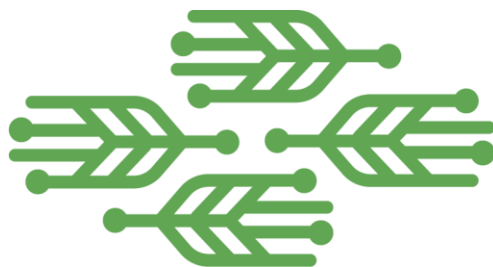


# **Deliverable 5.8 Vision paper of** **SIB on high impact KRs**



# EURAKNOS

*Connecting Thematic Networks as Knowledge Reservoirs towards a European Agricultural Knowledge  
Innovation Open Source System*



### TASK 5.3

#### Summary

The aim of WP 5 is to widen and maximise the impact of the EURAKNOS project through dedicated communication, dissemination, exploitation and networking activities. The specific objectives of WP5 are:

- to develop a detailed and dynamic communication plan;
- to progress a detailed and dynamic dissemination plan and exploitation plan;
- to efficiently communicate the concept, progress and results of EURAKNOS to a wide variety of stakeholders;
- to fastidiously disseminate EURAKNOS outputs with a focus on two groups of actors: TN coordinators as multipliers and farmers, foresters and advisors as end users;
- to provide a wide range of materials targeted at end-users;
- to link to educational programs and training initiatives;
- to promote cross exchange between different TNs.

Vision paper: The Strategic Innovation Board will be guided to produce a vision paper on the future of KRs in agriculture and forestry practice.

Conducted as part of T5.3 Networking, a vision paper on the future of KRs in agriculture and forestry practice was developed in collaboration with the SIB. The vision paper reflects an ideal scenario for an EU-wide open source KR for agriculture and forestry practices based on outputs of H2020 TNs which could feasibly be developed within 5 years.

The SIB vision paper will be integrated into discussions occurring in T3.5, a 2-day workshop with the coordinators of all TNs and linked OGs (if applicable) and KIP and SIB where results of WP3 will be presented and HIKR (TN) technical guidelines for a harmonised approach will be developed. The vision paper will also help to inform T4.3 in the conceptualization of a future vision for the e-KRP. The standalone vision paper will be published to help guide further developments towards an EU-wide open source KR and support policy and funding decision-making.

Deliverable Number	Work Package
5.8	WP5
Lead Beneficiary	Deliverable Author(S)
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Planned Delivery Date	Actual Delivery Date
M13	M14



Type of Deliverable	R	Document, report (excluding periodic and final reports)	X
	DEC	Websites, patents filing, press & media actions, videos	
	E	Ethics	

Dissemination Level	PU	Public	X
	CO	Confidential, only for members of the consortium	

**List of abbreviations:**

TN - Thematic Network (e.g. AFINET, OK-Net Arable, OK-Net EcoFeed)

OG - Operational Group

KIP - Knowledge Innovation Panel

SIB - Strategic Innovation Board

KR - Knowledge Reservoir (e.g. [Organic-Farmknowledge.org](https://www.organic-farmknowledge.org))

HIKR - High Impact Knowledge Reservoir

e-KRP - electronic Knowledge Reservoir Platform

AKIS - Agricultural Knowledge and Innovation Systems

EIP-AGRI - European Innovation Partnership for agriculture

CMS - content management system (e.g. DRUPAL, TYPO3, JOOMLA)

[ZENODO](#) - Open Access Platform connected to Open AIRE

[Open AIRE](#) - Open Access Information Platform for publications from H2020 projects (links) from other repositories (e.g. [Organic Eprints](#))

EU SCAR - European Standing Committee on Agricultural Research

SWG – Strategic Working Group

C&D - Communication & Dissemination

KPI - Key Performance Indicator

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## 1. Introduction

### 1.1. Project overview

EURAKNOS is a Thematic Network (TN) which aims to collate knowledge from all TNs to build a single community. Currently, a set of 34 H2020 TNs produce knowledge for practitioners independently from each other. These TNs have the potential to maximise the uptake and impact of new knowledge by stimulating shared learning and coordinating dissemination of practical information.

EURAKNOS aims to strengthen the EU agricultural knowledge base by co-creating “the network to connect all TNs”. To achieve this objective, EURAKNOS will:

- Facilitate and support TNs, linking similar initiatives at EU and national levels and feeding into national educational and training programmes;
- Widen and connect existing TNs to build knowledge reservoirs (KRs) within the agricultural European Innovation Partnership (EIP-AGRI);
- Collect, evaluate and compare the knowledge, materials and tools that have been produced by TNs and Operational Groups (OGs);
- Develop a harmonised approach by producing technical guidelines on how to make a high-impact KR;
- Develop a blueprint for creating an EU-wide, dynamic, open-source agricultural knowledge innovation database, and explore the value of doing this.

