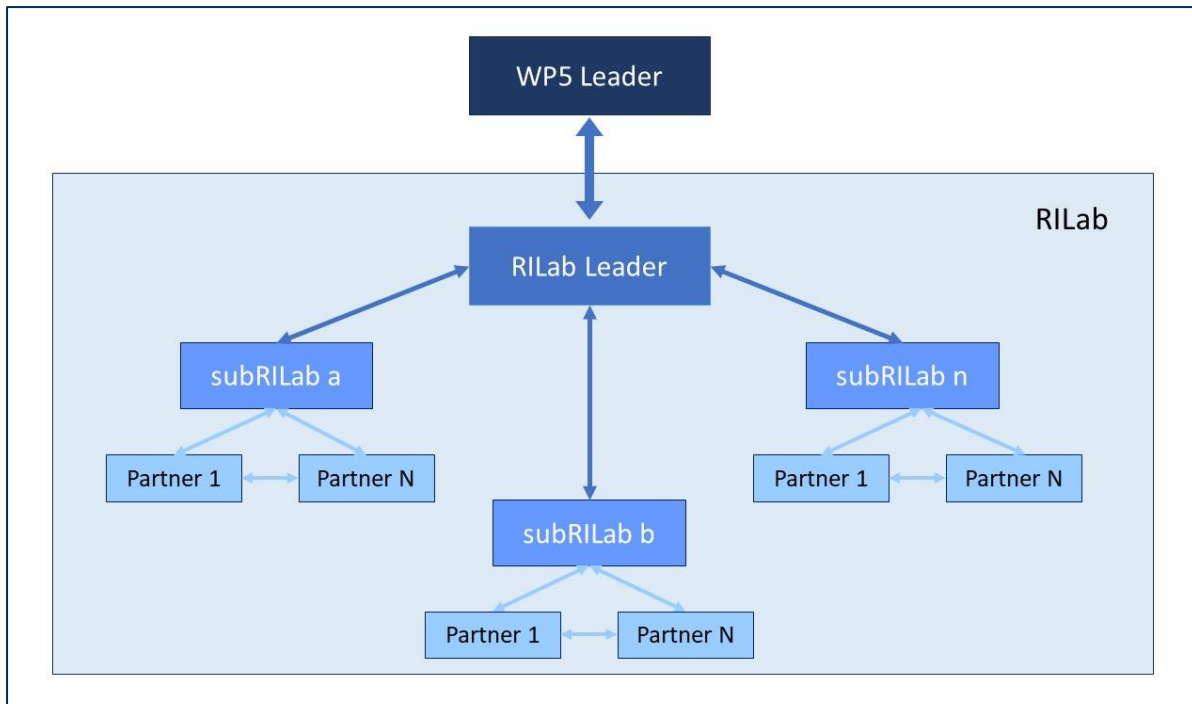


Figure 3: Overview of the structure of RILs with subRILs.

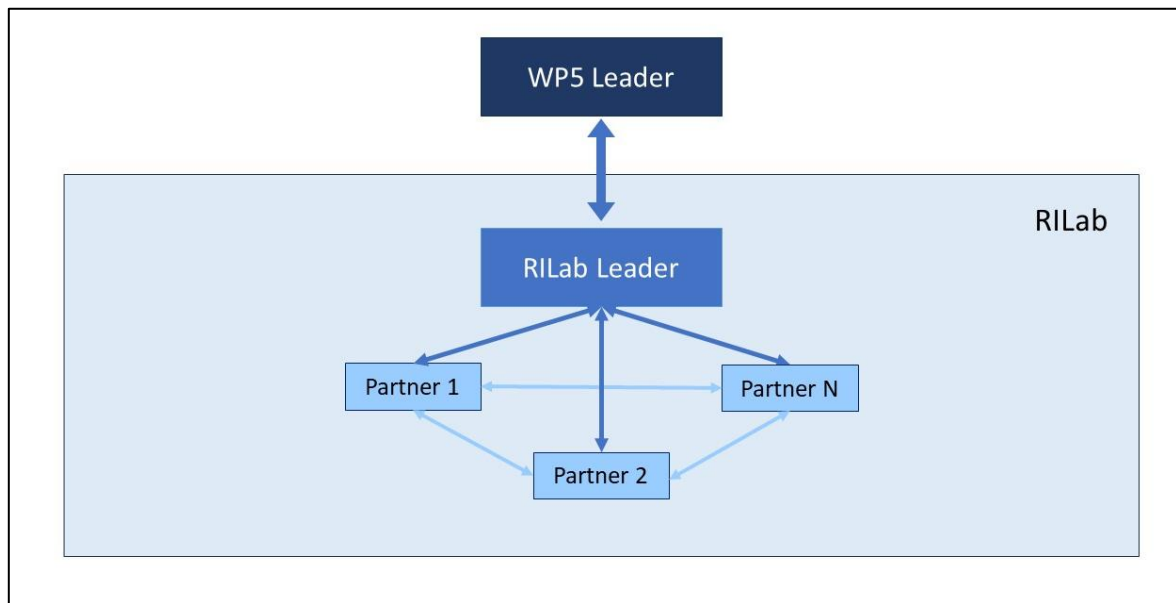


Figure 4: Overview of the structure of RILs without subRILs.

As presented in Figures 3 and 4, the overall WP5 and RILs structure includes the following roles.

WP5 leader: The WP5 leader (Neuropublic) is responsible for ensuring the proper functioning of the work package, as well as leading all aspects related to the supervision and monitoring of the different RILs with the help of the Task Leaders. In this sense, the WP5 leader and Task leaders will oversee the coordination of the execution of all RILs in close collaboration with WP2, WP3 and WP4. It is especially important to search for synergies, common challenges and solutions that can affect all RILs in terms

of the economic, environmental, and social impact of the project along the agri-food value chains.

RIL leader: The RIL leader will be responsible for coordinating the partners of the RIL. Therefore, the RIL leaders must seek to ensure that each activity carried out is aimed at achieving the specific objectives of the RIL and its contribution to each sustainability dimension. At proposal stage, each RIL defined its focus and prepared an initial detailed planning with respect to both the supply and the demand side, specifying most probable solution alternatives in terms of efforts and costs based on most recent state-of-the-art. However, since innovations are at a high pace, planning made in the proposal and kick-off phase may need updating.

SubRIL leader: Some RILs include several subRILs. In this case, each subRIL is responsible for executing the activities that have been described in their plan for deployment of selected innovative approaches.

RIL partner: Each RIL consists of the RIL leader and different partners who actively participate in the activities of the RIL.

3.2 RILs Execution Plans and Timelines

Each RIL must ensure that its activities are aligned with its primary objectives and the plan for the deployment of innovative approaches. This will support a successful execution plan and data collection, allowing effective monitoring and evaluation vis-a-vis what was planned.

For the second iteration, each RIL leader will need to refine and update their execution plan, incorporating insights and outcomes from the first iteration. This plan will guide the deployment of activities, ensuring continuous improvement and adaptation where necessary.

An overview of the execution plan is provided in *Annex I*, with a detailed analysis of its key elements and structure outlined in the following sub-sections.

3.2.1 Structure of the RILs Execution Plans

The RIL's Execution Plan provides an analytical overview of each RIL and its plan of action during the first iteration. It is a dynamic file that will be updated throughout the project. The information in the Execution Plan is organized in different sections horizontally and vertically (Figure 5).

- Vertically there are three different sections: The first section contains information regarding the planning of the work of each RIL.
- The second and the third sections contain information about the first and second iteration respectively.

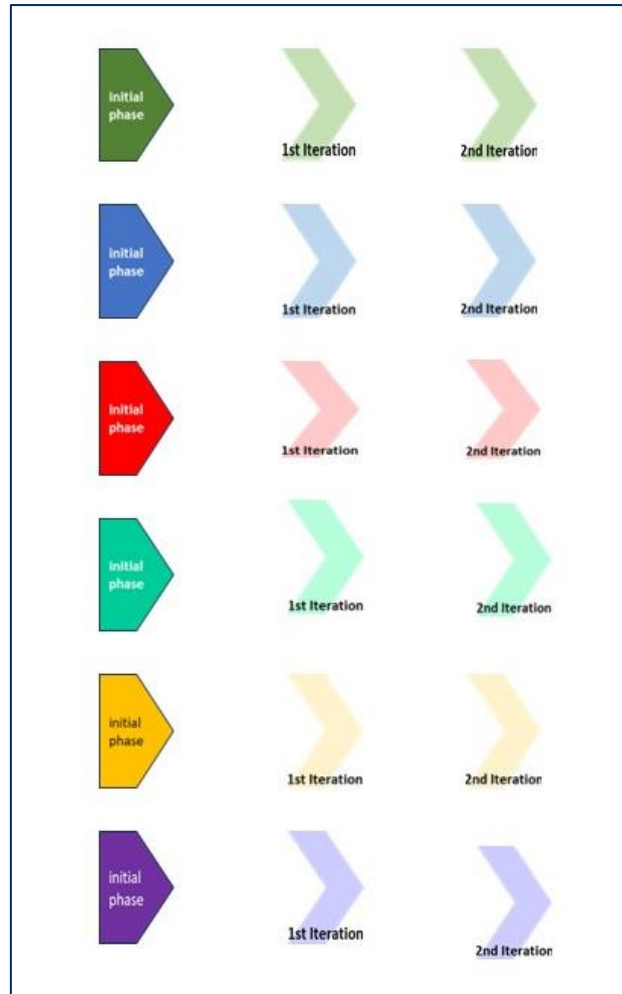


Figure 5: Overview of structure of Execution Plan.

The horizontal sections are thematic based, as presented in Table 1.

Table 1: Thematic sections of the Execution Plan

1	<p>RIL's Crops/Products:</p> <p>The first section contains information about the areas and crops/ products of interest</p>
2	<p>Gathered Data:</p> <p>The second section contains information about data that will be gathered and is divided in three subsections:</p> <ul style="list-style-type: none"> • Sensor data • Earth Observation (EO) data • Rest input data (in-situ measurements, etc.)
3	<p>Innovative Approaches and User Stories:</p> <p>The third section contains information about the innovative approaches deployed by the RILs and specific user stories of the RILs.</p>
4	<p>Requirements & Technical Providers:</p> <p>The fourth section is linked to requirements and technical providers that contribute to each RIL</p>

5	Outputs: The fifth section contains information about the outputs of the RILs.
6	Demonstration The six section contains information on Demonstration main and sub activities
7	Impact & KPIs: The seventh section contains information about the impact and the KPIs that each RIL will aim to achieve

3.2.2 Main elements in the RILs Execution Plans

The first thematic section of RILs' Execution Plans (Figure 6) is focused on the areas of interest and the crops or products that will be researched in each area of interest. Also, the start and end of season for each crop is mentioned, which is related to the scheduling of specific activities of the RILs. Furthermore, information on the pilot fields of the each iteration in the areas of interest is included, such as the number of pilot fields, their total area, the average pilot parcels extend per area of interest and any details each RIL may consider important.

In the next thematic section of the execution plan, information regarding the input of the RILs is included. It is further divided into three sub-sections, sensor data, EO data and other data. In Figure 7, the sub-section of RILs' sensor data is presented. It includes a brief description of the sensors each RIL will use, the data each sensor will provide, the number of already installed sensors and the RIL partner that will be responsible for each sensor type. For each iteration, more analytical information is required including the number of sensors that will be installed and used, the plan for technological upgrade of sensors and the time priority of the upgrade. Also, the sub-activities that are related to sensor data, the programmed start and end of each sub-activity and possible dependencies or risks are included.

