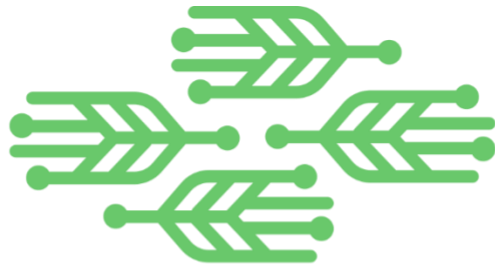


D1.5 - Report on multi-actor knowledge reservoirs + best practices



EUREKA

European Knowledge Repository for Best Agricultural Practices

TASK 1.3 Learning from how the Multi Actor data is currently stored in Knowledge Reservoirs

Summary

Task (T) 1.3 on 'Learning from how the Multi Actor data is currently stored in Knowledge Reservoirs' will use the same methodology as T1.2 (overview knowledge produced, KIS). T1.3. builds on the work from T1.1 and T1.2: T1.1 – mapping of all MA projects (USC) and T1.2 – specifically analyse which of the MA data is already stored in a KR (KIS). T1.3 will address the question of how this data is stored and what types of KRs exist.

The results of this task will be fed on an ongoing basis to the team of T1.6 (developing a framework to compare the impact of MA projects, HSRW) that will combine the results from WP1 to make an overall MA impact assessment. The output of T1.3 will also feed into T3.4 (Data Pipeline Design, MU) and T4.3 (FarmBook Data Repository Development, AUA).

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Lead Beneficiary		Deliverable Author(s)	
LAAS		Gintare Kucinskiene, Laura Girdziute, Dovile Petkeviciene, Monika Dmukauskienė, Reda Milciuviene, Erika Mankute, Ilma Rimkeviciene,	
Beneficiaries		Deliverable Co-Author(s)	
AUA		Hercules Panoutsopoulos, George Kalogeropoulos, George Papadopoulos	
IFOAM		Maria Gernert	
KIS		Meta Candek-Potokar	
UNITO		Andrea Masino	
ICROFS		Ilse A. Rasmussen, Malene Jacobsen	
USC		Maria Rosa Mosquera Losada	
MU		Kumar Parveen, Christopher Brewster	
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Dissemination Level	PU	Public	X
	CO	Confidential, only for members of the consortium	





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List of abbreviations and acronyms

ASO	Advanced Search Options
AKIS	Agricultural Knowledge and Innovation System
CORDIS	Community Research and Development Information Service
C,D & E	Communication, Dissemination & Exploitation
CRUD	Create, Read, Update, Delete
CSA	Coordination and Support Action
DMP	Data Management Plan
DMS	Data Management Strategy
DROP	Digital Research Object Portal
EC	European Commission
EIP-AGRI	European Innovation Partnership for Agriculture
FAIR	Findable, Accessible, Interoperable, Reusable
FG	Focus Group
GDPR	General Data Protection Regulation
H2020	Horizon 2020
KR	Knowledge Repository
MA	Multi-Actor
MAA	Multi-Actor Approach
MAP	Multi-Actor Project
OG	Operational Group
RIA	Research and Innovation Action
T	Task
TN	Thematic Network
WP	Work Package
RNs	Rural Networks



SWG SCAR AKIS	Strategic Working Group of Standing Committee on Agricultural Research on Agriculture Knowledge and Innovation Systems
FAO	The Food and Agriculture Organization

List of EUREKA Partners

Partner No	WP1 partner organization name	Acronym	Country
1	Ghent University	UGent	BE
2	Institut de l'élevage	IDELE	FR
3	Royal Agricultural University	RAU	UK
4	Agricultural University of Athens	AUA	EL
5	Magyar Agrar-, Élelmiszergazdasági és Vidékfejlesztési Kamara - Hungarian Chamber of Agriculture	NAK	HU
6	Int. Federation of Organic Agriculture Movements - European Union Regional	IFOAM	SE
7	3A – Umbria Agrifood Technology Park	3APTA	IT
8	Highclere Consulting SRL	HCC	RO
9	Zuidelijke Land- en Tuinbouworganisatie	ZLTO	NL
10	Lithuanian Agricultural Advisory Service	LAAS	LT
11	International Centre for Research in Organic Food Systems, Aarhus University	ICROFS AU	DK
12	Kmetijski Inštitut Slovenije (Agricultural Institute of Slovenia)	KIS	SVN
13	Emphasis University of Torino	UNITO	IT
14	Faculty Environment and Communication, Rhine-Waal University of Applied Sciences	HSRW	DE
15	Magyar Agrar-, Élelmiszergazdasági és Vidékfejlesztési Kamara - Hungarian Chamber of Agriculture	NAK	HU
16	Universidad de Santiago de Compostela	USC	ES
17	Interregional Chamber of Agriculture Association	AC3A	FR
18	Maastricht University	MU	NL



1. INTRODUCTION

1.1. Project overview

In the H2020 project EUREKA (European Knowledge Base for Agricultural Best Practice Solutions) 21 multi-actors from 16 countries cooperate to strengthen the EU-wide agricultural knowledge base and develop an open-source e-platform called FarmBook based on best practices and analysis of MA projects.

Projects were selected from a total of 101 MA projects of which online information in the CORDIS database and on project websites was retrieved. Based on:

1. the type of project (IA, RIA, and CSA-non-TN),
2. project duration (at least in the first reporting period),
3. responsiveness of coordinators (response to workshop invitation and interview requests) a subset of 19 projects were studied in more detail with several workshops and interviews in the tasks of WP1.

Work Package (WP) 1 focus is:

1. to map all MA projects (T1.1);
2. to generate an overview of knowledge/data produced and how MA project knowledge objects are currently stored (T1.2);
3. to review of communication, dissemination, and exploitation of MA projects and to analyse the MA approach adopted in projects (T1.3).

Based on the above an overview of MA KRs and best practices will be created, which will put background for FarmBook Data Repository Development.

1.2. The objectives of Task 1.3

In this task, EUREKA aimed to:

- Evaluate linked open data design architectures from EC, FAO, OECD, and national databases;
- Conduct user tests to validate the user interface and customer journey from the most relevant KRs.

Special attention was given to data gaps and other data that are less accessible based on the available knowledge and activities within the MAPs. Fifteen (15) in-depth online interviews were performed to obtain quality insights about the different layers of knowledge produced in the selected representative subset of MA projects. The questionnaire (Annex 2) for these interviews (Annex 3) was designed and optimised in an iterative process-based way.

The output of T1.3 is a report on the overview of MA KRs and best practices (D1.5). EUREKA partners involved in T1.3 are demonstrated in Table 1.

Table 1. Partners involved in WP1.3 (in bold the leader of 1.3)

	UGent	IDELE	RAU	AUA	NAK	ARC	IFOAM	HCC	ZLTO	LAAS	KIS	UNITO	LFG	ICROFS AU	AKI	HSRW	USC	OC3A	MU	3A PTA	CEJA
Partners involved in T1.3				X			X			X	X	X		X			X		X		



As it is seen from the table above eight Eureka consortium partners were involved in the T1.3 implementation process. The task leader was LAAS.

2. METHODOLOGY

Task T1.3 ‘Learning from how the Multi Actor data is currently stored in Knowledge Reservoirs’ used the same methodology as T1.2 (overview knowledge produced, KIS).

The task T1.2 methodology identified the main data features of the KR objects:

- “Findable” - the first step in (re)using data is to find them. Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, which makes this an essential component of the FAIRification process;
- “Accessible”- means that once the user finds the required data, she/he needs to know how they can be accessed, possibly including authentication and authorisation;
- “Interoperable”- relates to the integration of data with other data. Also, the data need to interoperate with applications or workflows for analysis, storage, and processing;
- “Reusable”- metadata and data should be well-described so that they can be replicated and/or combined in different settings.

Implementing T1.3 the KRs of all MA projects were analysed by identifying the type of KR design and relationship with the data management content and structure, as well as KR sustainability. This evaluation of the format and design of KRs (as open sources) within completed or on-going MA projects included how they link to open data sources used by the EC (e.g. OpenAIRE) and different international (e.g. FAO, OECD, EFSA) and similar national databases of RNs.

The KRs analysis methodology consisted of these phases:

1. Identification of MA projects (see 2.1 subsection);
2. KoM workshop (see 2.2 subsection);
3. Desktop analysis (see 2.3 subsection);
4. Interviews (with selected 15 (+4) projects) (see 2.4 subsection);

Validation survey (see 2.5 subsection).

2.1. Identifying MA projects

First of all, the EIP-AGRI and CORDIS websites databases of the European Commission was analysed to identify completed or on-going MA projects in the field of agriculture and food research, i.e. that were being accepted or financed until February 2020 (not including, TNs which were under consideration in the by EURAKNOS project).

As a result, an Excel database with a list of 101 MA projects was created which comprised:

1. information on the type of the project (RIA, CSA, IA);



2. category and topic covered (according to EIP-AGRI);
3. topic call identifier;
4. itinerary to the web site of the project;
5. project duration;

coordinator contact.

2.2. KoM workshop

During the EUREKA kick-off meeting (KoM) the coordinators of the selected MA projects were invited to participate in the workshops. They were asked to provide the examples of knowledge that was produced in their project; what is the importance for the end-user and whether this outcome is available according to the FAIR principles. The cases of eight projects were covered in the KOM's workshop, namely IMAGE, FAIRSHARE, TREASURE, OPTIMA, FEED-A-GENE, IOF2020, SMART-AGRI-HUBS, and RUSTWATCH. Based on the kick-off meeting feedback the first version of the questionnaire was compiled.

2.3. Desktop analysis

The desktop study was carried to investigate open-source repositories of 101 MA projects webpage (Annex 1, Desktop study). It aimed to understand the open interconnectedness with other KRs, the structure of webpages, search possibilities, format and design of websites, functionalities, language used, access, contact information, and targeted end-users.

This step of the methodology involved two stages:

1. distribution of MAP among WP 1 partners for carrying desktop analysis of respective projects' webpage.
2. T1.3 leader (LAAS) performed the quality check.

The details of each step were provided in Annex 1.

2.4. Interviews

In this stage of the project, the main goal was to develop a questionnaire and select the MA projects for the in-depth on-line interviews aiming to help us obtain quality insights about the generated data and knowledge objects.

The questionnaire design process consisted of several key stages:

1. During the EUREKA kick-off meeting (KoM) on 2020 January in Bruges (BE) a workshop was organised for which the coordinators of the selected MA projects were invited to participate and give their opinion on the knowledge that was produced by their projects and how this knowledge synergize with FAIR principles. This workshop put the foundations for the questionnaire (Annex 2).

Notice: the questionnaire developed and used for the T1.3 was a part of a broader Questionnaire for WP1, so the numerical index of the questionnaire items relating to T1.3 ranged from the number 20 to number 34.

2. Project selection criteria were identified:
 - projects should cover the three types of actions in H2020 (Innovation Actions- IA, Research Innovation Action – RIA and Coordination and Support Actions-CSA);



- projects should at least have completed their midterm of activities/duration (close to the end or ended);
 - projects should cover existing relevant topics.
3. For deep-insight analysis 15 projects from 101 “population (N=101) were selected and 4 extra projects were added (Table 2). The main reason for this step was the intention to ensure the desired number of responses. As practice showed, there was a lack of some MAP interviews for some tasks as people became non-responding.

Table 2. Selected projects for "deep-insight interview" (15+4)

MAP	Topic	Actions			Implementation time
		IA	RIA	CSA	
1.LIVERUR	Sustainable food and non-food value chains		X		2018-2021
2.SiEUGreen	European innovative green and smart cities	X			2018-2021
3.SmartAgriHubs	Digital revolution	X			2018-2022
4.Feed-a-Gene	Animals and health		X		2015-2020
5.NEFERTITI	AKIS - on-farm demonstrations			X	2018-2021
6.LIVESEED	Integrated ecological approaches		X		2017-2021
7.FAIRshare	AKIS - Innovation systems, advisory services, skills, and social capital			X	2018-2023
8.OPTIMA	Plant health, pest management		X		2018-2021
9.RUSTWATCH	Plant health, pest management		X		2018-2022
10.MycoKey	Sustainable food and non-food value chains		X		2016-2020
11.DIVERSIFOOD	Sustainable cropping systems		X		2015-2019
12.BOND	AKIS - Innovation systems, advisory services, skills, and social capital			X	2017-2020
13.TomRes	Genetic resources and breeding		X		2017-2020
14.TREASURE	Genetic resources and breeding		X		2015-2019
15.EMPHASIS	Plant health, pest management		X		2015-2019
16. NoAW*	Sustainable food and non-food value chains		X		2016-2020
17. IoF2020*	Digital revolution	X			2017-2020
18. Diverfarming*	Sustainable food and non-food value chains		X		2017-2022
19. InnoForEst*	Provision of public goods	X			2017-2020
Statistics		4	12	3	Implementation: 81,57%

Note: Projects that were not interviewed marked with *

The interview process was undertaken by four partners involved in T1.3 (Table 3). Interview type – online meeting, which was recorded. Part of the process consisted of gathering signed Consent forms and preparing the transcription of the interviews. All interview transcripts were harmonized with the respondents and only then all data was submitted for evaluation.

The data from the interviews (i.e., the interview transcripts) was used to proceed to a qualitative deep analysis of the selected project.

2.5. Validation survey

As a last methodological step, the interviews were validated using the online (internet) survey. For that purpose, five “key statements” from the interviews were identified:

1. There is a need to ensure wider use of the data in knowledge repositories of multi-actor projects.
2. Data stored in current MA projects usually meet the criteria of the FAIR principles.



3. The target users must be involved in the creation of an online knowledge repository from the beginning to ensure that it will meet their needs.
4. The best strateg(y/ies) to maintain an online MA knowledge repository is/are:
 - to create a broad and active user community with actors from in and outside of the MA project who share the effort of maintenance;
 - to continue building on and using the KR in future projects;
 - to have a designated company or organization responsible for maintenance paid by the European Commission;
 - to have a designated company or organization responsible for maintenance paid by the end-users;
 - to create a centralized online knowledge repository.
5. MA projects must collect and share user feedback (e.g., star-ratings, comments) in an interactive way on the data stored in their online MA knowledge repository.

These statements were adapted into the questions of the validation survey and transcribed from a Word-document version into a Microsoft Forms survey by members of the coordinating team (UGent). The survey was shared via email to the ~150 contacts from all ongoing or recently finished MAPs by the coordination team. All consortium partners were involved in sharing the survey with this target group in their region via email, social media, and in-person or virtual meetings. Survey results please are in the Annex 1.

3. RESULTS

Data received from the 15 interviews transcripts (selected from 101 projects) (Annex 3) and online desktop analysis (Annex 1) were grouped into three main groups (Table 3):

1. **Concept & Interconnection** – the first part consists of content from the responses provided about the overall strategy of the project website, the FAIR principles, the main storage place of project results and data sharing in other platforms, and the use of languages issue.
2. **Management System & Search options** – the second part makes the overview of the administration of project webpages, content updating, search options, and origin of data issues. In this part, a general evaluation of the structure of the project website is included.
3. **Challenges, Ranking & Sustainability** – the third part focuses on the main challenges (changes and improvements, sustainability, ranking systems on websites, feedback collection, etc.) that are faced in all MAPs.

Table 3. Division of data into analysis groups

Part of Collected data	1 GROUP: Concept & Interconnection	2 GROUP: Management System & Search Options	3 GROUP: Challenges, Ranking & Sustainability
Questionnaire (Annex 3)	Q20.Strategy of project website, Q21.Fair principles, Q22. The main storage place of project results and data sharing in other platforms.	Q23. About the specific Content Management System, Q24. Who can upload data on the KR, Q25. New data in the KR, Q26. Data search options, Q27. The origin of shared material.	Q.28 About changes or improvements to the KR throughout the lifetime of the project and learned lessons, their experience, Q29. KR Maintenance Sustainability of platform,

Part of Collected data	1 GROUP: Concept & Interconnection	2 GROUP: Management System & Search Options	3 GROUP: Challengers, Ranking & Sustainability
			<p>Q30. Are there any ranking options for the user on your website to rank the results,</p> <p>Q31. How was the KR promoted,</p> <p>Q32. Was any user feedback collected,</p> <p>Q33. How was feedback collected,</p> <p>Q34. What type of information collects/attracts more attention/feedback.</p>
Online Desktop analysis (Annex 1)	<p>1. Column "Hyperlink to homepage website" (for Domain type),</p> <p>2. Column "Is website only KR",</p> <p>3. Column "In case of No, describe the other KRs",</p> <p>4. Column "Names + hyperlinks to common open repositories",</p> <p>5. Column "Are common open repositories used for outputs",</p> <p>6. Column "Languages for website",</p> <p>7. Column "Languages for other KRs".</p>	<p>1. Column "Describe the user features of the website?",</p> <p>2. Column "Search function available on main KR" + next three columns about search options & results.</p> <p>3. Column "Provide the data categories?".</p>	

Please find below the detailed group analyses and conclusions drawn from this.

3.1. Concept & Interconnection

QUESTIONNAIRE ANALYSIS: Data analysis (Q20: Strategy of project website) in the group "Concept & Interconnection" revealed (table 4) that 27% of respondents (SiEUGreen, SmartAgriHubs, LIVESEED, TomRes) indicated that data storage and management is carried out according to a structured data management plan (DMP) or data management strategy (DMS), but the majority (40% or Feed-a-Gene, NEFERTITI, OPTIMA, MycoKey, DIVERSIFOOD, TREASURE) of the respondents did not have a clear strategy on data storage or data management (plan). This was due to various reasons, such as not being relevant, as the data provided is open access to ensure its availability and maximum use, or there was no requirement for a data management strategy during the relevant project period with the results focusing on practical, demonstration use and other. The remaining 33% of interviewees (LIVERUR, FAIRshare, RUSTWATCH, BOND, EMPHASIS) indicated in their responses that there is a partially integrated data management strategy, which is used in a fragmented way because the project implementation is ongoing and certain issues with a direct impact on data management remain unresolved.



In principle, data management strategy includes a lot of processes, such as collecting, organizing, protecting, storing, and sharing data, interfaces with other databases. By question Q22 (The main storage place of project results and data sharing in other platforms) was tried to understand what the main storage place is -Knowledge Repository or KR- of the knowledge data of the MA project. The analysis of the interview results showed that one out of five respondents (20%) indicated that knowledge (data) is stored in private repositories, which helps to ensure data protection requirements. 13 % of respondents did not provide answers or the question is not relevant. The remaining (67%) of respondents indicate the websites, portals, and public data repositories created during the project as the main place of knowledge (data) storage. This indicates that the data collected has interfaces with other databases. Content is not available in these databases, but almost all project results can be found using the search functions. This choice was influenced by the fact that the results of most projects are publicly available, creating public access to maintain FAIR principles. Go forward with FAIR principles analysis (Q21), is worth mentioning what FINDABLE principle is also related to MA projects domain's name: is it easy to find for the user or not. After checking the 101 MAPs (Figure 1), it can be stated that 22 of them have in their domain clear their activity of field identification, for example, <https://ecobreed.eu/>, <http://landmark2020.eu/>, <http://rural-urban.eu/>, etc. But mostly (even 78.22%) use the unclear domain. That runs the risk the project to become difficult to find for potential users. Unclear domain choices also affect - not memorable (not easy to find), waste user's time (long search process), reduced the first impression effect, and so on.

It is a common ground that innovation projects are usually implemented in the context of the EU H2020 funding program. So, people who are going to search for project-related information may also use this piece of information to form their search queries. It is interesting that in the case of 21 out of the total 101 MAPs, the term "h2020" is part of their domain name. As an example, we may refer to the following MAP domain names: <http://optima-h2020.eu/>, <https://www.h2020fairshare.eu/>, <https://agridemo-h2020.eu/>.