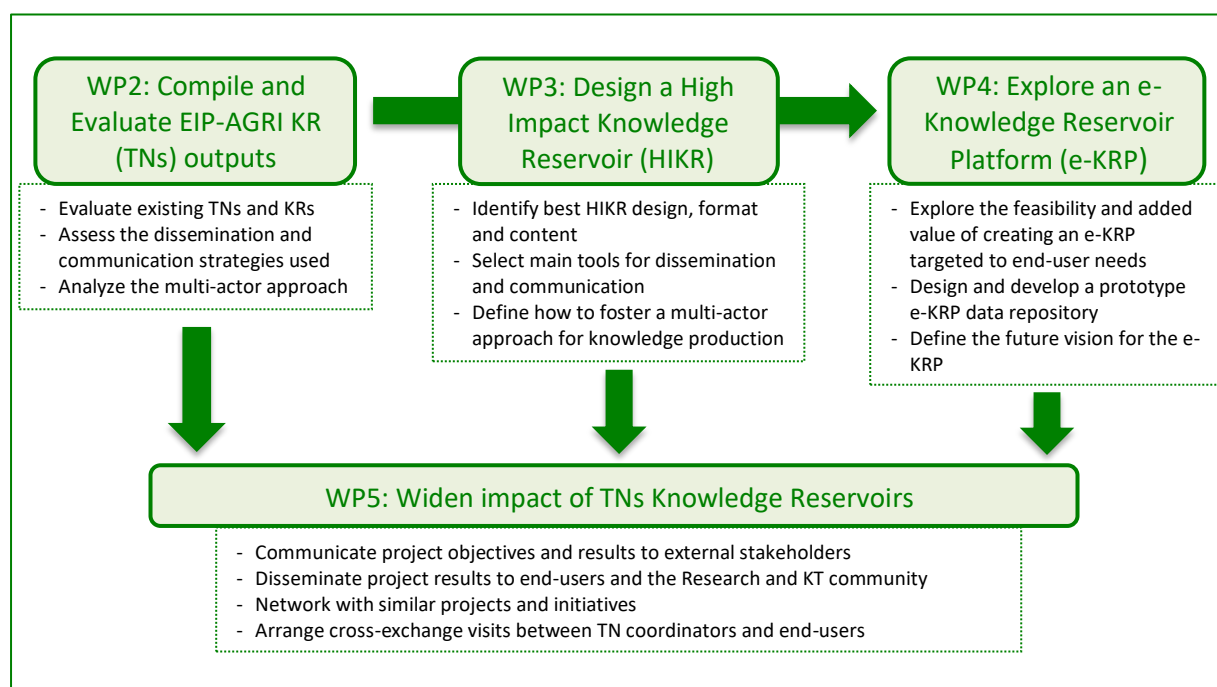


Figure 1: Links between Work Packages in the EURAKNOS Project

The main objectives of EURAKNOS are to:

1. develop guidelines for building a successful TN based on the multi-actor approach
2. define best dissemination practices (tools, materials, channels...) with high impact on the end-users in particular farmers, foresters and advisors
3. to develop a pilot for an open access EU wide agricultural knowledge innovation system.

This network will raise the impact of TNs, connect them, and make a pilot for an open access EU-wide database. This will bring innovative knowledge and best practices to farmers and foresters throughout the EU.

## 1.2. Vision paper aims

The vision paper focuses on the future of Knowledge Reservoirs (KRs) in agriculture and forestry practice within the EU. The purpose of the vision paper is to demonstrate how a common repository could create added value for TNs and agricultural society and explain key features to help ensure positive engagement from end-users. The vision paper will include how a KR becomes a high impact system and indicates how EU policy could support and benefit from a common EU-wide KR for agriculture and forestry practices.

## 1.3. Definitions

1. **Knowledge Reservoir (KR):** a collection of best practices, instruments, materials, methodologies, and tools that contribute to the use of innovative solutions for sustainable agriculture and forestry.
2. **A High Impact Knowledge Reservoir (HIKR):** strives to maximize impact through best content, structure and methodologies focused on urgent end user needs. It provides the best ways, channels and tools, to reach the end-user (farmer, forester, and advisors).
3. **Electronic Knowledge Reservoir Platform (E-KRP):** a digital system designed to allow easy access to informative content contained within a KR.

