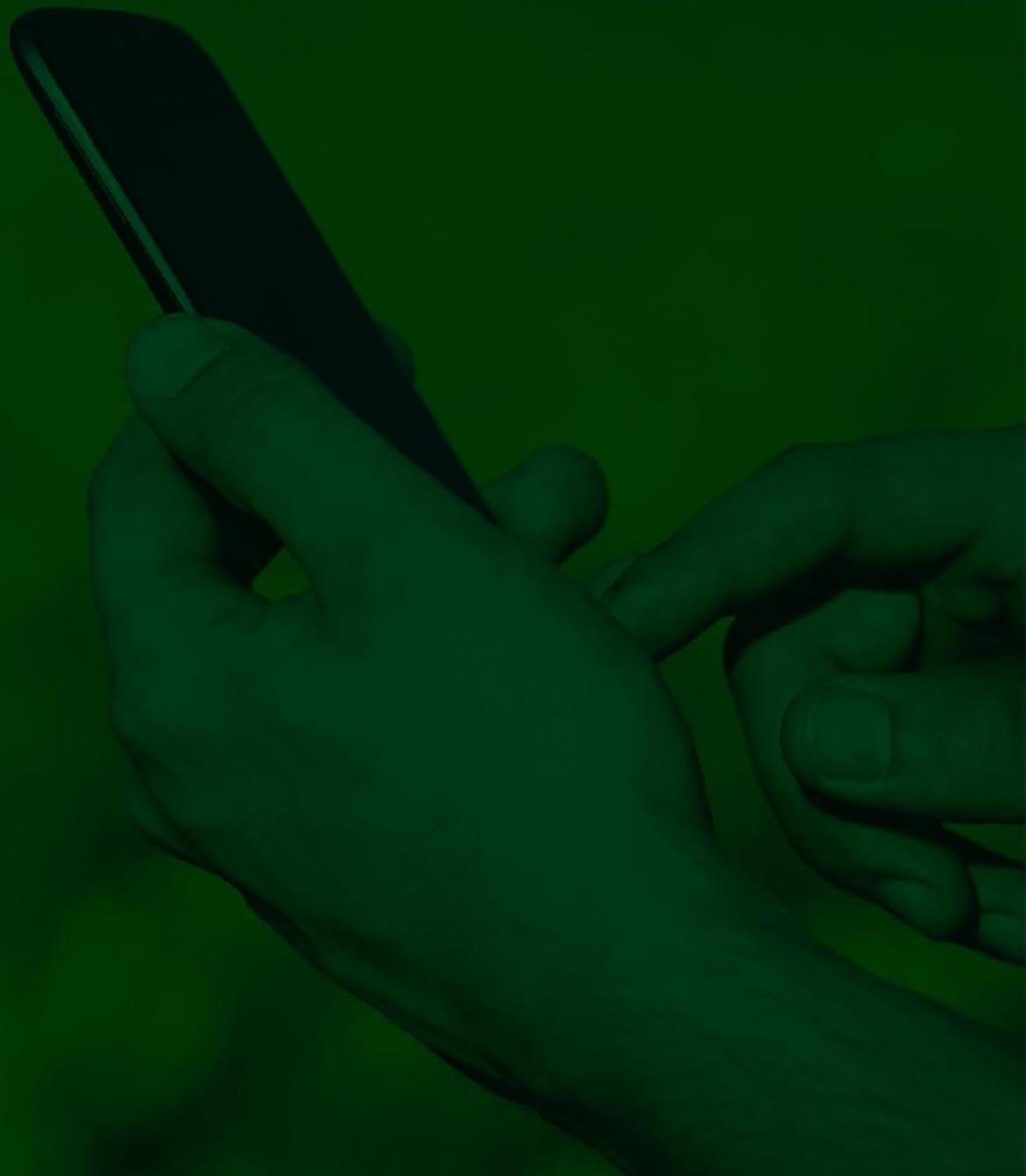




FAIRshare

DIGITAL TOOLS FOR FARM ADVISORS



D3.2: Typology and reference list of popular applications in DA

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Technical References

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Introduction

The document at hand is the result of the work undertaken in Work package 3 “The interface between DA and the advisory & farming communities”, specifically Task 3.2. “Understanding farmer engagement with DA and novel digital technologies” between the project months 13 and 23.

1.1. Survey Aim

The objective of T3.2. was to review current advisor farmer engagement activities and identify motivating factors for farmers and their advisors that actively engage with or not engage with novel digital advisory technologies. The results of T3.2. serve as a basis for the focus groups and the co-design process of T3.3. and T3.4.

Task 3.2. has conducted two separate online surveys with farmers and with advisors aiming to:

- Understand what is working and what is not working in the field of digital advisory tools and services on the end-user side.
- Understand the motivations for the adoption of digital advisory technologies.
- Identify the digital advisory technology „entry” factors that both farmers and adviser consider when assessing digital advisory technology – capital cost/ongoing costs/knowledge and training costs.
- Assess the baseline knowledge among survey responses of perceived „benefits” of using the digital advisory technologies and of their attitudes to perceived risks of using it.
- Capture details on the communication methods used to raise the knowledge of the benefits of digital advisory technologies.
- Understand incentivising factors that have impacted digital advisory uptake, use and impact.
- Capture perceived „benefits” and „risks” of using digital advisory technologies.
- Understand barriers in the adoption of digital advisory technologies, but also explore tools which receive a widespread use.

The surveys were targeted towards a large population of farmers and advisory. A diverse group of users was addressed aiming to collate information on the adoption of digital advisory among different farming sectors (livestock, field crops, horticulture etc.), different farm sizes, education levels of end-users as well as across a broad age spectrum, both for farmers and advisors.

1.2. Survey Methodology

Upon creating the surveys the consortium considered the following questions methodologically to ensure a representative set of answers:

1. Identification and selection of representative sample members

Within the surveys these concern is addressed by the “Demographic Information” section of each survey. In the case of farmers they cover farm size, agricultural

exploitation as well as all age and educational groups. For advisors the focus was put on different types of advisory organisations, on a vast variety of advisory services as well as a broad age spectrum to ensure a representative sample.

2. Contact and collect survey answers from a broad variety of farmers and respondents

To achieve a broad and representative distribution of survey respondents' two major criteria were considered: a) language proficiency and b) communication channels for survey collection.

A major concern was that many farmers are not proficient in English. Thus many partners decided to translate the surveys in local languages and subsequently transfer the translated answers back to English. This meant additional work on part of the FAIRShare consortium, however at the same time it enabled us to increase the representativeness of the sample. The language issue was less prevalent with advisors.

The distribution channel of the surveys was of concern. The distribution channel was primarily via online surveys. However the number of – not digitally minded – advisors and farmers is expected to be still high. Thus the partner decided to extend the contact channel for potential respondents by using a) telephone interviews, b) in person interviews, c) workshop-based interview sessions, and d) in-person interviews. Due to the multi-channel approach it was possible to collect more responses and thus make the replies more accurate and representative. Personal contact has also improved respondents' willingness to participate.

Hindering factors to the collection of survey answers, was that the collection occurred during the summer when most farmers are busy with fieldwork. In addition the COVID-19 pandemic strongly restricted the possibility for movement and interaction.

3. Evaluation and pre-testing of questions

The surveys were co-created by several of the partners working in T3.2. To ensure user-acceptance and a high-response rate, the questions were pre-tested with farmers and advisors in 8 different pilots across European countries. The acceptance rate was higher among advisors than farmers. Specific feedback was requested (and given) on changes which would increase usability. Before roll-out the surveys were adapted accordingly.

4. Mode for posing questions and collecting responses

Due to the high complexity of both questionnaires, but also the collection logistics with different communication channels and languages, we opted for a majority of multiple choice questions, with very few open ended questions. This resulted in highly structured survey, however making them longer and more complex, due to the attempt to cover as many of the answers as possible.

The collection of responses was done using a hybrid communication model (see point 2). All results were subsequently collated in one online database – in English language – which represented the basic data set for analysis.

5. Data collection and checks

Data collection was done either through direct interaction of end-users (farmers and advisors) with the online survey or by manual input of data in the questionnaires (in the case of telephone surveys and in person interviews).

The online collection of data was done without any direct human checks on data. However some of the questions had some mandatory fields (automated checks), ensuring that a minimum of data for the validity of the questionnaire was available.

In case of the other data collection methods (telephone, in person) the completeness check was done immediately by the interviewer. This surveys have a higher rate of completeness as the ones which were filled online.

To ensure proper data protection and privacy all data was collected anonymously. None of the data sets – or their combination – allows for specific identification of persons and/or enterprises. Additionally, all survey participants could at any time interrupt the survey answer process or discard the data collected from them until the final submission into the database. For data complaints

The timeline for data collection was as follows:

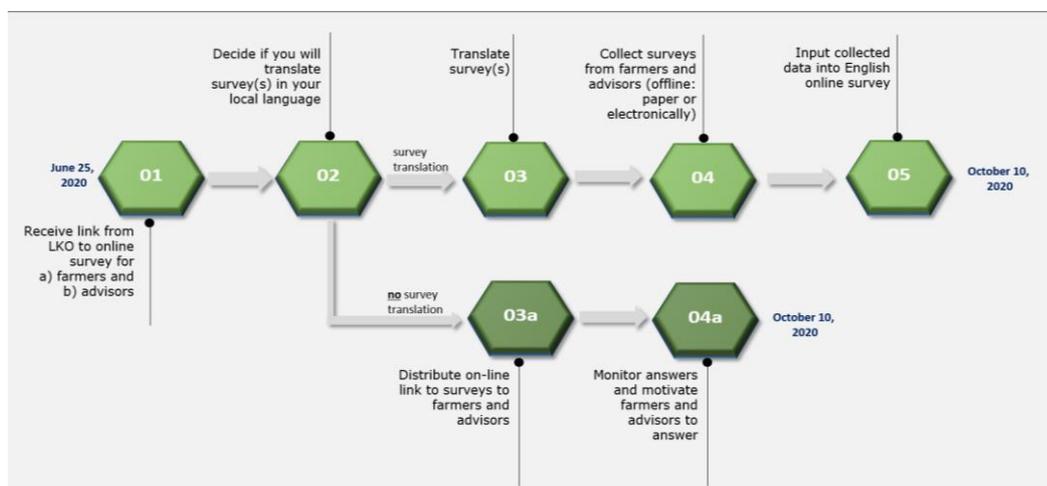


Fig. 1: Data collection timeline for FAIRShare surveys

6. Analysis

The analysis of the collated results was done using the data analytics software Tableau. All data sets were included which contained the minimal necessary data (i.e. demographics data and basic data about the importance of digital advisory tools. The results of the analysis are presented in detail in Chapter 3.

2. Farmer and Advisor Surveys

2.1. Advisor Survey

The advisor survey focused on advisors' needs and interests for digital advisory services. It gathered a broad range of information related to (digital) tools and advisory services. To this end it included four separate sections:

- Within the first section demographic data was collected
- Secondly data regarding the importance of digitalization and farm advisory was asked about
- In the third part the aim was to understand the needs for digital advisory tools and services, and
- Lastly questions about the competences advisors consider necessary to be able to use DATS efficiently and effectively were asked.