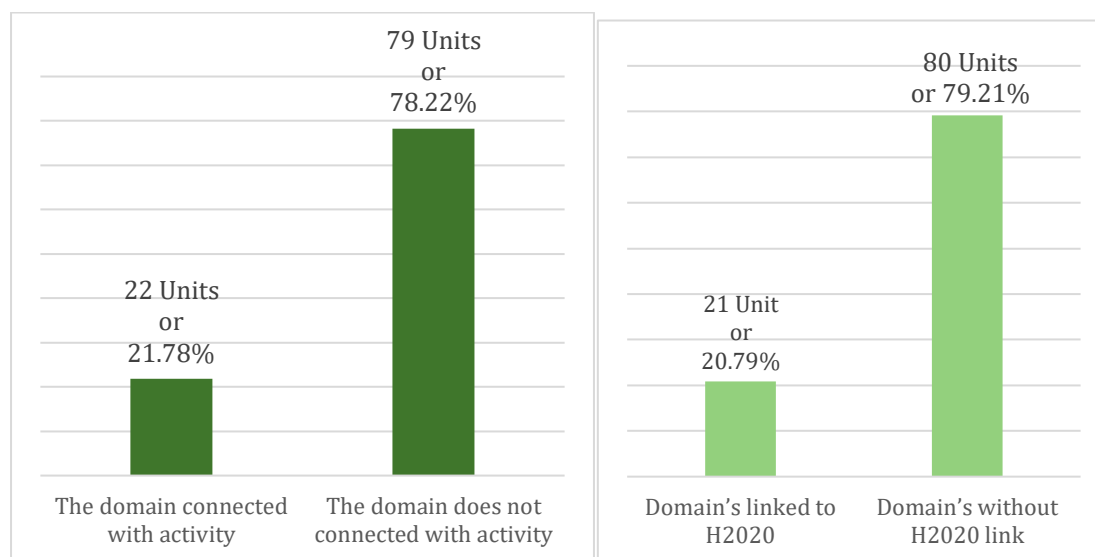


Figure 1. Comparison of MAPs domains and website links.

It is very natural that under the evaluation of domains and acronyms it was noticed a number of those that were very accurate and delicate way described their activities or field of them (without already mentioned domains above): RURALIZATION, FERTIMANURE, GoodBerry, SOILCARE, PoshBee, WATERPROTECT, SuperPests, Diverfarming and DIVERSIFOOD, LIVE RUR, RUSTWATCH, LIVESEED.

From the answers provided to Q21 about if they (i.e. the MAPs) took into account the FAIR principles to make data findable, accessible, interoperable, and reusable, it can be seen that the rate of the positive responses received was up to 86% (table 4).

Detailed desktop analysis answers distribution can be seen in table 4.

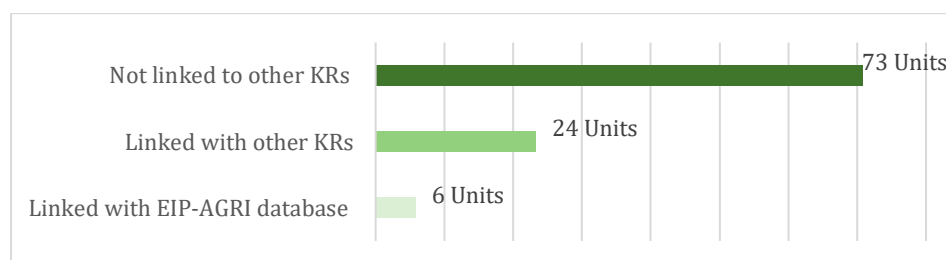
Table 4. Layout of the answers from Interviews

MAP	What was your overall strategy for data storage and management in your Multi-Actor Project (MAP)?			Did you take into account the FAIR principles to make your data findable, accessible, interoperable and reusable?		What is the main storage place (Knowledge Repository or KR) of the knowledge (data) of your MA project?		
	clear strategy	no strategy	primary strategy	yes	no	public storage place (incl. web sides and etc.)	private storage place	not relevant / did not answer
LIVERUR			X	X				X
SiEUGreen	X			X		X		
SmartAgriHubs	X			X		X		
Feed-a-Gene		X		X				X
NEFERTITI		X		X		X		
LIVESEED	X			X		X		
FAIRshare			X	X			X	
OPTIMA		X		X			X	
RUSTWATCH			X		X	X		
MycKey		X		X		X		
DIVERSIFOOD		X			X	X		
BOND			X	X		X		
TomRes	X			X			X	
TREASURE		X		X		X		
EMPHASIS			X			X		
TOTAL units:	4	6	5	12	2	10	3	2
TOTAL, %:	27 %	40%	33%	86 %	14 %	67 %	20 %	13 %

Some respondents (Feed-a-Gene, TREASURE) state that they did not think about the FAIR principle during the implementation of the project, but this came naturally, as it is in the interest of making the results of the projects as accessible and frequently uploaded as possible (beneficial). Further FAIR principles interfaces will be looked at in the desktop analysis (please look below).

DESKTOP ANALYSIS: The quantitative online analysis of the desktop of the MAPs (101) showed that 24 projects (Annex 1, column "In case of No, describe the other KRs") are linked with other KRs, or databases (except CORDIS, as all MAPs could be found there). The database interfaces mentioned are the following: Zenodo, INRA platform, NETXTFood Platform, the XF-ACTORS Digital Research Object Portal (DROP), stakeholders, or related projects platforms, organic Farm Knowledge, Organic Eprints (Items affiliated to

"Organic-PLUS"). In another Desktop analysis it six projects were found that declare connection with the database of EIP-AGRI (see Figure 2).



Note: Diverfarming and XF-ACTORS declared connection to several KRs (see Annex No 1).

Figure 2. MAPs linkages with other KRs

Also, during desktop analysis, was tried to evaluate if common open repositories are used for outputs (Annex 1, Column "Are common open repositories used for outputs"). From analysed cases (101 MAP) it was found four cases that we could identify as mentioned cases: MAGIC (ESRI, <https://www.esri.com/en-us/home>), COASTAL (MDPI, OpenAccess Journal - <https://www.mdpi.com/2073-4441/11/7/1407>), PLAID (FarmDemo Hub, <https://farmdemo.eu/hub/>), RELACS (<https://organic-farmknowledge.org/>) and SmartAgriHubs (WUR research datasets + <https://library.wur.nl/WebQuery/datasets>).

It is very important to mention, that all MA projects focused on real problems or opportunities that farmers, foresters, or others who need a solution ("end-users") are facing. That is why the multi-language web - pages/repositories are very attractive and meaningful to them. Especially the older users who choose a language that is acceptable and understandable to them. This increases the likelihood of the project results being used. During the desktop, the analysis was evaluated (Annex 1, Column "Languages for other KRs"), how many different languages are used in connected databases or KRs (Figure 3). From all the 101 made desktop analysis it was found only a few cases (Nefertiti, BOND, Fatima, TREASURE, and FAIRshare) that are multilanguage in connection with other KRs/platforms or databases. Mentioned MA used 7-12 different languages in web page/repository. All MA is translated into the English language. Other popular languages are Spanish, French, German, Italian.

		Language Code																						No of Languages	
No	MAP	DE	ES	PL	FR	IT	SE	CZ	EL	TR	CN	NL	HU	CA	NO	PT	RO	BG	FI	HR	RS	LT	SI	LV	
1	FOX	x	x	x																					3
2	TROPICSAFE				x	x																			2
3	MyToolBox				x																				1
4	NEURICE				x																				1
5	AgroInLog		x				x		x																3
6	EXCALIBUR	x	x	x	x	x																			5
7	FATIMA	x	x		x	x		x	x	x															7
8	(ISQAPER										x														1
9	REFRESH	x	x									x	x												4
10	TRADITOM		x		x	x								x											4
11	BOND		x	x	x	x		x				x	x		x	x	x								10
12	FAIRshare	x	x		x				x				x		x					x		x		x	9
13	NEFERTITI	x	x		x	x			x			x	x			x		x	x	x	x				12
14	OPTIMA		x		x	x			x			x				x									6
15	TREASURE	x	x		x											x				x		x	x		7
	Total:	7	11	3	11	7	1	2	5	1	1	4	4	1	2	4	1	1	1	3	1	2	1	1	EV.5
		Nordic-Baltic				Atlantic/North Sea				Danube				Mediterranean											

Figure 3. Linguistic diversity in MAPs* (Annex No 1, Column “Languages for website”)

In conclusion, the groups “Concept & Interconnection” received answers in a way it can be stated that there is different comprehensiveness of FAIR principles. Interviewers pointed out that they took into account the FAIR principles. However, the desktop analysis revealed that only a minority pays attention to the implementation of FAIR principles. So it's very important to define precisely FAIR principles and make it conveniently accessible, public, e.g. on the project's web page. This is very related to the issue of having a strategy. The analysis showed that only 27 % MAP had a clear management strategy. A clear strategy helps to identify the project gaps on time, to come up with targeted activities. That is very important.

The Management system and search options were further reviewed in the report.

3.2. Management System & Search Options

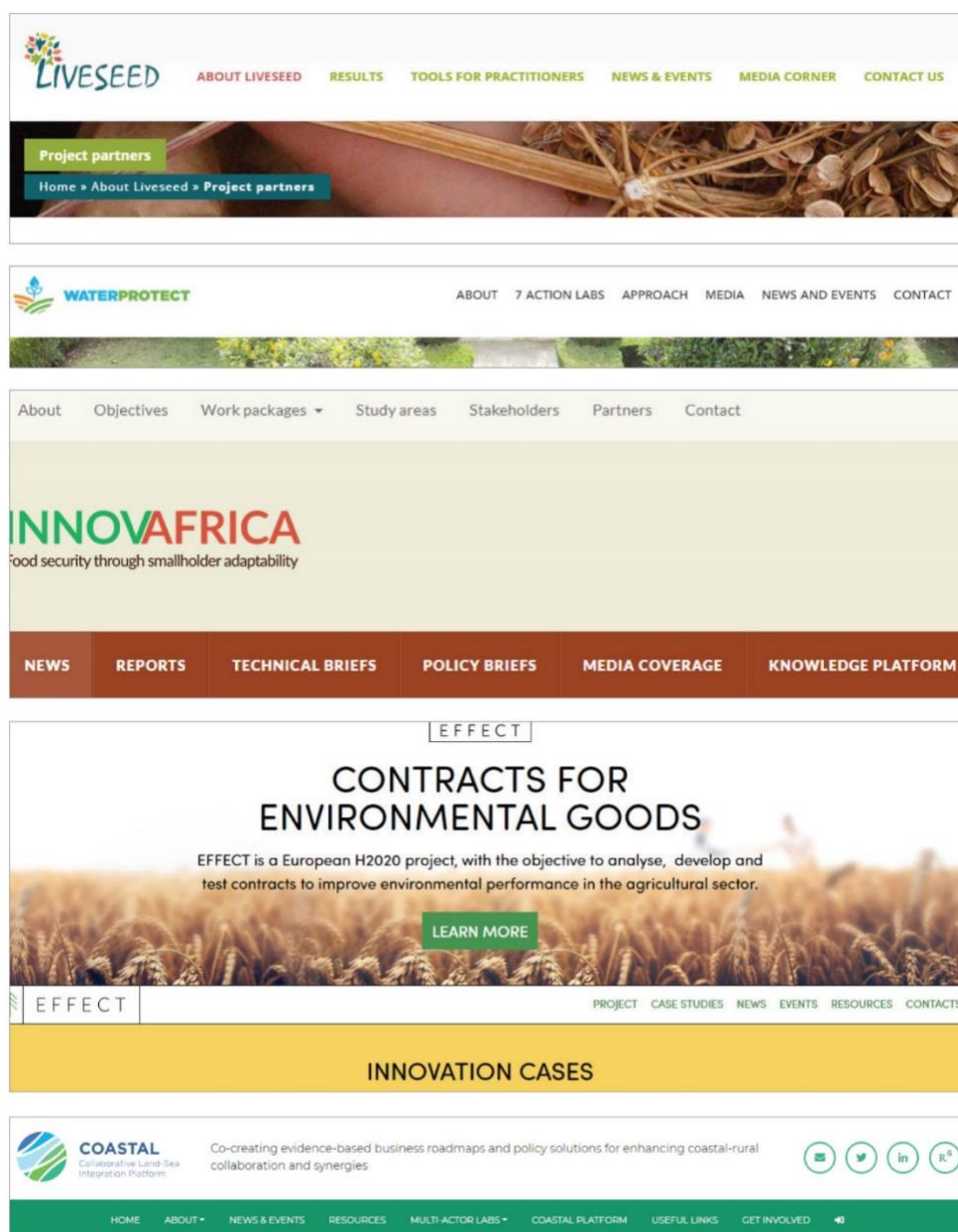
DESKTOP ANALYSIS / QUESTIONARE ANALYSIS:

Coming to the part of the work considering the ‘used management system for created/shared data and existing search options’ the first step of attention concluded the desktop analysis. Project websites were carefully checked to find clear signs or parts that could be identified as a specification of a Knowledge Reservoir.

All MAPs websites are constructed by the standard functionality of the portal. This is normal for the projects' information portal. Because most projects have the same information, which already is clustered in categories (project name, project period, partners, etc). 52% of data is clustered in categories according to the selection menu (Annex 1 Column “Provide the data categories?”).

Based on the results of the mentioned desktop analysis (Annex 1, column “Describe the user features of the website?”) it can be stated that all projects (with one exception SmartAgriHub) follow a more or less similar structure approach by providing menu options such as “Home”, “Project”, “Results”, “Stakeholders”, “News”, “Events”, “Media”, and “Contact” (Picture 1). They also provide access to functions relating to information and content search, contacting the project representatives, user authentication, view of newsletters, subscription to receive updates and newsletters, etc. It is very easy for a visitor of the webpage to get clues about the website's structure and navigate through it.





Picture 1. Print Screen of randomly selected five projects website layout

The answers to question Q23 (i.e. the used specific Content Management System (namely, specific data layouts, specific content for files name, etc.) relating to the project websites showed that most of them 73%, (LIVERUR, SiEUGreen, SmartAgriHubs, Feed-a-Gene, NEFERTITI, LIVESEED, FAIRshare , OPTIMA, RUSTWATCH, BOND, TomRes, EMPHASIS) use existing content management systems and only a small rate of project participants (13%, FAIRshare, MycoKey) have developed their content management systems. The other 13% (DIVERSIFOOD, TREASURE) did not provide the information or it was not clear (Figure 4).

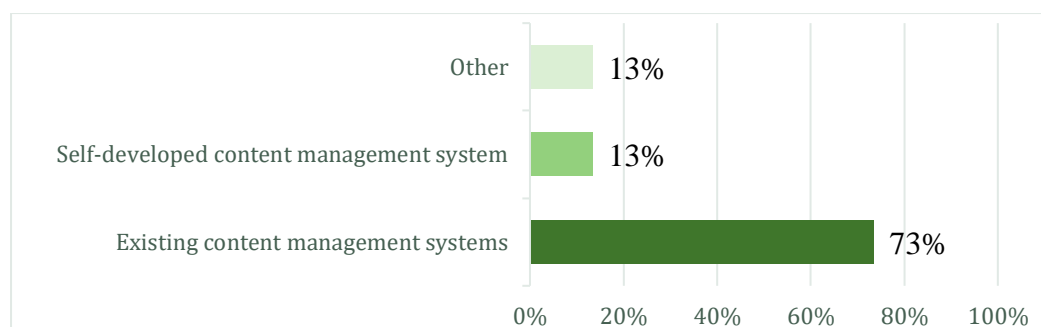


Figure 4. Content Management System in MAPs

A detailed analysis of the 15 selected projects let us see more specific cases of developing tools (EMPHASIS tool for sharing new knowledge), databases (FAIRshare Digital Advisory Tools inventory), and knowledge sharing (SmartAgriHubs dynamic page under log-in fact), that could be described as “hidden tools” as from the fast first look a visitor can miss them.

In most cases 80% of analysed projects (15) (LIVERUR, SmartAgriHubs, Feed-a-Gene, LIVESEED, FAIRshare, OPTIMA, MycoKey, DIVERSIFOOD, BOND, TomRes, TREASURE, EMPHASIS), data repositories are hosted by project partners or by an administrator assigned to do so. Project partners (*Q24. Who can upload data on the KR?*) usually upload data related to the activities carried out. But from the data of the interviews, it was noticed that depending on the result of the projects, for whom it is intended, the data can be accessed by certain platforms and all their users. In this case, the uploaded data is checked for quality (passing control). Uploaded data can be also edited. This can be done by administrators or project partners who have been assigned this role and are responsible for their uploaded cases. Users can also edit their uploaded data, but they cannot do it in the system by sending the corrected data, which is uploaded into the system from the beginning. Uploaded data cannot be edited in cases when authorial, scientific works are published, the content of which cannot be changed.

Nearly half of the MAP cases (47% of the respondents) have indicated that data can be uploaded by any project partner, 20% indicate a person assigned this role in the project, and the remaining 33 % state that data can be uploaded by any user (in this case, quality checks are in place) (Table 5).

For project content management system usually, such elements are characteristic: data quality is controlled by the project administrator, data usually have open access feature, big attention is given to data protection. Data updates are usually performed at a certain frequency. This issue will be discussed next in Q25.

Table 5. Who can upload data on the KR?

No	MAP	a) Administrator	b) Project partners	c) Others (partners and not partners)	How is this done?
1	LIVERUR	X			The WP leaders send information to the coordinator, because he is the leader of the communication. So, they don't upload it themselves.
2	SiEUGreen		X		
3	SmartAgriHubs			X	
4	Feed-a-Gene	X			
5	NEFERTITI		X		
6	LIVESEED			X	Uploading to the website is conducted by project managers, the uploading of information to the Organic Farm Knowledge Platform is coordinated by the organization responsible for dissemination WP.
7	FAIRshare			X	-
8	OPTIMA		X		
9	RUSTWATCH			X	
10	MycoKey		X		
11	DIVERSIFOOD	X			
12	BOND			X	On the website, there is a form where everybody can suggest uploads, but this is curated by admin before uploading
13	TomRes		X		
14	TREASURE		X		
15	EMPHASIS		X		
TOTAL		3	7	5	15
Percentage distribution		20%	47%	33%	100 %

For Q25 (i.e. how often new data is uploaded in the KRs), most of the projects responded the same way by stressing that this depends on the project results and the need to update them (Table 6). Project results that work with the actual data needed for identification and forecasting are usually updated frequently (regularly, daily, weekly). Data related to scientific work, various IT tools, data which creation takes time or the information that does not change so fast may be updated on a less frequent basis (according to the plan, monthly, etc.).

Table 7 reveals that most projects try to update their information as frequently as possible “every few days” or “every week” or even “daily” if possible. It depends on project-specific and what data and when they can generate as well as from the project stage (beginning, middle, end).

Table 6. Frequency in which new data is entered in the KR

No	MAP	a) Daily	b) Every few days	c) Every week	d) Every month	e) Every few month	f) Other
1	LIVERUR*					x	
2	SiEUGreen						As of now, the knowledge repository is ... We are transitioning to it; we haven't even utilized it yet. All the partners have data, but there are encouraging the partners to utilize it as much as possible now
3	SmartAgriHubs**	x	x				
4	Feed-a-Gene				x		
5	NEFERTITI		x	x			
6	LIVESEED				x		
7	FAIRshare		x	x			
8	OPTIMA						Once per two weeks
9	RUSTWATCH***	x		x		x	
10	MycoKey		x	x			
11	DIVERSIFOOD						Other-when necessary
12	BOND****	x					
13	TomRes						What we tend to do because it's quite a labor-intensive process, so we wait until we've got a dozen protocols, or not even –when a big data set arrives, we might do it in one go. But generally, we do it in batches.
14	TREASURE						The data entered in the KR is not controlled. As soon as possible after the publication
15	EMPHASIS						There are a lot of activities on the website and we are promoting activities, organize events. The website is using very often.
TOTAL		3	4	4	2	2	15

*It depends on the Gantt, on the process of the progress of the project

**I would say every hour, every minute! But, I would also say that we receive requests several days in advance to upload something.

***Daily yes, for disease surveillance data. Every week, data from Trap nurseries at VCU sites. Every few months. 2-3 times per year re genotype or race data. Data from Field Nurseries, 214 most grown cultivars in Europe planted at 6 sites across Europe

**** The uploading of material is a continuous process.

Usually, the projects that are more orientated to certain types of knowledge use an amount of the data created or generated not only by project partners but also someone from collaborators outside of it (who do not have a direct link to the project). Making a presumption that MAPs might act in several positions, namely as creators of new knowledge and as a knowledge collection and sharing body, it was interesting to know more about the data sources. This was the purpose of Q27 (Annex 3) relating to the investigation of whether these KR have reused data from other projects or created it (“Do/Did they also present content on your KR that was not developed by the MA?”).