## 2. Vision Paper

This section presents the standalone vision paper, *The Future of Knowledge Reservoirs: Developing High Impact through an EU-wide Open Source Knowledge Reservoir for Agriculture and Forestry*. The vision presented is based on outputs from the EURAKNOS H2020 project and was developed through discussions with the Strategic Innovation Board (SIB) which were facilitated by the T5.3 team. The vision paper is aspirational. It reflects a 5-year vision for an EU-wide open source KR for agriculture and forestry practices based on outputs of H2020 TNs. The vision is based on an ideal world and is not designed to investigate the feasibility of achieving the desired elements.

### 2.1. Introduction

In the Agricultural Knowledge and Innovation System (AKIS), innovation in agriculture and forestry is built on the sharing and exchanging of knowledge between all key actors such as policy makers, farmers, foresters, associations, SMEs and media. In the AKIS, all actors are knowledge suppliers and knowledge users. In the frame of strengthening the national AKISs, open access to agriculture- and forestry- related data and information objects can enhance transnational knowledge exchange between all actors.

H2020 TNs<sup>1</sup> are funded through Horizon 2020 – the European Commission’s main 2014-2020 funding programme for research and innovation and are connected through the agricultural European Innovation Partnership, EIP-AGRI<sup>2</sup>. TNs collect practice-oriented knowledge in animal and plant production, and cross sectoral themes such as rural development to share innovative solutions, best practices and methodologies. One of the main aims of TNs is translating this knowledge into easily understandable end-user material which provide informative recommendations, guidelines and solutions e.g. in the form of leaflets, practice abstracts, factsheets, and audio-visual outputs including videos, photos and podcasts. This material should be made available beyond the lifespan of the project through the main dissemination channels which farmers and foresters often use. Collecting ready-for-practice materials in an easily accessible and user-friendly common EU-wide knowledge reservoir (KR)

<sup>1</sup> <https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-brochure-thematic-networks-under-horizon>

<sup>2</sup> <https://ec.europa.eu/eip/agriculture/en/about/thematic-networks-%E2%80%93-closing-research-and>



would provide a single point of access for practitioners to discover information, giving more accessibility and visibility to resources, and stimulating interest in the implementation of knowledge and innovative practices in farming and forestry. Thus, agriculture and forestry actors are the main target end-users for the open source system proposed in this vision paper.

The EURAKNOS H2020 project is connecting all H2020 TNs and exploring the feasibility and sustainability of setting up such an EU-wide open source KR. In frame of this, the project's SIB has reflected on the features and functionalities of such a system within 5 years during a foresight exercise that was held in Bruges on January 31<sup>st</sup> 2020.

## **2.2. A 2020 Vision on a common EU-wide knowledge reservoir for agricultural and forestry practices**

This vision paper aims broadly to address the question: *What should an open source KR for agriculture and forestry look like, and what do we need and want from it?* The paper will discuss achieving high impact, the needs of target end-users in terms of interactivity and content, and ways to attain a self-sustaining system to secure the longevity of such a system.

The proposed KR platform will serve two main purposes:

- To be a tool for TNs to share and disseminate solutions to the agricultural or forestry challenges which they sought to address
- To be a destination for end-users (agriculture and forestry actors including farmers, foresters, educators and advisors) to easily find and access relevant information so that they can opt to implement it in their own systems.

## **2.3. Achieving High Impact**

It is not enough to simply collate TN resources into one place: internet users have a myriad of options to find information e.g. using search engines. The proposed KR platform is to be a high impact system, meaning that it provides access to meaningful, practice-oriented knowledge to targeted actors, improving the processes of seeking and implementing information relevant to agriculture and forestry. To achieve high impact, the system must first attract TNs to provide their resources to the KR system, then end-users to engage with the information.

The system should function as a live structure, constantly being updated and enhanced. To ensure that TNs are engaged and willingly adding content, the platform will need to achieve its unique selling point: to be the common EU agricultural and forestry KR which end-users value and use. Actors, TNs, and their networks should be involved throughout the co-creation process of the KR through participatory and validation exercises and consultations. The sense of co-ownership and responsibility to an open source KR will add to the likeliness to use and share knowledge, as well as to disseminate the added value out into agricultural society.