Part A - Demographic information

1. In which country are you located?

2. What is the highest educational level you completed? (Please tick the relevant box)

Elementary /primary school	<input type="checkbox"/>
Secondary school	<input type="checkbox"/>
Technical school and/or apprenticeship (approx. 2-4 after secondary school)	<input type="checkbox"/>
University (any level - Bachelor, Master or PhD)	<input type="checkbox"/>

3. For which kind of organization do you work? (Please tick the relevant box)

Self-employed farm advisor	<input type="checkbox"/>	Chamber of Agriculture	<input type="checkbox"/>
Public sector advisory services	<input type="checkbox"/>	Local farmers' group	<input type="checkbox"/>
Farmers association/Farmer union	<input type="checkbox"/>	Agri-input supplier	<input type="checkbox"/>
Bank, legal counsel, accountancy firm etc.	<input type="checkbox"/>	Agri-tech provider	<input type="checkbox"/>

4. What is your role in the organization? (Multiple selection possible)

Farm advisor	<input type="checkbox"/>	Project officer/project manager	<input type="checkbox"/>
Advisor with support role	<input type="checkbox"/>	Manager/Coordinator	<input type="checkbox"/>
Trainer	<input type="checkbox"/>	Other (please specify): _____	<input type="checkbox"/>

5. To which of the following topics do you offer advisory services? (Multiple selection possible)

- Cereal production
- Vegetable production
- Plant production (other)

- Dairy production (cows)
- Dairy production (other)
- Meat production in general (beef)
- Meat production in general (sheep)
- Meat production in general (pigs)
- Meat production (poultry)
- Meat production (other)
- Aquaculture
- Farm-based added-value/diversification processes
- Farm management & Economics support
- Other (please specify): _____

6. How old are you? (Please tick the relevant box)

< 20	<input type="checkbox"/>	40-49	<input type="checkbox"/>
20-29	<input type="checkbox"/>	50-59	<input type="checkbox"/>
30-39	<input type="checkbox"/>	>60	<input type="checkbox"/>

7. For how long have you been working as a farm advisor/in the farm advisory field?
(Please tick the relevant box)

less than 1 year	<input type="checkbox"/>	6 - 10 years	<input type="checkbox"/>
1 – 2 years	<input type="checkbox"/>	10 -20 years	<input type="checkbox"/>
3 - 5 years	<input type="checkbox"/>	more than 20 years	<input type="checkbox"/>

8. Gender (Please tick the relevant box)

Male	<input type="checkbox"/>	Other	<input type="checkbox"/>
Female	<input type="checkbox"/>	Prefer not to say	<input type="checkbox"/>

Part B – Digitalization and farm advisory

9. What is the degree of personalization (to the farmer's needs) in your farm advisory services? (Please tick the relevant box)

less than 10%	<input type="checkbox"/>	51 – 65%	<input type="checkbox"/>
10 – 20%	<input type="checkbox"/>	66 – 80%	<input type="checkbox"/>
21 – 35%	<input type="checkbox"/>	>80%	<input type="checkbox"/>
36 – 50%	<input type="checkbox"/>		<input type="checkbox"/>

10. To which of the following categories belong the digital farm advisory services you offer?
(Multiple selection possible)

One-to-one farm advisory (online, phone call, personal, text)	<input type="checkbox"/>	Online discussion and knowledge exchange groups	<input type="checkbox"/>
Social media	<input type="checkbox"/>	Radio, TV	<input type="checkbox"/>

Digital newsletter	<input type="checkbox"/>	Blogs at regular times	<input type="checkbox"/>
Chats, forums, message groups	<input type="checkbox"/>	E-mapping, Drawing	<input type="checkbox"/>
Tutorials	<input type="checkbox"/>	E-Learning Platforms	<input type="checkbox"/>
Webinars/Farminars	<input type="checkbox"/>	Videos	<input type="checkbox"/>
Messenger Services	<input type="checkbox"/>	Infographics	<input type="checkbox"/>
Mobile apps	<input type="checkbox"/>	Analysis and benchmarking	<input type="checkbox"/>
Farm advisory subscription services (e.g. an annual or monthly advisory farm plan)	<input type="checkbox"/>	Real time monitoring and decision support	<input type="checkbox"/>
Client Billing Management	<input type="checkbox"/>	E-applications and regulations	<input type="checkbox"/>
Customer Relationship Management	<input type="checkbox"/>	I don't use digital tools (N/A)	<input type="checkbox"/>

11. What kind of information do farmers request from you in the context of digitalization?
(Multiple selection possible)

Digital tools for specific farm services (e.g. milking robots, fertiliser, yield mapping,...)	<input type="checkbox"/>
Technical information (hardware, software) in the context of digitalisation	<input type="checkbox"/>
Information about the use of social media	<input type="checkbox"/>
Information related to preparation and submission of online subsidy forms	<input type="checkbox"/>
Information about Internet of Things (IoT) solutions	<input type="checkbox"/>
Advice about data privacy and security	<input type="checkbox"/>
Information about the use of online products and services (webpage, apps, web shop, online newsletter)	<input type="checkbox"/>
Information about information systems or services for farm management (e.g. electronic time records etc.)	<input type="checkbox"/>

12. What percentage of your clients (farmers) use digital tools in their activity (e.g. for communication, farm management, crop management, animal management etc.)? (Please tick the relevant box)

less than 10%	<input type="checkbox"/>	51 – 65%	<input type="checkbox"/>
10 – 20%	<input type="checkbox"/>	66 – 80%	<input type="checkbox"/>
21 – 35%	<input type="checkbox"/>	>80%	<input type="checkbox"/>
36 – 50%	<input type="checkbox"/>		<input type="checkbox"/>

13. Please indicate to which extent you agree/disagree with the main benefits/positive impacts associated with DATS. (1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

DATS Impact	1	2	3	4	5
Increase of productivity	<input type="checkbox"/>				
Improvement of yield quality	<input type="checkbox"/>				
Optimization of resource use	<input type="checkbox"/>				
Environmental protection	<input type="checkbox"/>				

Biodiversity preservation	<input type="checkbox"/>				
Increase of profit/farm income	<input type="checkbox"/>				
Minimization of input costs	<input type="checkbox"/>				
Effective strategy planning	<input type="checkbox"/>				
Effective operational management	<input type="checkbox"/>				
Financial assessment/reporting	<input type="checkbox"/>				
Task scheduling/time management	<input type="checkbox"/>				
Labor saving/limit stress/increase famers leisure time	<input type="checkbox"/>				
Limit human exposure to chemicals	<input type="checkbox"/>				
Limit the number or severity of human injuries	<input type="checkbox"/>				
Compliance records management	<input type="checkbox"/>				
Effective operational management	<input type="checkbox"/>				
Better interaction between advisor and farmer	<input type="checkbox"/>				
Control of animal health problems	<input type="checkbox"/>				
Better interaction between advisor and farmer	<input type="checkbox"/>				
Enhanced adaption and resilience to climate change	<input type="checkbox"/>				

14. For each of the following statements concerning digital advisory tools and services (DATS) please indicate the extent to which you agree or disagree.
(1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

	1	2	3	4	5
Using DATS in my work as an advisor is important	<input type="checkbox"/>				
The valued added by DATS to my advisory services is clear	<input type="checkbox"/>				
I don't know what DATS exist and how I could use them in my field of advisory services	<input type="checkbox"/>				
There are incentives/supports in place from my management/organisation to use DATS	<input type="checkbox"/>				
Other advisors influence me in my decision to use DATS	<input type="checkbox"/>				
I am confident in my ability to use DATS correctly	<input type="checkbox"/>				
Most DATS are user friendly	<input type="checkbox"/>				
The investment cost for DATS (i.e. capital costs, training costs, on-going costs) is high	<input type="checkbox"/>				
Existing DATS are mostly compatible with one another	<input type="checkbox"/>				
There is a lack of access to raw data for DATS	<input type="checkbox"/>				
My organisation adheres to data privacy regulations like GDPR	<input type="checkbox"/>				
My organisation adheres to proper data security	<input type="checkbox"/>				
My organisation adheres to proper data management (data ownership and sharing)	<input type="checkbox"/>				
My organisation adheres to proper data storage	<input type="checkbox"/>				

15. For each of the following statements concerning digital advisory tools and services (DATS) please indicate the extent to which you agree or disagree.
(1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

	1	2	3	4	5
The use of digital tools by farmers in farm management is beneficial	<input type="checkbox"/>				
Farmers have the necessary digital competences to use DATS	<input type="checkbox"/>				
Face-to-face advice to farmers is important even if a digital advisory tool is available to perform the service	<input type="checkbox"/>				
Farmers trust that their data is being used appropriately by DATS	<input type="checkbox"/>				

Part C – Digital advisory tools and services utilized

16. What types of digital tools and services (DATS) do you use?

Standalone applications (Software installed on your computer) <input type="checkbox"/>	Web-based/Cloud-based applications (e.g. Facebook) <input type="checkbox"/>
Client server applications (e.g. E-Mail, Skype, WhatsApp) <input type="checkbox"/>	Mobile apps <input type="checkbox"/>
Spreadsheets (e.g. MS Excel) <input type="checkbox"/>	Others (please specify): _____ <input type="checkbox"/>

17. If you use digital advisory tools and services (DATS), which do you find the most useful? (If applicable please name the 3 most useful tools for you)

Tool 1: _____

Tool 2: _____

Tool 3: _____

18. Please provide the following information about the most useful tools (if applicable):

Tool	Tool 1	Tool 2	Tool 3
Source where you obtained the tool			
Why do you consider the tool useful			
How long have you used the tool (in years)			

19. Where did you get information about these tools? (Multiple selection possible)

Fairs, Agriculture events and shows	<input type="checkbox"/>	Farmers	<input type="checkbox"/>
Further training events or conferences	<input type="checkbox"/>	Ministry of Agriculture/ Chamber of Agriculture or other public institution	<input type="checkbox"/>
Farmers' union/ Farmers' association	<input type="checkbox"/>	Research institutions	<input type="checkbox"/>

Farmers	<input type="checkbox"/>	Agri-input/tech supplier	<input type="checkbox"/>
Other farm advisors	<input type="checkbox"/>	Internet	<input type="checkbox"/>
Advisors Networks (EUFRAS, IALB, ...)	<input type="checkbox"/>	Other	<input type="checkbox"/>
From the organization I currently work for	<input type="checkbox"/>		

20. Where do you get the data from which you use in your digital advisory tools and services (DATS)? (Multiple selection possible)

Manual input	<input type="checkbox"/>
Technical third party services (i.e. satellite services, weather services)	<input type="checkbox"/>
IoT (Internet of Things) installed devices (i.e. sensors, probes, GPS, camera)	<input type="checkbox"/>
Administrative third party services (i.e. CAP data, fiscal data, transaction data)	<input type="checkbox"/>

21. [Only if “IoT” was chosen in Q19): Which data do you use? (Multiple selection possible)

Sensor data	<input type="checkbox"/>
Barcode/QRcode data	<input type="checkbox"/>
RFID (radio frequency identification) data (e.g. for identification of livestock, tracking of agricultural products across the supply chain)	<input type="checkbox"/>
Others (please specify): _____	<input type="checkbox"/>

Part D – Digital advisory tools and services training

22. Please rank the **5 areas** you feel you need training and knowledge (1 being most needed, 2 being the second most needed etc.)

Please rank 1-5	
Using online meeting technologies (i.e. software for webinars, online meetings etc.)	
Creating blended learning content (i.e. webinars, online courses, farminars)	
Methodological support in farm advisory services when using new technologies (e.g. farm advisory via whats app, chats etc.)	
Compliance and data protection regulations in online farm advisory services	
Creating online information material (general)	
How to realise online applications for subsidies	
Database search for specialised information	
Data acquisition knowledge (how and where to get the data)	
Data processing knowledge storage and use (e.g. excel)	
Data visualisation knowledge (how to present and communicate the relevant findings)	
Data analytics knowledge (e.g. statistics, relationships)	

23. Please rank your **3 most preferred methods** to receive information and training about DATS (1 being your favourite, 2 being your second favourite, and 3 the least favourite).