According to the analysis of results, eight from fifteen MAPs are reusing data from other projects (Table 7). For example, producing some videos, handbooks, links to other projects, statistical data, etc. However, only two of them (FairShare and SiEUGreen) declared that have an agreement or license for providing data.



Table 7. Distribution of answers provided on the use of external data

No	MAP	Clear statement - Yes *	Clear statement- No**	A bigger part of data is from MAP partners	A bigger part of data is from outside	Short comments from interviews
1	LIVERUR	X		X		
2	SiEUGreen		X			
3	SmartAgriHubs	X			X	
4	Feed-a-Gene		X	X		
5	NEFERTITI	X			X	
6	LIVESEED	X				Till 30 %
7	FAIRshare	X			X	
8	OPTIMA		X	X		
9	RUSTWATCH	X			X	30% all of the material is origin type.
10	MycoKey		X	X		
11	DIVERSIFOOD		X	X		
12	BOND	X				
13	TomRes	X				Yes, but this is an insignificant part.
14	TREASURE		X			
15	EMPHASIS		X			... more or less origin.
TOTAL		8	7	6	4	25
Percentage distribution		32%	28%	24%	16%	100 %

Clear statement - Yes * means that the project disseminates data that is produced not only by project partners.

Clear statement - No** means that the project disseminates data ONLY produced by project partners.

Evaluating the data search function (Figure 5), Advanced Search Options (ASOs), and user-friendliness (Q26 Data search), the following can be said.

KR user-friendliness. "Is an Advanced Search option with optional filters available for users?"), it was seen that the search function is available on most project websites (more than 50 %) and in most cases, the elements used to provide access to this functionality are a search box or the availability of specific search keywords (28 %). User-friendly searching such as searching by separate words or phrases is only possible in 19 % of websites (ref. [Annex 1](#), Columns "Search function available on main KR", "How can users search for information/content in the KR", "Data search in the search box is done using", "What kind of information is presented to the user per result?" and [Annex 3](#), Q26).

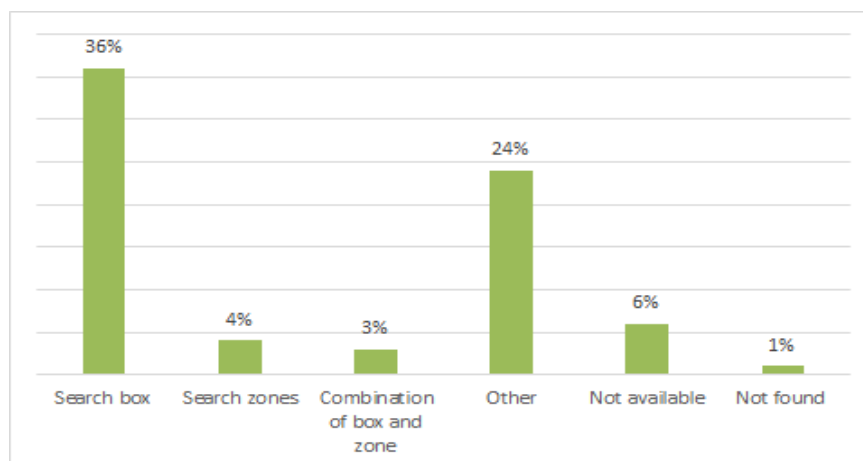


Figure 5. The search functions on the main MAPs page

The additional information/metadata such as title, author/developer name, date of creation/last modification, the abstract is presented in Figure 6 as part of the delivery of the results of a search operation. More detailed information is in Annex 1.

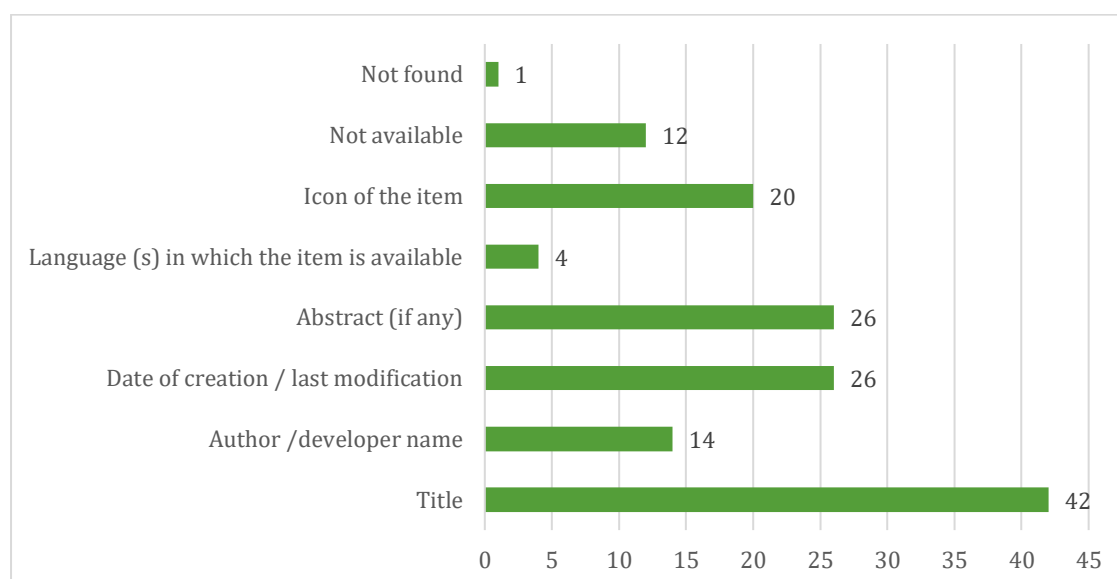


Figure 6. What kind of information is provided over per search result (numbers in Units)

Finally, it was also important to get insights into how often a user authentication feature is used in the Maps' websites. Figure 7 displays the respective findings: in 52% of the cases user authentication is required, in 44% of cases user authentication is not needed to have access to the Maps' data, in 4% of the MAP cases, we have not been able to conclude the use of such a feature.

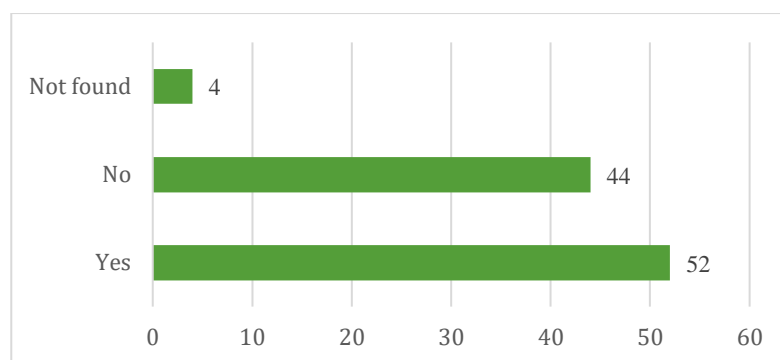


Figure 7. Required private space with login (%)

In conclusion, we can note that all MAPs websites do have the standard functionalities of a web portal. Because most projects have the same information, which already is clustered in categories (project name, project period, partners, etc.). Projects content management systems focus on data quality control, open-access feature, data protection, and frequent update. While data published are not only generated by projects themselves but also data from external sources are used - the problem of not using the license for data sharing and distribution was identified.

3.3. Challengers, Ranking & Sustainability

This part consists of results derived from the 15 conducted interviews. All collected answers from MAPs representatives were carefully read by professional specialists of Marketing and Public relations (LAAS, UNITO). This qualitative analysis reflects the main challenges that are faced by all MAPs. Challenges, in this case, do not mean only updating the website with new elements, attractive things, or created tools, but also collecting visitor's feedback on the provided information, and finally, the questions of MAPs result related to sustainability.

Starting with a simple question if MAPs made the major changes or improvements to the KR throughout the lifetime of the project (Q28) it was also planned to know the lessons learned and their experience in these processes. More than half of the respondents (53 % - LIVERUR, SmartAgriHubs, FAIRshare, RUSTWATCH, MycoKey, BOND, DIVERSIFOOD, TomRes) said that during the project lifetime they have faced challenges which led to improvements. Five from fifteen MAPs (i.e. 40%) (Feed-a-Gene, NEFERTITI, OPTIMA, TREASURE, EMPHASIS) stated that they didn't had big improvements, just small or insignificant changes. About 7 % of participants (SiEUGreen) did not provide a clear answer and the same 7% of participants (LIVESEED) mentioned that they did not make any changes or improvements to the KR throughout the lifetime of the project. Detailed information is showed in Figure 8.

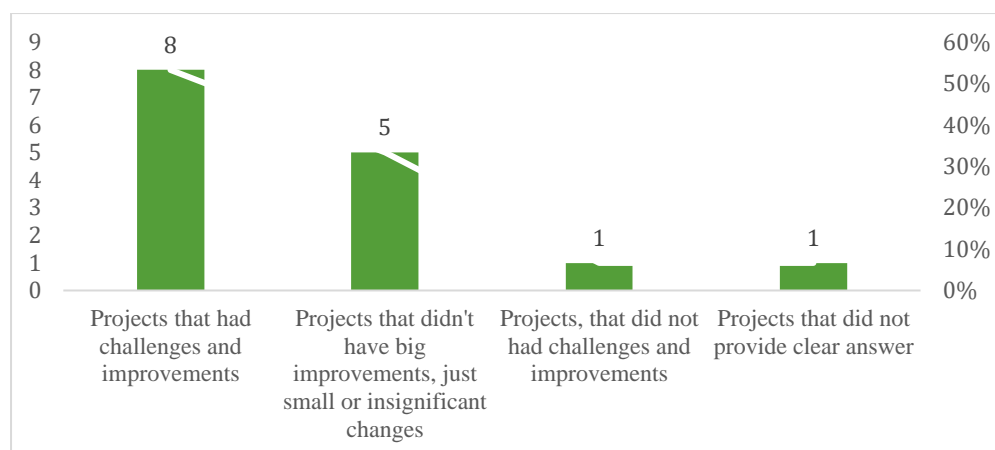


Figure 8. How many projects faced with challenges during MAPs improvement?

The major challenges that were mentioned to be faced to during the MAPs proceeding were the following:

- difficult to identify the essential needs of the project target group (farmers, project partners, stakeholders);
- difficult to get real feedback from the target group in different project stages (farmers, project partners, stakeholders);
- difficult to manage a big stream of data;
- lack of IT knowledge (problems with subcontractors, etc.).

For the questions about the Sustainability of the platform (Q29) and how to ensure the maintenance of the KR, or for how long, and with what resources to work, further answers were collected – please take a look to Table 8. More than half (53%) of the respondents (i.e. SmartAgriHubs, NEFERTITI, FAIRshare, RUSTWATCH, MycoKey, DIVERSIFOOD, BOND, EMPHASIS) say that after the end of the project, websites will be still “alive”. However, the period will vary from 1 year at a minimum to a maximum of 10 years. Some respondents have plans to use project data and platforms/websites incorporated into future projects and this will facilitate continuity. One-third of the MAPs (LIVERUR, LIVESEED, Feed-a-Gene, OPTIMA,) state that they have no plans and resources for the maintenance of platforms because there are no additional funds for it. About 20 % of the respondents did not provide a clear response to the question.

Table 8. Platform existence after the project's end

Existence after the end of the project					No possibility for existence after the end of the project	No answer	Abstract answer
depends on collaboration with other projects	for 2 years after the end of the project	for 3 years after the end of the project	for 5 years after the end of the project	for 5-10 years after the end of the project			
SmartAgriHubs, FAIRshare	EMPHASIS, NEFERTITI	DIVERSIFOOD, BOND	RUSTWATCH	MycoKey	LIVERUR, LIVESEED, OPTIMA, Feed-a-Gene	SiEUGreen	TomRes, TREASURE
2 cases	2 cases	2 cases	1 case	1 case	4 cases	1 case	2 cases
53 %					27 %	20 %	

The analysis of the option of evaluation of the provided digital content by the visitors of the MAP's website/KR has been a very important step in T1.3. More specifically, it was intended to find out about

the existence of any ranking options for the user on the website to rank the results and specify how they made a ranking of the produced results (Q30).

Less than half of the respondents declared that users could not rank project results on their websites (Figure 9). No rationale argumentation for the absence of such functionality has been provided. Less than half of the respondents reported that this kind of functionality is available; yet no additional comments were made from their side. Some respondents commented that they are trying to draw insights from user feedback by analysing websites and social media traffic and user engagement.

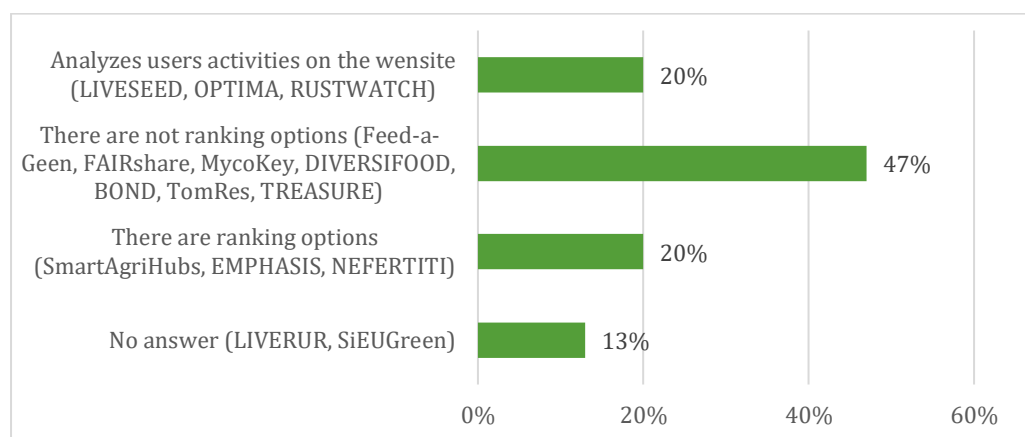


Figure 9. Content evaluation/ranking options for the user on the website of MAP/KR

About 60 % of respondents (LIVERUR, SmartAgriHubs, Feed-a-Gene, NEFERTITI, RUSTWATCH, BOND, MycoKey, TomRes, EMPHASIS) for the question ‘was any user feedback collected (Q32)’ declared that they collected feedback from the users (Figure 10), but they separated users into several groups – internal (project team members) and external (focus groups – stakeholders, farmers). Some of them tried to collect opinions in different stages of the project, which helped to improve the platform for the target audience. Respondents for feedback collection normally used digital tools such as Google forms and questionnaires integrated into their webpages.

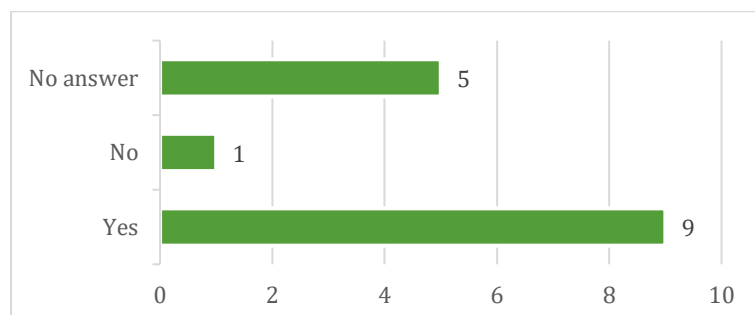


Figure 10. Feedback collection from users (Units)

Concerning Q33 (namely, How was feedback collected), figure 11 represents the most popular feedback collection methods, that can be divided into two groups:

- digital means: Google forms/forums, emails, social media (Facebook, Twitter, LinkedIn) statistic metrics - likes, engagement, shares rates, website statistic – visitor’s traffic, click per link/post, google analytics, webinars.
- direct contact: workshops/work sessions, meetings, dissemination events with farmers and stakeholders (oral comments, emails after events).

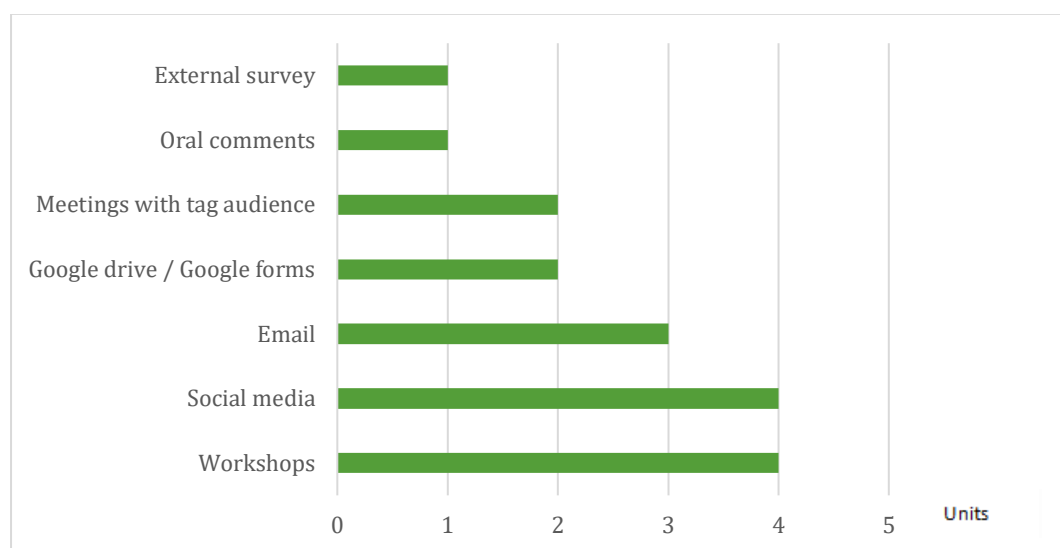


Figure 11. The most popular feedback collection methods (Units)

Coming to the marketing issues, it was asked by MAPs representatives (Q31) how they promoted the use of the KR. All respondents stated they are promoting all project activities. Most of them are thinking that the best way for promotion is through digital channels – social media platforms (Figure 12).

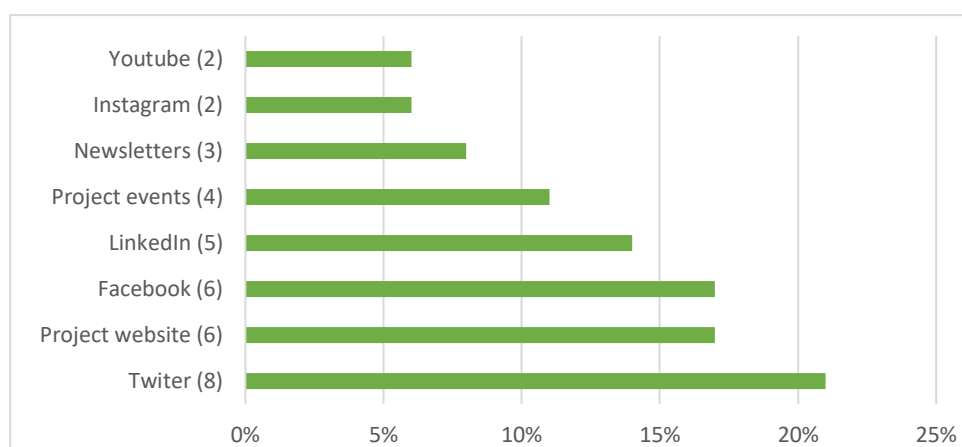


Figure 12. KR promotion channels

Some respondents expressed that for project promotion they are using dissemination channels such as TV spots, conferences, seminars, workshops, events, forums with the target audience, researchers, and farmers. Respondents said that is very important to have an active and operative internal project communication system as well. All respondents declare that the most important for project dissemination is to use multi-channel marketing.