It is necessary to focus on a well-defined target group for the system to be successful and fill a niche market. The content and relevant structures of the KR must be relevant to farmers, foresters, educators and advisors as the main end-users seeking information on specific areas within agriculture and forestry. End-users must be aware of the KR platform, attracted to try the KR platform, and experience the system positively such that they become a return user and/or recommend the platform to others so that the valuable and trustworthy content it contains can be further obtained and utilized. This process requires that end-users perceive the KR platform to have intrinsic value by improving end-user experiences of searching for and accessing agricultural or forestry knowledge.



## 2.4. Providing a Positive User Experience

For the KR to go beyond being simply a comprehensive collection of resources from past and ongoing EU TN projects, it is essential that the platform enables users to quickly and easily find relevant knowledge. The platform should be easy to find and access (e.g. through personal recommendations or specific networking activities aimed at promoting the KR, and more general visibility e.g. through being a top result for relevant search terms within existing search engines). The KR should be available as both web and mobile app platforms. The KR should also reduce the time spent searching for accurate, relevant and high-quality practice-oriented information by utilizing a well-structured content framework based on an end-user-oriented ontology and problem-solving approach. Existing tools can provide inspiration; the open source KR system should function similarly e.g. with a search function which filters and prioritizes information. First time users should be able to use all functions of the KR platform with great ease, requiring that the platform is available in all local languages.

Although the platform will be available for use by anyone regardless of registration, the option should be available for end-users to create an individual profile which allows the interface and provided functionalities to be tailored and adapted to suit their needs according to their areas of interest and their required level of engagement, setting their own filters and preferences. It should be possible to store and personalize the KR experience for different end-users and to develop user journeys with knowledge pathways based on individual demands. It should also be possible for the KR to make connections with meteorological and market data, which farmers use on a daily basis, as a useful feature which may add to the popularity and functionality of an open source KR. When a platform is more personalized it encourages the user to feel more comfortable operating the system, which in turn leads to a higher level of engagement. To better address users' needs, analytics and interactions should be incorporated in a feedback mechanism and used for further development and improvements to the open source KR system and to provide content suggestions based on commonalities between user profiles. In this way, an individual's experience can be tailored beyond the overarching 'farmer', 'forester', 'educator' and 'advisor' user typologies.

## 2.5. Delivering Useful Content

Content will be obtained and regularly uploaded from past, present and future H2020 TN projects. In broad terms, the platform should contain up-to-date technical and practice-oriented information conveyed using appropriate (jargon-free) language which is easily understood and can be adapted for practice according to the end-user's context and specific needs. Materials might also include comprehensive information about recent policy and sector developments and their implications for practice. The content should be classified by sector and organized around a problem-solving framework which targets the knowledge needs of farmers, foresters, educators and advisors as the key end-users. The structure of the content should be organized by the problems facing each sector: if a user is seeking a solution to a problem, they cannot search for the answer if they do not know what the solution is. The information resource materials themselves can take several forms in order to visualize information e.g. text-based reports, guidelines, fact sheets and practice abstracts; infographics; podcasts; and videos. Wherever possible, open access documents should be accessible via the KR platform, although intellectual property rights must be respected.

Quality control is extremely important. Wherever possible, automated systems should be taken full advantage of, including with respect to facilitating the upload of content to the KR platform. An easy, automated method for adding new content from projects requires interoperability of data and information systems. Furthermore, automation cannot do everything, and it is necessary to have a human element of moderation to ensure that uploaded materials are appropriate, relevant and inoffensive; criteria which TNs must ensure are met before uploading to the platform. (An) appropriate



administrator(s) should be selected who can ensure there is suitable quality control on content that is uploaded and that content sustainability is maintained. It is critical that content is carefully monitored to avoid providing ineffective information which disillusions users leading to lower levels of engagement. Incorporating a user feedback system will allow reviews from end-users to help to assess the quality and validity of materials once uploaded. This feedback system should include an option to flag information as outdated or obsolete, and suggest new materials which they find relevant.

The main working language of the platform and its contents will be English. However, to further ensure an optimal personalized experience, it is essential that end-users can access the platform and its contents in their own native language. This will be achieved through automated systems, incorporating integrated user learning so that the technology is able to improve grammatical mistakes and translate sector-specific terms when prompted by the user. Although this may currently be a difficult feat to achieve, it is anticipated that automated language translators will become ever-more accurate in the near future.

Although meant as an inclusive and pluralistic framework, this proposed system may be more oriented to (young) farmers and foresters who are more digitally skilled. To be as inclusive as possible, educators, advisors and facilitators should be strongly valued as end-users who also interact with and educate other groups of farmers and foresters. Therefore, information should be made readily available as training materials for further dissemination and exploitation by advisors and other educators such as teachers at vocational schools, technical colleges and agricultural universities using a problem-based learning approach with new learning methodologies. It would also be possible to connect with adult learning and lifelong learning programs including farmer learning groups and OGs.