Please rank 1-3	
Blogs	

Written documentation (handbooks)	
Video tutorials	
Online training	
Webinars	
Face-to-face interaction	

2.2. Farmer Survey

The goal of this survey was to understand farmers' needs and interests regarding digital advisory services (DATS) in different European countries. For this purpose the survey was structured in three different parts:

- Part A – Demographic information
- Part B – Needs fields for DATS
- Part C – Technology.

Part A - Demographic information:

1. In which country is your farm?

2. What is the total area cultivated /farm enterprise size:

- <2 ha
 2-10 ha
 11-50 ha
 51-100 ha
 101-200 ha
 201-500 ha
 > 500 ha

3. What is the legal status of your farm:

- Family farm or family company
 Company without family shareholder
 Cooperative farm
 Other (please specify): _____

4. What is your age?

- < 20
 20-29
 30-39
 40-49
 50-59

>60

5. Gender

- Male
- Female
- Other
- Prefer not to say

6. What is the highest educational level you completed?

- Elementary/primary (approx. 4-7 years of general education)
- Secondary school (approx. 8-12 years of general education)
- Technical school and/or apprenticeship (approx. 2-4 years follow-up after secondary school)
- University (any level, Bachelor, Master or PhD)
- Other (please specify): _____

Part B – Needs “fields” for DATS:

7. What agricultural sector are you active in (multiple selection possible, please check/tick the according boxes):

- Cereal production
- Vegetable production
- Plant production (other)
- Dairy production (cows)
- Dairy production (other)
- Meat production in general (beef)
- Meat production in general (sheep)
- Meat production in general (pigs)
- Meat production (poultry)
- Meat production (other)
- Aquaculture
- Farm-based added-value/diversification processes
- Farm management & Economics support
- Other (please specify): _____

8. For each statement below concerning **Digital Advisory Tools and Services (DATS)** (please indicate the extent to which you agree or disagree)

	1	2	3	4	5
The use of DATS is important in my work as a farmer.	<input type="checkbox"/>				
Other farmers use of DATS influences my decision to implement them.	<input type="checkbox"/>				

I am confident in my ability to use DATS correctly.	<input type="checkbox"/>				
The use of digital tools by farmers in farm management is <u>not</u> beneficial.	<input type="checkbox"/>				
Face-to-face advice from advisors is important even if a digital advisory tool is available to perform the service.	<input type="checkbox"/>				
There is a high investment cost in implementing DATS (i.e. capital costs, training costs, on-going costs)	<input type="checkbox"/>				
DATS are not user friendly	<input type="checkbox"/>				
The value added by DATS is not clear	<input type="checkbox"/>				
Existing DATS are not compatible with one another	<input type="checkbox"/>				
Farmers trust that their data is being used appropriately	<input type="checkbox"/>				
There is a lack of access to raw data for DATS	<input type="checkbox"/>				
Farmers (in general) have the necessary digital competences to use digital tools	<input type="checkbox"/>				
I don't know what DATS exist and how I could use them	<input type="checkbox"/>				

9. Please rank 1 to 5 the main benefits/positive impacts associated with digital tools and services (1 having the most benefit, 2 having the second most benefit etc.)

Increase of productivity	
Improvement of yield quality	
Optimization of resource use	
Environmental protection	
Biodiversity preservation	
Increase of profit/farm income	
Minimization of input costs	
Effective strategy planning	
Effective operational management	
Financial assessment/reporting	
Task scheduling/time management	
Labor saving/limit stress/increase farmers leisure time	
Limit human exposure to chemicals	
Limit the number or severity of human injuries	
Compliance records management	
Better interaction between advisor and farmer	
Control of animal health problems	
Enhanced adaptation and resilience to climate change	

10. How important are the following information sources to inform your decisions? (Please rank according to importance of each source, 1 not important at all to 5, most important)

	1	2	3	4	5	N/A
Public extension service	<input type="checkbox"/>					
Farmers' union/Farmers' association	<input type="checkbox"/>					
Farm advisors	<input type="checkbox"/>					
Private advice (e.g. family members)	<input type="checkbox"/>					

Local farmer groups	<input type="checkbox"/>					
Agri-tech provider	<input type="checkbox"/>					
Agri-input suppliers	<input type="checkbox"/>					
Bank, Insurance, Legal Counsel	<input type="checkbox"/>					

11. How important are the following resources to support your decisions? (Please rank according to importance of each resource, 1 not important at all to 5, most important)

	1	2	3	4	5	N/A
Digital advisory tools (apps, decision support software)	<input type="checkbox"/>					
Public internet (Websites, blogs, on-line videos,...)	<input type="checkbox"/>					
Paper-based guidance (Newspapers, journals,...)	<input type="checkbox"/>					
Discussions with other farmers	<input type="checkbox"/>					
Discussions with advisors	<input type="checkbox"/>					
Training	<input type="checkbox"/>					

12. How often do you talk to a/your farm advisor?

- Every month
- Every quarter
- Every half-year
- Once a year
- Less than once a year
- Never

13. Are there any particular decisions that you rely on farm advisors to make?

- Yes
- No

14. [Only if "Yes" was chosen] Which decisions are these (please provide some examples)?

15. What topics do you discuss with your farm advisor?

- Production management (crop management, livestock management...)
- Business administration topics (finance and budgeting, operational management...)
- Legal matters (compliance with legislation and standards....)
- Supply chain topics (logistics...)
- Distribution (sales, marketing)
- Alternative business models (agri-tourism, educational and leisure events, social farming....)
- Subsidy management, applications, compliance
- Environmental issues (Green House Gas measurement and management)
- Other (please specify): _____

16. Do you know if your farm advisor uses software, mobile apps, or digital tools and services to help you?

- Yes
 No

17. Please indicate how comfortable you are to share farm input data (e.g. fertilizers and pesticides application etc.) (Please rank according to level of comfort, 1 not at all to 5, very comfortable)

	1	2	3	4	5	N/A
With your farm advisor	<input type="checkbox"/>					
Farmers union	<input type="checkbox"/>					
Public administration/government	<input type="checkbox"/>					
With service/technology providers	<input type="checkbox"/>					
Public extension service	<input type="checkbox"/>					
Farmers' association	<input type="checkbox"/>					

18. Please indicate how comfortable you are to share production data? (Please rank according to level of comfort, 1 not at all to 5, very comfortable)

	1	2	3	4	5	N/A
With your farm advisor	<input type="checkbox"/>					
Farmers' union	<input type="checkbox"/>					
Public administration/government	<input type="checkbox"/>					
With service/technology providers	<input type="checkbox"/>					
Public extension service	<input type="checkbox"/>					
Farmers' association	<input type="checkbox"/>					

19. Please indicate how comfortable you are to share data derived from machinery use? (Please rank according to level of comfort, 1 not at all to 5, very comfortable)

	1	2	3	4	5	N/A
With your farm advisor	<input type="checkbox"/>					
Farmers' union	<input type="checkbox"/>					
Public administration/government	<input type="checkbox"/>					
With service/technology providers	<input type="checkbox"/>					
Public extension service	<input type="checkbox"/>					
Farmers' association	<input type="checkbox"/>					

20. Please indicate how comfortable you are to share your business operation data (Please rank according to level of comfort, 1 not at all to 5, very comfortable)

	1	2	3	4	5	N/A
With your farm advisor	<input type="checkbox"/>					
Farmers' union	<input type="checkbox"/>					
Public administration/government	<input type="checkbox"/>					

With service/technology providers	<input type="checkbox"/>					
Public extension service	<input type="checkbox"/>					
Farmers' association	<input type="checkbox"/>					

21. Do you trust your farm advisor to respect the confidentiality of your data?
- Yes
 No
22. Do you think it is useful if your farm advisor shares your data with third-parties (e.g. technology provider) if you received a more personalized (better tailored to you) service by it?
- Yes
 No
23. How does your farm advisor provide you advice and information? (multiple selection possible):
- Orally
 Written by hand
 In print
 Digitally

Part C – Technology:

24. Does your farm have broadband internet?
- Yes
 No
25. Do you use mobile devices (e.g. smartphones, tablets) on your farm?
- Yes
 No
26. [Only if “Yes” was chosen] For which kind of apps do you use your mobile devices for?
- Agricultural apps
 Weather apps
 Business administration apps (e.g. timesheets)
 Customer communication
 Communication with other farmers/cooperative/association/farmers union apps
 E-Mails
 Social media (to push information about my farm or to receive information from other farmers, demonstrations etc.)
 Internet surfing

27. Do you use farm management software (e.g. applications for crop management, applications for production management, time management software etc.)?
- Yes
 - No
28. Do you have Internet of Things (IoT) installed devices (e.g. sensors, probes, GPS, cameras) on your farm?
- Yes
 - No
29. What or who influenced your decision to use farming technologies?
- Agricultural media
 - Farm advisors
 - Other farmers
 - Farm discussion groups
 - Tradeshows
 - Classroom education
30. What supports would you prefer to use technology on the farm?
- Face-to-face training specific to your needs
 - Discussion or knowledge transfer groups
 - Dedicated or exclusive agri-tech advisors
 - Video-based training (live or available on-demand)
 - Online documentation
 - Online messaging and chat service
 - Central online resource to assess benefits and limitations from technology
 - Telephone hotline
 - Written documents on paper
31. How do you document your farm data?
- By hand
 - Digitally
 - Both
32. Which external party receives data from your farm? (multiple selection possible)
- Agri-tech provider
 - Technical third party services (e.g. satellite services, weather services)
 - Administrative third-party services (e.g. CAP data)
 - IT-providers (e.g. transaction data)
 - Advisors
 - Public extension service

- Nobody
- I don't know
- Other (please specify): _____

33. Who manages the data collected on your farm? (multiple selection possible)

- You
- Family member
- Someone working on my farm
- Nobody from my farm
- I don't know

34. How long do you/they spend weekly on data recording?

- < 1 hour
- 1-2 hours
- 2-4 hours
- > 4 hours

3. Survey Results Analysis

As a result of the survey process conducted by the FAIRShare partners we collected about 1.000 survey answers in total. Due to the large number of answers as well as the high complexity of the surveys, the following analysis presents their key findings, which are relevant to the next steps in the project. The **focus of the analysis in the following** is to present

- advisors’ and farmers’ perception towards digital advisory tools and services (DATS),
- the barriers and motivations to adopt such DATS in the daily farming/advising practice
- the sourcing and prevalence of specific DATS
- the technological readiness of farms and farmers to adopt DATS, as well as
- the training needs for advisors in providing digital services and tools (DATS) to the farmers.

However the complete data and analysis is available on the project SharePoint, respectively for external users, can be obtained from Mrs. Elena Miron at e.miron@lk-oe.at

Statistical and demographic data

A total of 665 advisors from Europe responded to the survey. The answer intensity was commensurate with the country size. As the survey was made widely available online, there are also some outliers from Eastern Europe. Another outlier is Ireland, who has a higher response rate vis-à-vis its size than any other survey country. Thus the Irish answers carry a relatively higher impact in the following analysis.