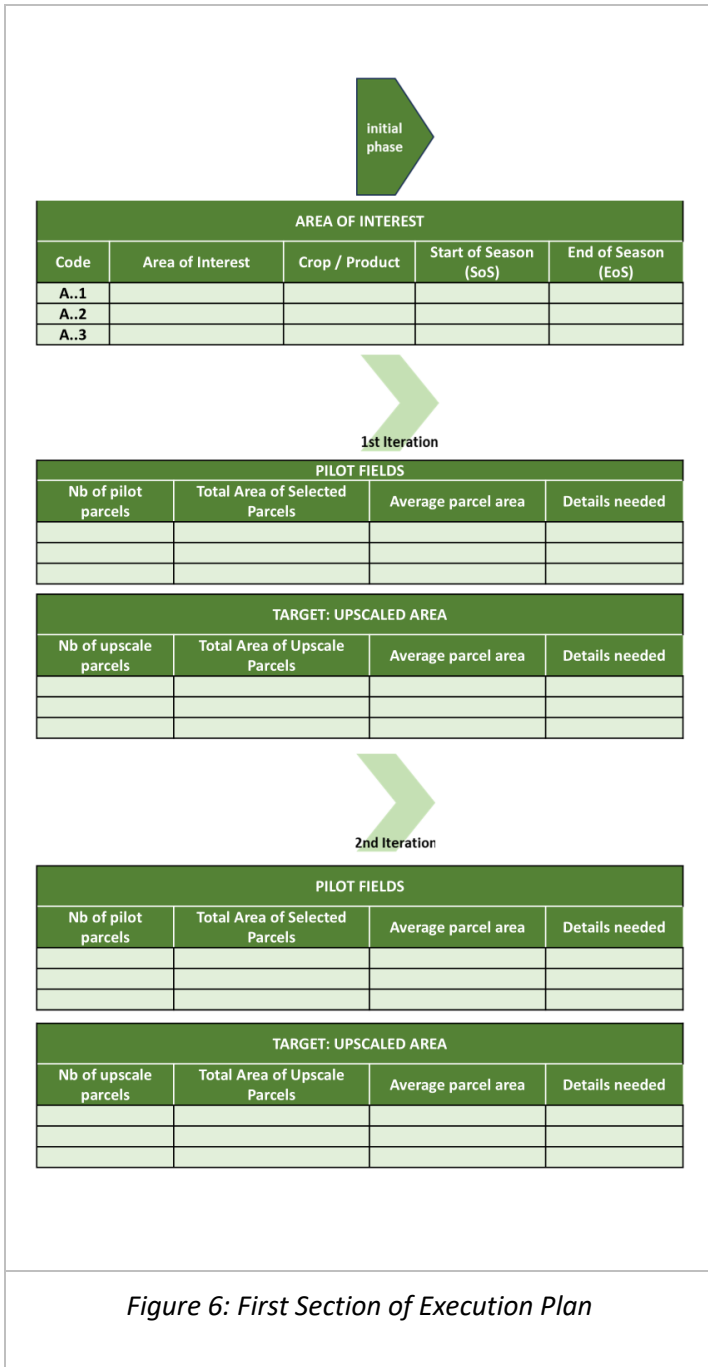


Figure 6: First Section of Execution Plan

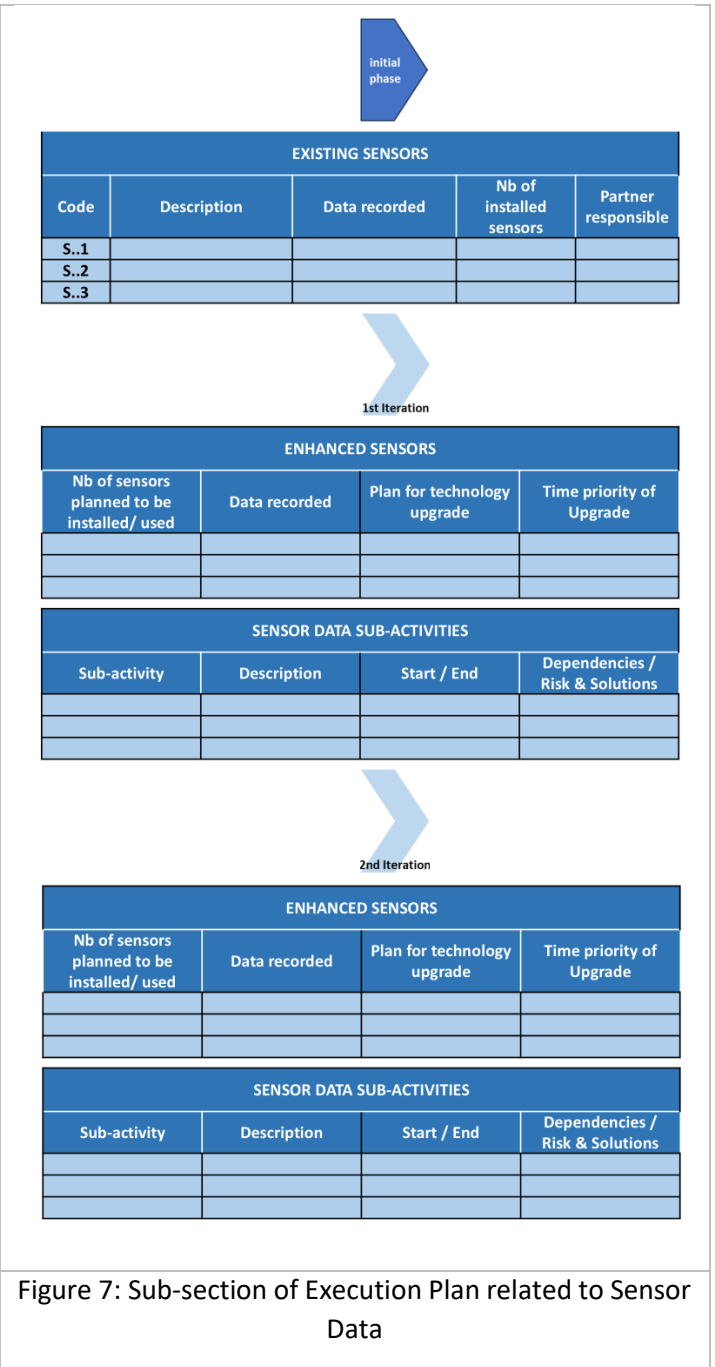
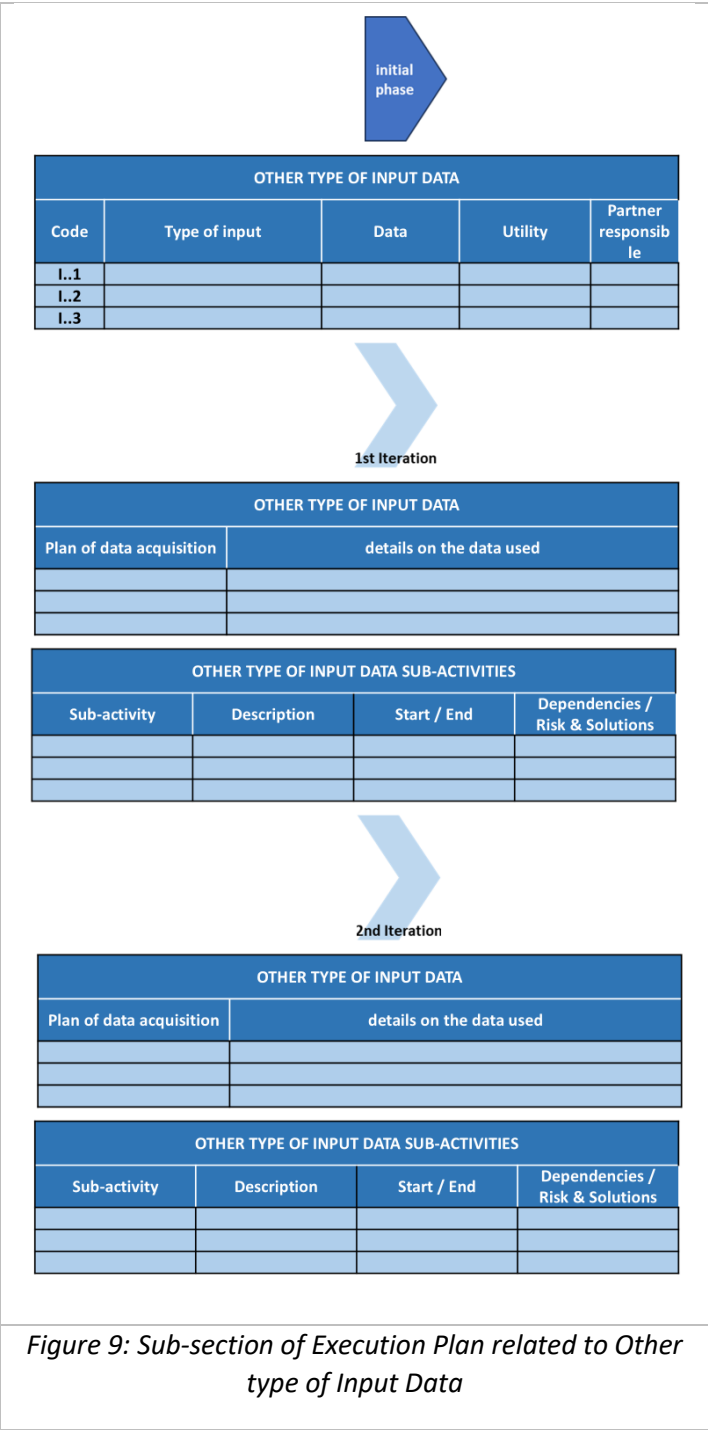
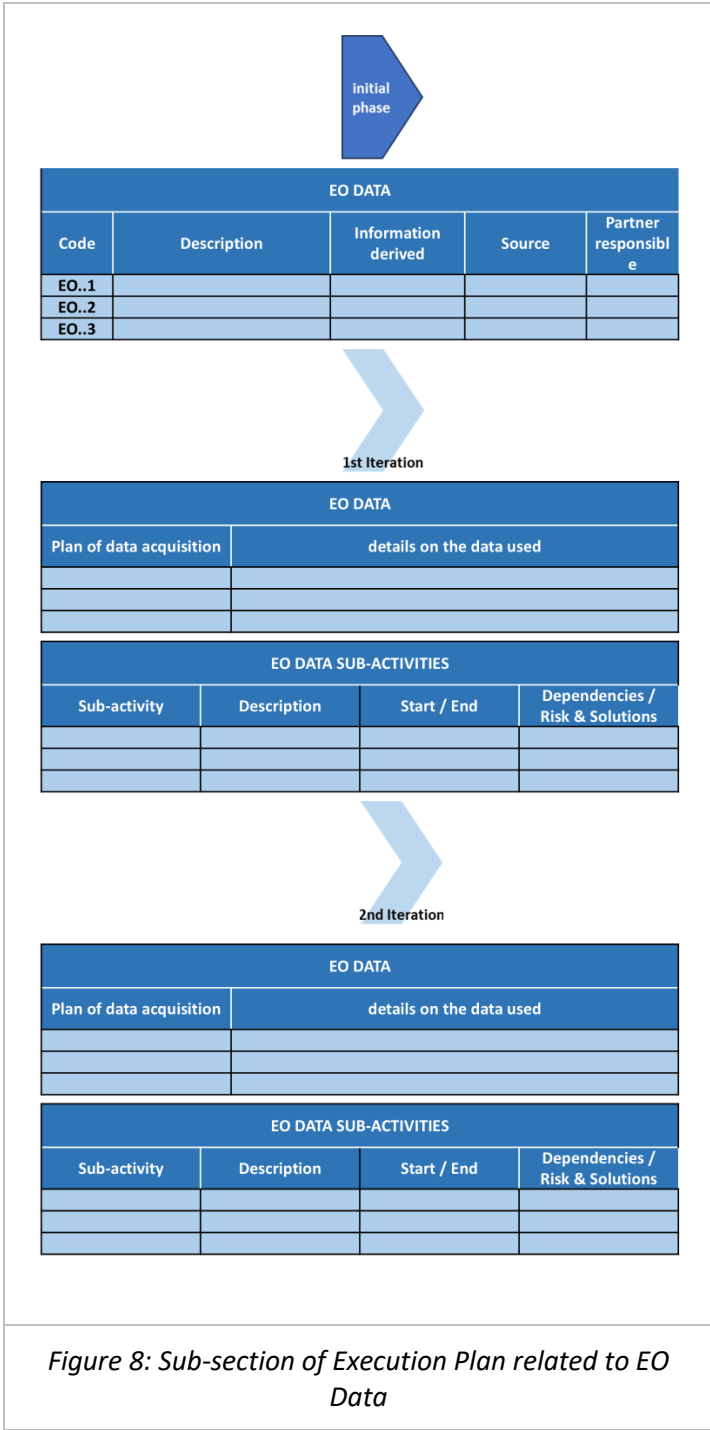


Figure 7: Sub-section of Execution Plan related to Sensor Data

In the next sub-section of the Execution Plan (Figure 8), information is required about the EO data each RIL will utilize in its research. For every type of EO data, a brief description is provided, the information derived from them, their source and the RIL partner responsible for them. Regarding each iteration, extra information is given about the plan of EO data acquisition and details on the data. Furthermore, the sub-activities that are related to EO data are listed, also including information about the planned start and end date and dependencies and risks of each sub-activity.



In situ measurements or any other type of input data are listed in the next sub-section of the Execution Plan, as presented in Figure 9. Information about the type of input, the data that is derived, their utility for the RIL and the RIL partner that is responsible for them. For each iteration, information about the plan of data acquisition and extra details about the data are given. Also, the sub-activities related to this input are listed, the start and end of each sub-activity and the possible dependencies and risks.

The next section of the execution plan is focused on the deployment of the innovative approaches and the user stories of the RILs. In the first sub-section (Figure 10), the description of the deployment of the RILs' innovation areas is included, as well as the related innovation areas and tasks and the RIL

partner that is the main contributor. The deployment of the RILs' innovative approaches is broken down into the sub-activities that are needed to accomplish it during the first and the second iteration. Also, the possible dependencies, critical points and risks are included. Furthermore, the criteria for the assessment and points for update are required for each of the RILs' innovative approaches to be deployed.