At the end of the survey, it was asked (Q34) what type of information collects/attracts more attention/feedback). LIVERUR, SiEUGreen, SmartAgriHubs, NEFERTITI, LIVESEED, FAIRshare, OPTIMA, RUSTWATCH, TREASURE, EMPHASIS, TomRes responded to this question. Almost all respondents stated that the project content available on a webpage or social media accounts (Facebook, Instagram, YouTube, Twitter) should be short, understandable, dynamic, visual, and attractive. They admitted that video content is the best content type for dissemination-related purposes. SiEUGreen, SmartAgriHubs,

NEFERTITI, LIVESEED, FAIRshare noticed that interactive information is very attractive for website visitors. Such kind of interactive information may be provided through an interactive demo farms map with filters, events calendars, etc. Few respondents said that they are using mixed tools (i.e. digital communication/dissemination channels and face-to-face events) to reach their target audience (farmers, project partners, stakeholders, etc.). Measures that attracts the most attention of users are represented in table 9.

Table 9. Measures that attract the most attention of users

No	Measure	Answers, %
1.	Specific, short/understandable information valuable for the target group	30
2.	Attractive information in social media	21
3.	Visual information (pictures, video, diagrams and etc., newsletters)	17
4.	Specific apps, data portals, innovative tools	13
5.	Demo activities	9
6.	Workshops	9
7.	Traditional media (newspaper, journals, TV, radio)	1

Note: several answer options were possible.

As it is seen from the table above, that content and its representation are extremely important to attract users. The information must be concrete, well disseminated (using social media), and easy to absorb (using such formats as pictures, video, diagrams, etc., newsletters).

4. DISCUSSION

1. DMS is understood as a common vision for data that was produced or generated over project activities management plan or vision. It could cover such questions as to how we have to conduct data sharing over the website, what design we would select, in what target groups we have to orientate more, A common vision for data management may think on how to combine ongoing projects with already created results from other projects, etc. A DMS is directly connected with DMP (the document was not, but is now in many cases mandatory) and shows the design level of preparation for the coming activities and the idea maturity. From the interviewer's answers, we can see that to ensure timely filling of websites and portals with relevant information, it is necessary to define the main (general) parts of the DMS which have to identify what, how, and until when the information must be provided.
2. There are existing project domains or acronym tendencies in recent years that show more often used linkages to the financial program H2020. It should be kept in attention that, in general, these projects are losing in their "names" a reflection to their type of activities. The possibility to find the project not knowing the exact acronyms becomes in this way more complicated
3. Even though most of the MAPs declared that they followed FAIR principles in their data management, no clear indications about how these recommendations have been followed are found. An evaluation of the analysis of these principles (i.e., findable, accessible, interoperable, and reusable) shows that the traceability of the last two elements is difficult to justify because of the existing lack of developed response online systems on the websites. In none of the interviewed projects (15) online rating or utility rating systems for published data (Annex 3) were found.

4. Many projects use website templates most likely in the hope that this will make it easier for the visitor to find the information. This probably makes sense compared to those websites that do not provide any information without additional registration. After all, current google tools make it possible to fully measure the behaviour of visitors on a website.
5. It would be good to admit that in evaluating the project management systems, attention must be kept on data management plans (DMP) also. In some cases (LIVESEED, FAIRshare) DMP was followed very consistently. This helped projects to get their style/face and make partners comfortable to conduct their work under clear rules of dissemination actions. Finally, it was stated that a DMP helped to ensure the specific system of page traceability and the quality of the provided information.
6. This research revealed that there is a basic search-related functionality provided with a search box and multiple filters that the user can use to narrow down the number of search results obtained.
7. An advanced search option is understood as a set of fields in which the user can provide certain pieces of information (e.g., the name of an author) or the use of logical operators (namely, "AND", "OR", "NOT") that could help to extract more specific information related to certain categories. Only a few projects (LIVERUR, FAIRshare, SmatArgiHubs, and LIVESEED) have mentioned the creation and availability of advanced search functionalities in their KRs.
8. It was noticed that 8 projects (EMPHASIS, BOND, MycoKy, RUSTWATCHM, OPTIMA, FAIRshare, NEFERTITI, SmarAgriHubs) declared that they share new information quite often: daily or every week. In 5 cases (BOND, RUSTWATCH, FAIRshare, NEFERTITI, SmartAgriHubs) projects share data that mostly is not produced or partly produced in the project. Only 3 projects (EMPHASIS, MyciKey, and OPTIMA) stated that they upload their own produced data daily or weekly.
9. The analysis of who uploads data to MAPs websites shows that only three projects are taking a conservative way to upload themselves (administrator, responsible partner for C, D & E). In most cases of the project partners or third parties can provide data for sharing. That is why shared data origin correlates with the possibility to upload data and data origin type.
10. It could be learned from project SmartAgriHubs concept to collect flows of information not creating new knowledge under project run. SmartAgriHubs shows a holistic view of webpage understanding. Despite the fact, that the page is asking for log-in, you should need time "to accustom the eye" to the layout and structure of the website. In case you would open the page after some time, you will need more time to understand what you have passed.
11. Often, the same website is used for private space with login required (about 52 %). It is very good for the project manager and command to have one portal for external and internal communication, information transfer. But on the other side, it is waste of time. For public money created knowledge and websites should be open access without any obstacles. Login should be used only for contact sharing (in case you are searching for a certain service, knowledge, technology, etc.).
12. Analysis of improvements shows that most projects are faced with websites changing. From a practical point, it is costly (time financial resources) and needs to know HOW. Interviews analysis revealed that if you have clear DMS or used it before starting the MAPs website, it probably means that website will have minor changes in the future. It turned out that there are no very clear rules about how to start with a project website as it is a very subjective process.
13. The research revealed that MAPs collect feedback mostly using workshops and social media. It could be only predicted that the first one would be rapidly changed by webinars, farminars (seminars for farmers), and other online meetings format. In most cases, such meetings could be recorded and used for future training or another kind of knowledge sharing.



14. Meanwhile, the use of KR is usually promoted by using Twitter. Project websites and Facebook are still very important in the process. YouTube has been also becoming popular and in the future, it will be used more often as the identification of the most attractive material (a short clear content video) produced by MAPs.

5. CONCLUSIONS

After implementing T1.3 on 'Learning from how the Multi Actor data is currently stored in Knowledge Reservoirs' and conducting the questionnaire (Annex 2) and interviews (Annex 3) these main conclusions were reached:

1. DMS is the first and most important step of any project. It helps in ensuring that data collection will be sustainable and the target audience will be attracted to the project, and the necessary expert community is formed.
2. To ensure project information being accessible and usable by the end-user, the adaptation of the FAIR principle must be ensured. FAIR principle adaptation to data repository can be ensured by using FAIR compatibility assessment questionnaires. Detailed information on this issue can be obtained in the Go FAIR initiative (<https://www.go-fair.org/>), which provides rich content and information on the FAIR principle.
3. To ensure a regular and frequent (e.g. once or twice per week) KR dissemination process, it would be very useful to prepare the special templates for external data providers. It is recommended that only data expert providers should be asked to register on the platform, KR, or website.
4. A project domain's name should reflect the project's activities or field identification, this will help to find potential users to trace the project. Unclear domain choice puts a negative impression on the whole project as it is difficult to find and it requires a lot of time effort.
5. The most popular languages in the project's websites/platforms are: English, Spanish, French, German, Italian. So the main focus is on the Atlantic/North Sea and the Mediterranean regions. It is important to note, that FarmBook also has to be oriented towards the Nordic-Baltic and Danube region countries as well. The principle of equality must be maintained by creating FarmBook. This database must be well known, accessible, and easy to use in all regions of Europe.
6. The most popular menu options on the project's website are: "Home", "Project", "Results", "Stakeholders", "News", "Events", "Media", and "Contact". They also provide access to functions related to this information and content search, contacting the project representatives, user authentication, view of newsletters, subscription to receive updates and newsletters, etc. It is very easy for a visitor of the webpage to get clues about the website's structure and to navigate through it.
7. For project content, a management system should adopt these elements: data quality is controlled by a project administrator, data has open access feature, big attention is given to data protection, data updates are performed frequently, external data should be disseminated according to a license or an agreement.
8. these issues must be taken into consideration to improve the planning of a MAP: how to manage a big stream of data? Whether problems with subcontractors may occur? Whether problems may occur to get real feedback from the target group in different project stages (farmers, project

partners, stakeholders)? Whether there will be problems in identifying the essential needs of the project target group (farmers, project partners, stakeholders)?

9. The sustainability of the website can be ensured by incorporating the project's data and/or its platform/website into future projects. So the lifespan of the platform/website will not depend on the funding of the project.
10. Feedback collection in different stages of the project can help to improve the platform/website for the target audience. For feedback collection, it is nowadays popular to use digital tools such as Google forms and questionnaires integrated into their webpages.
11. The most popular feedback collection methods are:
 - digital means: Google forms/forums, emails, social media (Facebook, Twitter, LinkedIn) statistic metrics – likes, engagement, shares rates, website statistic – visitor's traffic, click per link/post, google analytics, webinars.
 - direct contact: workshops/work sessions, meetings, dissemination events with farmers and stakeholders (oral comments, emails after events).
12. The most popular KR promotion channels are Twitter, project website, Facebook, LinkedIn. To increase the effectiveness of promotion it is recommended to use multi-channel marketing.
13. The project content, available on a webpage or social media accounts (Facebook, Instagram, YouTube, Twitter) should be short, understandable, dynamic, visual, and attractive. The video content is the best content type for dissemination-related purposes.
14. To attract end-user, it is important to put in website/platform concrete and to end-user relevant information. It is advisable to use social media for dissemination. The format of the information must become easily absorbed. So it is recommended to use such formats as pictures, videos, diagrams, etc., newsletters.
15. The search mechanism is an important part of the website/platform. The required feature of this mechanism is that the system provides a clear and concise set of filters for limiting the number of search results provided after the execution of a free-text search operation. In addition to that, the use of search zones (i.e. predefined lists of values associated with appropriately created search categories) may prove to be of considerable help to the user. Finally, the potential to access other, external databases may contribute to an enhanced user experience relating to the potential to enable access to the desired content and information.
16. There are no correlations between the vision of a DMS and further actions for the development of MAPs websites. This indicates a statement that the project should start with the website as early as it has a vision in general keeping in mind an expected modification in the future.
17. The detected data rating system on web pages (SmartAgriHubs, EMPHASIS, and NEFERTITI) should be analysed very carefully to take over the best experience and practice.
18. To managing the epidemiological situations (existing and in future), workshops (face-to-face meetings) should be transformed into online events with the ability to provide reviews (records). It is very important that provided material, data and results should be "specific, short/understandable information valuable for the target group".





6. ANNEXES

6.1. Annex 1: Desktop analysis online

6.2. Annex 2: List of interview questions for Multi-Actor Projects (MAP)

T1.3 How MA project knowledge (+ data) is stored & managed

A) What you want to know?	B) Why you want to know it?	C) What is your interview question.
Q20. Overall data management strategy	What was the thinking behind data management	What was your overall strategy for data storage and management in your Multi-Actor Project (MAP)? _____
Q21. Strategy in accordance with FAIR principles	How did the project take into account the FAIR principles?	Did you take into account the FAIR principles to make your data findable, accessible, interoperable and reusable? If Y, how? ____ If N, why? ____ Other _____
Q22. Main data storage place	Did the project just use a website or something more complicated. For the latter, did they use existing repositories or did they build something on their own.	What is the main storage place (Knowledge Repository or KR) of the knowledge (data) of your MA project? I. Project website II. Open & common repositories (Zenodo, Cordis, EIP-AGRI, ResearchGate) III. Other sector dedicated platform IV. A tool to share your data V. Other ____ Is the KR linked to other databases? (Y/N) ____ If Y, specify the names of the databases: ____ (provide links to the databases) Is there a possibility to retrieve content stored in other repositories as well by making use of the search functionality of your KR?
Q23. Content Management System (CMS)	How and who manages the content of the KR	Has your KR used a specific Content Management System (specific data layouts, specific content for files name, etc..)? If Y, specify which one ____ Why did you choose it? ____ If N or other remarks ____
Q24. About new data in the KR	Who can act in KR page as an interactive member to upload content	Who can upload data on the KR? I. Administrator of the CMS only II. All project partners III. Others ____ Why? ____ How is this done? ____ Is there a possibility to edit data stored in the system? (Y/N) ____ If Y, how and by who? ____
Q25. Page feeding by information (data)	How often is the KR updated with new information	Usually new data is entered in the KR I. Daily II. Every few days III. Every week

		IV. Every month V. Every few months VI. Other _____
Q26. Data search	KR user friendliness	Is an Advanced Search option with optional filters available for users? (Y/N) _____ If Y, describe it _____
Q27. Original data issue	Are these KR reusing data from other projects or creating it themselves	Do/Did you also present content on your KR that was not developed by the MA? (Y/N) _____ If Y, what content and why? _____ If Y, what license terms/agreements are/were used? _____
Q28. Are there any plans to further develop the KR?	Are these KRs fixed or more dynamic. Does the system change over time. Any lessons learned or challenges faced..	Did/Will you make any major changes or improvements to the KR throughout the lifetime of the project? If Y, what changes and why? _____ Did you face any challenges? _____ Are there any lessons learned or advice for other MA projects? _____
Q29. KR Maintenance	Sustainability of platform	How will the maintenance of the KR be ensured? _____ For how long and with what resources? _____
Q30. Ranking options	The possibilities for users	Are there any ranking options for the user on your website to rank the results? (Y/N) _____ Could you please specify how you made ranking of your produced results? _____ What criteria were chosen to evaluate results usefulness: I. Ranking by relevance II. Ranking by popularity III. Ranking by user ratings IV. Other (specify)(Y/N) _____
Q31. Promotion	To collect used experiences	How do/did you promote the use of the KR? _____
Q32. Feedback collection	To know user feedback	Is/Was any user feedback collected? (Y/N) _____ If Y, please specify on what: I. Satisfaction with general information content II. Engagement and wish to know more III. On specific knowledge objects IV. On updates or usability cases you fixed V. Other _____ (specify)
Q33. Feedback collection format	How was feedback collected	If Y, how is feedback collected? I. Likes II. Comments III. Rating IV. Sending a contact request V. Contacting another user VI. Other _____ (specify)
Q34. What attracts a bigger attention	How to get the desired attention of target group	What type of information collects/attracts more attention/feedback (Share few examples)_____

6.3. Annex 3: COLLECTED ANSWERS FROM ALL THE INTERVIEWS

INTERVIEW COVER LETTER

No	Project (KR)	Person to be interviewed	Interviewing person	Date
1	LIVERUR	José Manuel Avila	Maria Gernert (IFOAM)	`04/06/2020
2	SiEUGreen	Siddhartha Pandey / Manoj Pandey	Maria Gernert (IFOAM)	`04/06/2020
3	SmartAgriHubs	Lorena Van Der Kolk	George Kalogeropoulos (AUA)	`04/06/2020
4	Feed-a-Gene	Gilles Tran	Hercules Panoutsopoulos (AUA)	`26/05/2021
5	NEFERTITI	Milica Trajkovic	Maria Gernert (IFOAM)	`6/04/2020
6	LIVESEED	Monika Messmer	Gintare Kucinskiene (LAAS)	`15/04/2020
7	FAIRshare	Rui Almeida/Sofia Mauzeti	Gintare Kucinskiene (LAAS)	`23/06/2020
8	OPTIMA	Nikos Mylonas	Gintare Kucinskiene (LAAS)	`1/04/2020
9	RUSTWATCH	Jens Grønbech Hansen	Ilse Rasmussen (ICROFS)	`18/06/2020
10	MycoKey	Pasquale Del Vecchio	Ilse Rasmussen (ICROFS)	`16/06/2020
11	DIVERSIFOOD	Frédéric Rey	Ilse Rasmussen (ICROFS)	`24/06/2021
12	BOND	Enrico Pietrantonio	Ilse Rasmussen (ICROFS)	`26/06/2020
13	TomRes	Pete Iannetta	Maria Gernert (IFOAM)	`22/06/2020
14	TREASURE	Boris Ivanović	Gintare Kucinskiene (LAAS)	`3/04/2020
15	EMPHASIS	Laura Vivani	Gintare Kucinskiene (LAAS)	`14/04/2020

CONTENT OF QUESTIONS

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4./Q22. Is the KR linked to other databases?	42
5./Q22. Is there a possibility to retrieve content stored in other repositories as well by making use of the search functionality of your KR?	43
6./Q23. Has your KR used a specific Content Management System (specific data layouts, specific content for files name, etc.)?	44
7./Q24. Who can upload data on the KR?	45
8./Q24. Is there a possibility to edit data stored in the system?	46
9./Q25. Usually new data is entered in the KR.....	47
10./Q26. Is an Advanced Search Option with optional filters available for users?	49
11./Q27. Do/Did you also present content on your KR that was not developed by the MA?	50
12./Q28. Did/Will you make any major changes or improvements to the KR throughout the lifetime of the project? 51	51
13./Q29. KR Maintenance Sustainability of platform How will the maintenance of the KR be ensured? For how long and with what resources?	52
14./Q30. Are there any ranking options for the user on your website to rank the results? Could you please specify how you made the ranking of your produced results?	54
15./Q31. How do/did you promote the use of the KR?	55
16./Q32. Was any user feedback collected?	56
17./Q33. How was feedback collected?	57
18./Q34. What type of information collects/attracts more attention/feedback (Share few examples)?	58



COLLECTED ANSWERS FROM ALL THE INTERVIEWS

1./Q20. What was the thinking behind data management? What was your overall strategy for data storage and management in your Multi-Actor Project (MAP)?

LIVERUR. Let me give you some ideas about these because we are going, we are implementing the project right now. So, we had a plan. We have a data management plan, but we are not it is not fully implemented right now in the project. The IT partner, so I manage one part of the project and I am not the data management officer, but I manage a lot of information. So, I think I am the right person to answer you most of the question, but in some cases, I have some doubts. So we have a plan and early strategy that we defined in the first months of the project and try to concentrate all the information on the website, in a private state site, but inside the LIVERUR project, but we didn't implement that because we were under the decision to move to the right platform. We will have another website, let us say, for the users, and we did not decide yet which website we were going to use. So in the meantime, we are giving some autonomy to the work package leader to organize the information in a common repository, but they are managing their data information and the private information in our repositories – dropbox, google drive, depending on the work package leader – and the public information of course in the website. This is the overall strategy. Thank you. Okay, so you are only at the start of setting up a website for the users.

SiEUGreen. Yes, we wrote this data management plan which got approved by the Commission. We are going to use Zenodo as the common repository, but we are in the process of having all the partners put their data into it. It is an ongoing process yet. We have not completely utilized it that much, but we have written a very good plan for it and are planning to transition to our acceptable data management plan.

SmartAgriHubs. First of all, here, we need to make the distinction. The data management could be divided in two. So, first of all, all the documents and the Admin and everything that relates to management and are done by the project coordinator which is the University of Wageningen. For these purposes, we are using Basecamp, so basically, all the information that is produced by everyone in the project like work package leaders, partners, and so on is uploaded into Basecamp and that is not our organization task. Then, what we are in the lead of is the website and everything that has to do with the communication and innovation Portal. So, I think it is very important to make the distinction here, between the websites and the website is just the general part and the Innovation Portal is an interactive platform where people can contribute. So, the idea behind this data management was that everyone can access it. It is open-source you can contribute and enrich it. I do not know if this distinction is clear. Everything is related to the project, Admin and templates and reports and internal organizations are in the Basecamp and the internal but external part of data management that relates with the result and impact of the project are on the website and Innovation Portal.

Feed-a-Gene. In the Feed-a-Gene project, there was no project-level data management plan, which was not (yet) mandatory for H2020 projects when Feed-a-Gene was started in 2015. To raise awareness about data management, we had several presentations about this during our annual meetings made by specialists, but the lack of ontologies relevant to the project's research fields, as well as the lukewarm reception to these ideas made implementation unlikely. Tracking down the publications and making sure that everything published was accounted for was already difficult! Some researchers did upload their research data on repositories like Zenodo, but this was their initiative and we did not record this.

NEFERTITI. The logic behind what we created in NEFERTITI is to make, let's say, available all of the knowledge on selected themes from NEFERTITI, demo activities, and demo farms. We will get to it in the questionnaire how we fill in the base, but basically, that's what we wanted you to make, the biggest possible database on demo farms and demo activities within the EU. So, knowledge reservoir, you don't only see the NEFERTITI website but also the demo farm website. Yes, we will get to that later in the questionnaire, but we are intertwined with the farm demo.