Table 1: Distribution of survey answers/country - ADVISORS

Country	# of Responses	Country	# of Responses	Country	# of Responses	Country	# of Responses
Ireland	90	Belgium	65	Lithuania	37	Hungary, Austria	16
France	79	Croatia	54	UK	28		<10

Greece	69	Germany	48	Switzerland	25	Serbia, Moldova, Latvia, Estonia, Poland Ukraine, Norway, Albania, Romania, North Macedonia, Italy, Denmark, Czech Republic, Armenia	
Spain	68	Slovenia	38	Netherlands	24		

Table 2: Distribution of survey answers/country - FARMERS

Country	# of Responses	Country	# of Responses	Country	# of Responses	Country	# of Responses
Portugal	63	Lithuania	34	France	17	Estonia, Slovenia, Norway, Denmark, Moldova, Poland, Bosnia Herzegovina	<10
Ireland	56	Greece	32	Germany	15		
Spain	51	Switzerland	30	Netherlands	10		
Croatia	46	Belgium	23	Austria 9			

Farm advisory services are personal(ized)

The relationship between farmers and their advisors is a personal one.

Asked “To which of the following categories do your digital advisory tools and services (DATS) belong to?” (Fig. 2) the overwhelming majority of advisor answers were “One-to-one farm advisory” as their most important digital advisory service, referring primarily to the communication channel (online, phone call, text etc.). It is also worth observing that the two most frequent service modes include synchronous communication modes between farmers and advisors.



Fig. 2: “To which of the following categories do your digital advisory tools and services (DATS) belong to?” (Advisor survey)

Farmers receive a high degree of personalized services, which are tailored to their individual farm needs. As such almost 1 in 4 advice sessions have a personalization degree of 80% or more (Fig. 3). About 66% of services which farmers receive are customized to their individual needs to more than 50%.

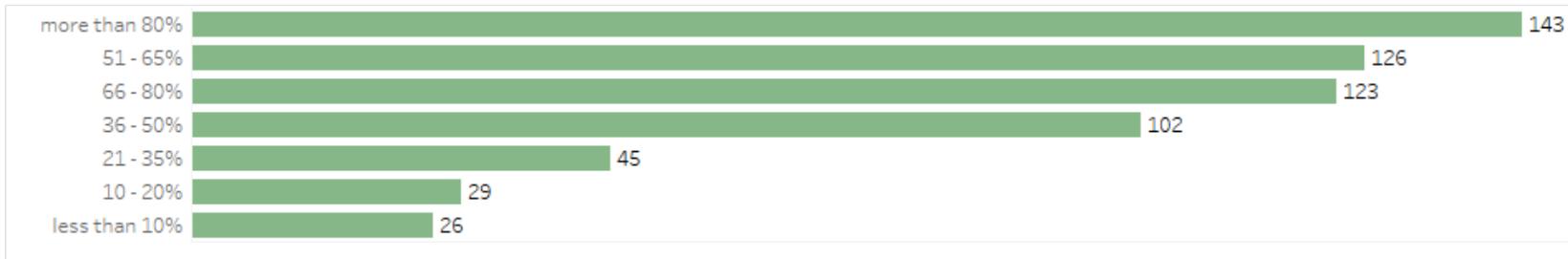


Fig. 3: “What is the degree of personalization (to the farmers’ needs) in your farm advisory services?” (Advisory survey)

Farmers talk to their advisors also quite often. Almost every second farmer (46.66%) are in contact with their advisor at least once a month. And 3 out of 4 farmers (74.55%) talk to their farm advisor at least once every three months (Fig. 4).



Fig. 4: “How often do you talk to your farm advisor?” (Farmer survey)

Farmers include advisors in their decision making process

When asked who influences their decision in general farmers rank “Discussion with advisors” as the most influential factor, closely followed by “Discussions with other farmers”. What should be also remarked that other classic information sources like “Newspapers and journals” as well as the “Internet” are widely used for decision support. While still at the lower end of the influence (with about 158 strong influence answers) digital advisory tools (like apps, decision support systems etc.) have entered the decision universe of farmers (Fig. 5).

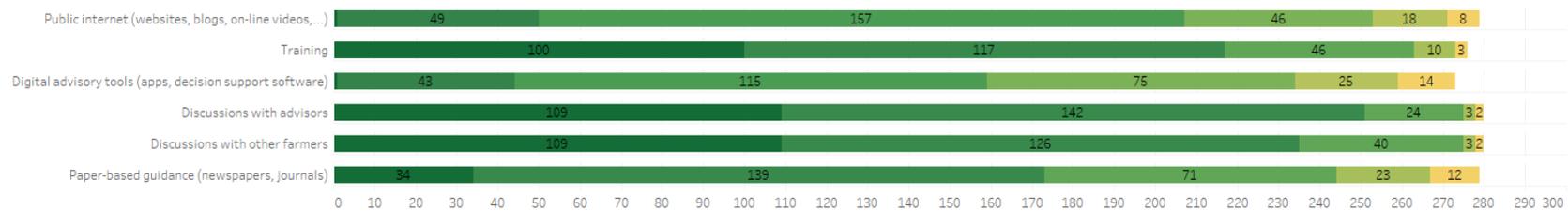


Fig. 5: “How important are the following resources to support your decisions?” survey answers

Color Legend

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly agree

The most often addressed topics are “Production management (crop management, livestock management)”, “Legal matters”, “Subsidy management” and “Business administration topics (finance and budgeting, operational management)”. In a second tier consideration are topics like “Distribution”, “Supply chains”, “Alternative business models” and “Environmental issues” (Fig 6).

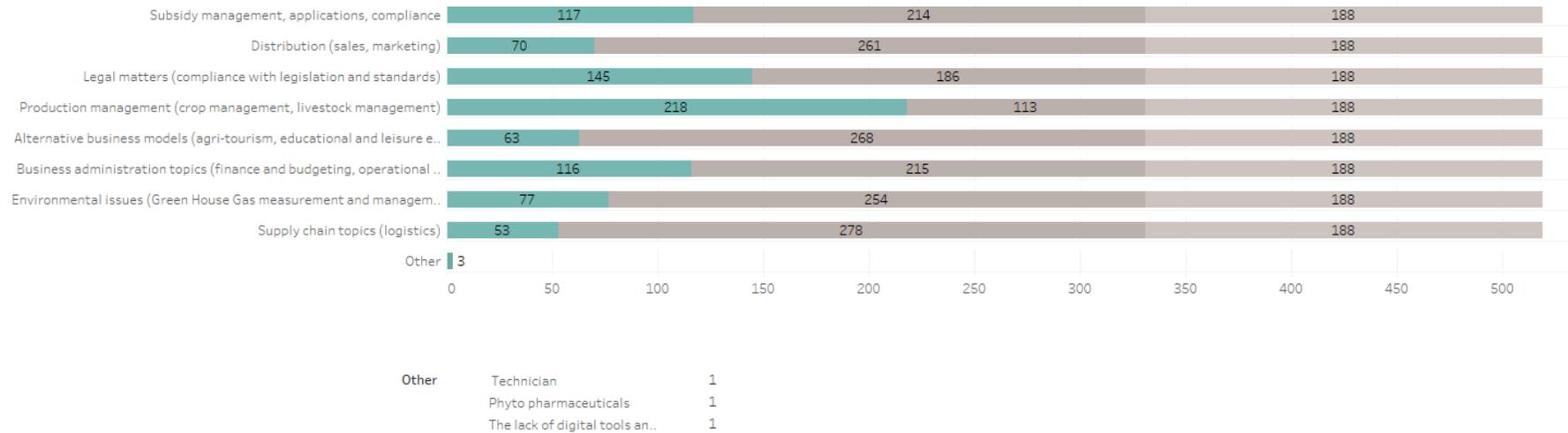


Fig. 5: “What topics do you discuss with your advisor?” (Farmer survey)

However when asked to name some decisions for which they rely on advisors to make their decisions, farmers named a wide variety of topics – more than 50 in total. The most frequent topics include “Phyto sanitary”, “Fertilization” and “Plant protection” themes as well as those addressing “Investment projects” and “Financial planning”. Other frequent themes are “Feeding schedule/analysis”, “Chemical use”, “Crop protection products” and “Agricultural treatments” (excerpt of answers from question 13 of the Farmer survey).

Farmers and advisors agree on the (perceived) benefits of digital advisory tools and services (DATS)
 Both farmers and advisors agree that digital advisory tool and services (DATS) are have a positive impact on their activity. When asked advisors see the **biggest returns from digitalization in making the farm activities more cost-, time-, and resource-efficient, thus driving productivity, quality and finally income of farms.**

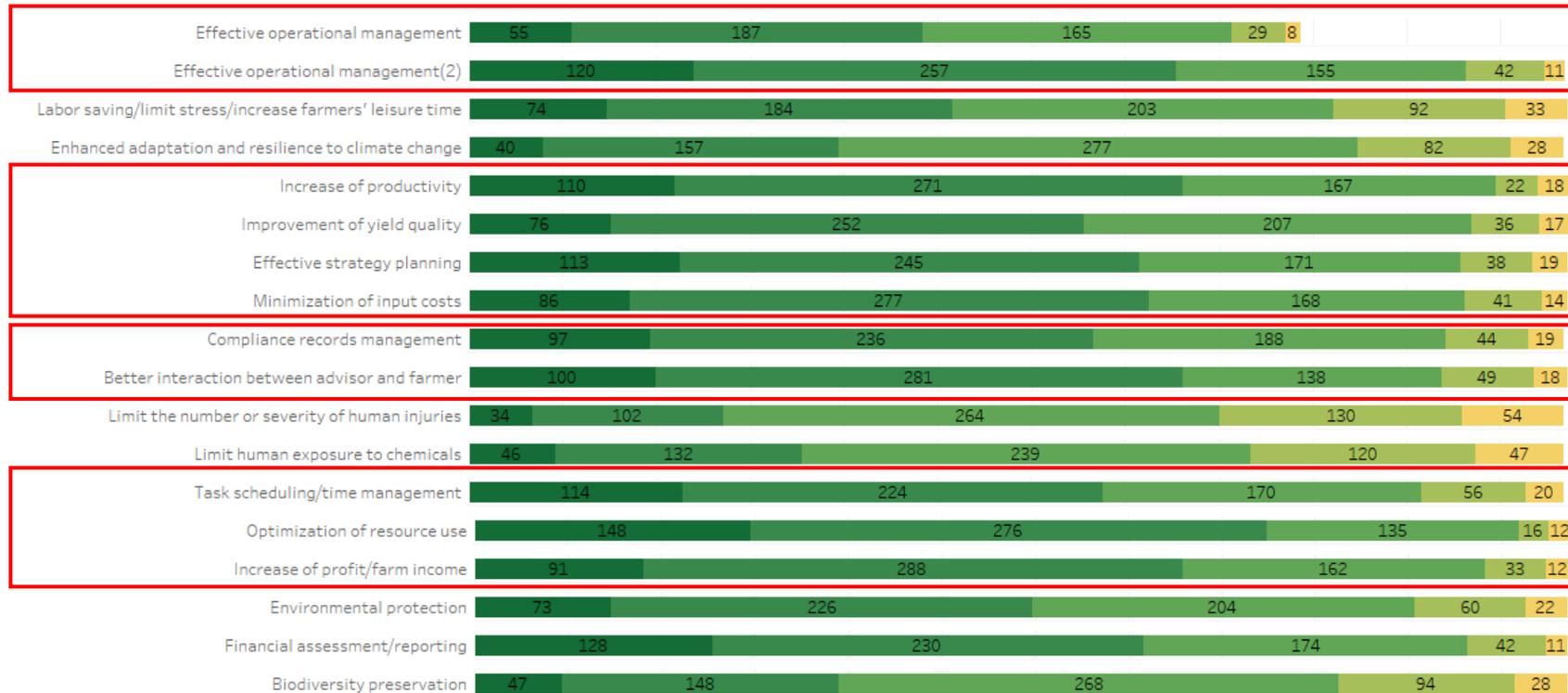


Fig. 6: „Please indicate to which extent you agree/disagree with the main benefits/positive impacts associated with DATS?“ (Advisor survey)

It is worth noting, that farmers see the introduction of DATS as an aid to have a better interaction with their advisors (“Better interaction between advisor and farmer”). Similarly to advisors farmers have high expectations on the value added to their farm activities by DATS. The levels of expectations are quite similar between the two groups surveyed, as can be seen from the chart in Fig. 6 and Fig. 7.