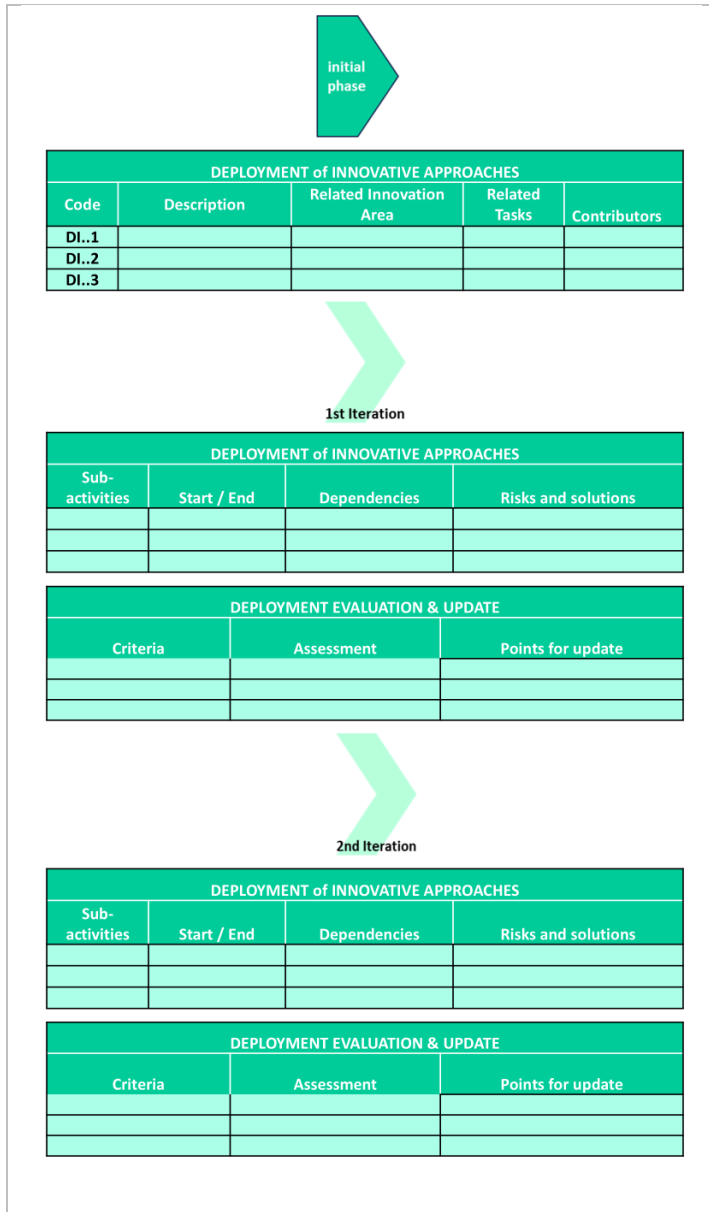


Figure 10: Deployment of the RILs' Innovative Approaches

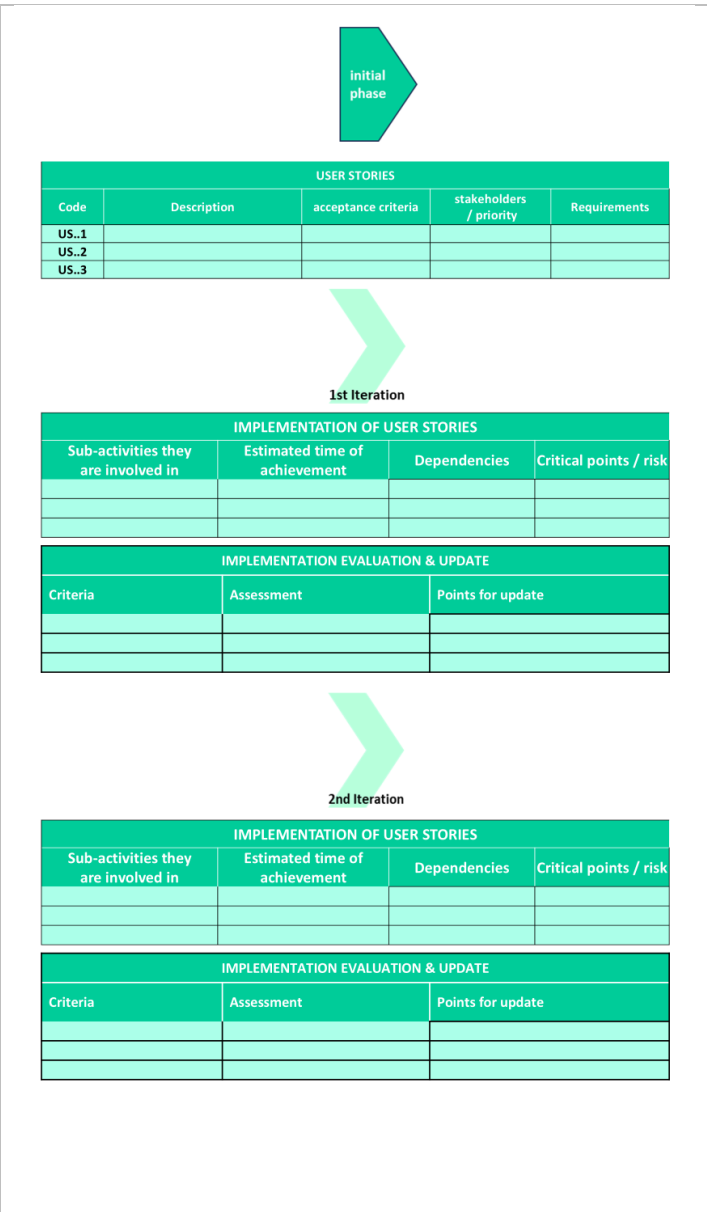
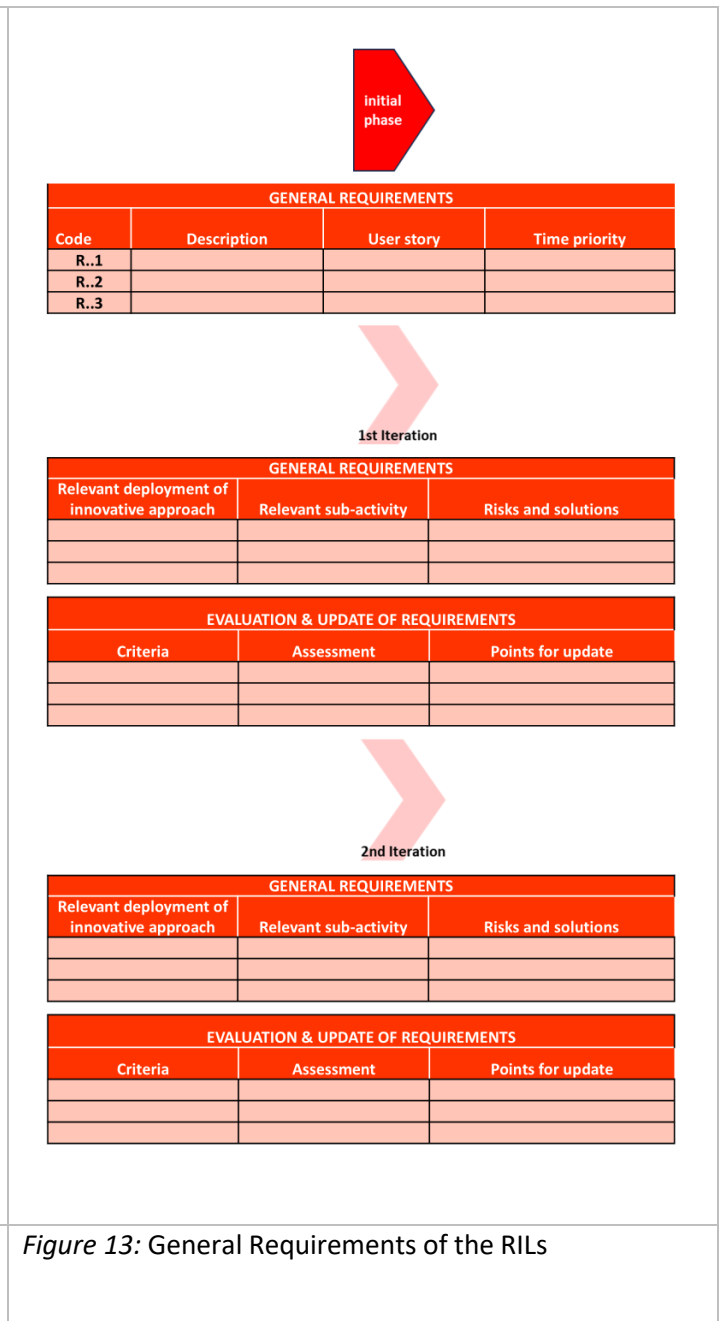
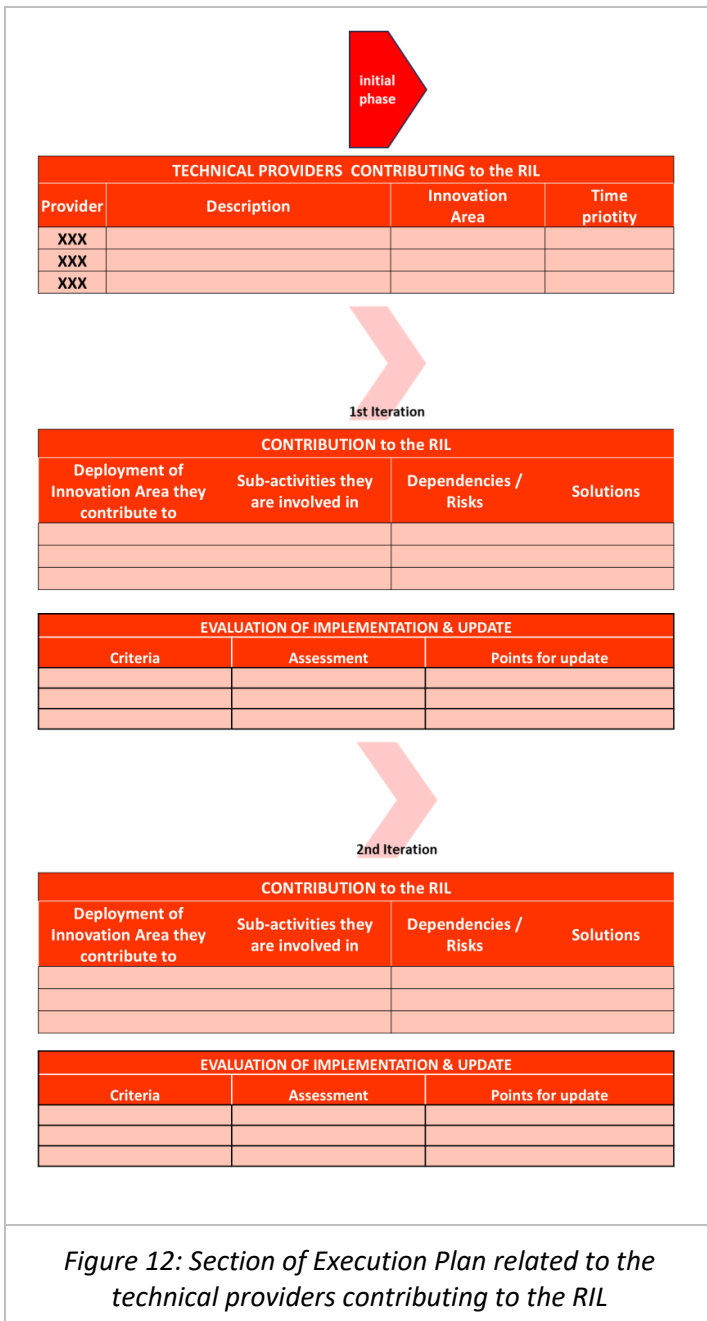


Figure 11: RILs User Stories

In the next sub-section of the Execution Plan (Figure 11), the user stories of the RILs are described. For each user story, a brief description is included, the acceptance criteria, the time priority, and the needed requirements. This information was provided by each RIL during WP2 activities and updated accordingly by each RIL. For each iteration, the sub-activities that are related to each user story, the estimated time of achievement, possible dependencies and critical points or risks are required, as well as information related to evaluation of their implementation and points for update.

The following section of the Execution Plan is related to technical providers that contribute to each RIL (first sub-section) and to the RILs general requirements (second sub-section). In Figure 12, the sub-section relevant to technical providers is presented. It includes information about the description of the contribution of each provider and the time priority. Furthermore, for each provider the most relevant deployment innovation area and sub-activities are required and a brief description for each iteration. Also, the criteria of evaluation, the assessment, and points for possible update of the contribution of each technical provider are included.



The sub-section of the RILs general requirements is presented in Figure 13. It includes a brief description of each requirement, the innovation area it is linked to and its time priority. Also, regarding each iteration, extra information is required concerning the relevant deployment of innovation area

and sub-activities for each requirement, as well as a brief description. Furthermore, information relevant to the evaluation and update of each requirement is included.

The fifth section of the Execution Plan is related to the outputs of each RIL and their possible usage (Figure 14). It includes a short description and the RIL partner that is responsible for each output, as well as the deployment of innovation approach and user story it is relevant to. Regarding the first and the second iteration, the sub-activities related to each output, the estimated time of achievement, possible dependencies and critical points or risks are also required.