LIVESEED. In the project, they had a Data Management Plan (DMP). They followed it and the strategy of data storage and management was not changed during the project. The main activity of data storage and management was taken by project WP leaders and task leaders.

FAIRshare. The strategy was to create the FAIRshare community as soon as possible. And for that, we engaged all target audiences that were identified at the beginning of the project. At this time, we are aiming that all of the data are focused on presenting the project and to be engaged to our stakeholders mainly advisers and farmers to share all kinds of data related to digital advisory tools (DATS). And this is including mainly in the

project website communication must be available in different languages for a broader audience. All communication material is in different languages included newsletters, flyers, videos, and use cases. All data for external communication that is presented and available on the website are controlled by our privacy policy. In FAIRshare we have DATS, which represents Digital Advisory Tools and Services. The basic goal was to create a user-friendly interface and to engage users from the beginning of the project, to register in the platform by creating an account and upload the DATS. For that purpose, we are using a well-designed online form, which is the result of the very detailed questionnaire we were working on for the first six months of the project. The most substantial and meaningful information is required to describe a DATS entity. The users can upload DATS by filling in this form which resides in a well built and modern web application with the use of modern and prominent web tools. For the storage of the data, we use all the basic technics for the backup, support, and administration of the database. We have built our modules for authentication and authorization of the users. The application was created in a more modern and user-friendly manner and we follow the agile methodology with many iterations and constant feedback from the users.

OPTIMA. There is no answer.

RUSTWATCH. In our WPs WP1 and WP2 generated new data on the host and pathogen, in WP4 we stored, analyzed, did Quality Control, and visualized stored data. In WP4 we also developed tools and services to collect and disseminate data e.g. Smartphone Apps and also tools aiming at wheat rust early warning e.g. maps and charts on disease development across Europe. In WP3 these tools and services were tested and evaluated in six case study regions by stakeholders and we collected additional data, discussed the harmonization of existing and new data, and how we could merge data from existing data holding platforms and AKIS.

MycoKey. There was no DMP for the project (not required at the time). Research data was handled by individual partners. No public knowledge repository. Internally, HumHub was used for project communications. A technical app has been developed (for end-users e.g. farmers, advisors, SME's and others concerned about the mycotoxins) but the app is not publicly online yet. The plan is to have it online at the end of the year (project finishes October 2020). The app is constructed by a Dutch company.

DIVERSIFOOD. There is no DMP for the project. ORC was responsible for an internal database for data from research. The project was based on experience from the SOLIBAM project, e.g. about how to manage data and make the results visible. Output data was put on the project website: 1. Videos (find under "Media"), 2. Innovation fact sheets (corresponding to practice abstracts (23), 3. Booklets (8) not well disseminated but translated to several languages, 4. 2 main events (stakeholder meetings). Scientific publications are not found on the project website. The project made a special issue of Sustainability, but other than that, many publications were not published until after the end of the project. Much was uploaded to Organic Eprints – getting the information available (and promoted) on Organic Farm Knowledge. They are in the process of uploading all non-scientific publications there.

BOND. The main purpose of BOND data management was to give the highest possible visibility of those data. They did not plan a repository as a data storage/data platform, rather it was meant as a showcase. The website was organized to allow easy search and visibility of stories to farmers. And we created the website and we tried to organize it in the best possible way compared with the resources that we have to allow visibility and to allow the search inside this repository. There are stories on the website of other farmers or cooperatives or whatever but there are parts that can be defined as a database or a data storage. They used time on the collection of projects that were of relevance to farmers. They had to increase the storage capacity during the project. On their website are three different "KRs": The Barn with stories told by farmers & others, Communication materials with their publications (no scientific so far), and the Virtual Library with a collection of relevant information from other sources. Exactly, they didn't store those documents on their website because there is a problem with copyrights of the documents and they created just links. The problem with the technical problem that in case the link can be changed.

TomRes. So, yeah, we took care of the data management in TomRes. We've done it quite a lot in other EU projects. We're even thinking of marketing it as a service. So, yeah, we had quite a clear plan. We have experience with setting up a data server and a data repository and gathering standard operating procedures and methodologies and metadata and data – harmonizing it, standardizing it. It can be more or less sophisticated depending on the needs of the project. There's a very, very controversial high-end project we can even extend the principles to – you know, raw data are being gathered and punched in twice and then data sets cross-referenced to look for corrections before data goes into a database. So, yeah, we have a quite clear plan, although, you know, interesting things pop out when you start looking at something. Many people call what they have a database, but a database by definition is something searchable, and most people need a data repository, not a database. Since, if you want to make a database, that means being very sophisticated with your method of data capture to allow your repository to be searchable. Therefore, a proper database in the true sense of the word is very labor-intensive to generate and make it publicly accessible. TomRes has a data

repository (if you accept the definition just given – but most people do not know what the difference is in functional terms). I think most projects have a data repository. I think having a database would be extremely expensive. I doubt that most projects could afford a proper open online searchable database. What I mean is that you can literally search terms or keywords or buzzwords, and I would go in parameters and it would come up with. But generally, what TomRes is searchable in terms of the, you know, was it tomato, was water use efficiency study – the general keywords of the data set. And it wouldn't be searchable in the same way that a website might be. Yeah, I think TomRes data repository is fit for purpose, and it's done reasonably well. Data sets of different projects create different demands. And the challenge for me is not ... standard biological data and field data and things like that are quite easy or routine to capture – in relative terms – whereas other forms are designed generally to catch non-traditional science data. For example, when you start dealing with social science data, that becomes more challenging, because you just got lots of text quite often, so developing methods to capture the subjective social science data or information is a challenge. And it's OK, I mean, the social science is designed in a particular way that is run like a scientific experiment – less of a problem, but if it's run as the multi-actor workshop and you're just capturing ad hoc, random opinions, then that's a tough problem necessarily, but different challenges. The data set will appear in different ways that we stored in different ways that we communicate in different ways. There will be numbers sitting in a spreadsheet. So yeah, probably designing tools to make social science data more searchable would be quite useful. When we do not do things manually this can process of interrogating social science data for storage and characterization is time-consuming. However, if you have a program identifying words remotely (online), allowing you to make your special social science data searchable based on content then things become more exciting.

TREASURE. The page will be on the same platform, it will be available for a couple of years after the project will be ended. The data will be available for the Agriculture Institute of Slovenia. We had some problems to move the data from Italy partners. Italy partners were responsible for the website of the project, but after a year or a couple of years, they stepped out of the project. The primary data produced were mainly genetic data (e.g. DNA seq) - which will be made accessible once the publication is published. Other raw data that was collected has not been put in open access. All secondary data - various outputs - was assured to be openly available. We uploaded systematically all publications at Zenodo platform and on the project web page. Also, at ResearchGate, but this was left to partners so it is less systematic, though rather complete, at least with most important publications.

EMPHASIS. There is an answer for Q no 1 and Q no 2. The strategy does not been designed; we did not have a specific strategy on this. After the beginning of the project, there was a question about that and we said about that kind of strategy, we want on that and we did it derivable. In this derivable, you can find our overall document of the strategy of management. Art. 29.3 of the Grant Agreement (Open access to research data) did not apply to the EMPHASIS project, which was one of the first funded projects under H2020, having started in February 2015, before the Open Research Data Pilot was fully operational in 2017. EMPHASIS participated voluntarily in the Pilot on Open Research Data of Horizon 2020, in line with the Open Access to research data policy for facilitating access, re-use, and preservation of its research data. The beneficiaries committed to deposit the digital research data generated in the action in institutional research data repositories (whenever available) at each partner organizations' complying with Open Access rules, but there was no centralized KR for the project. They took measures to make it possible (whenever applicable) for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user: (i) The data, including associated metadata, needed to validate the results presented in scientific publications as soon as possible; (ii) Other data, including associated metadata, as specified in the data management plan. Data generated by the project not covered by data protection were collected and stored. During the project lifetime, the access to data was restricted to project partners to ensure full exploitation of data produced by the consortium. According to our Data Management Plan, data (not susceptible to be exploited further by project partners) will be disclosed 24 months after the end of the project and new data will become accessible at regular intervals, provided they have been fully exploited by project partners.

2./Q21. Did you take into account the FAIR principles to make your data findable, accessible, interoperable, and reusable?
If Y, how? ___ If N, why? ___ Other ___

LIVERUR. Yeah, the idea is we completed ... first implemented in the data in the data management plan trying to achieve this idea. Here the outputs, ... it's based on that principle, but the outputs here are our now mainly the deliverables. So yeah, we tried that this information is reusable – or followed the FAIR principles.



SiEUGreen. Yes. All the data is findable, accessible, interoperable, and usable. So, we are planning to do that because Zenodo by itself has it built in the way it manages the data. So, we are following the FAIR principles, at least trying to. In practice? As of now, we are in the transition phase, but we are planning to use it as a common naming principle for all files shared between the partners as well as when we're storing it. So it is easily understandable and findable within the consortium. Most of the data we are going to put in the repository is going to be reusable. Meaning it's going to have a creative license, so it should be reusable by any other actors outside of the consortium. Yes, and most of the data are managed by people who are experts in their fields, so it should be very interoperable. It should not be very hard to realize what the data is. Of course, we also have the metadata alongside the data, describing what the data will do.

SmartAgriHubs. Yes, all our data is findable, accessible. Interoperable is a bit restricted, depending... limited in the sense, that depends on the type of organizations and users. I am not sure what your definition of interoperable is, but I would say it is. Yes, all our data is findable, accessible. Interoperable is a bit restricted, depending... limited in the sense, that depends on the type of organizations and users. I am not sure what your definition of interoperable is, but I would say it is.

Feed-a-Gene. Generally, no we didn't take the fair principles account. I guess we made it possible for people to access this but not in a formal way.

NEFERTITI. I would say yes, the information is pretty easily findable on our website, actually on our platform. It can be accessed well, basically by anyone. So anyone can see the database and search through it. It's interoperable as we get the ... We've filled in the database also with farmers from the farm demo project. So in a way, it is interoperable with that database. And of course, if there is a need for interoperability with some other database, you know if we get a request that that can easily be done. And, you know, in that sense, it can also be reused.

LIVESEED. YES. All data and created knowledge were used under FAIR principle. Data were first stored on internal SharePoint. Data or knowledge that cannot be published due to IP rights had to be indicated by the partner before. Data are shared as a supplement to publications on repository organic eprints or Zenodo. Only after publishing data will be shared.

FAIRshare. Yes. All these principles are followed to some extent. All data is easily findable and accessible by the platform's users who can use all functionalities developed based on our designed data model. Regarding interoperability and reusability, they can be easily deployable because the database and the application already have an API (Application Programming Interface) which can expose information to other applications in case another interested party wants to get or reuse our data.

OPTIMA. Yes. We took them.

RUSTWATCH. Raw Data was not publicly available. Data was shared between relevant persons (Analysed data not raw data) upon request.

MycoKey. All scientific publications from the project can be found on the website (<http://www.mycokey.eu/>) under "Dissemination". All scientific publications are Open Access. A procedure for this was described. If OA was not applied in the first place, authors must choose the "Green Road". All other publications it is voluntary to put on the website (Conference papers etc.). The Chinese partners: when the papers were produced with European partners there was open access. When the papers were produced with only Chinese authors the open access was not pursued.

DIVERSIFOOD. No. It was not an issue at that time. However, scientific publications had to be published with open access.

BOND. They did not know or thought about FAIR principles. The focus was on the highest possible visibility. The persons providing the data/material had to sign their acceptance to use the data/material. Before collecting the data, they asked them can they share the data with them. There is no DMP.

TomRes. Yes, in that sense, the database does comply, the data repository does comply with FAIR in we look at what goes on; we make sure we can understand it. We tried to come up as if we were a user, accessing data for an experiment or looking at a method and I'd say, 'Does the metadata describe what's in the datasheet? Can we understand the experiment?'. Also, we ask people for more information at times, regarding their experimental design and whatnot. So, the hope is that anybody approaching the data set or using those methods can understand the experiment enough to make sense of the data, of course, but also to repeat the experiment. So, we believe we're applying those principles. We don't know if you're applying those principles until somebody independent comes in and checks – will they agree with what you are saying? And ultimately, we are more familiar with what's going on project, so it's easier for us to understand what's going on, so it's easy for me to say we've complied with FAIR, but who has checked? At the end of the day as well, but if somebody does find something that's confusing or not explained, something else they want to learn, the source of the data is always there; contact details of the original data providers – they can always contact them.

TREASURE. It was not used as an official document, but it was done naturally. The information will be available and will be as simple as possible for everybody. If someone will find data useful, they can use it. As mentioned, we respected the demand for GA for open access to all publications derived from the project. The raw data planned to be made open are not yet available.

EMPHASIS. There is an answer for Q no 1 and Q no 2. The strategy does not been designed; we did not have a specific strategy on this. After the beginning of the project, there was a question about that and we said about that kind of strategy, we want on that and we did it derivable. In this derivable, you can find our overall document of a strategy of management. Art. 29.3 of the Grant Agreement (Open access to research data) did not apply to the EMPHASIS project, which was one of the first funded projects under H2020, having started in February 2015, before the Open Research Data Pilot was fully operational in 2017. EMPHASIS participated voluntarily in the Pilot on Open Research Data of Horizon 2020, in line with the Open Access to research data policy for facilitating access, re-use, and preservation of its research data. The beneficiaries committed to deposit the digital research data generated in the action in institutional research data repositories (whenever available) at each partner organizations' complying with Open Access rules, but there was no centralized KR for the project. They took measures to make it possible (whenever applicable) for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user: (i) The data, including associated metadata, needed to validate the results presented in scientific publications as soon as possible; (ii) Other data, including associated metadata, as specified in the data management plan. Data generated by the project not covered by data protection were collected and stored. During the project lifetime, the access to data was restricted to project partners to ensure full exploitation of data produced by the consortium. According to our Data Management Plan, data (not susceptible to be exploited further by project partners) will be disclosed 24 months after the end of the project and new data will become accessible at regular intervals, provided they have been fully exploited by project partners.

3./Q22. What is the main storage place (Knowledge Repository or KR) of the knowledge (data) of your MA project?

a) Project website

b) Open & common repositories (Zenodo, Cordis, EIP-AGRI, ResearchGate)

c) Other sector dedicated platform

d) A tool to share your data

e) Other ____

LIVERUR. Yeah.

SiEUGreen. We are planning to use both the project website as SiEUGreen as well as the Zenodo public repository. I think the Zenodo will be the main repository after the project period where it is easily findable for other actors after the project, like after 20 years of when it has finished. And it corresponds to a lot of the FAIR principles as well. We are also, of course, going to have a copy in the SiEUGreen website for people to find it. But the main database would be Zenodo that the website is also linked with Zenodo.

SmartAgriHubs. For us, the project website, which is also, as I mentioned before is a part and the Innovation Portal. So, I would say the project website/Innovation Portal. So, for us, the website is just the interface, but Innovation Portal is the interactive platform, where we store all the knowledge.

Feed-a-Gene. No, I don't. No, I know that some people involved in the project have made some of the data available, but we never record it that. We only put it to the website, only the publications have links. We did the publication through the data but we never mention it. We only recorded the publications.

NEFERTITI. Yes. So basically, the main storage place for the farms and the demo activities is the NEFERTITI platform, whereas the website is more focused. I mean, you can get to the platform from the website and you can get some of the information also on the website, but the website is more about just representing the project as a whole, what it's about. So, let's say deliverables, work packages, news videos, stuff like that.

LIVESEED. The project developed the SharePoint platform for the communication of project partners. The next place for knowledge sharing was a project webpage. Main KR is open access to Organic Eprints, it is used for all reports, scientific publications, presentations, and data. We also used Zenodo for scientific publications and the Organic Farm Knowledge Platform, which is specifically for farmers; there a special topic of seed was implemented within the project for practice abstracts and collected knowledge on seed production. PA under Cordis will not be found by farmers.

FAIRshare. All the data (on the project's website) is stored in our private Consulai repository that we have. We are quite careful with GDPR procedures. We do not use open or common repositories. For DATS we use a



private server for the DATS Inventory which we have set up specifically for this purpose, for FAIRshare. We do all the administration, updates, and backups from this private server.

OPTIMA. The main data storage place is a private repository for meets of the project and the internal use.

RUSTWATCH. Project website: Data is stored in The Wheat Rust Toolbox. This is web-based but data are only available after login. All public maps and charts are available on different websites e.g. Wheatrust.org and RustTracker. Knowledge and interpretation of data – what do it mean for practice is on our website, on EIP_Agri abstracts (the project is not on yet), in farmer's journals, etc. see. AU Publications are registered in PURE. Jens had a question about Open Access.

MycoKey. Project website x + HumHub (internal); Open & common repositories - Zenodo, possibly SOLAR? A tool to share your data - App is under development.

DIVERSIFOOD. The project website, b) Open & common repositories - Organic eprints, Other sector dedicated platform - Organic FarmKnowledge planned.

BOND. Project website and a tool to share your data - internal project repository. Most are on the website. They created a BOND FB community with around 60-70 people. They had a private group on FB. They had twitter. Every time something new happened on the website this was announced on social media. In their consortium, they discussed the dissemination and exploitation of some of the results. There is an idea to carry out the scientific publication and have a more administrative repository, and it is located in Coventry's virtual space and it is managed by Coventry and not public deliverables and so on.

TomRes. We have a separate data server as a secure data server. It's encrypted and we're fully compliant with GDPR. And we won't make people who have registered get access; only project partners who have registered get access. Most people don't access those databases or repositories, in my experience. Some projects rely on it more, but generally speaking, the data goes in and very few people will look at it and the people who use it, that data, have it already before it goes to the data repository. So, we end up storing it. Several years ago, in another project (not TomRes) we had a partner excluded from a project, for publishing data they did not own but had retrieved from a data repository. That is, you have to register your IP address, so only certain computers can access. You have to get a username, a password, and access from a specific computer. When you go in, we know where you're going. We can see where you're going. It's all recorded. If anybody downloads anything, we can see it's been downloaded. It's all secure and monitorable in that sense. And the guidelines are given out to project partners as to what they, and others can access data or part of these data. That is, not every partner necessarily gets access. So, data owners can put restrictions on a data set - so some can be opened by project partners; others can be restricted and are made available only on request. These share requirements of the data owner are collected on the metadata form. In the case where a partner breached the agreement - used the data and published a paper with the consent of the original data owners' descriptions, and during the project), which is a breach of the grant agreement and the consortium agreement. So, yeah, they were excluded from the project. And, you know, so that's good. I think it's good that you can provide partners with safeguards.

TREASURE. The main data storage place is on the website, but some kind of data basis is on the France site. Some data on the beginning was not shared, because data was not completed. Project web site (subpage), Zenodo, and ResearchGate.

EMPHASIS. We have the website of the project and we put there the main results and publications. There is an intranet and we can share information between the partners. There was created a toolkit to inform stakeholders about our results. Each of the partners has a policy where to store the data. We do not have any central repository of the data.

4./Q22. Is the KR linked to other databases?

If Y, specify the names of the databases: ____ (provide links to the databases)

LIVERUR. Not yet. We didn't have at least public databases. We didn't share that information and we didn't prepare that. This is just, at this point, it's owned by or managed by each work package leader, and it's not publicly delivered. But it will be. It will be prepared to provide for the usage of the general information, but we don't have a repository yet. And even we didn't decide the repository for example Zenodo.

SiEUGreen. But the main database would be Zenodo that the website is also linked with Zenodo.

SmartAgriHubs. No, but there is an exception. For example, YouTube. So, all of our videos are not stored in the Innovation Portal, but they are findable by linked on YouTube. So basically, when you are looking for videos, we do not store them in Platform so you will go to an external Database which is the YouTube Chanel.

Feed-a-Gene. No, not at all.

NEFERTITI. Yes, to the database of farm demo projects.



LIVESEED. https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/becoming-organic-farmer/organics-country_en.

FAIRshare. It is predicted to be linked, with the platform www.ask-valerie.eu.

OPTIMA. No, we do not have links to other data basis. There are some links their users can redirect to other web basis but not into provided search tools. There is a list of relative projects, so I can say that we have it

RUSTWATCH. ESRI Cloud services for the SmartPhone Apps, Data is harvested every week - dashboard.

MycoKey. No - HumHub; Yes - Website, <https://zenodo.org/>.