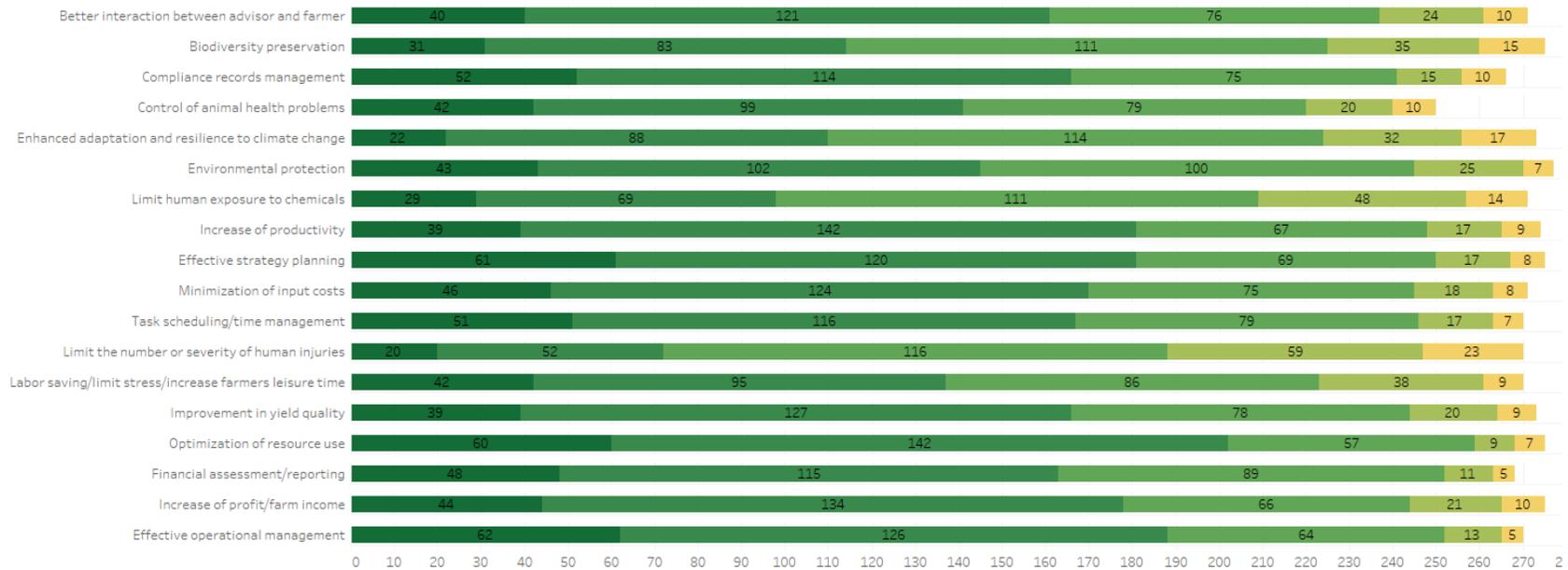


Fig. 7: „Please indicate to which extent you agree/disagree with the main benefits/positive impacts associated with DATS?“ (Farmer survey)

Color Legend

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly agree

However there are several barriers which have yet to be overcome for the adoption of DATS

Farmers recognize that there is a **lack of digital competences** which hinders the adoption of DATS. Only 97 respondents agree strongly or very strongly that they are adequately equipped with the necessary competences. Another barrier recognized by farmers is that **existing DATS are not compatible** with each other. This results in additional effort for data management, but also time needed to be able to use different DATS (due to learning, investment costs as well as general interoperability). About half the respondents also recognize a **lack of suitable information on available DATS**- which could be mitigated with demonstrators/best-practice stories most preferably provided by their advisors or other farmers, as these are the groups which farmers include in their decision making process (see pg. 24 of this analysis) . **Investment costs (in terms of money and time) are also considered by about 90% of farmers to be too high** for the yield DATS produce, which can be identified as major barrier, which needs addressing to foster the adoption of digital tools in farming (Fig. 8). Also similarly to advisors farmers consider that there is a lack of access to raw data (with data being the “oil of the digital economy”) which hinders an optimal use of DATS.

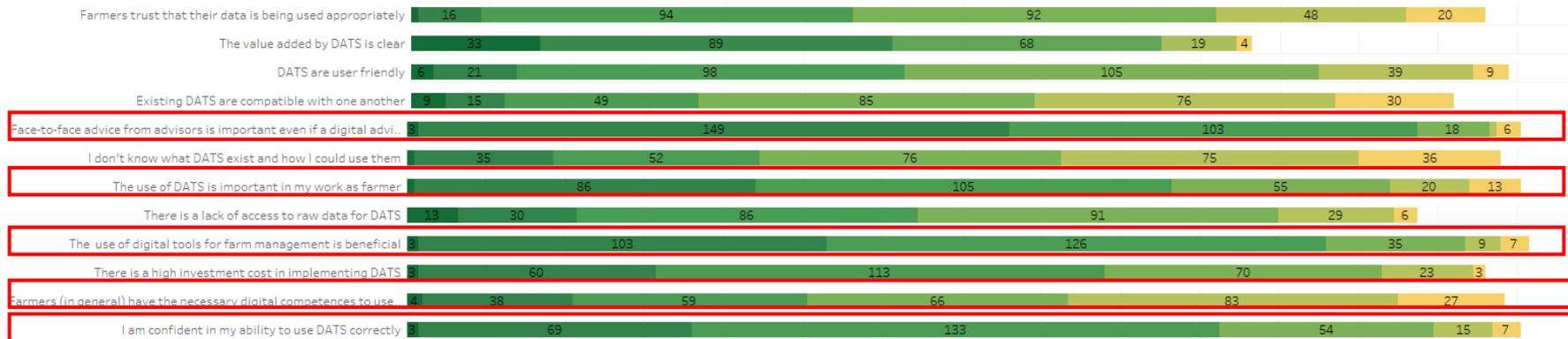


Fig. 8: „For each statement concerning DATS please indicate to which extent you agree or disagree?“ (Farmer survey)

Color Legend

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly agree

Similarly to farmers advisors consider that there is a need to build up digital competences on farmer side. While they confirm once again that it will be beneficial for farmers to be able to use DATS themselves to improve their farm management, they still see – with a very large majority of about 600 out of 665 respondents – that **face-to-face advisory will remain important event with DATS**. Thus advisors’ opinion is in line with Fig. 7, where farmers consider DATS a helpful tool to improve advisor interaction but will not replace it. Advisors recognize that there is a **need to build farmers’ trust in the proper use of their data**. About 234 (a majority position) advisors are neutral in the belief that farmers trust DATS in the use of data. An 96 advisors straight out disagree with this assessment recognizing a need for action here (Fig. 9).

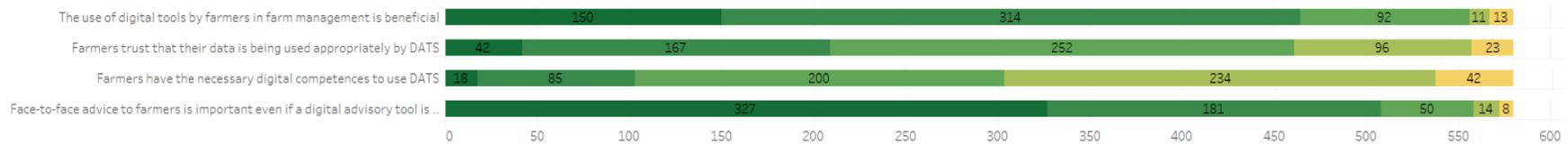


Fig. 9: „For each statement concerning DATS please indicate to which extent you agree or disagree?” (Advisor survey)



We have also asked farmers about trust – both in their advisors and also in DATS – as well as with whom they are ready to share their data. Those farmers who share their data with their advisory (about 60% of farmers), 70% trust their advisors to handle the data properly. However there is a 30% share who have trust issues. Also it is notable that about 30% of all farmers, do not share data with their advisors. If we assume that better data access will enable better services, there is clearly a **need to increase farmers trust in data handling vis-à-vis their advisors**.



Fig. 10: „Do you trust your advisor to handle your data properly?” (Farmer survey)

However when **farmers** are asked how comfortable they are to share their data (Q15 – Farmer survey), they clearly state that they **trust advisors most in comparison to all other groups with whom they are likely to share their data**. As such 97 respondents are most comfortable with sharing their data and 115 respondents still being comfortable in data sharing. This shows the strong bond between farmers and their advisory. A weaker trust relation – however still a strong one- is given between farmers and farmers union and farmers associations. Farmers are most reluctant to share their data with public administrations/governments, followed by service and technology providers.

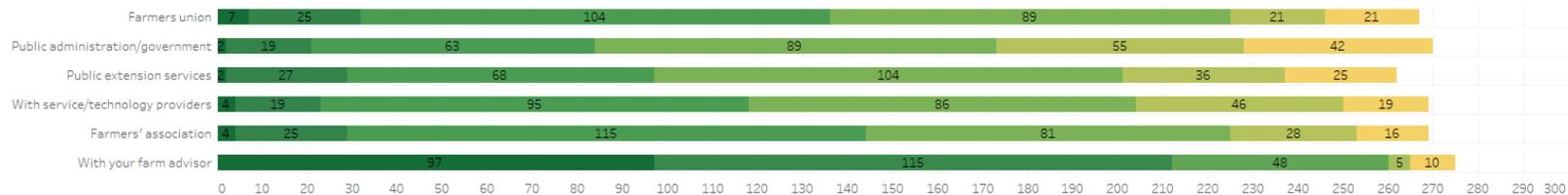


Fig. 11: „How comfortable are you in sharing your data with the following?“ (Farmer survey)



No clear position is recognizable on the side of farmers when data sharing between advisors and third-parties (e.g. technology providers) for the purpose of service improvement is concerned. While about 38% of respondents don't have an opinion at all on this, about 35% agree with data sharing under the described circumstances, and 27% refuse the data sharing (Fig. 12). A more detailed analysis would be necessary to understand, under which conditions and which kinds of data farmers would be ready to share.



Fig. 12: „Do you think it is useful if your farm advisor shares your data with third parties if you receive a more personalized service by it?“ (Farmer survey)

There is a wide variety of DATS in use however no dominant software solution is recognizable

When asked about the names of DATS they use advisors provided a wide variety of tools, which is available to them. A **total of 162 different tools were named as useful for digital advisory**, while about 143 of them were mentioned as to be used regularly. Below there is an overview of the tools mentioned by advisors as well as their prevalence in mentions. What can be clearly seen is that a general consensus on useful agricultural DATS is not recognizable. One could conclude that this is still a young software market, where a clear market leader has yet to establish itself. However the diversity of solutions available indicates that there is a strong activity of digital tools development ongoing in the agricultural sector.