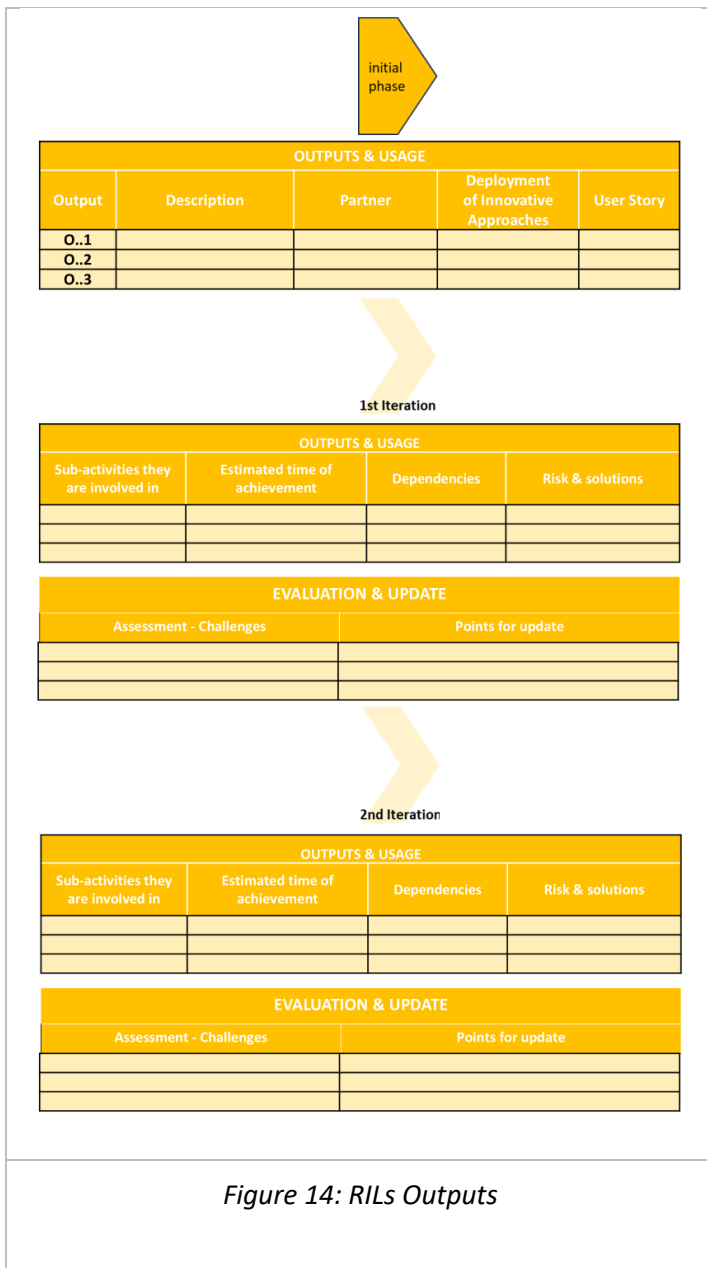


Figure 14: RILs Outputs

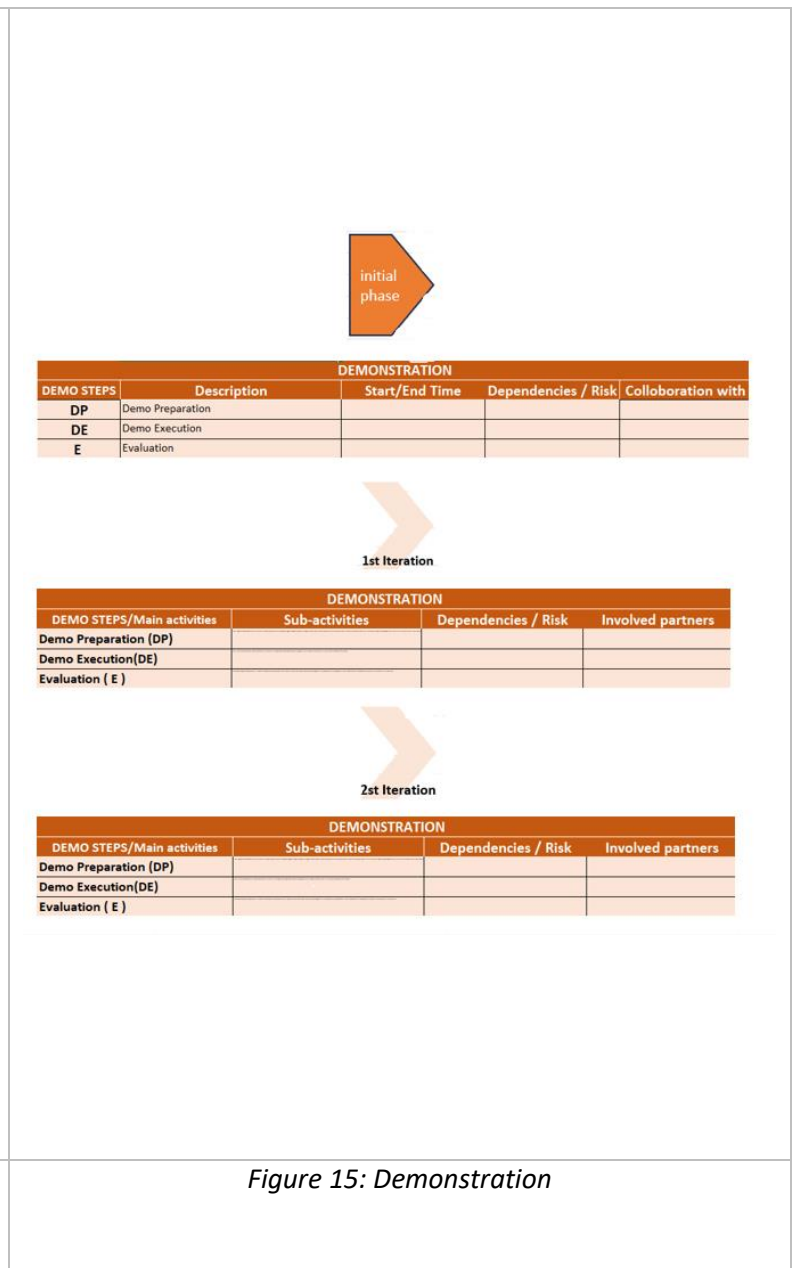


Figure 15: Demonstration

The sixth section provides details on the demonstration steps and the activities required for each step, including descriptions of each step, information about the involved partners, as well as dependencies and risks (Figure15).

In the last section of the Execution Plan the KPIs of each RIL are presented (Figure16). For each KPI a brief description is included as well as the RIL partner that is mainly responsible, the relevant deployment of innovation approach and user story. Conserving the first and the second iteration, the target for each KPI and the estimated time of achievement is included.

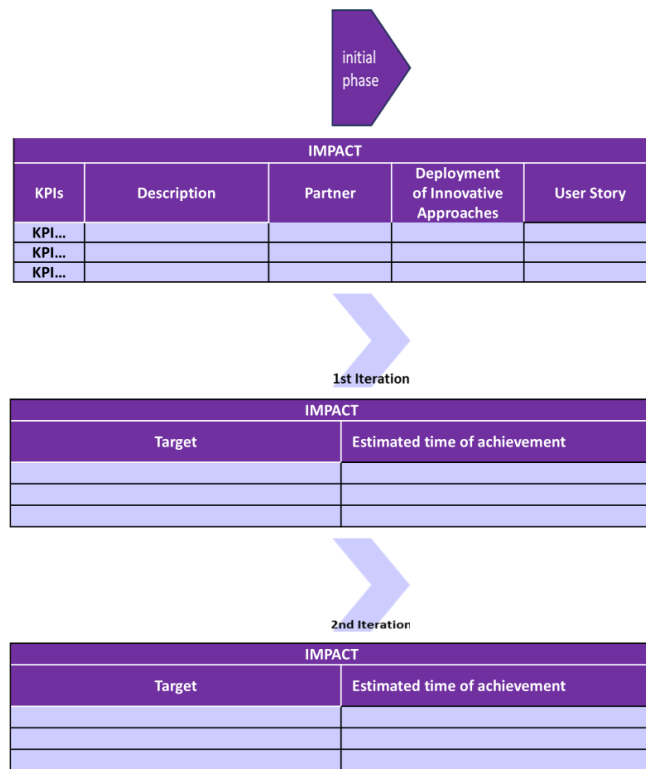


Figure 16: RILs KPIs

It is important to note that all the elements of the execution plans are coded and have a unique code for each RIL, according to the following approach (Table 2).

Table 2: Coding system of the Execution Plans

Element	First letter of RIL	A/a	Final code
AREA OF INTEREST (A)	W	1,2,3,,,	AW1,2,3,,,
EXISTING SENSORS (S)	W	1,2,3,,,	SW1,2,3,,,
EO DATA (EO)	W	1,2,3,,,	EOW1,2,3,,,
OTHER TYPES INPUT (I)	W	1,2,3,,,	IW1,2,3 ...
REQUIREMENTS I	W	1,2,3,,,	RW1,2,3..

DEPLOYMENT of INNOVATIVE APPROACHES (DI)	W	1,2,3,,,	DIW1,2,3...
USER STORIES (US)	W	1,2,3,,,	USW1,2,3...
DEMONSTRATION (DP/DE/ E)	W	1, 2, 3,	DPW1,.. DEW1,.. EW1,..
OUTPUT (O)	W	1,2,3,,,	OW1,2,3...

For the Crop Management subRILs, the code letter “C” is followed by the letters “a”, “b”, or “c” corresponding to RIL2a, RIL2b and 2c, respectively.

The only elements that are not coded like that are Technological Providers and KPIs, which have a common coding for all RILabs. Technological Providers are coded through the name of the provider. The KPIs are coded as described in Section 3.4 and the KPIs template included in Annex IV.

3.2.3 RILs Timelines

Based on the sub-activities that are listed in the sections of the Execution Plan, the timeline of the RILs is produced, as presented in Figure 17 and Annex I. In each sub-activity, the expected start and end month as well as the main contributors are listed.

RIL	Activities	Main participant	Contributors	2023			2024			2025			2026				
				1	2	3	1	2	3	10	11	12	10	11	12		
XXX	Application Domain																
a	Preparatory activities																
a.1																	
a.2																	
a.3																	
b	Data Collection																
b.1																	
b.2																	
b.3																	
c	Data ingestion																
c.1																	
c.2																	
c.3																	
d	Data processing / modelling																
d.1																	
d.2																	
d.3																	
e	Data reporting																
e.1																	
e.2																	
e.3																	
f	Data offering																
f.1																	
f.2																	
f.3																	
g	Demonstration (Preparation & Execution)																
g.1																	
g.2																	
g.3																	
h	Evaluation																
h.1																	
h.2																	
h.3																	

Figure 17. RILs' Timelines

In the timeline, the sub-activities are organized in the following suggested groups of activities:

- a. Preparatory activities
- b. Data Collection
- c. Data ingestion
- d. Data processing / modelling
- e. Data reporting
- f. Data offering
- g. Analysis of results & evaluation

The execution plan and the timeline will be updated during the lifespan of the project and will contribute to meaningful monitoring of the progress of each RIL.

3.3 Monitoring and Reporting

In order to make sure that everything is running smoothly, issues are identified in time and needed mitigation and troubleshooting actions are performed, a monitoring process was established. The

defined process is based on regular meetings, where progress reports will be prepared aiming at the documentation of the activities for monitoring and troubleshooting.

3.3.1 Regular meetings for monitoring and troubleshooting

Due to the large number of partners in the project, WP5 related meetings will be scheduled ahead of time and will take place at two levels: Task Leader-RIL Leader- and RIL Leader-subRILs and / or RIL Partners. However, depending on the needs of each RIL, it will also be possible to arrange meetings where the Task Leader, the RIL Leader and the RIL's partners participate.

3.3.1.1 Meetings between Task Leader and the RILs / subRILs Leaders

These meetings will take place monthly starting from January 2025 and their concept is presented in Figure 18.

In each RIL meeting, the RIL leader should participate and if it is considered helpful the RIL partners can also participate. These meetings will be managed by Task 5.2 Leader and WP5 Leader (NP). The frequency of the meetings can be changed to once every two months during the project if it is decided that this serves best the RILs' needs.

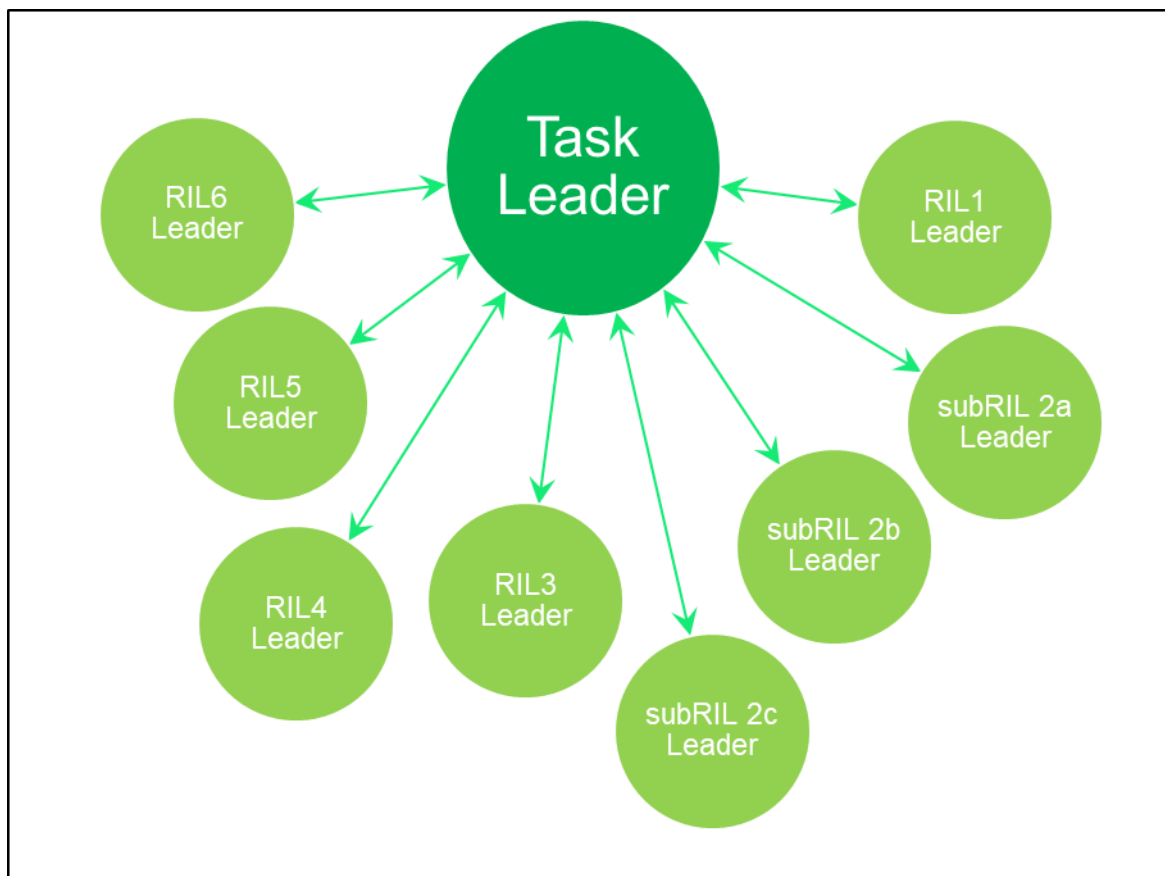


Figure 18: Concept graph of the RIL follow-up meeting with Task Leader

The scope of these meetings are:

- Intra- and inter-RILs interactions and synergies.
- Discuss challenges and potential solutions during RIL implementations or evaluations, as well as seeking synergies (of solutions) among RILs.
- Actively monitor progress KPIs, supporting periodic evaluation of the RILs.
- Gathering information and experiences from all RILs for the methodology update regarding the second iteration and the compilation of the replication guidelines.