DIVERSIFOOD. No. Some of the Booklets link from Organic E-prints. For the publications in Organic eprints, they can also be found in OpenAire.

BOND. The virtual library on the BOND website is linked to other databases: FAO, Campesina, European cooperatives of farmers. 90% comes from FAO. There are no scientific publications, however, the plan is to publish. Wageningen, Cordoba, and Coventry universities are partners. Coventry has an internal repository that is not accessible to any externals.

TomRes. The website, as far as I know, isn't. We haven't put the link on the website to our data server. But we could; it's very easy to do. You still need the username and password and registered IP address to access it. But we haven't gone as far as linking to other databases. We are aware of them, for example, several databases from the previous projects. And it seems curious, again, don't think that many projects do this unless they have to. Unless you've got a very specific data that you require – most projects don't go back to other projects data sets in my experience, unless a very specific need or opportunity arises. So, unless you've named it very specifically in a deliverable, 'We will go to X database and extract...', fine. But it's not, ...like people in many projects are saying, 'We will look at historic data from project X Y or Z' this is suggestive and not definitive. Also comments like, "we might use it if it's interesting", or "if it's relevant". And the reality is, very often, it is not quite fit for purpose. But having said that, I'll bet you more could be made of existing historical data. So, if you were to employ someone specifically to mine historical data sets, I bet you they would find things that other people had not.

TREASURE. Yes, there are some links. For example, to the websites of the partners of this project or important documents. <https://zenodo.org/> <https://www.researchgate.net/>

EMPHASIS. Yes, the KR is linked to other databases. The links which are on the website redirect to other websites and platforms where you could find different information about the pests of diseases for example.

5./Q22. Is there a possibility to retrieve content stored in other repositories as well by making use of the search functionality of your KR?

LIVERUR. Yeah, we don't we don't have now another open repository apart from the website. Yeah, only when on the website.

SiEUGreen. From Zenodo, or also from other databases. We haven't thought about that much. Of course, Zenodo has the capability of linking a special identifier, the document identifier, unique to all the files uploaded. So, it can access other websites or every repository which has the data identifier, the object identifier it's called, I think. Zenodo does have a search function.

SmartAgriHubs. The possibility to retrieve content stored in other places is actually No, but like the use of the share functionality of your, KR to search data, Yes.

Feed-a-Gene. Not directly what I did by the end of the project, when we had the publications, I upload it to the publications on the website, and then there was a link to a repository web entering. I guess there are links to the other repository.

NEFERTITI. Yes. The farm demo database is, I think not filled regularly anymore because the main focus is now one on NEFERTITI. But whenever there is a new entry in the database for Farm Demo, it instantly also goes to the database of NEFERTITI platform. So, anything that's in the database of Farm Demo is in the database of NEFERTITI platform, so anyone who searches our database will also be able to find anything both from NEFERTITI and from Farm Demo.

LIVESEED. The question was not created at the moment.

FAIRshare. There is no answer.

OPTIMA. There is no answer.

RUSTWATCH. At the moment, they are not integrated, however, one partner (INRA) would like to do so.

MycoKey. No.

DIVERSIFOOD. No.

BOND. Yes, in the virtual library. No search function only browse.



TomRes. Certainly, we've done, we've come up with historical data repositories, databases. I don't mine the data as an institute. Perhaps they will be using data within TomRes because we're doing a system-level analysis, so I'm pressuring – particularly now towards the end of the project – people to get the data to look at the system level, which means bringing together sources, economic data, environmental data, economic data for the system-level assessment, nutritional data. And so, in that sense, I have to retrieve the data for that purpose. Most other people in the project have their data before it goes into the repository. The work package leader would call on what another work package leader needs and they would then exchange the data directly without going through the database, so to me, the database for the repository serves more of a legacy function. They can help data moving in part in the projects, but mainly, I think it's a legacy function. The data is available to other projects as part of open and transparent science. And it means when you publish a paper based on certain datasets that people want to check the data that you used to generate the publication, they can't – or exploit it in other ways. So, we haven't linked directly to other databases. But we could if we wanted to. And we'll put all of our data in Zenodo eventually because it's the most popular database at the moment, I think.

TREASURE. There is no answer.

EMPHASIS. There is no answer.

6./Q23. Has your KR used a specific Content Management System (specific data layouts, specific content for files name, etc.)?

If Y, specify which one __ Why did you choose it? __ If N or other remarks __

LIVERUR. What do you mean? Apart from the PDF of the deliverables, there is no other scientific information on the website. I think this is this was made on WordPress. ... For the view of the website, I think it's on WordPress. Yeah.

SiEUGreen. I'm not sure exactly with the website on the Web site because a partner manages the website.

SmartAgriHubs. We are using Pimcore because it is very flexible, so you can add tasks and functionalities and features to meet your request for the project, it is in open source and we are also very knowledgeable on using this tool because we have been working on it for many years.

Feed-a-Gene. Our website is based on Drupal so there is a special data structure for holding all kinds of publications. It's only for publications, not the data file.

NEFERTITI. Well, we used, let's say, a specific questionnaire. So, we, along with other partners of the project, saw what type of information we needed. So, when somebody wants to join NEFERTITI and wants to put an entry in the database, we know what information we need. So, all of the needed information is, of course, mandatory. So, everybody that fills in the questionnaire, deducted, the end result will always be the same. So, you will always have, for example, the name of the farm, the farmer, where the farm is at, what activities they're doing, they're offering, and stuff like that.

LIVESEED. The project data management systems were clear from the beginning as they worked under PMP. Partners received training in the utilization of DMP, metadata, and the uploading of knowledge to organic eprints, Zenodo, and Organic Farm Knowledge Platform. These KR can be searched by author, themes, topic, keywords, year, organizations, projects, etc. According to the DMP WP leaders and Task leaders were responsible for any information sharing. Information on the Organic Farm Knowledge Platform is automatically translated into 14 different languages to reach more farmers.

FAIRshare. We do not use any known commercial CMS (Content Management System) for the Inventory, or any other already made solution. We developed our features and modules to do the content management on our own. We give specific rights to the users to perform the basic CRUD (Create, Read, Update, Delete) actions and we do the database administration. We have a specific CMS for the contents of the project's website.

OPTIMA. Dissemination and communication managers manage the content. He is responsible for updating data in the portal and he gives the administrative efforts. Nikos is a Technology provider - he is updating the interface or any required problems.

RUSTWATCH. Our website uses TYPO3 CMS, the same as used by Aarhus University. The Wheat Rust Toolbox and databases are developed by us from scratch. All data are defined and agreed upon via the European and global rust communities. All basic data e.g. country codes, geocodes, plant names, etc. follow iso-codes.

MycoKey. No, the system was built up from scratch.

DIVERSIFOOD. No.

BOND. WordPress was used. It was suggested by their web developer, primarily due to the user-friendliness of this system. There was also a web designer and web developer involved.



TomRes. I didn't build the website; that was a different partner. So, I'm not sure, but in terms of the database, the data repository, that's done in Access; it's an Access-based facility. So we can take files in pretty much any form, but we prefer people to use the Access metadata form that we've generated, that we use the templates we've generated for standard operating procedures because they're easier to access, but they can use Word, they can use Excel, they can use whatever they want. But ultimately, everything is stored and linked in the Access format. So, when it's uploaded to Zenodo, they won't just go in as datasets, files, as an experiment i.e. files tied with each specific experiment. And in Zenodo, I don't believe it gives you the function to link data sets. We can do it in our data repository, but we couldn't do it in Zenodo. Other than by the project, you could say, 'This is TomRes experiment one, and this is TomRes experiment two.' So, in that sense, every data set has its unique object identifier, which allows us to distinguish it, and we could uphold that as a kind of, a piece of metadata in Zenodo. But Zenodo again is more of a repository at the moment. The practice abstracts are not uploaded, I believe, to the EU with keywords. So, you're restricted for how mineable or searchable they are. But to me, having keywords and having to search for practice abstracts based on their title or abstract would make the practice abstract repository much more powerful.

TREASURE. The page is on 10 languages. In all partners countries are people who are responsible and have the right to put information. They translate information from English into their languages, but not all of the documents. The webpage is maintaining by ourselves because all countries write information by themselves. Meta wrote I can't/do not know how to reply.

EMPHASIS. The website has rules of publication and communication. A tool kit was created to show practical abstracts and information.

7./Q24. Who can upload data on the KR?

a) Administrator of the CMS only

b) All project partners

c) Others__

Why? __ How is this done? __

LIVERUR. It's the coordinator, it's UCAM. The work package leaders send information to them because they are also the leader of the communication. So, they don't upload it themselves. They send it to the coordinator. Everything is coordinated by UCAM

SiEUGreen. On the knowledge repository, all partners can upload the data. We have a community page linked to the SiEUGreen project, and the administrator of the knowledge repository can accept the tag in the community debate. So, it's compiled together, but everybody can request it there. They can upload the data and request to be connected to the SiEUGreen project. And the response, it will be for the partners to upload their data and then connect to the community of SiEUGreen.

SmartAgriHubs. Everyone. It is open to anyone that is part of the Innovation Portal. I can share my screen with you to show how it is done. After you enter to the 'Portal' section in the website, where you have to be logged in and then you can submit something to all categories in the website ('Latest', 'Open Call', 'Network', 'Library', 'Training', 'Calendar', 'Forum'). So, any user can do that and I know you have some questions afterward and I can explain afterward how this could be checked and so on. But you as the user, you are free to upload anything in these categories, of course, relevant to the project.

Feed-a-Gene. Just the administrator.

NEFERTITI. Anybody can access the platform, and anybody can input the data, but once the entry is sent to us, there is a quality check. So, it's not that someone somebody fills in the questionnaire, it's automatically on the website; there needs to be a quality check so that we are sure that what gets put in the database is of good quality.

LIVESEED. All project partners can upload information to the EU Participant portal and the two KR organic eprints and Zenodo. For each repository, they need a password and need to link the information to the project. Instructions are provided by DMP and guidelines for the specific KR. Also, external users can upload information to organic enprints and Zenodo. Uploading to the website is conducted by project managers, the uploading to information to the Organic Farm Knowledge Platform is coordinated by the organization responsible for dissemination WP. Here was an additional question about the languages that were used on the project website. Monika said that the main languages of the project were mainly English, but they used 14 other languages using automatic translation. The project flyer and booklet information was translated up to 10 languages.

FAIRshare. (project website) The managers can upload the data on the project website. We are trying to centralize it because we are working with communication and it has a common language and common strategy. For the DATS it is perhaps the opposite. We do not have one dedicated person who uploads the data for the DATS. We allow all users, first of all, FAIRshare's partners, but it is open for everyone, who is interested in an agricultural advisory. Everyone can upload the information required for a DATS or just create a profile account on the page. Additionally, the users can navigate through the Inventory and update or delete the uploaded information by themselves. We wanted to give freedom to all users from the beginning to engage them as much as possible from the beginning.

OPTIMA. All members of the project can upload the data.

RUSTWATCH. Many types of data suppliers. We have Crowdsourced Smartphone App for upload of wheat rust data in Europe – all stakeholders = breeders, extension, farmers, scientists, AgChem partners, etc. Tested in 6 case study regions in 2020; Smartphone App for registered users for use when we sample rust isolates. Dedicated breeders, scientists, and advisors. Appr. 20 users (only for specialists and first years of the test in 2019/20); Barberry survey App for sampling rust on Barberry (Rust can have sexual recombination, only on Barberry). Dedicated breeders and scientists. Appr. 10 users (tested in 2018 and 2019). This is only for special campaigns and certain countries; Webform for upload of rust disease surveillance data. All appointed surveyors from many countries – that can log in to the toolbox. Currently, we have appr. 100 registered surveyors from more than 30 countries; Webform for upload of rust disease surveillance data. All appointed surveyors from many countries – that can log in to the toolbox. Currently, we have appr. 100 registered surveyors from more than 30 countries; Five labs in Europe, ICARDA lab in IZMIR, ESDA-CDL in Minnesota, and CIMMYT can upload data on rust genotypes and races via CSV files after login to the toolbox; Official variety testing partners (VCU) from 17 countries (most countries are not part of RustWatch) can upload data on disease surveillance on 6 differentials planted in 109 trials across Europe and susceptible reference cultivars for yellow rust, leaf rust and stem rust.

MycoKey. The administrator of the CMS only - Website; All project partners - HumHub. Each partner has a login.

DIVERSIFOOD. The administrator of the CMS only - FormicaBlu.

BOND. Only the communication team. On the website, there is a form where everybody can suggest uploads, but this is curated by admin before uploading. They had had a problem with hacking earlier.

TomRes. Yeah, the project partners only, and we will allow people from outside the project to access the database and maybe even more data where it is relevant. But we would ask for permission, that all the partners are happy with that before we do that. We would have a vote, a poll, at least for the work package leaders, but I would prefer with all partners regarding somebody from outside the project who hasn't signed the grant agreement or the consortium agreement – I'd be very wary of somebody from outside that group. Partners have signed a grant agreement etc. – that's sort of a 'deal', so in that sense, we feel the BOND or share responsibility. But once somebody is extracting data from the database, how can we know it's not being shared more widely? At the end of the day, you operate on trust. If somebody came in and asked for access, you are working only on trust. And is this acceptable? It's probably not really compliant with data regulation guidelines. You have nothing signed from them. Even if the partners did say it's OK for an outside partner to access, I suspect I would get them to sign a legal agreement regarding the terms under which they're being allowed access or being provided with data sets, and especially the data owners must be assured that the data is protected.

TREASURE. The page is in ten languages. In all partners' countries are people who are responsible and have some rights to put information. They translate information from English into their languages, but not in all of the documents. The webpage is maintaining by ourselves because all countries write information by themselves. The care for upload was on one partner for Zenodo, coordinating institute for web page, partners themselves for ResearchGate.

EMPHASIS. At the beginning of the project was information about the project and what is it about. A different person who is participated in activities can upload data on the KR but only by the manager of the website. The uploaded data is reviewed and verified for some responsible people. We feed our website with information from Eip-Agri too.

8./Q24. Is there a possibility to edit data stored in the system?
(Y/N) __, If Y, how and by who? __

LIVERUR. Yes, what is uploaded, yes, it's possible to be edited. Yeah, by the coordinator.



SiEUGreen. Yes. The partners themselves are responsible for doing quality checks when they upload the data. It is. I think that you can if you edit and then it becomes a newer version of the data. You can have a newer version of the data. Yes.

SmartAgriHubs. Yes, you can upload it and this data will be checked before, so, for example, you are in the 'Library' and you want to upload/submit a document, so you will add the document that you will like to add, upload it (Figure 1) and then someone has to approve it. So, we as an organization and in charge of the Innovation Portal, we approve and republish everything in the Portal. Then for editing the data, I think it is easier to understand if I show you live (Figure 2). I am on the 'Network' category and then you click here everywhere and you have an organization and you see here all this information of the organization, so you can see here a main Contact person 'Name of Contact name', he/she can edit the information or his/her organization. Imagine that his/her website changed or social media or e-mail address or I do not know he/she wants to update the text of his/her organization he/she, can do that so any organization or any user can edit the data regarding their organization, of course. We can also modify that, so as an Admin you can also modify the text or things in the Portal.

Feed-a-Gene. No.

NEFERTITI. So, yes, it can be edited. But for example, for anything regarding the farm itself, the farmers cannot edit it themselves; they need to get in contact with us or with other people from the project, and then we can edit it on the platform. But for example, when it comes to demo activities, that can be edited also by the farmers who are working on the activity itself.

LIVESEED. Yes. The responsible people for editing information needed to work under the DMP guidelines. The deliverables undergo several rounds of corrections by involved partners and the scientific coordinator. The newest versions are indicated by an updated version number on the SharePoint. Only final knowledge objects will be released to the project website and repositories. Inorganic enprints it is also possible to update or correct submitted objects.

FAIRshare. There is no answer.

OPTIMA. Yes. The data stored in the system is editing by the page administrator.

RUSTWATCH. There is no answer.

MycoKey. Scientific material and reports for EU: not possible. Project partners can edit reports etc. but need to go through the administrators to get a new version uploaded.

DIVERSIFOOD. No, it is not possible to edit once it is there.

BOND. Once it is uploaded, there is no possibility to modify if you are external unless you write an email. Only the administrator can edit.

TomRes. No, I mean, you can edit it, but not in the system. So, if somebody uploads something and we looked, it looks great, and we put into the repository or database and then they say, 'Oh, there's a mistake. I want to add something else', so that's OK, you have the data set back, but then they give us that version, too. So, we keep all the versions. When the new version would supersede the old version, the old version would still be there. I think when we upload things to Zenodo or wherever it happens to be, we would upload the last version, the most up-to-date version rather than all the different versions because it becomes cumbersome to do that.

TREASURE. Yes. All partners in all countries could do this. Meta wrote I can't/do not know how to reply.

EMPHASIS. Yes, there is a possibility to edit stored data. It is editing by the manager.

9./Q25. Usually new data is entered in the KR...

- a) Daily
- b) Every few days
- c) Every week
- d) Every month
- e) Every few month
- f) Other _____

LIVERUR. At this point, once the deliverable is ready. So, it depends on the Gantt; it's probably each semester or each quarter, but each time several deliverables. It depends on the Gantt, on the process of the progress of the project.

SiEUGreen. As of now, the knowledge repository is ... We are transitioning to it; we haven't even utilized it yet. All the partners have data, but there are encouraging the partners to utilize it as much as possible now.

SmartAgriHubs. I would say every hour, every minute! I mean so much data information, we have 510 organizations now in the Portal and more than 1.400 users, so for sure daily, it is the right answer, but I would



say that we receive requests several days to upload something. When you see in the 'Latest' category. Last time, you signed in you can see the latest activities in the Portal, so for example, if you have not been logged in for two days there are the new things that happened so you can see this morning three posts in the forum there are many organizations that registered. There is also for example someone that uploaded an event, someone that wrote something in another event in the Library. So basically, you can see the latest activities. So, I would say daily that happens several times a day.

Feed-a-Gene. Once a month.

NEFERTITI. Well, I wouldn't say daily, but every couple of days probably, yes. It depends – from every few days to every week, not more often than that, and every month would be an underestimation. So, between every few days and every week.

LIVESEED. Every month.

FAIRshare. The project websites are quite dynamic which is mandatory. Every time you visit our website, we try to have different features here. We have developed the website in different stages, first step to present the project and its objectives, on the second stage (where we are now) we are including project achievements and outputs. We are also translating in different languages some of the outputs for abroad and dissemination and on the final stage, we will do the connection to improve the synergies along with other European projects. Now we are updating the webpage with the Covid-19 new scenario, we are also trying to engage our advisors to use this digital advisory tool and mainly focus on Covid-19. The project is also linked to social media which can be quite diverse and quite dynamic. New DATS are usually uploaded every week or every few days.

OPTIMA. New data is entered in the KR once per two weeks.

RUSTWATCH. Daily yes for disease surveillance data. Every week, data from Trap nurseries at VCU sites. Every few months. 2-3 times per year re genotype or race data. Data from Field Nurseries, 214 most grown cultivars in Europe planted at 6 sites across Europe.

MycoKey. Every few days and every week.

DIVERSIFOOD. Other - when necessary.

BOND. They have around 30 stories and the aim is 100. Upload of material is going on continuously. They also upload material such as reports which are produced by the project itself. In BOND the website is taking up most of the time. Brochures and newsletter much: less time and effort were used as the website is considered the most attractive for farmers.