Table 3: DATS used by advisors in their activity

Tool name	No.	Tool name	No	Tool name	No	Tool name	No
Excel	29	Uitrijtool	1	OneSoil	1	fieldcrop	1
Whats-App	23	Trendoo messenger	1	On line calculator programmes	1	FeedByte, nutrition formulation tool	1
E-mail	15	Text messages	1	Omgevingsloket	1	fail sharing via folders	1
Other Social Media Apps	14	TeOvin	1	ÖDüPlan	1	ErklärYes	1
IKMIS	11	teamviewer	1	Octagri	1	Equipilote éco	1
Web	8	Teagasc NMP Program	1	negative advise	1	Elektronikus vény kitöltő rendszer - Pesticides operation webpage	1
Facebook	7	Tabellenkalkulation	1	NDVI maps	1	E-learning	1
Couprod	7	Standalone toepassing	1	NDS (rations) MLP	1	E profit monitor	1
Agro-Tools	6	Stand alone eg SPSS	1	Auswertungsprogramm	1	E mapping	1
crop protection app	5	Software of management of plots and consultancy (Agroasesor)	1	Meteo France mestbankloket en e-loket	1	Documentation of company visits digital	1
Weather forecast	4	Software	1			DMS, CRM	1

Teams	4	social media	1	MesParcelles	1	Diverse App-Applikationen für ausgewählten Themen	1
Nutrient calculation / management/ Planning	4	SMS	1	Mes satimages	1	Digital mapping systems	1
Client server applications	4	site	1	Maps	1	Digital field notebook	1
YES	3	Sharepoint	1	managing advisory work	1	demeter tool	1
Video software	3	Share Point	1	Management software	1	Decision support system IKMIS	1
Power BI	3	Satellite data	1	Logbook	1	Data visualization and data management	1
Google Apps	3	SAR	1	Lernplattformen zur Lagerung von Infomaterial	1	DAFM ONLINE	1
DIAPASON	3	riegos.ivia	1	laptop	1	DAERA ON Line Services Financial Benchmarmking	1
Youtube	2	Riego IVIA	1	IST Lync calls	1	Custom software	1
Standalone applications	2	Remote sensing servers with multispectral imaging	1	Irristrat	1	Crop data storage	1
Pre-installed Software	2	Rationneur Larelev (advisor access only)	1	InVEST	1	Cordis	1
Other	2	Rationing software	1	internet agent portals, persmissions e.g DAFM/ICBF agent login	1	cell phone messages	1
Margin over Concentrate	2	ProConseil	1	Interbev	1	cashflow tool	1
Forecasting	2	Powerpoint poslužiteljske aplikacije	1	inspection of surfaces	1	Calculatin of manure balance	1
Fertilisation	2		1	INRARion	1	BZH Cereal Advice	1

el. paštas	2	Planten	1	Information on experimental results	1	Business planning tools	1
e-GEBA	2	Pest warnings pest identification apps	1	Info-Apps	1	BPS Online	1
Database Computing programs	2	PastureBase App	1	inet DAFM BPS	1	Bovis	1
Communication tools	2	Pasturebase	1	ideaaragon	1	bodemcan	1
Cloud-based	2	pašto programa	1	ICBF reports	1	Biocheck	1
CAFRE	2	pašto programa	1	lcbf https://ng.fieldclimate.com/	1	Bigdata	1
		OVALL	1			BetVor	1
		Our own website for what plant protection product to use when	1	http://agromet.mko.gov.si/	1	Betriebswirtschaftsprogramme	1
ZLTO OPTIcow	1	Optimap	1	Homepage	1	Application for pest and diseases of Cajamar	1
Zifo II	1	Optibull	1	geopunt	1	App CaNopy cover free (Calculate crop coverage)	1
wapp	1	Operational planning	1	Geoportal (mobile app)	1	app	1
Vineyard Cloud Various Apps (e.g. YARA ImigeIT, BAYER Agronomy Tool, Sectometer, WaterAware)	1	Online-Coaching	1	GEOPORTAL	1	animal welfare calculator	1
		Online software installed on my computer	1	Fitos	1	Anais	1
VACcent	1	online forms	1	fieldscout	1	Airtable	1
		Online Betriebskonzept	1			advisory service issue tracking and monitoring system	1

Similar to advisors those **farmers** who use mobile devices (about 40% of overall respondents) also **use their mobile devices for digital advisory tools**. Quite similar to advisors there is a wide variety of DATS used with weather apps and e-mails being the most common ones. Agricultural apps have the first most mentions with 161, followed by social media with 143 mentions. Business administration apps as well as customer communications are lagging behind with only about 75 mentions each. The **adoption of farm specific DATS among farmers has yet to develop its full potential, according to the distribution of responses, where 211 persons (i.e. about 33% of respondents) choose the topic as not relevant for them.**

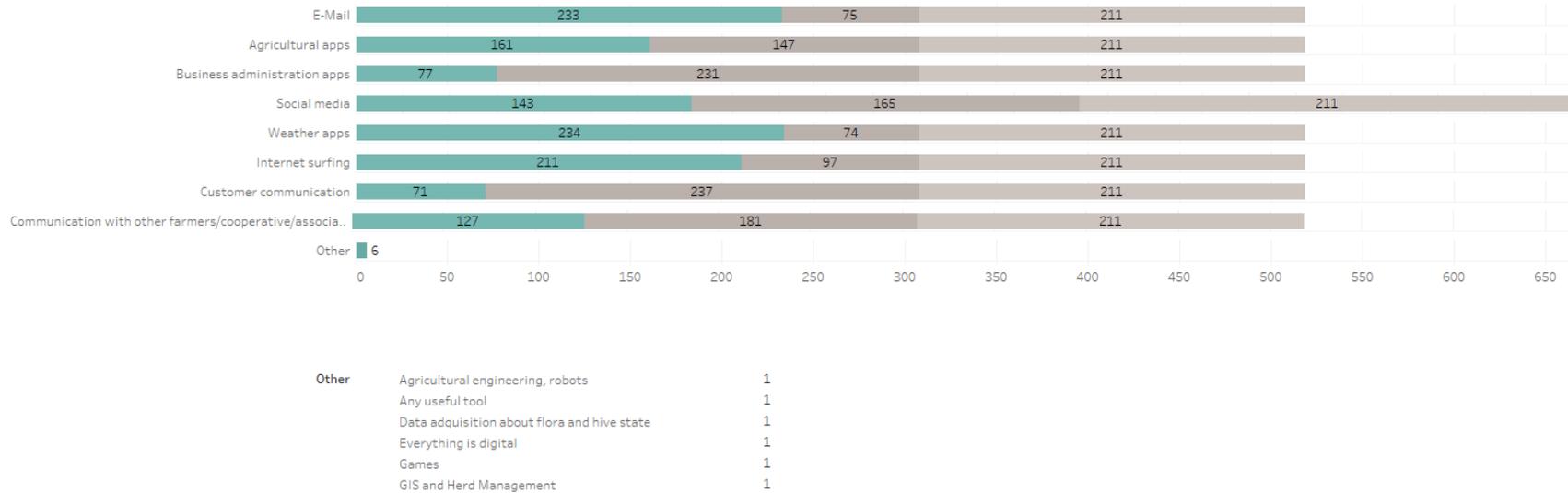


Fig. 13: „For which kind of apps do you use your mobile for?“ (Farmer survey)

Farmers get their DATS from advisors or other farmers

Farm **advisors and other farmers are the major sources, which influence farmers in adopting DATS**. Also a relatively high sway on adoption is hold by the agricultural media. It is remarkable that the internet is seen as a far less reliable recommender in the case of farmers, differently than with advisors who adopt software more easily from the internet (see Fig. 16).

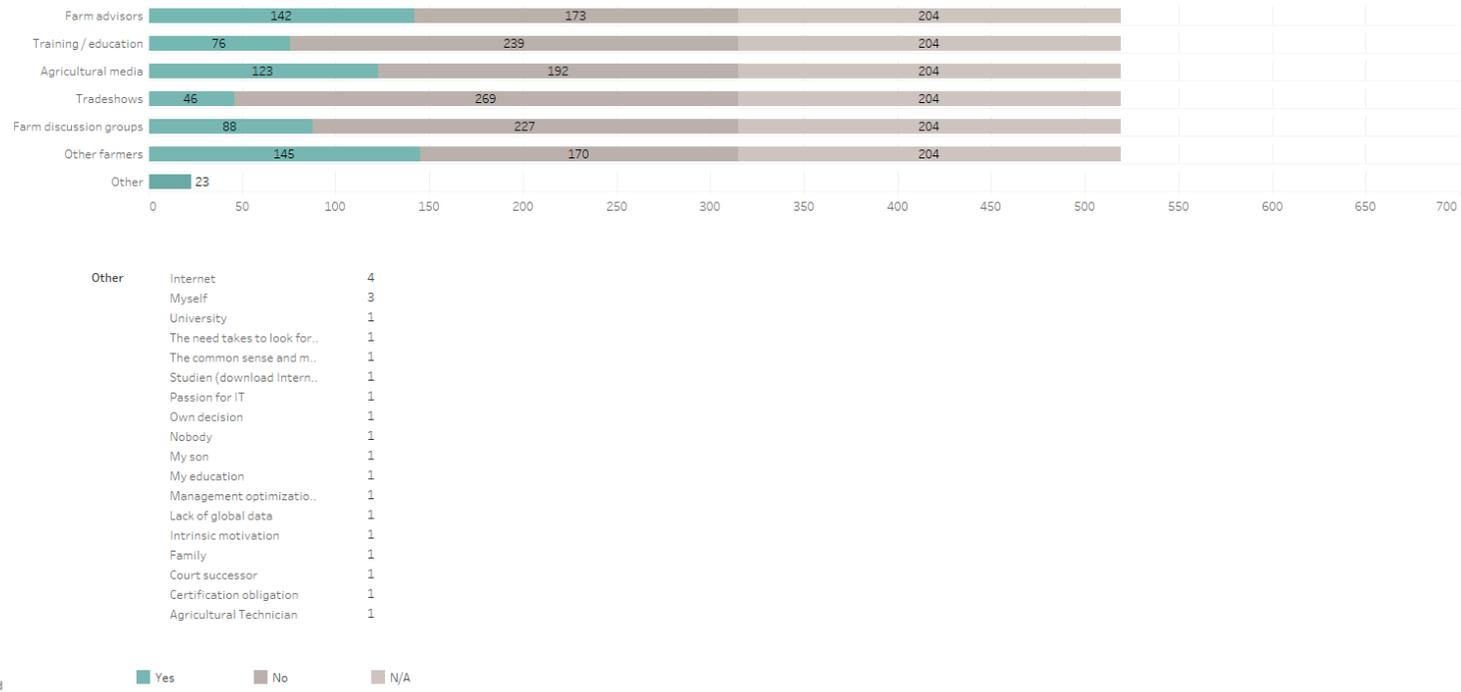


Fig. 14: „What or who influenced your decision to use farm technologies?“ (Farmer survey)

As for the types of DATS advisors use, in terms of technology provision mode, the distribution is similarly broad. Client/server applications are the most prevalent with standalone software being available at a similar level. Mobile apps and web-based/cloud-based applications are used less. This might be due to the facts that these kind of solutions haven't been that long in the market.