3.3.2 Meetings between (sub) RIL Leader and partners inside each RIL

The frequency of these meetings will be decided by the RIL or subRIL Leader and its partners according to the needs of each RIL (Figure 19). Both the RIL leader and all the partners involved in the RIL must participate in this meeting. Nevertheless, the RIL Leader could organize specific meetings with any of the partners to solve a specific issue.

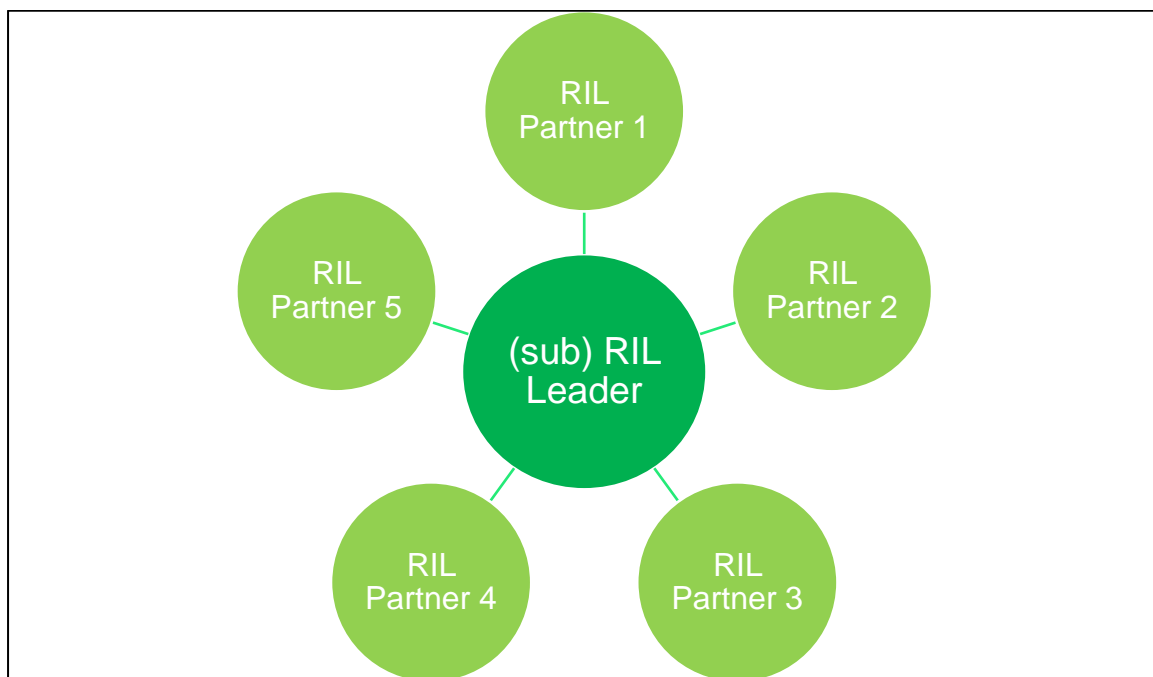


Figure 19: Concept graph of the internal RIL meeting

The scope of these meetings is:

- Coordination of all partners within the RIL, including implementation.
- Sharing of and reporting on status of the activities, including detailed planning, challenges, risks and solutions
- Assuring constant KPIs evaluation for each RIL.

In addition, the RIL leaders are also members of the Executive Board which currently convenes on a regular basis. In this forum the RIL leaders can also share updates with all the WP leaders as well as the coordinator.

3.3.3 Meeting Schedule

The following table presents an overview of the meetings' schedule.

Table 3: RIL meetings schedule

Type of Meeting	Frequency	Means
Meeting between Task leader and the different RILs leaders	Monthly (or bimonthly)	Online meeting
Meeting between RIL leader and partners inside each RIL	Monthly or based on needs	Online or face2face meeting
ExBo meeting	Monthly or every two months	Online meeting

3.3.4 Meeting Documents

For the meetings between the Task Leader and the RILs, a draft meeting agenda will be prepared by the meeting chair and distributed seven calendar days in advance of the meeting following the template that is attached to the Annexes of this document. Any partner can add an item to the original agenda by written notification to all the other partners no later than three calendar days preceding the meeting. During the meeting the facilitator can add new items on the agenda following a unanimous decision.

Meeting minutes will be distributed within seven calendar days following the meeting by the chair; the meeting minutes template is also maintained within the project Teams folder and all meeting minutes of all nature will be uploaded at the document repository. The minutes (or a corrected version of them) shall be considered as accepted if, within fifteen calendar days from distributing them, no partner has sent an objection in writing to the chairperson. All decisions become binding after they have been recorded in the meeting minutes and the meeting minutes are accepted.

The meeting document that contains the meeting agenda and minutes can be found in Annex III of this deliverable.

3.3.5 Progress reporting

During the regular monitoring meetings, a progress report will be completed, providing an update on the progress of each RIL and its associated activities during the reporting period (Figure 20). If a RIL follows an internal reporting procedure which records sufficient information on a monthly basis, the

Progress Report Template may be completed quarterly instead.

During the regular monitoring RILs meetings, all key elements of the execution plan along with the information detailed in the timelines will be reviewed. Specifically, update will be provided on the area of interest, inputs, collaborations with technology providers, requirements, outputs and KPIs. Any modifications to the plan will be documented in the relevant section of the Execution Plan (Figure 21).

RILx Progress Report – Period: Mx
[Please enter the number of the RIL - Please enter the month of the project]

<p>Partner Organisation name:</p> <p>Contact Person:</p>	
RIL Activity Progress	<p><u>Information about the on-going activities during the reporting period</u></p> <p>(Name of the sub-activity, Name of major activity the sub-activity is part of, <u>Short</u> description of the sub-activity, Main contributors of the sub-activity, Possible risks / dependencies / proposed solutions)</p>
Collaborations	<p>Details on Collaborations with other RILs and / or partners of the project</p> <p>(Name of RIL or <u>Details</u> of the collaborations (if any) with other RILs: Identify the RIL and include key details on the nature of collaboration, joint efforts, and notable achievements)]</p> <p style="text-align: center;">External collaborations</p> <p>[Please provide details of the external collaborations (if any) with other initiatives and / or projects: Identify the project or initiative and include key details on the nature of collaboration, joint efforts, and notable achievements]</p>
KPIs	<p>Information on the KPIs that have been achieved during the reporting period.</p> <p>(Code of KPI, Sub-activity linked to KPI, RIL partners involved, <u>Short</u> description)</p>

Figure 20: Progress Report Template

Month	Code	Justification

Figure 21: Monitoring RILs modifications in Execution Plans

3.4 KPIs Monitoring

The monitoring of the achievement of the KPIs will be accomplished through a file in which all RILs will provide information about their goals. This file is organized in three sections, grouping KPIs based on being related to either objectives of the project, to an impact or to dissemination activities. The template of the KPIs monitoring file is attached to Annex V. After all the RILs have provided their input, the first version of the file will be produced, and the results will be discussed during the monthly meetings of the project. It will be updated on a bi-monthly basis so as to monitor the progress on KPIs achievement and to help identify possible delays or other issues.

Additionally, each RIL will provide more analytical information regarding its KPIs in its execution plan. There is a specific section where the activity and period of execution linked to every KPI will be included. KPIs progress will be monitored in the progress report of the RILs providing the value obtained during each month. Based on this input, the KPIs monitoring file will be updated and it will be possible to estimate the exact percentage of achievement of the activities throughout all phases of the project.

3.5 Demonstration and Evaluation Methodology

3.5.1 Demonstration

The demonstration methodology for ScaleAgData is structured to ensure that planned activities are executed systematically, with clear objectives, stakeholder engagement, and measurable outcomes. This methodology uses an iterative approach, incorporating feedback loops to refine and improve demonstrations at each stage. This ensures that demonstrations are not only effective in showcasing the capabilities of the developed data products and methodologies, but also adaptable to the evolving needs of the various user groups involved. The approach emphasizes collaboration between RIL leaders, partners, and technology providers, ensuring alignment with the overall project goals. By using standardized tools and templates, the methodology supports consistent documentation and evaluation across all demonstrations, enabling a thorough assessment of the impact of ScaleAgData solutions.

3.5.1.1 Demonstration Steps

To facilitate efficient planning and monitoring, we have outlined the necessary activities for each project development phase and iteration (two iterations across four phases, see Figure 1). The steps guide each R&I Lab from gathering user needs for co-design to evaluating the demonstrations.

For each step, we have listed key activities and assigned responsibilities, taking into account not only the RIL actors and leaders but also aligning with the relevant work packages (WPs) and tasks to reduce administrative overhead. RIL leaders are required to submit a demo preparation, execution, and evaluation plan for each iteration. These plans must be flexible and easy to manage, ensuring that all partners and participants are aware of what needs to be done, by whom, when, and why. For example, as WP3 and WP4 partners serve as technology providers, it's critical to list which assets or services must be available for the demonstrations and when. The plans will also outline the activities related to WP6 and provide details on evaluation processes. Each iteration will involve updating the plans based on feedback and emerging needs.

Demo Preparation

In this step, demonstrations are designed based on the Demonstrator description. RIL partners, led by the RIL Leader, begin preparing for the demo execution by gathering necessary information, engaging stakeholders, preparing materials, and confirming the demo locations. These activities may vary across RILs, but synergies between Labs may occur to support specific objectives. Preparation activities are not limited to Task 5.2 ; data collection, integration, and solution development also take place under Task 4.3. Additionally, WP6 and Task 6.2 support activities related to stakeholder engagement.

Demo Execution

The execution phase is the core of the demonstration process, where developed products are presented to targeted end users, and the Demonstrator is tested under real-world conditions. This phase occurs during the fourth and final stage of the project iteration cycle, focusing on the hands-on implementation of the demonstration plans.

The primary objective of this phase is to ensure the successful execution of the demonstrations, verifying that the system performs as intended and that participants can effectively utilize the tools and processes. This stage is critical for showcasing the practical application of the system, collecting operational data, and identifying opportunities for improvement in future iterations. By the end of this phase, the demonstration should clearly illustrate the system's capabilities, uncover any operational challenges, and provide valuable insights for refining and enhancing the system.

Evaluation

The evaluation step focuses on analyzing the impact of the Demonstrators and assessing how different target groups can benefit from the developed solutions. Task 5.3 will use collaborative tools and develop report templates for data collection. The initial set of KPIs is outlined in Deliverable 5.3. These KPIs will be further expanded, refined, and updated through workshops focusing on the impact that can be created by the solutions developed in each Lab. This process ensures the KPIs align with the specific impacts the Labs aim to achieve. The updated and enriched list of KPIs will be presented in Deliverable 5.2. Evaluation results from each iteration will be fed back into WP2, informing Phase 1 of co-design and supporting the evolution of the Demonstrators. The leader of Task 5.3 will work closely with RILs and WP5 leader to manage the evaluation process effectively.

3.5.1.2 Roles and Responsibilities in Each Demonstration Phase

The demonstration process in the ScaleAgData project is structured into four main phases: Design, Preparation, Execution, and Evaluation. Each phase involves specific roles and responsibilities to ensure smooth coordination and alignment with project objectives.

- **Work Package Leader (WPL):** Manages overall timelines, risks, and coordination across all phases. The WPL ensures that all activities adhere to the project's strategic goals and objectives.
- **Task Leader (TL):** Establishes the planning framework, refines key performance indicators (T5.3), and oversees stakeholder interactions, with support from WP6.
- **R&I Lab Leader (RIL):** Leads the setup, integration, and execution of the demonstration

activities. The RIL works closely with R&I Lab Partners, who provide essential resources, data, and support throughout the process.

- **Technical Providers (WP3, WP4):** Ensure seamless integration of technological components and provide ongoing technical support. WP4 and WP5 monitor this integration, address technical issues, and ensure that all systems are fully operational.
- **WP6:** Plays a critical role in stakeholder engagement, communication, and dissemination of results. WP6 ensures that insights gained are effectively shared and incorporated into subsequent project phases.

These coordinated efforts ensure a smooth transition between each phase, culminating in a comprehensive evaluation that informs future project activities. A more detailed breakdown of responsibilities is provided in Table 4.