TomRes. What we tend to do because it's quite a labor-intensive process, so we wait until we've got a dozen protocols, or not even – when a big data set arrives, we might do it in one go. But generally, we do it in batches. But what people tend to do is, they wait, and most partners are still quite new to it. 'Good god, I've got to provide my data to a database.' And so it's when the project is nearing a deadline or it's nearing a time when somebody's required your data, and they all come at once. 'Here's the data set.' So, it might just be a function of project deadlines, so I wouldn't say it's done regularly. I don't think it will be done regularly until partners get used to this. It's quite a new thing. I know some universities and other institutions; this is quite a normal thing for them to keep the data in a very strict format. But then, a lot of universities are very old fashioned in how they deal with the data, and when you suddenly say to a researcher 'We need your data?' they ask 'what are you going to do with that tool?' And I must say, 'we covered this in the first month of the project, I gave you a talk, ... I gave you a presentation. I told you what was happening, why it was happening. You've got forms, guidelines, emails. The partner might ask, 'how do I know you're not going to use the data to publish it?'. I must tell them, 'It's not my job, I have no interest in publishing your data, it's a requirement for the audit'. So, it's curious to know many people don't realize that. They are just doing the research, and they forget about deadlines and they forget about the requirements of all ORDP and open science. I wonder whether I should have, with TomRes, created a video, a really short video, with me talking – which isn't difficult for me to do, as you can tell – and 'So, here are some frequently asked questions: We're not going to report your data, you know? Provide your data on time. When we say we're going to check your data, we're not checking it scientifically. Don't worry. We're only checking that it is FAIR.' And all these things that partners worry about. And they worry about it when they're quite deep in the project. Every time I stand upon in a meeting, I explain the same thing in many ways, I sometimes wonder if it's some sort of dedicated educational provision that is necessary for a partner. Since it is easy for me, as somebody who manages databases or data repositories - I feel it's second nature to me. But to many researchers, having to do that is – apart from being an inconvenience – not something they understand. And many scientists don't understand – even though they are in many EU projects, they don't understand the multi-actor approach. You know, and they might say 'I'm an academic. I think about my academic science'. Now, I would say 'you have to be multidisciplinary, and appreciate the opinions of all these other people, not just your little biology world'. Databases are a bit like that, as EU projects become more sophisticated, multi-actor database – ORDP, open science, GDPR ...' Some or many of the partners are still entrenched in their academic 'must publish papers' bubble.

TREASURE. The data entered in the KR is not controlled. All partners know what to write, what kind of information to share with others. Meta checks are everything is all right and makes some corrections. As soon as possible after the publication.

EMPHASIS. There are a lot of activities on the website and we are promoting activities, organize events. The website is using very often. You can find a lot of information about meetings, training, and webinars, news about publications or presentations at some kind of important conference. We can work with potential innovators.

10./Q26. Is an Advanced Search Option with optional filters available for users?
(Y/N) ___ If Y, describe it___

LIVERUR. Yeah, yeah. I am not sure if we are going to do this here in LIVERUR or in the platform that we are defining yet, but we hope to ... I understand this kind of question, but I think that depends on the project. In our case we will have data for creating new business models, so we will have a database with tools, techniques, etc. – I'm not sure if this is data or if it's a methodology – and we provide specific advanced research for that. The idea is to complete a questionnaire with some very specific questions about their business to provide them the best input for the best methodology and use cases. But this is for the new platform that we are... It's on the definition. Customized approach for the user website.

SiEUGreen. I believe Zenodo does have an advanced search. Or no, actually it does not. But you can search for a PDF.

SmartAgriHubs. Yes. There is one, but we also want to improve it. Here (Figure 3), you can search any words such as 'robots' and then you see the organizations that they have the word 'robots' in their name or their description. You can also have basic filters, so for example, if you want to know all the companies that there are in the Portal organizations by the sectors, such as 'Arable' or just 'Fruit' and then also if you want, for example, 'Fruit' and in a specific part of Europe, such as Italy Malta, you can see the organizations and then if you want to add another country such as France you can keep the same filters from search functionalities. Then, if this is not enough and you want to see the start-up companies of them, we only have three for example, if we have all these filters on. So now, we have actively four filters on (Figure 4, Figure 5) but you can add as many filters as you want and then unclick, etc.

Feed-a-Gene. No not sure, you can search by author by date, very simple.

NEFERTITI. So, yeah, yeah, there is search functionality. The search is can be found easily in the main menu on the header of the website. And within it, you can search the farms by a couple of instances, so you can search by, for example, the network it belongs to, the country where it's at, the demo activities, how it operates, that it's organic. So, yeah, it is, let's say, an advanced search option. the data that is on the platform, but because the data also incorporates data from another project, you can search what's in both databases. Yes, so basically, as I mentioned, you have a search functionality where you can search for different options. So, in NEFERTITI, all of the farms are divided into 10 thematical networks. So, you can search, for example, by the network, you can search by country, you can search by farm type, by demo activities, and whether the farm is organic or not. So, you can search by only the network that you want to see all of the farms that belong to that network, or you can also do network and country, for example. So, you can search by only one of those options or multiple.

LIVESEED. Yes, there filter options in organic enprints for thematic teams, projects, languages, etc.

FAIRshare. There is a basic search functionality right now regarding the Inventory with a search box and multiple filters that the user can combine if he/she desires to limit down the number of results he retrieves. We are currently working on providing a more advanced search option, in collaboration with the ask-Valerie platform.

OPTIMA. No, there is no Advanced Search option with optional filters on this website.

RUSTWATCH. You can search on maps and charts where and when a certain race or genotype was found globally. See also our Dashboards searching on which cultivars are affected early in the season by rust and which are not (Early warning tool). Yes, this is an advanced search.

MycoKey. On the website, it is possible to search for scientific articles by open word search and to narrow a search by WP, for the HumHub Basic search platform.

DIVERSIFOOD. No.

BOND. The free text search function is a difficult tool to develop, especially in the WordPress template used in the project. A lot of time was used on developing a toolbar with a search function. For the virtual library, they developed 6 themes and then no further search possibilities.

TomRes. There is no answer.



TREASURE. No.

EMPHASIS. There is no answer.

11./Q27. Do/Did you also present content on your KR that was not developed by the MA?
(Y/N) _____ **If Y, what content and why?** _____ **If Y, what license terms/agreements are/were used?** ____

LIVERUR. Most are about or project. We probably have linked to other projects or their sister projects, but not specific data – properly news or the link to them.

SiEUGreen. No.

SmartAgriHubs. Yes, as you see in the 'Library' many documents that are uploaded by our users so not everything is developed by the partners of the project. So yes, we do have. But I do not know exactly the percentages between the people that are partners of the project and outsiders. We have in general data management policy of the project, but we do not have any specific license or agreement that we use.

Feed-a-Gene. No.

NEFERTITI. So, on the platform, yes. Again, regarding the farm demo database. And for example, on our website, we also have a section where you can find useful information and links which are not made by anybody from NEFERTITI. So it is usually sent for example to BioSense by other partners of the project. So if they're working, let's say, or something which is tied to NEFERTITI but is not a NEFERTITI activity on its own, it can be put on the website because the partners are the ones working on it or, for example, producing some videos or some useful, for example, handbooks or something like that. So that can be put on the website if we find it connected to what NEFERTITI is about.

LIVESEED. Yes. The material was used as supplementary information that is not directly connected with project results. About 30 %. This contains statistic data, but also existing knowledge in a different local language that contributed to the project. We also build our knowledge on the experience and outcomes of former or parallel MA projects

FAIRshare. Yes, we use licenses, terms, and agreements for provided data.

OPTIMA. The majority of the data we use is our origin. If the data are reused from another resource, we inform our users and page visitors because we respect the licenses of data.

RUSTWATCH. However, there is data from the VCU testing from 109 test sites, of which only 26 are part of the project.

MycoKey. No.

DIVERSIFOOD. No. Data not developed in the project was not presented.

BOND. Yes - a virtual library, only links to the material.

TomRes. I would assume it is only content that's been gathered in the project. However, you probably appreciate that some of the data that's acquired is not acquired just with EU funding. So, the EU funding might support the gathering of some experiments, but, for my case, I'm also supported by the Scottish government, and the money that the EU gives me is not sufficient. And that's OK. Where the data acquisition is funded by two parties, you both have the same obligations under ORDP, open science, and open data sharing – there's no conflict. But if that data is also supported by an industry that has provided some background IP, the way that data is handled might be different, so we do like to know if data has been put in a repository, where it comes from, who funded it, and the extent to which it can't – it shouldn't be given to us if it's going to be confidential. Or if it is, we need to know what the restrictions are. We don't want to put something on Zenodo eventually and find out that it's a confidential method that's protected by, you know, licensing for example. So yes, it is possible to have data in the database from a non-EU funded source; that's feasible. We just have to check; we just have to be aware of that and account for that in the metadata form.

TREASURE. No - apart from photos, which came from partners' archives.

EMPHASIS. We have not any original data coming at the beginning of the project. After that, we started to collect people who are working with some problem and we started to share the information which is coming out of the project and it is more or less our origin.

12./Q28. Did/Will you make any major changes or improvements to the KR throughout the lifetime of the project?

If Y, what changes and why? __ Did you face any challenges? __ Are there any lessons learned or advice for other MA projects? __

LIVERUR. We ... yes, this is what I try to ... it's difficult for us to manage all the different tools that we defined theoretically for helping for the rural areas, for the rural businesses' businessman, businesswoman. So this is now a challenge how to provide the information to them easily and this was not foreseen from the beginning, so we are under progress trying to define the best way, but yes, some change will happen in the following months and we hope to have this defined by September and yeah, we probably we should change some of the ways that they access data and make the methodologies. I think regarding data ... will probably it's always the same, but it's very important to have a well-defined data management plan, real and adapted to the project because from my point of view, this is not the idea of the project and there are a lot of partners that are not technical and are not in the idea, they don't know exactly how to manage data, and usually they define a very generic plan – sometimes copy and paste – and I think it's very important to think from the beginning, trying to define from the beginning this strategy, but the real strategy and trying to imagine how they are going to manage exactly the place and how they are going to manage daily the data in the data management.

SiEUGreen. There is no answer.

SmartAgriHubs. With the other work packages. In two weeks, we will launch two new tools in the Portal. I can self-assessment for Digital Innovation Hub and like self-assessment for technology competing centers and, in the future, we would also have a 'Match-Making' function. So, imagine, these organizations, that I show you in 'Network'. For example, an organization in Ireland is looking for an organization in Bulgaria and they could easily just apply a few filters or getting touch with someone they could start collaborating, so we want to have these 'Match-Making' features. Nevertheless, we also have a forum, where people can write their opinion and get in touch with each other. So, the software that we use that is external but the Data Management and everything we retrieve it is internal and is saved on our internal server. I think it is really important to highlight that we have more than 160 partners, so it is a challenge to bring all the interests in one common place and make one that will be useful for everyone. So, there are of course a lot of negotiations, coordination and communication and talks and so on. But I think it is just a magnitude of the project and try to align the different interests of the people. I think there are many lessons to be learned, but the most important one is the communication and being clear and what the objective of this tool or this website and so on, because everyone at the micromanagement level is looking for their interest but you need to have a clear overview what you want to achieve at this website or Portal and try to fit the small pieces inside to make the big puzzle. I would say that the biggest lesson that we learned is trying to get feedback and do lots of cost thinking groups and cost thinking alone with the partner's trial the process.

Feed-a-Gene. A little bit. At first, it was simple and during the project, I added some fields I added some new categories of publications and like that.

NEFERTITI. Well, it depends on what people see as major changes, but the platform itself is constantly getting updated and upgrades based on the needs of the project. So, whenever we have monthly meetings of all of the work package leaders and whenever we see that something could be done better, or that we need new functionality, we try to implement something new on the platform. So, it's constantly developing and changing. Sometimes it's something very minor, sometimes it's something a bit bigger. For example, now we're working on a functionality to be able to register for the events on the platform. So, you know, constantly doing something new to make it more accessible, more interesting to people. Well, the only thing that we're constantly working on is how to make it more, I don't want to say interesting, but how to motivate the farmers to visit the platform more often, and how to have sort of a habit of finding useful information there. So, it's always about the end-user and how to make them come to the platform as often as possible. I would say mostly just listening because we work with, as I mentioned, we have like ten networks and each network has a leader who is working with the farmers. So, it's just listening to the feedback that you receive from them because in the end, it's about what the end-user thinks. You know, maybe we think that the platform needs something and some spectacular solution, but if it's of no use or value to the end-user, then then, you know, you shouldn't implement it.

LIVESEED. No. It would be good to have a common template for DMP like for the consortium agreements. A big challenge was to instruct partners to follow DMP.

FAIRshare. Yes, for sure, for the website project. The main challenge that we will have is to connect with other projects and also with other initiatives in different countries, that will be the biggest achievement. Our project



website is not only focused on FAIRshare and we are trying to enlarge the focus and that will imply frequently to add new functionalities to the project website. It is mandatory for our project and this is an obligation and concern that we have for our partners. We were very lucky to start the design and development at the beginning of the project. We followed a very thorough design phase for 6 months, but even so, we could not predict everything from the start. We are continuously working on it and we will add new functionalities or improve features that are already there. We have very good collaboration with the users and the partners of course and when we get feedback, we are trying to translate it into improvement or new functionalities. We are also open to everything happening in our society. For example, during the Covid-19 crisis, we responded quickly and added a new filter regarding the DATS which were most used during the pandemic. The more time you invest in the design process, the better result you will get. We pursue constant engagement for the end-users. We know our partners very well and we always collaborate with them and have our users in mind. We are trying to engage and keep our target audience in the project. Sometimes it is quite difficult, and it is a huge challenge.

OPTIMA. That was the interactive process. The project of the portal was started by collaboration on how to build this portal. All partners were provided input on how the content should be arranged or how the interface should look like, also was used and brainstorming from other partners. Since the beginning, until then nothing was changed, neither interface nor content.

RUSTWATCH. Yes. All tools, and services we develop ourselves, and they are improved every day throughout the project. Advice: develop common tools and services and include actors and end-users right from the beginning. Do not always (only) ask farmers what they want, because agriculture, in general, is conservative.

MycoKey. Yes. All tools, and services we develop ourselves, and they are improved every day throughout the project. Advice: develop common tools and services and include actors and end-users right from the beginning. Do not always (only) ask farmers what they want, because agriculture, in general, is conservative.

DIVERSIFOOD. Yes. The external partner managed the website as subcontractor. This was a problem. Each time something had to be changed, they charged the project. After a while, the whole website was rebuilt by the partner (FormicaBlu) to regain control of the website.

BOND. The search tool took up a lot of time. They had to change to host at some point to get something with more sufficient power. Everything was moved overnight.

TomRes. I'm not the IT specialist, from the profession, who oversees everything. We have another guy, Mark Young, who works specifically as the IT specialist. He's also a plant physiologist. So, he understands a lot of the data that comes in. And he's always updating the reports that we keep the server the most up-to-date server; we might buy a new one occasionally. And the way the data server fits with our institutes' IT system, that interface could change – you know firewalls change, security changes, operating systems can change. So, in that sense, we're always trying to keep the repository state of the art. That relates more to the – not to the database itself, but the operational capacity of it. And we change it all the time. We are always making incremental improvements. Spend more time communicating with your partners what the database and what it does and just make videos – anything that means partners can regularly and easily remind themselves and assure themselves of what the purpose and operational structures of the database are. And I think, next time I would make a video that's of good quality, two minutes, maybe a bit longer – two and a half minutes, to just say, 'This is what it's about. Don't worry. We're not going to...' You have lots of documents and guideline sheets and you've got all that stuff, but partners don't read them. So always market your database internally.

TREASURE. No, we did not make any drastic changes. After Italy left the project, Boris took the webpage project and because of the complicated structure, the design was not changed. It was a challenge to take a webpage from other partners and he must study all from the beginning.

EMPHASIS. The main instrument of information was modified following our activities. We decided to put calls on the web site, this activity was not available before.

13./Q29. KR Maintenance Sustainability of platform How will the maintenance of the KR be ensured? For how long and with what resources?

LIVERUR. In fact, not. I'm not sure how we are going to provide the sustainability of the platform after the project. I mean, this is always – or at least for us – this is something that is usually not defined and in this case we should define because when we won't have support for the project, we are not sure how to get funds that list for the maintenance of the website. Yeah, that's also important for the website you are still going to build for the users.

SiEUGreen. There is no answer.



SmartAgriHubs. Now until 2022, this Innovation Portal is part of our budget as work package 1 for communication and ecosystem building. So, we have the resources to maintain it and improve it and so on. After the ending of the project, we are looking for a sustainable way of maintaining it. I think the power will be the power of community, but it is still an ecosystem that is growing and you will have to make sure that the Portal is a useful tool for them who being interested even if the project is done or working anymore or running. We also try to link this project with other projects in Europe so not only SmartAgriHubs but and other agricultural projects. So, the more communities involved the more the diversity and richness of the information and the knowledge there, we make it self-sustainable in the future.

Feed-a-Gene. There is no way to do that. I am because we are paid to do that. So, we are maintaining the websites ourselves but not when the project is over. We are going to maintain the project as long as we can but there is no formal way to do that the repository will be In the next few years.

NEFERTITI. Yes, so it is agreed that after the project ends, the BioSense Institute will provide, for two more years, we will be maintaining the platform.

LIVESEED. The maintenance of project results in the web page will continue under project lifetime, and data in other reservoirs - feeding relevant and structured targeting information. Monica thinks that all pieces of knowledge that were created under the project frame will appear in a different format in different knowledge reservoirs. Such a way of sharing information should reach target groups in a better way. The main idea is to use or to connect your knowledge with existing knowledge platforms that are fed by other resources also.

FAIRshare. It is a question of millions of dollars. We think what the digitally advisory tool will have a huge success in the future in all of Europe. At this moment we are thinking about how to keep this project webpage alive and this is based on FAIRshare community. If you can create this community, I am sure, that the project website and outputs can be used as a repository for future projects. Our experience in the Eureka project helped us also. I hope what we will create a very nice platform and people will visit it after the end of the project. If we manage to create a need for that, then I guess that somehow, we will find resources for its maintenance.

OPTIMA. The end of the project will be in the next year. At this moment there are no plans to maintain the KR beyond the project life.

RUSTWATCH. The web site will be alive and updated up to five years after the project has ended. The wheat rust toolbox is long-lasting as it also serves data storage and management of data from the Global Rust Reference Centre and The Borlaug Global Rust Initiative (A global community funded by Bill & Melinda Gates Foundation). The project itself will not receive any basic funding so after this. The website will also benefit countries outside of Europe e.g. in Asia and Africa. See also Rusttracker.org.

MycoKey. Project partners will have access to the website, the project coordinator will ensure that it will stay "alive" and accessible for 5-10 years. HumHub will be maintained until the end of the project and as long after that as considered relevant. All scientific publications are on Zenodo and should be findable on OpenAire (only 3 appear).

DIVERSIFOOD. Legally the project website must be maintained for 3 years. Then it is archived and fixed. It is still possible to find after this amount of years but links that are broken are not restored. There are two options. To freeze as an archive or to upload to a storage repository.

BOND. They committed to keep the website going for 3 years after the end of the project. This is not covered by the project funding. The website will not be updated and worked on. This is a pity as the information is valuable. However, a partner may take over the domain and keep it updated at their own cost.

TomRes. I guess that would be an issue. Yeah, we have databases going back 10 years and we have projects, internally as well as EU projects, that rely on that same structure, and I will give you another piece of advice to partners. I've been with another EU project and we brought in an external database or data repository company. It wasn't my choice. A colleague was coordinating that project. My colleagues' position was, 'I have this partner in another country, and I've got good reports about them, and I'd like to give them a trial'. My position was, 'Yes, no problem, give them a trial.' They did that, and that's fine. But I don't think they got much value out of that. I think the partner involved behaved as if they were doing a service, and that's fine; there's nothing wrong with that. But to me, it's a lost opportunity because they didn't add any value to the science of the project. They just said, 'Give us your data. We will store it in this way. Here are the different gold and green and whatever standards for publications etc., and they talked in very general ways. On project meetings, they'd be on their mobile phones, computers. They were just there in the project as a service provider. Now, in that case, you could be as well subcontracting somebody. To me, a project partner should help deliver the multi-actor aspect of the project. So, if you've got somebody like a database company that's in your project, but they're not adding value to the science, I would question why they're there. So, I am biased from my own experience. But we can bring in a social scientist, plant physiologist, molecular cameras, nutritionist ..., and we can embed them in the database. And when data comes in, we can have that nutritional data looked at by nutritionists; we

can bring it if we need to, science expertise to check the data, and make sure it is FAIR. I don't think a lot of these companies who are specializing in simply data capture can quality assure data in the same way that we can, nor can they add value to the project and its operations in the same way that we can. So that is not so much advice to another project, but might be advised to the EU or to project assessors, to say, 'What should database specialists be doing? And are they behaving as a multi-actor partner in the project or a service provider?'