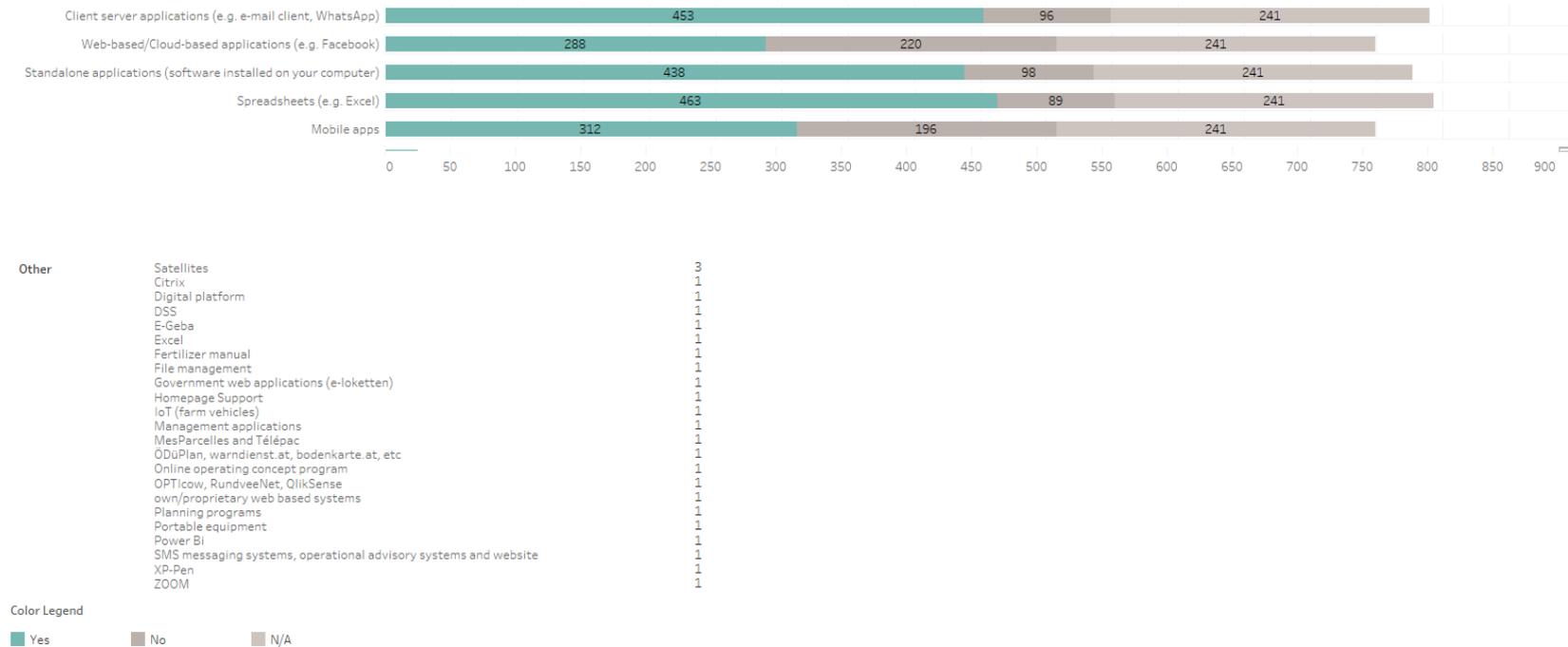


Fig. 15: „For which kind of apps do you use your mobile for?” (Farmer survey)

Advisors get DATS from their company or from the internet

Advisors who named a specific tool, were asked to identify the source from which they obtained that tool (Q18 – Advisor survey). About 40% of respondents did not indicate any source, which another approximately 25% of advisors identifying their company as a source of provision of tools. Free tools are sourced from the internet or app stores (about 25%). Individual software development represent another 5% of usage, while standard software providers are indicated by the other 5% of advisors as the source of their software. When asked where they get information about the apps, a majority of answers reference the company, followed by the internet and training events/conferences (Q19 – Advisor survey). This aligns with the sourcing answers from Q18 (Fig. 15).

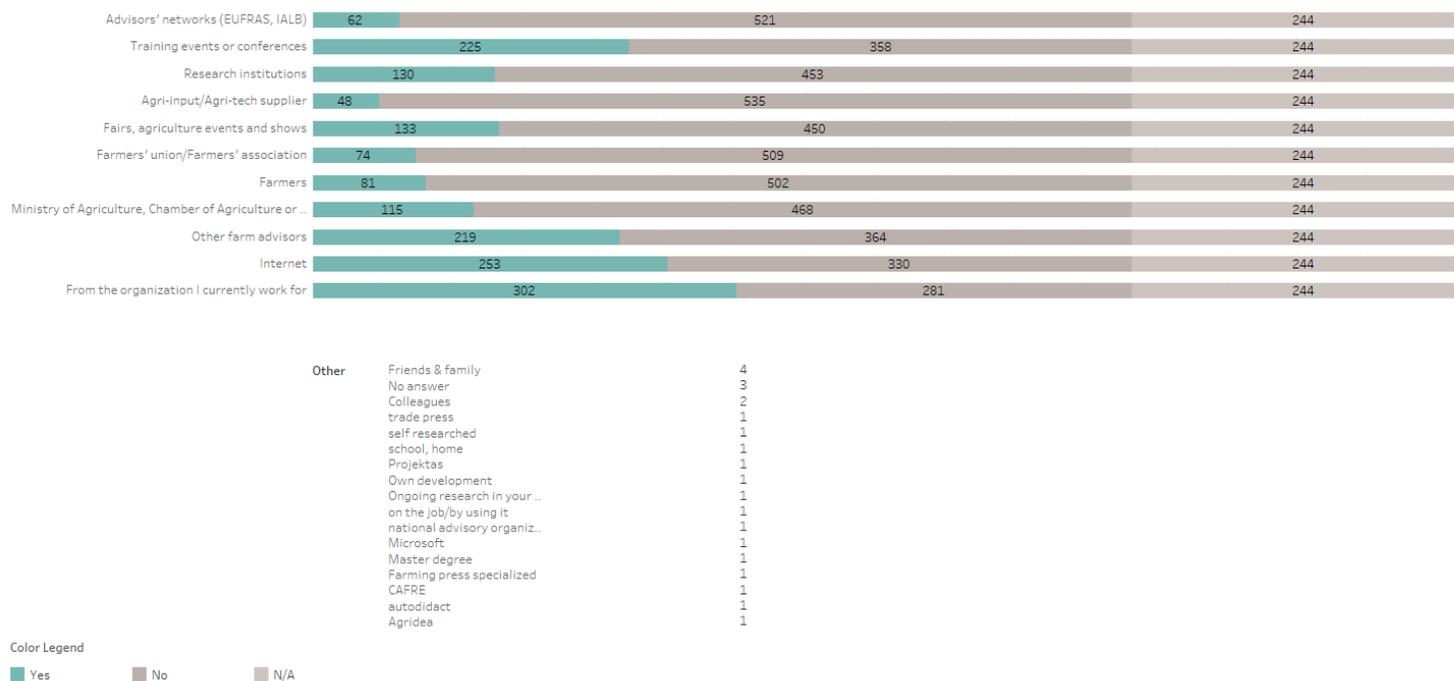


Fig. 16: „Where did you get the information about these tools?“ (Advisor survey)

Broadband internet and mobile devices are available on 50% of respondent farms

Out of the 362 farmers who responded to the question if their farm has **broadband internet access about 50% have one**, while the other 50% don't have one. Given that software applications tend to be data heavy and IoT and farm automation solutions rely heavily on internet connectivity, the update of **infrastructure on farms is a topic which needs to be addressed as a possible barrier to the adoption of digital advisory tools and services (DATS)**. It will be also interesting for the following tasks in the project to address, why some of the responding farmers (about 30% considered that "broadband internet" was a question they chose not to respond in the survey).

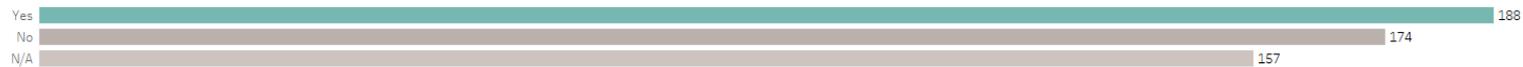


Fig. 17: „Does your farm have broadband internet?“ (Farmer survey)

The availability of broadband internet however does not fully correlate with the adoption of mobile devices on farms. About 60 respondents, who do not have broadband internet use mobile devices on their farm. However the number of those who see the issue as irrelevant for their farm or activity is also higher (i.e. 204 respondents who choose „not applicable“). The number of those who choose not to use mobile devices on their farm is only about 15% of the total respondents. Thus as a follow-up **in the focus groups we recommend to address and understand the motivations of those farmers who are undecided and consider that the use of mobile devices it not applicable to them.**



Fig. 18: „Do you use mobile devices (e.g. smart phones) on your farms?“ (Farmer survey)

DATS (e.g. farm management software, IoT) not widely adopted among farmers

While a majority of respondents of the farmer survey, mentioned that they expect DATS to be beneficial for farm operations, only 124 of the overall 519 respondents, use „farm management software (e.g. applications for crop management, applications for production management, time management software etc.) - Q24 Farmer survey“. A total of 189 respondents do not use this kind of software, while the majority consider that the question of farm management software does not apply to their farm.

A similar distribution of responses can be observed in Q20 of the Farmer survey, addressing the use of „Internet of Things (IoT) installed devices like sensors, probes, GPS, cameras on the farm. Again 124 farmers use such devices while 198 do not use them and 207 respondents do not consider them even relevant for their activity.

Reasons for the discrepancy between expectations of benefits and the current adoption rate can be addressed in the focus groups respectively the regional discussions.

Data collection needs more efficiency and interoperability is lacking

A wide majority of farmers document their data both digitally and by hand (125 respondents). While the reasons were not explored deeper in the questionnaire, one can observe a **potential for a more effective and efficient data management** here, either through data management DATS or other optimization procedures.



Fig. 19: „How do you document your farm data?“ (Farmer survey)

Efficiency and effectivity of data management (in terms of time) is a topic which needs to be addressed as the farmer or a family member are in charge of documenting the data, thus investing time which could be used otherwise in farm management and innovation if not for the redundancy of the data collection (Fig. 20).

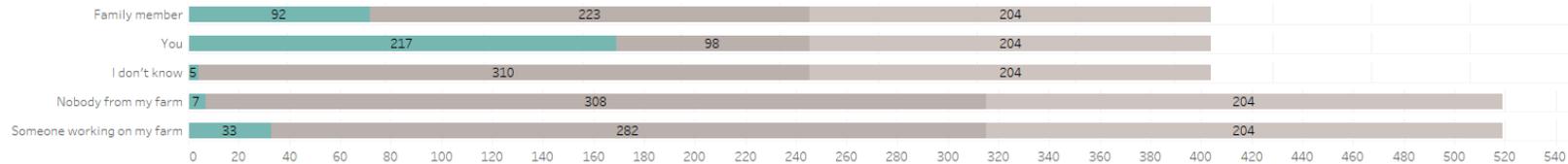


Fig. 20: „Who manages the data collected on your farm?“ (Farmer survey)

The lack of available farm data can be explained by the fact that a majority of data is inputted manually and that the responsible parties have little time in their daily activities. Those who manage the data use less than 1 hour a day for this activity (Fig. 21).



Fig. 21: „How long do you/they spend daily on data recording?“ (Farmer survey)

While 144 respondents on the farmer survey (Q29) mention that advisors receive their data, advisors still identify manual input as the main source of their data basis. Services like technical data from satellites and weather apps are followed by administrative data from CAP or fiscal data (Fig. 22). Here one can recognize a barrier in the adoption and use of DATS which needs to be addressed.