Table 4 Roles and responsibilities per demonstration step

Demo Preparation	<ul style="list-style-type: none"> • WPL: Oversee demo preparation, ensuring timelines and risk management. They provide strategic guidance, and ensure that the preparation activities across different RILs are coordinated effectively. WPLs also facilitate communication between the R&I Lab Leaders and other work packages to ensure that all necessary resources and support are available. • Tasks 5.2 and Task 5.3 Leaders: Fine-tune KPIs, update stakeholders, and monitor demo preparation. They provide guidance to R&I Lab Leader and partners to ensure that the preparation phase runs smoothly and efficiently. • R&I Lab Leader: RIL Leaders are responsible for overseeing the preparation activities for their respective demonstrators. This includes organizing the collection and preparation of necessary information, coordinating stakeholder engagement with support from WP6 and in the context of the T5.1, preparing informational materials, and ensuring that all logistical arrangements for the demo are in place. • RIL Partners: The partners work closely with the RIL Leader to execute the preparation tasks. Their responsibilities include gathering and processing information, engaging with stakeholders, and contributing to the creation of the materials. They also assist in addressing any specific needs or challenges unique to their demonstrator. • Tech Providers (WP3, WP4): They are responsible for preparing and making available the necessary data, tools, and services required for the demo. Tech Providers work closely with R&I Lab Leader to integrate these technological components seamlessly into the demonstration. They also provide ongoing technical support to address any issues that may arise during the preparation phase. • WP6: Support demo preparation by creating dissemination materials, promoting the event, and ensuring stakeholder involvement. They support the R&I Lab Leader s by organizing stakeholder activities, ensuring that the
------------------	---

	right participants are engaged, and that all necessary preparatory steps related to stakeholder involvement are completed.
Demo Execution	<ul style="list-style-type: none"> • WPL: WPLs supervise the execution phase, ensuring that timelines are adhered to, risks are managed, and any necessary interventions are made promptly. • Tasks 5.2 and 5.3 Leader: Oversee demo execution, ensure KPIs are met, and coordinate with stakeholders. They work closely with the Tech Providers and RIL Leaders to ensure that the demo runs smoothly and that all systems are fully operational. • RIL Leader: R&I Lab Leaders are responsible for leading the execution of the demonstration activities. They coordinate all aspects of the demo, ensuring that the plans are implemented as designed. UCLs facilitate communication among all participants, manage any arising issues, and monitor the overall progress of the demo. They are also responsible for ensuring that the demo captures all necessary information for subsequent evaluation. • RIL Partners: R&I Lab Partners play an active role during the demo execution. Their responsibilities include executing their designated roles, such as presenting the demo, collecting the information, and facilitating the involvement of stakeholders. They ensure that the demo activities align with the planned objectives • Tech Providers (WP3, WP4): Provide ongoing technical support, resolve integration issues, and monitor progress. • WP6: Monitor and resolve issues related to stakeholder engagement. WP6 also manages the promotion and communication aspects of the demo, leveraging media and social platforms to share progress and results with a broader audience.
Demo evaluation	<ul style="list-style-type: none"> • WPL: WPLs oversee the evaluation process, ensuring that it is conducted according to plan and that the results are accurately documented. They work with the Task Leaders and RIL Leaders to ensure that the evaluation activities are aligned with the project’s strategic goals. WPLs also play a key role in ensuring that the feedback from the evaluation is used to inform future project activities and iterations. • Task 5.3 Leader: Coordinates the evaluation process, oversees the information collection and analysis, and compiles actionable feedback for future iterations. • RIL Leader : R&I Lab Leader play a critical role in the evaluation phase by providing feedback on the performance of the demos. They are responsible for gathering and submitting the evaluation templates provided, ensuring that all relevant information is captured accurately. RIL Leaders also collaborate closely with the T5.3 leader. • RIL Partners: R&I Lab Partners are involved in the evaluation process by participating in the collection of data and feedback during the demo. They help in filling out the evaluation templates, contributing insights and observations that are essential for assessing the impact of the solutions.

	<ul style="list-style-type: none"> • Tech Providers (WP3, WP4): Tech Providers contribute to the evaluation by providing technical feedback on the performance of the demonstrators. They help identify any technical issues that arose during the demonstration and suggest improvements. • WP6: Communicate and disseminate the results of the demonstration and evaluation reports looking towards the next iteration
--	--

3.5.2 Evaluation Methodology

To support the project’s objectives, Task 5.3 will identify and tailor a suitable evaluation methodology. Such a methodology is critical as it can deliver clear, functional outcomes while ensuring transparency and standardization in the evaluation process. Additionally, it allows us to move quickly from the macroscale level (impact assessment) to the microscale level (solution acceptance for specific focus groups). The macroscale level deals with expected societal (including environmental), economic, technological and scientific impact generated by the results of the developed services and products. The microscale level aims to assess the added value and acceptance of the product and services to specific focus groups.

Within Work Package 5 (WP5), the evaluation will be performed along two main dimensions:

1-Performance Analysis: We will assess the performance of the demonstrators and the project’s overall outcomes by tracking key progress parameters related to deployment and demonstration execution. This approach aims to promptly identify potential shortcomings and weaknesses in the demonstrator operations, ensuring effective collaboration across work packages to overcome these challenges.

For continuous monitoring, we will use the KPI monitoring file (see section 3.4), defined timelines, , collected reports and RIL meetings. By doing so, we can confirm whether the RILs and demonstrators are meeting their targets and delivering the expected results. Any emerging delays or issues will be identified and addressed throughout all phases of the project.

2-Impact Assessment: The impact evaluation will be based on the KPIs defined in Task 5.1, designed to measure the applications’ impact on economic, scientific, and social aspects. WP5 will use standardized report templates and tools distributed to the Research and Innovation (RI) Labs at scheduled intervals. Within T5.3, the KPIs initially presented in D5.3 will be enriched through workshops and stakeholder input to better capture the intended impacts of each Lab’s solutions. The final, expanded list of KPIs will be presented in D5.2.

Overall, the evaluation process involves collecting and analyzing feedback, comparing outcomes against established criteria and KPIs, and determining how effectively the demonstrators meet the project’s overarching objectives. By doing so, the evaluation will guide improvements, support informed decision-making, and enhance the long-term impact of the project’s results.

3.5.2.1 Target groups

Target groups are defined as the specific sets of users, beneficiaries, or communities that a product, service, or intervention aims to affect. Identifying these groups is essential for conducting meaningful impact evaluations, as it ensures that assessments are not only focused but also relevant to those who stand to gain the most. By clearly defining target groups, evaluators can tailor their data collection

methods, select appropriate indicators, and analyze outcomes that directly matter to these groups. This targeted approach provides a clearer understanding of the solution’s effectiveness, guides improvements to better meet the identified needs, and ultimately supports the delivery of more sustainable and meaningful results.

3.5.2.2 Aligning Needs Assessment and Solution Evaluation through Co-Design (WP2)

As illustrated in Figure 22 of the PMI Business Analysis Guide, Needs Assessment, Solution Evaluation, along with Traceability and Monitoring, are key activities in our adapted approach. Recognizing the direct link between Needs Assessment and Solution Evaluation, we have integrated this relationship into our methodology. By actively collaborating with WP2 on co-design activities, we ensure that the evaluation process remains effective, closely aligned with stakeholder needs, and fully supportive of the project’s overall objectives.

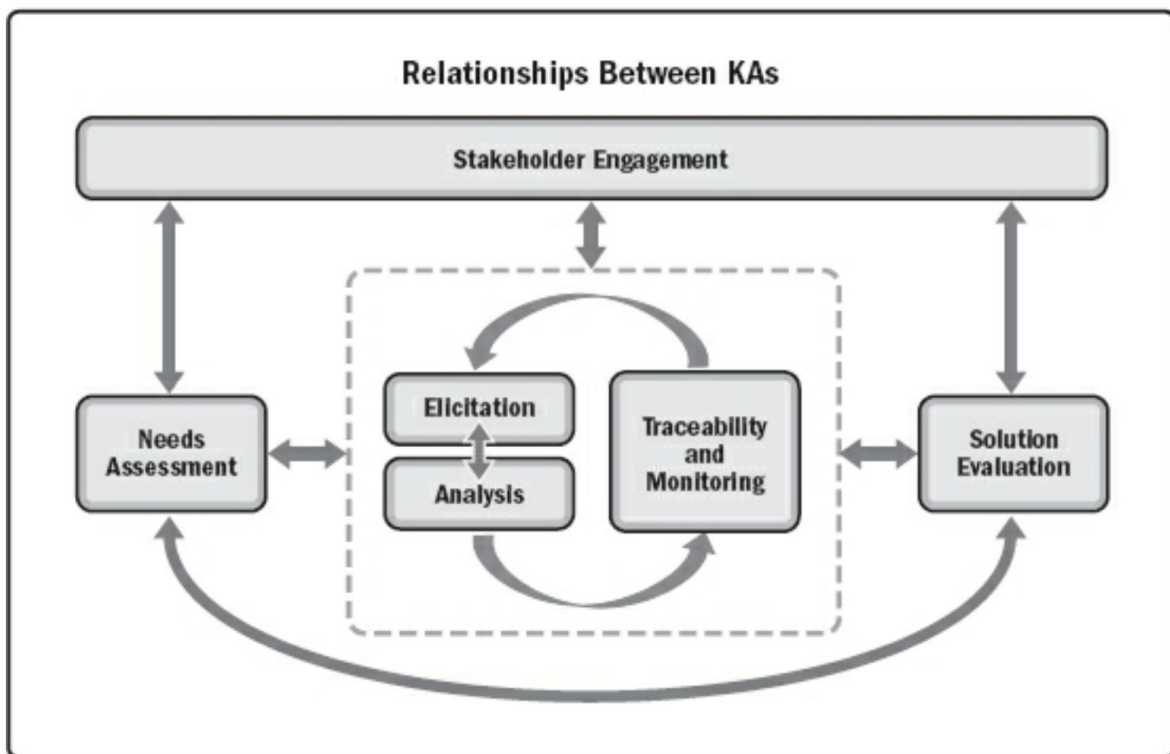


Figure 22. Needs assessment and Solution evaluation, together with Traceability and Monitoring, are Key Activities in Business Analysis. Source “The PMI Guide to Business Analysis”.

In this regard, outputs from the co-design process such as generated requirements (business, stakeholder, functional, and non-functional), acceptance criteria, and estimated timeframes—are integrated within the execution plan to support continuous monitoring. This ensures that the evolving requirements and timelines remain visible, allowing for timely adjustments and improved alignment with stakeholder needs and overall project objectives.

Additionally, we will leverage acceptance criteria from WP2. These criteria, derived from business and stakeholder requirements, will guide the identification of relevant metrics/KPIs for impact assessment

and also help to assess the products' usefulness and usability. This feedback loop will inform WP2's co-design activities, ultimately improving the products to better meet end-user needs.

It's important to mention that acceptance criteria set the conditions a solution must meet before it is deemed satisfactory, ultimately ensuring that users' needs and expectations are fulfilled and acceptance criteria might be set based on the goals, objectives, key performance indicators, project metrics, customer metrics, sales and marketing metrics, or operational metrics (see D2.1 for details).

3.5.2.3 Metrics and Indicators

Metrics are qualitative or quantitative measures or inferences used to evaluate the effectiveness of a criterium or a process¹. Metrics indicate effectiveness, so some prefer the "indicator" instead of "metric". The measures or the inferences are presented with values. There are three main ways to assign the values: qualitative, quantitative and a combination of these two². More specific:

- Quantitative. When measures can be assessed quantitatively, some metrics such as time, cost and revenue can be used as evaluation criteria.
- Qualitative. When the effectiveness is difficult to measure, and there we focus more on inferences.
- A combination. When several aspects of a metric must be assessed quantitatively and qualitatively.

Within the scope of our work, we have determined that adopting a combined methodology is the most effective approach.

Baseline values

Establishing baseline values is essential when metrics need to be compared across different stages. In the context of impact assessment, determining or assessing these baselines can be particularly challenging and often involves drawing upon multiple sources—ranging from proprietary datasets and historical records to published literature, statistical analyses, and expert insights.

3.5.2.4 Dimensions of Impact

Below we describe the three dimensions of Impact (Figure 23) using the Horizon Europe Programme Guide as a source.

- **Scientific Impact:**

Driving scientific advancements across and within multiple disciplines, generating new knowledge, and strengthening research infrastructures (e.g., scientific equipment, instruments, and computing systems).

- **Societal Impact:**

Benefiting society by improving productivity, working conditions, and human health, as well as informing policies and decision-making processes. This also involves enhancing environmental and climate performance—especially for farmers and businesses—by emphasizing sustainability,

¹ The PMI Guide to Business Analysis (p. 350). Project Management Institute.

² Maghsoudi, S., Duffield, C. and Wilson, D. (2015), "Innovation Evaluation: Past and Current Models and a Framework for Infrastructure Projects", International Journal of Innovation Science, Vol. 7 No. 4, pp. 281-297

biodiversity, and alignment with European Green Deal objectives. For example, initiatives may focus on reducing soil and water pollution, mitigating greenhouse gas emissions, and preventing soil degradation.

- **Economic/Technological Impact:**

Providing economic and technological advantages that benefit businesses, farmers, and society at large. Examples include increasing operational efficiency, lowering costs, boosting profits, contributing to standards setting.

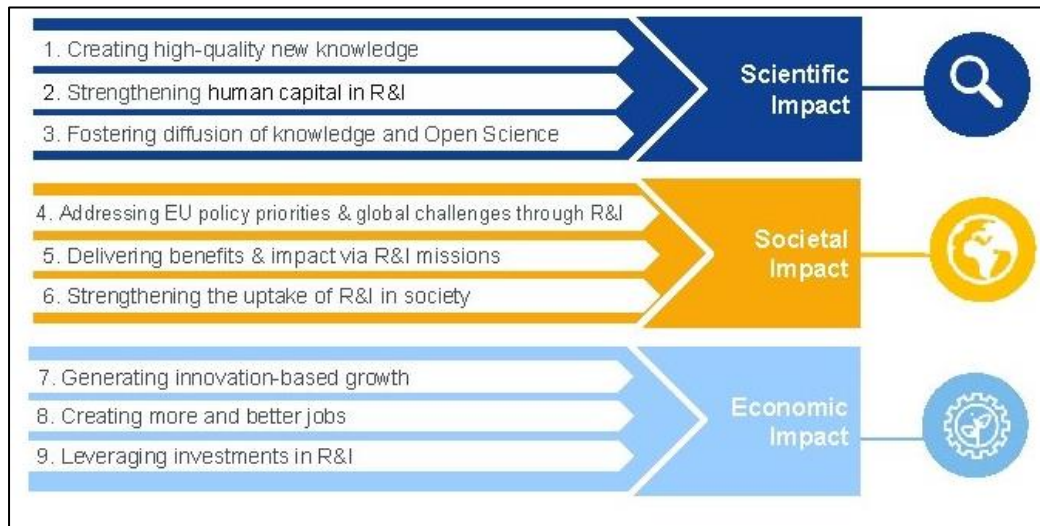


Figure 23. Key impact pathways

3.6 Communication Channels

Different aspects make it necessary to establish specific guidelines for the communication channels used throughout the project. Among them, we can highlight the internationalization level of the project, the current global situation with the coronavirus and the number of different members involved in the project. Therefore, the main communication channels used are specified below:

- SharePoint of the project: Platform which will be used to share all the information related to the ScaleAgData project between the members.
 - Table with information contact of partners, RILs leaders and WPs leaders.
 - Specific folder for each RIL and task.
 - Templates to use for piloting, monitoring and reporting the RILs (meeting agenda, minutes of the meetings, execution plan, progress report and KPIs).
 - Presentations shown in the meetings, as well as webinars or recorded meetings.
 - Other important documents and reports of the RILs.
 - In addition, it will be useful for collaborating on writing up project documents. Creating different folders for each RIL, partners involved in each could work together

in the same documents, having access to all the shared documents and information.