TREASURE. A duty in Boris's work positions is the maintenance of the KR ensured. He is responsible for this and only he knows how to work with it.

EMPHASIS. We have a lot of nice results and a huge community in the social network. We will maintain the website two years after the project.

14./Q30. Are there any ranking options for the user on your website to rank the results? Could you please specify how you made the ranking of your produced results?

What criteria were chosen to evaluate results usefulness:

- a) Ranking by relevance
- b) Ranking by popularity
- c) Ranking by user ratings
- d) Other (specify)
- e) (Y/N) ____

LIVERUR. There is no answer.

SiEUGreen. There is no answer.

SmartAgriHubs. In the Innovation Portal, we do not have any ranking options yet, at least not for the users. We are planning to do it in the future with badges, so we want every active user, and that could be by the relevance of the document that he/she shares or the organizations, we will have some badges that will indicate the activity in the Portal. Currently, we only have in the Forum the option to rank the posts by relevance and popularity. But it is currently only in the Forum of the Innovation Portal.

Feed-a-Gene. No.

NEFERTITI. Well, the search results are shown in a way that they are ... Because of all the networks, we know, for example, which network is which number. They will have a number and, of course, a name. So, the results are ranked from network one all the way down to network 10. So, you would see first the farmers who are in-network 1 and the last ones which are network 10.

LIVESEED. No ranking on lines was used. Of course, being the administrator of the webpage they could follow the visitors' traffic. Visitor traffic is monitored also for social media.

FAIRshare. Regarding the repository, during the design phase, we had very often discussions about ranking. Some partners were in favor of it, but some were against it, because of competition or conflicts of interest. In the case of FAIRshare we have many commercial applications and it was not so easy to find the solution and we decided not to put the ranking option in. We are thinking about giving priority or boost some of DATS, in some way based on usability and visibility inside the platform, but the ranking is a little bit tricky, so we decided do not to put it there. We can add functionality where the user could say if he uses the tool or not, more like a recommendation for future users or a soft preference, not ranking with stars.

OPTIMA. The page is managed by the company and we know how many people have visited this page in the previous year.

RUSTWATCH. Please look at many dynamic and interactive tools and charts, you can sort according to settings.

MycoKey. No.

DIVERSIFOOD. No.

BOND. No.

TomRes. No, not within our data repository. Again, I do not think most people... During the project, you use the database or data repository. They have the data they want as or before it gets to us. And occasionally they go into it. We have very big projects and very sophisticated datasets, and you are doing a meta-analysis, then we would probably have that information. But it varies by project, what the needs are. Most projects are just depositing data. Some projects, for example, the big landscape-scale kind of projects, have hundreds of hillsides, and people want metadata – harmonized metadata – then we could rank them, yeah.

TREASURE. No. There is a possibility to check how many people visited this webpage or from which country.

EMPHASIS. Yes, we have ranking options. We are using analytics, we can see several visits, we can see the type of the public we have, the kind of readers and followers. The main channels are Twitter and LinkedIn. Social

networks are managed by the manager. Facebook is also used, but the kind of communication on Facebook is different from the kind of communication that we are preparing for Twitter.

15./Q31. How do/did you promote the use of the KR?

LIVERUR. Yes, totally and we certainly use social media constantly – LinkedIn mainly, Twitter, Facebook to promote, and we also have ... This project is about living labs, so we have a lot of pilots and a good network for the dissemination of the use of the project website. And in fact, we are doing this in a co-creation way, so the daily information about the project, it is very important for us. So also, promotion on the ground.

SiEUGreen. Oh, yes, we do promote the website. We have multiple Twitter channels along with Facebook pages where we post often. Yes. And, of course, there is a lot of ... We have like workshops and seminars where we also have this forum.

SmartAgriHubs. I think it is part of the communication strategy that is integrated with all our communication products. So, you can think of our events, leaflets, internal communication, newsletters, videos, and so on.

Feed-a-Gene. Basically, through social media, we used LinkedIn and Twitter.

NEFERTITI. Yes, it is promoted through the network leaders I already mentioned, and through our social media. We have a Facebook, Twitter, LinkedIn. So, it is ... Constantly we post things both from the platform and the website. For example, when there is an event coming up, we promote it there, and then anybody who clicks on it will go directly to the platform.

LIVESEED. The answer is 13.

FAIRshare. The promotion is done by every partner as we have many of them. Each partner has a role to identify key messages and spread all the news in their country around Europe. From the beginning of the project, we had a strong strategy of how we will spread the word about FAIRshare. We are based on digital because it is a digital advisory tool and it has a big digital part. So are doing a huge effort in our social media and it is going with huge success. We are even comparing our members and we do it very well because people are very engaged. We have a strategy to be engaged in EUFRAS, which is a very good way to engage all advisory communities all over Europe. We present and will present this project in exhibitions, fairs in different project events in a case to communicate and disseminate our project. We will start our user cases in the next year and these use cases will have some kind of competition. The competition will improve relations between advisers and society because it is important to engage the civil society in solutions, we are proposing in our user cases. We think that competition will be a very positive thing to promote our products. DATs are a huge and powerful tool in this project.

OPTIMA. There is a dissemination strategy and we promote the webpage itself. There are newsletters and they come out once in six or eight months. The dissemination and communication point of view was managed better than we expected, and we already reached numbers about visitors, about the traffic on the page.

RUSTWATCH. Website, farmers and scientific journals, Reports, Extension new letters, Workshops, and conferences. Local AKIS, embedded in websites, Rusttracker, other websites In Europe as well as outside of Europe.

MycoKey. They promoted the project on FB (Pasquale) and Twitter (Gent uni) with the purpose of dissemination between the website and social media. They did not use LinkedIn.

DIVERSIFOOD. This question was left to Andrea for T1.4.

BOND. They promote BOND in many other projects they work with. They work a lot with social media. They have 2 x FB accounts (a private and a project). They have a twitter account, Instagram, and a YouTube channel for upload of project videos.

TomRes. Yeah, every time we have a project meeting, I am there, saying, 'Remember, you have to give us data? Any experiment you, support us with new data. Originally, in TomRes I took the role of asking partners 'I want a list of all your experiments of the year, and what experiments connected to each other's.' And that was something the coordinator preferred to do that. So, I respected that, and that is fine. So, I received an Excel sheet of a list of projects that were happening each year, which worked for year one year and year two, then started to disintegrate in year three. Also, in TomRes, the database facility is in a separate work package from coordination, whereas in other projects, it can be embedded into the coordination work package. So where do you think it fits best? I am not sure. I am not sure either. I suspect it is probably better embedded in the coordination. And the coordinator says, 'Hey, I want to make that list of project experiments over a year'. Fine. But we work very closely together on that. These projects are – they are very different. TomRes is a very Italian project – look at the number of Italian partners. It is not surprising, and so the Italians manage the Italians. And they know each other quite well; they have worked on those tomatoes for a while. Also, TomRes is a very

scientific or academic project, I would say, heavily scientific. TRUE, the project I coordinate, another project I am involved with, is a very multi-actor. It is not dominated by anyone crop or one country or even one discipline. Here, it is all about water and nitrogen. So, in that sense, it is easy to be all-inclusive. But every project is different, and you must work with the culture of the project. And the interpersonal dynamics of each project are different. So, I believe you require a high degree of people skills for database management, you must be able to get on with everyone and accommodate the different needs. It is almost like being a service provider in a few years, a customer and, we are an aggregator if you like. We aggregate information from a group of consumers and then provide it to the EU.

TREASURE. He thinks about what on the radio or TV stations or at some conferences. No specific promotion for the web page itself. There was a general promotion of the project and at each event (communication or dissemination); the web address to the project was presented.

EMPHASIS. Many of the public can see our information or reports on social media. We have an amazing activity on a social network. We promote our webpage on Twitter, LinkedIn, and other social media. We are promoting activities and organizing events. We use YouTube to be visible.

16./Q32. Was any user feedback collected?

a) If Y, please specify on what:

b) Satisfaction with general information content

c) Engagement and wish to know more

d) On specific knowledge objects

e) On updates or usability cases you fixed

f) Other _____ (specify)

LIVERUR. In fact, and now it is very important for us because we are defining the platform – I'm talking now about the second website that we are creating; we are co-creating. So, we take some feedback, the work package leader and the pilots – once per month probably.

SiEUGreen. There is no answer.

SmartAgriHubs. Yes. The idea is that the Innovation Portal is for the users, so we want to improve constantly based on their feedback, in the sense that this tool is developed for them. So, it does make sense that we developed things that do not fit with the interest of our partners and users. So, at every stage of developing the Innovation Portal, we had focused groups and as you have seen we have organizations from 28 member states, so we also wanted to cover this geographical feedback. So, we organized six focused groups from the beginning of the project until now, so we had one in Ireland, one in France, one in Spain, one in Brussels, one in the Hague, etc. We tried in every focused group that we had to include as many stakeholders as possible, so no one type of stakeholder, but different organization types (e.g. Competence Centre, Regional Cluster, etc.) as it is represented in Figure 3. So, in every focused group, we try to have a diversity of stakeholders that could feedback on the different possibilities or features on the Innovation Portal.

Feed-a-Gene. Not only through the numbers of views or far words or google analytics for YouTube and so.

NEFERTITI. Yes, we did that just last month. We made a Google Form, so with a couple of questions to know the overall opinion about the platform, if they find it useful if they find it user friendly, et cetera.

LIVESEED. There is no answer.

FAIRshare. There is no answer.

OPTIMA. The feedback from users is not collected.

RUSTWATCH. We track our website using SiteImprove, it is too early in the project to say much. We have a twitter account that announces New major data uploads and news stories on our websites, currently 102 followers, but we do not promote it.

MycoKey. Yes.

DIVERSIFOOD. No.

BOND. Yes - visits by country.

TomRes. Regularly, yes. And the most valuable feedback is informal, I would say – just people coming to you with problems, and that is good; that's a form of feedback. "I'm a social scientist", "how do I might enter data into this data collection form?" for example. And I have to say, "We'll need to make a new collection form for you". Or, partners come and say, 'What are you going to do with my data?', then I must ask, 'Why don't you know?', and they reply 'Well, I wasn't listening to the first talk.' Etc. So I think there's always feedback. But the best feedback is informal. So, when you are sitting, talking over coffee during breaks and people talk to you, you make a note of all the things... They would not be talking about it if it was running well. Generally, if



somebody speaks to you there is something they want to check or change or there is something that you have missed.

TREASURE. No answer.

EMPHASIS. Yes, we collect feedback from users.

17./Q33. How was feedback collected?

a) If Y, how is feedback collected?

b) Likes

c) Comments

d) Rating

e) Sending a contact request

f) Contacting another user

Other _____ (specify)

LIVERUR. In the beginning, we took advantage of the first place of the meeting of the committee that we had. We did a workshop for the presentation of this. Then, with all this situation, we moved to emails, but then we defined a slack channel and Google Drive document, or Form, for collecting the feedback. That was not planned, but it was in practice in these days.

SiEUGreen. There is no answer.

SmartAgriHubs. There is no answer.

Feed-a-Gene. There is no answer.

NEFERTITI. No, because not everything that is posted on social media is about the platform; there are other things posted as well so that the feedback was mostly collected through the Google form and because it was an annual meeting of the entire project, so through the workshop, we had there as well. So, we had a one-hour workshop. The Google forum was just a helping tool to go through the workshop. But there was a lot of conversation that arose from the Google form all the attendees were divided into 10 groups and each group filled in their own Google Form.

LIVSEED. The feedback b, d (oral comments, emails after events) was collected during different events.

FAIRshare. We do not have quite well defined that in our strategy for this moment. To get feedback from the main user is a huge challenge. We have two different approaches for that, first try to get feedback from different users directly from social media and from our project website (it is prepared for it). But we think if we will do it personally it will be more valuable (it will be prepared in the future and it will be based on an external survey). We do not have an organized and structured way to take feedback, but if we want to choose some of the given options, we will go with specific knowledge objects and update in usability regarding of platform. We get feedback from partners whom we meet in telcos every few weeks or months or contact by e-mails. They are the main pool of users right now and we get feedback all the time and they give us inspirations to improve things. We are also planning to prepare an external survey to collect feedback in a more structured way.

OPTIMA. We organize some work sessions, meetings with farmers there we demonstrate our website and then we ask people their opinion about our website. We are planning to collect feedback about KR in the future.

RUSTWATCH. Likes: Count of users visiting the website. Count of clicks on links. Keeping track of how often the website is used. A twitter account was used for dissemination. Other: Via Case study region workshops with stakeholders, Excom (that include representatives from 4 stakeholder networks), and project meetings.

MycoKey. HumHub: likes were collected. Also, FB, Twitter, LinkedIn.

DIVERSIFOOD. Yes - Likes; Awaits answer from Frédéric's colleague who has the statistics.

BOND. Yes - Google ANALYTICS, likes.

TomRes. In a more formal way? We put the data plan up every year. We have an idea – the coordinator and me – what needs to change. So, the partners are aware that every year we change the database, but the data management plan we have not changed after the second year. It is just running now, it is rolling. And so, people can input annually, but generally, after the second year, we had addressed most things, yes.

TREASURE. Where is no answer from Boris.

EMPHASIS. The feedback is collected using dissemination activities. The feedback is collected physically from the trainings and events and feedback are collected online by survey in webinars.



18./Q34. What type of information collects/attracts more attention/feedback (Share few examples)?

LIVERUR. Usually, it's more related to what they want to appear on the website – their specific case. They want to be reflected and a specific case on the platform the website on the data that we collect and sometimes the feedback is in that direction. And in second place probably the structure of how the information is organized or visualized. These are the most two most important areas for feedback.

SiEUGreen. Right now, we have this app called the Common Urban App, which is promoting urban agriculture and it has seen a lot of feedbacks among different students as well as like Facebook posts. So, I would say those.

SmartAgriHubs. I think the most popular section in the Innovation Portal is the 'Network' page. This is very useful for a company that just comes in and does not know what the competitors in the different sectors are or what are the people that might be used to partner up in a new project. You can see an organization by map or list and use filters too. I think this is a nice feature, because if you do not have the patience to go on the map you can also choose the list view, and then you can see the Organization Type, the Sectors, the Regional Cluster, and the Contact Information. In the future, we would here like to have this ranking or activity in the sense that if this institution has uploaded file documents, one training and has posted five times in the Forum that you see this an active member and someone you can contact for any sort information. It is a helpful tool. In the document, that I have sent you it is explained step by step and if you are also registered in Portal you can go to Documentation, where the Innovation Portal is covered in detail.

Feed-a-Gene. Well, to be fair it never attracted a lot of attention because it is very high technical, so we had some nice views for some videos something like one hundred views and some popular papers are made for the general public we could have them download.

NEFERTITI. I would say demo activities because those are the most innovative things that are worked on right now. So, of course, again, depending on the situation right now, what would be online activities due to the whole Covid-19 situation. But even before that, the most interesting part of the platform was the demo activities, which were done again by the demo farms which we would have in the database.

LIVESEED. Twitter and Facebook (social network) are used to announce new publications, workshops, or dissemination to reach a broad audience as soon as they are released on the home page. That message must be short with an interesting/attractive picture, fast delivered to recipients, repeated delivery of links. Videos and field days are very attractive to farmers and wider audiences. Articles in newspapers or online journals are well received.

FAIRshare. The videos are the best tool to attract and engage different stakeholders and the target audience even going beyond that. We can see videos that were uploaded in our social media have a huge amount of views. Short nonprofessional videos could attract lots of people. Regarding DATS inventory I would say contact information because people want to know who is behind all shared information. The most social aspect of this knowledge is important to build closer relationships. It is my impression that has gotten so used to them and looks for social networks everywhere. Regarding DATS inventory I would say contact information because people want to know who is behind all shared information. The most social aspect of this knowledge is important to build closer relationships. It is my impression that has gotten so used to them and looks for social networks everywhere.

OPTIMA. We create some practical abstracts. There is some small summary of the result. They are in five languages. These abstracts will be uploaded on the page soon. There are prepared eleven or twelve abstracts. Also, the EU commission is interested in them and wants to take them and circulate them among other institution entities and sources of communication.

RUSTWATCH. News stories on major media platforms: Nature, FAO, GRRRC website, RustTracker, GlobalRust.org.

MycoKey. I do not know.

DIVERSIFOOD. Awaits an answer from Frédéric's colleague who has the statistics.

BOND. They do not collect comments but visits on the website. Enrico does not have this information himself. He will ask the project director from Coventry that can extract the information and he will send the report to us once the project director has replied.

TomRes. Hard to say. I think if you ask me that question in 10 years when we can look at how many people have viewed or downloaded the data sets in Zenodo, during the project later... In TomRes, people do know what they are doing. It is very structured, very scientific. Data that needs to flow flows. Speaking generally, the data that gets the most downloads is the data that is synthesized. Are you talking now from within the project or outside the project? Mostly within the project, but you can also mention... Within the project, I question the extent to which partners look at other partners' data and find information. I see it in TomRes, but I also see it



in TRUE and other projects, I must tell partners to read other partners deliverables, for example. Because they are busy looking at their work. And they go to a talk, and they to the General Assembly meeting. And they will see high-level reports with some graphs and some slides, but that is only a snapshot. It is only a small part of a much bigger picture. But if you want to see the bigger picture, you must read the 20 or 30 or 40 or 50-page deliverable. And so, to me, the most valuable and impactful outputs are the deliverables. And partners do not generally read other deliverables. I would even question whether many partners read other work packages' technical reports. Because they are busy in their world. So, I'm kind of concerned about how much pressure research scientists are under because I do believe they are under immense pressure. And I won't be mourning about my workload, but... People just keep piling things onto researchers and many of them are just grateful to have a job, and they keep saying, 'yes, yes, yes, yes, we'll do that, we'll do this', but what they do is get their papers done. And if you were to take a researcher and look at all the things they do, your eyes would pop out. You know, you start taking stocking all, reviewing papers, writing papers, writing grants, reviewing grants, supervising students, knowledge exchange, contributing to databases ... - the list just goes on and on and on. So, you must question whether keeping people intensely busy, with tight deadlines and overworked... They could be downloading more data and making more of what is on their doorstep, but they're running so fast just to keep still, to stay in the same place. I do not think a lot of people download data unless they need it as part of the project. OK, thank you very much. And on the website, I saw you have also a lot of practice abstracts – do think they are useful for end-users? I think they can be, yes. There is the EU practice abstract repository that the last time I checked was not searchable or mineable. So, I think the best thing you can do with the practice abstracts has put them on your website – at least then people can see it. People who are interested in tomatoes will find tomato relevant practice abstracts. But maybe Zenodo is a better place. You know, just straight to Zenodo. Not in TomRes but another project I'm in – I encouraged TomRes to do that, but they haven't done it yet – is that when project output or practice abstracts, or anything else, are created, that they are uploaded to Zenodo, and that they are given a DOI immediately. Do not wait for them to appear six months later on Cordis. Who looks at Cordis for information? Even Zenodo – Zenodo is good, but it is not even as popular as ResearchGate. So, what we do is put it on Zenodo. We get a DOI. We then put it onto Research Gate as well, with the Zenodo DOI. And we also put it onto the website. Then we upload it to the EU. So, the data management plan is also linked to the communication and dissemination plan. But to me, that is a better way to use social media that is popular today – but they might be different from the ones that will be popular two years from now. So, you might have to change that strategy. But that is how we have done it. And if you want to increase impact and downloads, do not put it on an EU repository; you put it on the already popular social media repositories. So, what we use Zenodo to start to get the deal on. I think the practice abstracts would be more impactful if they went to Zenodo first, got a DOI, then you put it on your website, then you give it to the EU with its reference at the bottom. 'Please reference this practice abstract as...' Then it becomes traceable as well. And when you are looking for impact metrics, that is quite valuable.

TREASURE. The project (not only this) can cooperate with similar groups of interest not only with partners. There is a need to put links to other organizations and those organizations will put your link too. The information must be shorter because some people do not like to read long texts.

EMPHASIS. We trying to hear needs from stakeholders. We were asking for farmers which kind of need they have, or which kind of problems and we take it into our mind. We share the information with is relevant for farmers. We are in close contact with them.