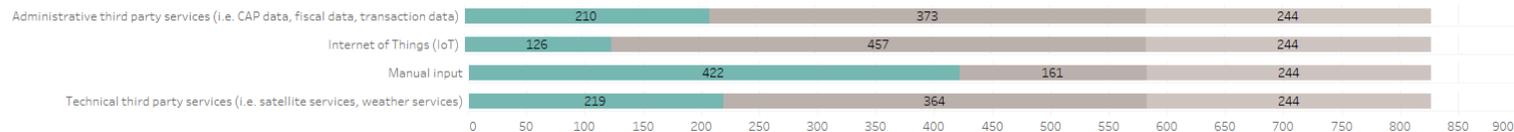


Fig. 22: „Where do you get the data from, which you use in your DATS?“ (Advisor survey)

Advisors and farmers desire in-person training on digital technologies

Advisors consider that the **most important topics** where they need training are **(1) online meeting technologies like software for webinars and online meetings, (2) skills to create blended learning content, and (3) methodological support on how to use new technologies in their daily advisory business. Also of importance is the proper data management (4) and the general provision of online information (5).**

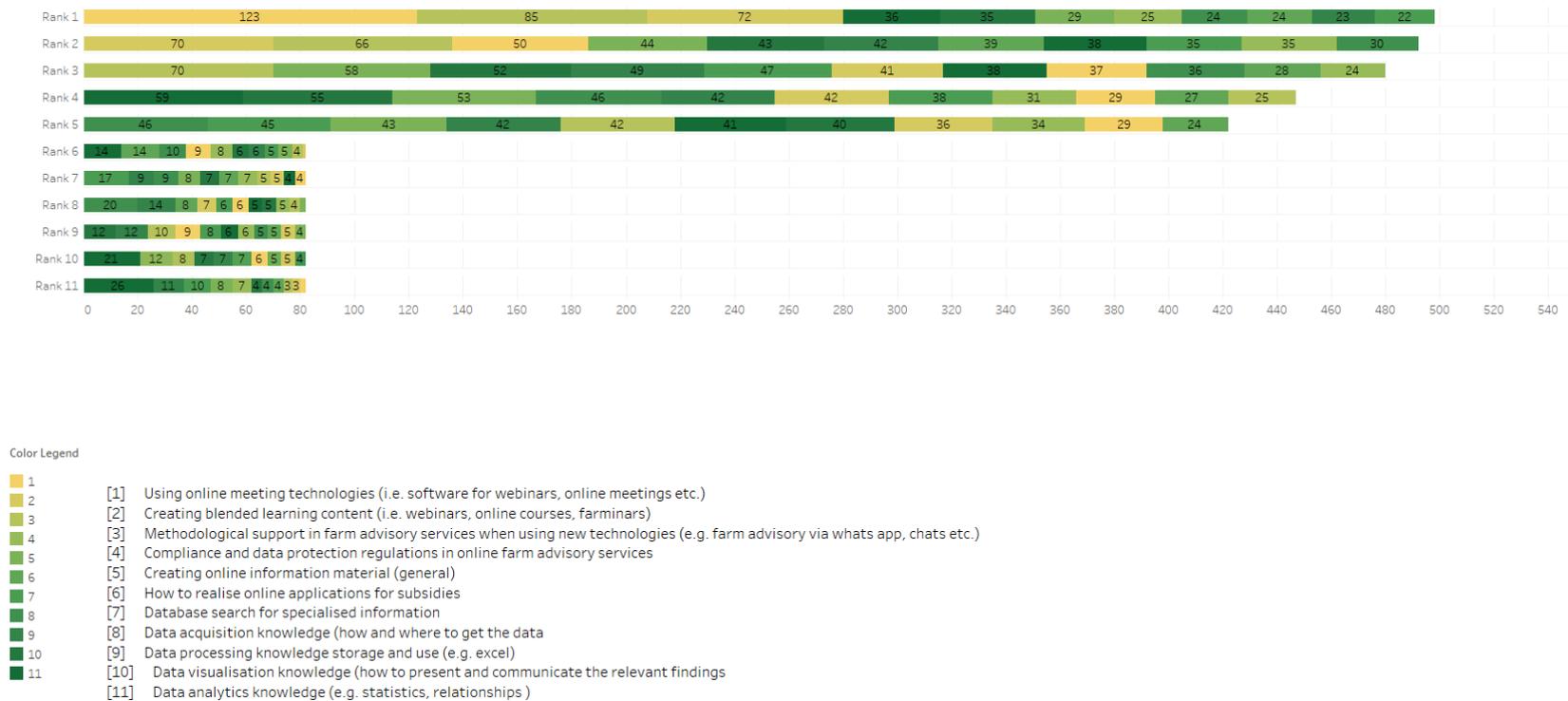


Fig. 23: „In which areas do you need training and knowledge?“ (Advisor survey)

As for the mode in which **advisors** would like to receive their further education there is a **strong preference towards face-to-face/in-person learning, blogs and written documentation**. The latter two modes allow for independent and asynchronous learning among the learner groups. As online learning means like video tutorials, webinars and online trainings have received the least preferences from advisors we recommend that the focus groups explore if age distribution defines these preferences or if other reasons influence the strong preference towards classical education/trainings modes.

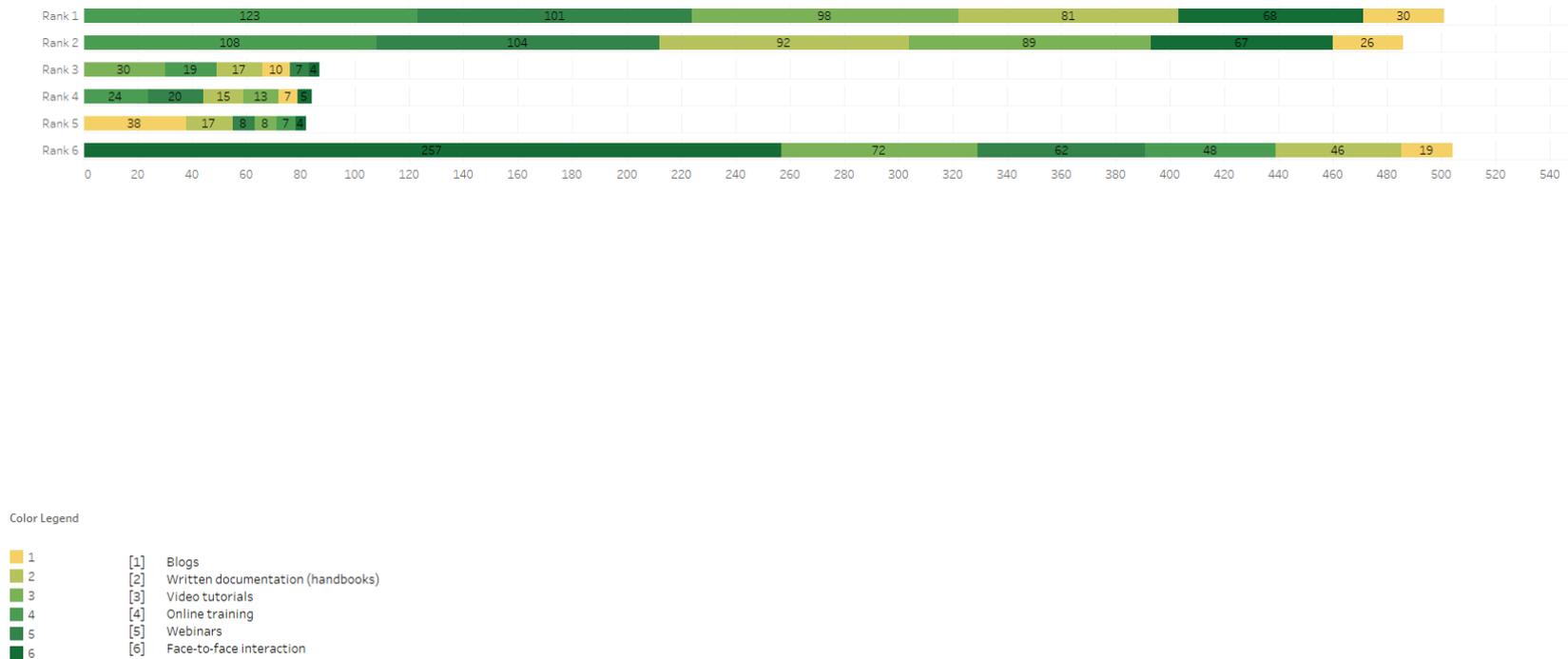


Fig. 24: „How do you prefer to receive your training?“ (Advisor survey)

Farmers however would prefer a more interactive support in learning on how to use technologies on the farm. Their most preferred mode is to receive one-to-one training adapted to their needs (thus in line with the high personalization of advisory services). The second most preferred mode of learning for farmers is in discussion or knowledge transfer groups. This answers also correlates with the high level of trust farmers put in their advisors or peers when making decisions for their farms

Another **potential field for advisors in their activity is to provide exclusive and dedicated agri-tech advisory services.** Farmers are also open to video-based training, online documentation.

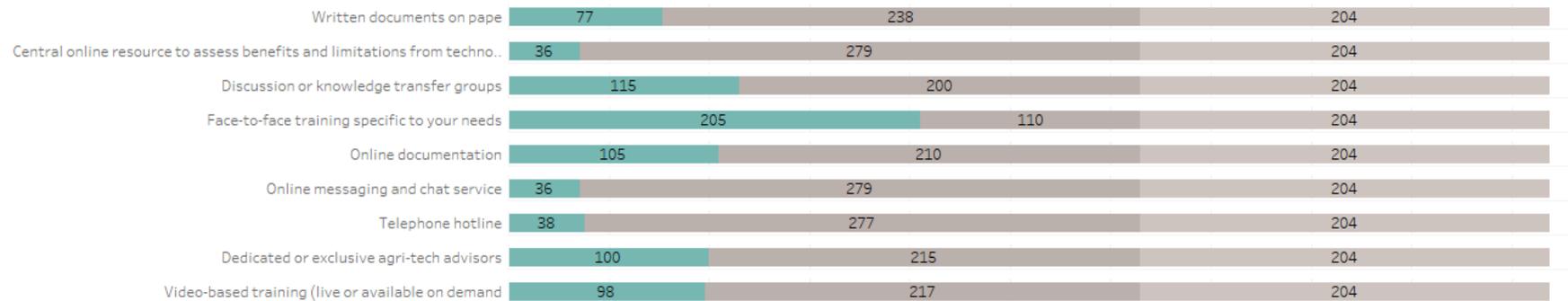


Fig. 25: „How do you prefer to receive your training?“ (Advisor survey)

4. Conclusion

The sample analysis presented in the deliverable from more than 1.000 survey answers from both farmers and advisors has shown that:

- (1) Farmers and advisors have a strong trust relations, with farmers relying heavily on advisors in their decision making process
- (2) Farmer are used to receive expert and personalized advice; they have come to expect his and DATS should be a useful add-on to the delivery services but not a replacement
- (3) Farmers and advisors agree on the benefits they expect from the use of digital advisory tools and services (DATS)
- (4) However DATS benefits are not necessarily easily understandable especially for farmers, posing a barrier to their adopting
- (5) In practice learning and investment costs for DATS need to decrease to become more attractive for use through advisors and farmers
- (6) Infrastructure issues like connectivity, availability of automated data and data interoperability are unsolved issues, which slow the dispersion of digital advisory tools and services.
- (7) Advisors do not have a reference source for their digital tools. They rely on their company/organization, on other advisors, or the internet to identify and discover suitable tools for service provision.
- (8) There are no recognized best practice tools and services for agricultural use. There is however a wide diversity of individual experiences, which are not collected in one place.
- (9) Farmers get their DATS from advisors or other farmers.
- (10) Advisors recognize their need to receive training in the provision of digital advisory services (from communication, to methodology, to content). However they would like to receive this training offline and in person.

The complete analysis data is available on the project SharePoint and can be used by the following tasks (e.g. focus groups co-designing DATS solutions) as a starting point for their work.