- Microsoft Teams, Google Meet, Webex, Skype: Any kind of similar platform could be used for the majority of the aforementioned project meetings, due to the impossibility of having numerous physical meetings. The coordination and the set up of the meetings can be done using doodles or timesheets.
- Emails: These will be used for daily and frequent communications, as well as for documentation and information exchange.

In addition, it is necessary to make clear that the overall information flow within the project will be ensured by the following means / guidelines:

- Activities like exchange of information, internal technical and business documents (i.e. meeting minutes), technical documentation generated by the project, notifications of relevant new publications, reports from external / bilateral meetings (if any), notifications of the consortium of any updates from the relevant standardization bodies, are foreseen to occur in electronic format via the project's web based repository (SharePoint) as well as by email. For each document upload the consortium will be notified by email.
- Urgent correspondence over email will be sent with a request for explicit acknowledgement and indicated in the title with "URGENT".
- Ordinary mail will be used for strictly formal correspondence, i.e. when executive signatures are required.

4 Upcoming activities

During the second iteration of the project, bilateral meetings between the Task 5.2 and WP5 leaders and the RIL leaders will be held to finalize execution plans and ensure that the RILs' activities are fully operational. These meetings will focus on aligning the plans with project objectives, addressing any challenges encountered during the first iteration, and refining activities to enhance performance.

As outlined in this deliverable, regular meetings will be conducted with each RIL to monitor progress, provide support, and address any emerging issues. Progress will be systematically reported using the provided templates to ensure consistency, transparency, and comparability across the RILs.

In the final stages of the second iteration, each RIL will consolidate its achievements, challenges, and the impact of its activities in the fourth deliverable of WP5, the Deployment and Evaluation Report (D5.4). This report will offer valuable insights for future iterations and play a key role in shaping the overall project strategy moving forward.

Regarding T5.3 (Coordination, Monitoring, Evaluation & Impact Analysis), the following activities will take place in the coming months.

Refinement and Preparation:

- Refine and enrich indicators to better analyze the potential impact of the developed solutions.

- Determine if baseline values are needed
- Define data types and value ranges for each indicator.
- Prepare questionnaires and related templates (e.g., KPI data sheets, surveys, interview guides) to support data collection.
- Perform necessary activities to ensure readiness for the demonstration.

Feedback Collection Phase:

- Gather initial indicators using surveys, interviews, and RIL meetings as reference points.
- Support the demo execution, ensuring smooth performance and gathering feedback.
- Monitor progress, collect feedback, and compile initial findings.
- Produce D5.2 Deployment and Evaluation Report (February 2025) based on the collected data.

Continuous Improvement and Final Reporting:

- Share feedback with other WPs and product/service providers to guide improvements.
- Conduct a second evaluation cycle, comparing outcomes against previous results.
- Finalize and deliver D5.4: Deployment and Evaluation Report

Additional Details:

More comprehensive information on the applied methodology, tailored elements, performed activities, as well as the finalized templates for KPIs, surveys, and interview questions, will be presented in D5.2 Deployment and Evaluation Report.

5 Conclusions

The information provided throughout this deliverable represents the overall guidelines to carry out a good and comprehensive procedure for piloting, reporting, troubleshooting and decision-making mechanisms for all Research and Innovation Labs (RILs). In addition to presenting the project, the WP5 and the RILs associated, this document has clarified the RIL structure and the function of its members. Moreover, the deliverable has determined the procedures and the documentation templates that will serve as a reference for the RILs leaders during the project. All the documentation related to the project, as well as deadlines or contact information, will be shared on SharePoint to be accessible for all the members.

In this sense, the deliverable “Piloting Plan and Evaluation Methodology” has also specified the procedure and tools for the communication between WP5 leader, Task leader, RIL leaders and RIL partners. This cooperation is one of the keys to the success of the project, ensuring its progress through a multi-actor approach. With all the partners actively involved in the development of the project, efficient solutions to different arising problems will be found much faster.

Also, the deliverable outlines key steps, roles and responsibilities for a successful demonstration and provides a brief overview of the evaluation methodology, offering a solid starting point for a successful demonstration and impact assessment.

Annexes

Annex I: Template for RIL execution plan

RIL ID	Phase	Area of Interest	Pilot Fields	Target: Upscaled Area	Pilot Fields	Target: Upscaled Area																																																																																				
XXX	Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Area of Interest</th> <th>Crop / Product</th> <th>Start of Season (SoD)</th> <th>End of Season (EoS)</th> </tr> </thead> <tbody> <tr><td>A_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>A_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>A_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Area of Interest	Crop / Product	Start of Season (SoD)	End of Season (EoS)	A_1					A_2					A_3					<table border="1"> <thead> <tr> <th>Nb of pilot parcels</th> <th>Total Area of Selected Parcels</th> <th>Average parcel area</th> <th>Details needed</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of pilot parcels	Total Area of Selected Parcels	Average parcel area	Details needed													<table border="1"> <thead> <tr> <th>Nb of upscale parcels</th> <th>Upscale</th> <th>Average parcel area</th> <th>Details needed</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of upscale parcels	Upscale	Average parcel area	Details needed													<table border="1"> <thead> <tr> <th>Nb of pilot parcels</th> <th>Total Area of Selected Parcels</th> <th>Average parcel area</th> <th>Details needed</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of pilot parcels	Total Area of Selected Parcels	Average parcel area	Details needed													<table border="1"> <thead> <tr> <th>Nb of upscale parcels</th> <th>Upscale</th> <th>Average parcel area</th> <th>Details needed</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of upscale parcels	Upscale	Average parcel area	Details needed												
	Code	Area of Interest	Crop / Product	Start of Season (SoD)	End of Season (EoS)																																																																																					
	A_1																																																																																									
A_2																																																																																										
A_3																																																																																										
Nb of pilot parcels	Total Area of Selected Parcels	Average parcel area	Details needed																																																																																							
Nb of upscale parcels	Upscale	Average parcel area	Details needed																																																																																							
Nb of pilot parcels	Total Area of Selected Parcels	Average parcel area	Details needed																																																																																							
Nb of upscale parcels	Upscale	Average parcel area	Details needed																																																																																							
RIL Lead & Partners	Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Data recorded</th> <th>Nb of installed sensors</th> <th>Partner responsible</th> </tr> </thead> <tbody> <tr><td>S_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>S_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>S_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Description	Data recorded	Nb of installed sensors	Partner responsible	S_1					S_2					S_3					<table border="1"> <thead> <tr> <th>Nb of sensors planned to be installed/ used</th> <th>Data recorded</th> <th>Plan for technology upgrade</th> <th>Time priority of Upgrade</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of sensors planned to be installed/ used	Data recorded	Plan for technology upgrade	Time priority of Upgrade													<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions													<table border="1"> <thead> <tr> <th>Nb of sensors planned to be installed/ used</th> <th>Data recorded</th> <th>Plan for technology upgrade</th> <th>Time priority of Upgrade</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Nb of sensors planned to be installed/ used	Data recorded	Plan for technology upgrade	Time priority of Upgrade													<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions												
	Code	Description	Data recorded	Nb of installed sensors	Partner responsible																																																																																					
	S_1																																																																																									
S_2																																																																																										
S_3																																																																																										
Nb of sensors planned to be installed/ used	Data recorded	Plan for technology upgrade	Time priority of Upgrade																																																																																							
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Nb of sensors planned to be installed/ used	Data recorded	Plan for technology upgrade	Time priority of Upgrade																																																																																							
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Information derived</th> <th>Source</th> <th>Partner responsible</th> </tr> </thead> <tbody> <tr><td>EO_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>EO_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>EO_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Description	Information derived	Source	Partner responsible	EO_1					EO_2					EO_3					<table border="1"> <thead> <tr> <th>Plan of data acquisition</th> <th>details on the data used</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Plan of data acquisition	details on the data used							<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions													<table border="1"> <thead> <tr> <th>Plan of data acquisition</th> <th>details on the data used</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Plan of data acquisition	details on the data used							<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																													
Code	Description	Information derived	Source	Partner responsible																																																																																						
EO_1																																																																																										
EO_2																																																																																										
EO_3																																																																																										
Plan of data acquisition	details on the data used																																																																																									
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Plan of data acquisition	details on the data used																																																																																									
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Type of input</th> <th>Data</th> <th>Utility</th> <th>Partner responsible</th> </tr> </thead> <tbody> <tr><td>I_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>I_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>I_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Type of input	Data	Utility	Partner responsible	I_1					I_2					I_3					<table border="1"> <thead> <tr> <th>Plan of acquisition</th> <th>details on the data used</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Plan of acquisition	details on the data used							<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions													<table border="1"> <thead> <tr> <th>Plan of acquisition</th> <th>details on the data used</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Plan of acquisition	details on the data used							<table border="1"> <thead> <tr> <th>Sub-activity</th> <th>Description</th> <th>Start / End</th> <th>Dependencies / Risk & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																													
Code	Type of input	Data	Utility	Partner responsible																																																																																						
I_1																																																																																										
I_2																																																																																										
I_3																																																																																										
Plan of acquisition	details on the data used																																																																																									
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Plan of acquisition	details on the data used																																																																																									
Sub-activity	Description	Start / End	Dependencies / Risk & Solutions																																																																																							
Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Related Innovation Area</th> <th>Related Tasks</th> <th>Contributors</th> </tr> </thead> <tbody> <tr><td>DI_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>DI_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>DI_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Description	Related Innovation Area	Related Tasks	Contributors	DI_1					DI_2					DI_3					<table border="1"> <thead> <tr> <th>Sub-activities</th> <th>Start / End</th> <th>Dependencies</th> <th>Risks & solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities	Start / End	Dependencies	Risks & solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update										<table border="1"> <thead> <tr> <th>Sub-activities</th> <th>Start / End</th> <th>Dependencies</th> <th>Risks & solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities	Start / End	Dependencies	Risks & solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update																		
Code	Description	Related Innovation Area	Related Tasks	Contributors																																																																																						
DI_1																																																																																										
DI_2																																																																																										
DI_3																																																																																										
Sub-activities	Start / End	Dependencies	Risks & solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Sub-activities	Start / End	Dependencies	Risks & solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>acceptance criteria</th> <th>stakeholders / priority</th> <th>Requirements</th> </tr> </thead> <tbody> <tr><td>US_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>US_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>US_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Description	acceptance criteria	stakeholders / priority	Requirements	US_1					US_2					US_3					<table border="1"> <thead> <tr> <th>Sub-activities they are involved in</th> <th>Estimated time of achievement (based on time priority of Requirements)</th> <th>Dependencies</th> <th>Risks & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities they are involved in	Estimated time of achievement (based on time priority of Requirements)	Dependencies	Risks & Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update										<table border="1"> <thead> <tr> <th>Sub-activities they are involved in</th> <th>Estimated time of achievement (based on time priority of Requirements)</th> <th>Dependencies</th> <th>Risks & Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities they are involved in	Estimated time of achievement (based on time priority of Requirements)	Dependencies	Risks & Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update																		
Code	Description	acceptance criteria	stakeholders / priority	Requirements																																																																																						
US_1																																																																																										
US_2																																																																																										
US_3																																																																																										
Sub-activities they are involved in	Estimated time of achievement (based on time priority of Requirements)	Dependencies	Risks & Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Sub-activities they are involved in	Estimated time of achievement (based on time priority of Requirements)	Dependencies	Risks & Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Initial phase	<table border="1"> <thead> <tr> <th>Provider</th> <th>Description</th> <th>Innovation Area</th> <th>Time priority</th> </tr> </thead> <tbody> <tr><td>XXX</td><td></td><td></td><td></td></tr> <tr><td>XXX</td><td></td><td></td><td></td></tr> <tr><td>XXX</td><td></td><td></td><td></td></tr> </tbody> </table>	Provider	Description	Innovation Area	Time priority	XXX				XXX				XXX				<table border="1"> <thead> <tr> <th>Deployment of Innovation Area they are involved in</th> <th>Sub-activities they are involved in</th> <th>Dependencies / Risks</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Deployment of Innovation Area they are involved in	Sub-activities they are involved in	Dependencies / Risks	Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update										<table border="1"> <thead> <tr> <th>Deployment of Innovation Area they are involved in</th> <th>Sub-activities they are involved in</th> <th>Dependencies / Risks</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Deployment of Innovation Area they are involved in	Sub-activities they are involved in	Dependencies / Risks	Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update																						
Provider	Description	Innovation Area	Time priority																																																																																							
XXX																																																																																										
XXX																																																																																										
XXX																																																																																										
Deployment of Innovation Area they are involved in	Sub-activities they are involved in	Dependencies / Risks	Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Deployment of Innovation Area they are involved in	Sub-activities they are involved in	Dependencies / Risks	Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Initial phase	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Innovation Area</th> <th>Time priority</th> </tr> </thead> <tbody> <tr><td>R_1</td><td></td><td></td><td></td></tr> <tr><td>R_2</td><td></td><td></td><td></td></tr> <tr><td>R_3</td><td></td><td></td><td></td></tr> </tbody> </table>	Code	Description	Innovation Area	Time priority	R_1				R_2				R_3				<table border="1"> <thead> <tr> <th>Deployment of Innovative Approaches (insert Code)</th> <th>Sub-activities they are involved in (insert Code)</th> <th>Dependencies / Risks</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Deployment of Innovative Approaches (insert Code)	Sub-activities they are involved in (insert Code)	Dependencies / Risks	Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update										<table border="1"> <thead> <tr> <th>Deployment of Innovative Approaches (insert Code)</th> <th>Sub-activities they are involved in (insert Code)</th> <th>Dependencies / Risks</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Deployment of Innovative Approaches (insert Code)	Sub-activities they are involved in (insert Code)	Dependencies / Risks	Solutions													<table border="1"> <thead> <tr> <th>Criteria</th> <th>Assessment</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Criteria	Assessment	Points for update																						
Code	Description	Innovation Area	Time priority																																																																																							
R_1																																																																																										
R_2																																																																																										
R_3																																																																																										
Deployment of Innovative Approaches (insert Code)	Sub-activities they are involved in (insert Code)	Dependencies / Risks	Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Deployment of Innovative Approaches (insert Code)	Sub-activities they are involved in (insert Code)	Dependencies / Risks	Solutions																																																																																							
Criteria	Assessment	Points for update																																																																																								
Initial phase	<table border="1"> <thead> <tr> <th>Output</th> <th>Description</th> <th>Partner</th> <th>Deployment of Innovative Approaches</th> <th>User Story</th> </tr> </thead> <tbody> <tr><td>O_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>O_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>O_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Output	Description	Partner	Deployment of Innovative Approaches	User Story	O_1					O_2					O_3					<table border="1"> <thead> <tr> <th>Sub-activities they are involved in</th> <th>Estimated time of achievement</th> <th>Dependencies / Risk</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities they are involved in	Estimated time of achievement	Dependencies / Risk	Solutions													<table border="1"> <thead> <tr> <th>Assessment - Challenges</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Assessment - Challenges	Points for update							<table border="1"> <thead> <tr> <th>Sub-activities they are involved in</th> <th>Estimated time of achievement</th> <th>Dependencies / Risk</th> <th>Solutions</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Sub-activities they are involved in	Estimated time of achievement	Dependencies / Risk	Solutions													<table border="1"> <thead> <tr> <th>Assessment - Challenges</th> <th>Points for update</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Assessment - Challenges	Points for update																							
Output	Description	Partner	Deployment of Innovative Approaches	User Story																																																																																						
O_1																																																																																										
O_2																																																																																										
O_3																																																																																										
Sub-activities they are involved in	Estimated time of achievement	Dependencies / Risk	Solutions																																																																																							
Assessment - Challenges	Points for update																																																																																									
Sub-activities they are involved in	Estimated time of achievement	Dependencies / Risk	Solutions																																																																																							
Assessment - Challenges	Points for update																																																																																									
Initial phase	<table border="1"> <thead> <tr> <th>KPIs</th> <th>Description</th> <th>Partner</th> <th>Deployment of Innovative Approaches</th> <th>User Story</th> </tr> </thead> <tbody> <tr><td>KPI_1</td><td></td><td></td><td></td><td></td></tr> <tr><td>KPI_2</td><td></td><td></td><td></td><td></td></tr> <tr><td>KPI_3</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	KPIs	Description	Partner	Deployment of Innovative Approaches	User Story	KPI_1					KPI_2					KPI_3					<table border="1"> <thead> <tr> <th>Target</th> <th>Estimated time of achievement</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Target	Estimated time of achievement							<table border="1"> <thead> <tr> <th>Target</th> <th>Estimated time of achievement</th> </tr> </thead> <tbody> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </tbody> </table>	Target	Estimated time of achievement																																																									
KPIs	Description	Partner	Deployment of Innovative Approaches	User Story																																																																																						
KPI_1																																																																																										
KPI_2																																																																																										
KPI_3																																																																																										
Target	Estimated time of achievement																																																																																									
Target	Estimated time of achievement																																																																																									

Annex II: Template for RIL progress report

RILx Progress Report – Period: Mx

[Please enter the number of the RIL - Please enter the month of the project]

Partner Organisation name: Contact Person:	
RIL Activity Progress	<p><u>Information</u> about the on-going activities during the reporting period</p> <p>(Name of the sub-activity, Name of major activity the sub-activity is part of, <u>Short</u> description of the sub-activity, Main contributors of the sub-activity, Possible risks / dependencies / proposed solutions)</p>
Collaborations	<p>Details on Collaborations with other RILs and / or partners of the project</p> <p>(Name of RIL or <u>Details</u> of the collaborations (if any) with other RILs: Identify the RIL and include key details on the nature of collaboration, joint efforts, and notable achievements)]</p> <p style="text-align: center;">External collaborations</p> <p>[Please provide details of the external collaborations (if any) with other initiatives and / or projects: Identify the project or initiative and include key details on the nature of collaboration, joint efforts, and notable achievements]</p>
KPIs	<p>Information on the KPIs that have been achieved during the reporting period.</p> <p><i>(Code of KPI, Sub-activity linked to KPI, RIL partners involved, <u>Short</u> description)</i></p>

Annex III: Template for RIL meeting agenda & minutes

RILx - Monthly Meetings

1st Meeting 2024

Date – Time

Meeting Space: Teams

Agenda

1.
2.
3.

Participants

.....
.....
.....

Minutes

-
-
-

To do:

-
-

Next meeting:

Will take place

Annex IV: Template for KPIs' monitoring

OBJECTIVES			RIL										Total Value	Target	% achievement
			Description title												
			1a	1b	2a	2b	2c	3	4	5	6				
			Water		Crop management			Yield monitoring	Soil health	Grasslands	Dairy				
Medicinal plants	Quinoa	Agri-environmental monitoring	Sustainability performance	Early Pest Detection											
Obj.1: Developing innovative approaches for collecting in-situ data and applying data technologies by actively involving stakeholders in the agricultural production process.	KP1: Implementation of sampling an sensor innovation	Target: 100% of the RI labs	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	
	KPI2: Applicability of sensors in different agri-ecological zones or agri-environmental systems.	Target: ≥ 3 field-based sensors (electrochemical, optical and piezoelectric biosensors) will be investigated	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	
	KPI3: Data processing architecture: Testing and application of new technology in processing platforms	Target: Testing and application of edge analytics and federated learning technology	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	
Obj.2: Enabling and promoting data sharing along the entire data value chain.	KPI4: RILs adopt and demonstrate data sharing best practices. The sensor data is readily available according to the metadata and governance models	Target: 100% of the RI labs	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	
	KPI5: Implementation of a best practice document on the different governance models, with drawbacks and benefits for the different stakeholders.	Target:	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	
	KPI6: Workshops to highlight the importance of data sharing can be organized.	Target:	X	X	X	X	X	X	X	X	X	XX	XXX	XX %	

<p>Obj.3: Demonstrating how the readily-accessible, locally-collected sensor data can be scaled to agrienvironmental data products at the national, regional or European level.</p>	<p>KPI7: Development of new data products which are available to the different stakeholders, both within the RI labs as to other stakeholders and cover the different environmental axes (water, air, soil and living organisms).</p>	<p>Target: ≥ 10 data products</p>	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
<p>Obj.4: Demonstrating the benefit of the improved monitoring capacities of the agri-environmental conditions in a precision farming context.</p>	<p>KIP8: the improved data products of RILs are used to optimize the services to farmers, providing information or a service that is not feasible with the in-situ sensors alone</p>	<p>Target: ≥ 5 RILs</p>	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
<p>Obj.4: Demonstrating the benefit of the improved monitoring capacities of the agri-environmental conditions in a precision farming context.</p>	<p>KPI9: The improved data products of RILs can be used in a precision farming context outside of the RI labs, where the farmer(s) don't have access to sensor technology.</p>	<p>Target: ≥ 1 demonstration</p>	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
<p>Obj.5 Demonstrating the benefit of upscaled regional datasets for the agricultural sector in general</p>	<p>KPI10: The improved data products are evaluated by at different users (both from within as outside the consortium) on their relevance and useability</p>	<p>Target: ≥ 4 users</p>	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
<p>Obj.5 Demonstrating the benefit of upscaled regional datasets for the agricultural sector in general</p>	<p>Number and feedback of the project's co-engagement activities such as workshops, webinars with national or EU policy makers, or with other liaised projects or initiatives such as the "Partnership of Agriculture of Data"</p>	<p>Target:</p>	X	X	X	X	X	X	X	X	X	XX	XXX	XX %

IMPACT				RIL											Total Value	Target	% achievement		
				Description title															
				1a	1b	2a	2b	2c	3	4	5	6	Yield monitoring	Soil health				Grasslands	Dairy
				Water productivity		Crop management													
Medicinal plants	Quinoa	Agri-environmental monitoring	Sustainability performance	Early Pest Detection									XX	XXX	XX %				
TOPIC OUTCOME	Topic Outcome 1: Strengthening capacities for smart farming, and thus to enhance the environmental and economic performance of the agricultural sector	KPI 1: number of newly developed Smart Farming solutions.	Target: 8	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %			
		KPI 2: Number of regions where those solutions were tested.	Target: 10	X	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %		
		KPI 3: Number of engaged possible users for all SF related data products.	Target: 16	X	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %		
	Topic Outcome 2: Strengthening capacities for agri-environmental (climate) monitoring, particularly of soil and crop conditions	KPI 1: Number of agri-environmental soil and crop parameters covered.	Target: 11	X	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %		
		KPI 2: Number of regions where these solutions will be tested.	Target: 11	X	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %		
		KPI 3: Number of engaged possible users for each soil and crop related data product.	Target: 22	X	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %		

T O P I C O U T C O M E	Topic Outcome 3: Provision of inputs to the work of the Horizon Europe candidate partnership "Agriculture of Data" and the potential R&I mission on soil health	KPI 1: Number of project agriculture data products that are of interest for the "Agriculture of Data" partnership.	Target: 14	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 2: Number of developed services and data that are of interest to the R&I mission on soil health.	Target: 3	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
W I D E R I M P A C T	Wider Impact 1: Innovative governance models enabling sustainability and resilience notably to achieve better informed decision-making processes, societal engagement and innovation	KPI 1: Number of defined governance and business models.	Target: 3	X	X	X	X	X	X	X	X	XX	XXX	XX %	
		KPI 2: Number of stakeholders involved in the definition of the governance and business models.	Target: 40	X	X	X	X	X	X	X	X	XX	XXX	XX %	
	Wider Impact 2: Green Deal related domains benefit from further deployment and exploitation of Environmental Observation data and products	KPI 1: Number of Green Deal objectives and actions contributed to.	Target: 3	X	X	X	X	X	X	X	X	XX	XXX	XX %	

W I D E R I M P A C T	<u>Wider Impact 3:</u> A strengthened Global Earth Observation System of Systems (GEOSS)	KPI 1: Number of project-specific data collections available in NextGEOSS	Target: 14	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 2: Number of engaged GEO activities that are testing or providing feedback on project outputs.	Target:	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
	<u>Wider Impact 4:</u> Sustainability performance and competitiveness in the domains covered by Cluster 6 are enhanced through further deployment of digital and data technologies as key enablers	KPI 1: Number of Cluster 6 areas of intervention contributed to.	Target: 5	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 2: Number of Cluster 6 related policies and strategies contributed to.	Target: 3	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 1: Number of engaged users.	Target: 40	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 2: Number of co-design workshops.	Target: 12	X	X	X	X	X	X	X	X	X	XX	XXX	XX %

W I D E R I M P A C T	Wider Impact 5: More informed and engaged stakeholders and end users including primary producers and consumers thanks to effective platforms such as Agriculture Knowledge and Innovation Systems (AKIS)	KPI 3: Number of capacity building webinars and workshops.	Target: 6	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
	Wider Impact 6: Strengthened EU and international science-policy interfaces to achieve the Sustainable Development Goals (SDGs)	KPI 1: Number of SDG indicators the project is directly contributing to.	Target: 5	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %
		KPI 2: Number of SDG targets the project is indirectly contributing to.	Target: 2	X	X	X	X	X	X	X	X	X	X	XX	XXX	XX %

DISSEMINATION		RIL									Total Value	Target	% achievement
		Description title											
		1a	1b	2a	2b	2c	3	4	5	6	XX	XXX	XX %
		Water		Crop management			Yield monitoring	Soil health	Grasslands	Dairy	XX	XXX	XX %
Medicinal plants	Quinoa	Agri-environmental monitoring	Sustainability performance	Early Pest Detection	XX	XXX					XX %		
KPI1: Participation in key user communities events (T6.3)	Target: ≥ 2	X	X	X	X	X	X	X	X	XX	XXX	XX %	
KPI2: RI Labs workshops (Wider Impact 5)	Target: 12	X	X	X	X	X	X	X	X	XX	XXX	XX %	
KPI3: Capacity Building Webinars (Wider Impact 5)	Target: 6	X	X	X	X	X	X	X	X	XX	XXX	XX %	
KPI4: Project Conferences	Target: 1	X	X	X	X	X	X	X	X	XX	XXX	XX %	