Although the focus should be on creating a digital (online) platform, the open source KR should facilitate (physical) interactions, meetings and exchanges. The platform would also connect and display the events of various institutions so that users can search by topic and location to choose the most local and/or relevant activity to attend from a comprehensive list. Furthermore, with appropriate permissions in place, registered users can share their contact details and areas of interest/expertise for other users to search and connect with other individuals to foster and facilitate peer-to-peer and farmer-to-advisor networking as part of an interactive community experience.

## 2.6. Attaining a Self-Sustaining System

The EU knowledge reservoir for agriculture and forestry should be a self-supporting open source system which links knowledge collected and co-created from all levels (regional, national, international networks) and all types of projects including TNs and other multi-actor projects, as well as OGs under EIP-AGRI and National Rural Networks. The proposed online knowledge resource must fit and perform within the existing innovation system (AKIS or AIS) which is about relationships, interconnections and resource flows. The sustainability of the system is closely linked with its level of impact. Networking and knowledge sharing by users of the platform who perceive the KR to have intrinsic value will make other practitioners aware of the open source KR, creating a ripple effect that will increase engagement. To further attract increased use of an EU-wide open source common KR for agriculture and forestry, it should connect to other communication and dissemination channels such as project websites, paper-based promotional materials (e.g. flyers, posters), social networks, emails, press releases, agricultural press (both print media and online) etc. A joined-up approach and concerted effort is likely to benefit all parties.

It must be anticipated that a change in policy could act as a threat to the longevity of the open source KR in terms of funding sources. A clear business model is needed that also takes into consideration intellectual property rights. A way to overcome a gap in public funding could be to partly use the



dissemination budget of new TNs who wish to share outputs through the open KR, by charging a fee to use the service in order to cover the platform's overheads. This would act as a marketplace for an exchange of benefits between the broad TN and agricultural practitioners community. Allowing paid advertisements to feature on the platform could also be considered, but they should not compromise the neutrality of the resources and knowledge content included in the platform, or the user experience.

Although policy makers are not a key target end-user group, they can use the KR platform to access information to understand the problems facing agriculture and forestry, and policy should be developed based on this understanding. As such, content for the open source KR could, on the one hand, be developed based on the regulatory framework set out for farmers and foresters, and on the other hand, policy makers can consider the challenges and opportunities these sectors are being confronted with. This improved understanding may contribute to removing the gap and stigma between these groups of actors, as well as other key actors in agricultural and forestry innovation.

The future EU Common Agricultural Policy (CAP)<sup>3</sup> highlights the importance of digitalisation of agriculture and rural areas. The proposals for the new CAP include the development of strategic plans in which member states outline how they intend to meet the nine CAP objectives using CAP support instruments while responding to the specific needs of their farmers and rural communities. According to the proposal, the member states have to address the cross-cutting objective of fostering and sharing of knowledge, innovation, and digitalisation in agriculture and rural areas, and encouraging their uptake (Article 5), and a specific objective to enhance market orientation and increase competitiveness, including greater focus on research, technology and digitalisation (Article 6b). Moreover, member states are asked to put forward in their CAP strategic plans a strategy for the development and use of digital technologies in agriculture and rural areas, and to highlight the elements of the CAP strategic plan that support the modernization of the agricultural sector (Article 102). Strategic approaches to ICT in agriculture and rural areas will be key to foster the digitalisation of the EU's agriculture and rural areas.

National KRs are increasingly being developed in member states. National Rural Networks as CAP networks can play an important role in strengthening the national AKISs through digitalisation and assisting in defining functionalities, use of coding and IT language, and facilitating the interoperability between the different KRs and the connection to an EU-wide common agriculture and forestry KR. In this way, the digital asset can adhere to the "FAIR principles"<sup>4</sup>, meaning that resources are Findable, Accessible, Interoperable, and Reusable. CAP networks could also play a role in providing translation of ready-for-practice materials into and from local languages which contribute to agricultural innovation and rural developments. An EU-wide open source system should be promoted by National Rural Networks as well as local authorities and policy makers as a destination to store and organize resources from projects to help ensure their impact and legacy.

## 2.7. Conclusion

An EU-wide open source KR for agriculture and forestry would provide agriculture and forestry actors with a valuable 'one stop shop' for their knowledge needs. By co-creating a user-friendly interface with useful, practice-oriented content, relevant information will be more easily found and implemented by end-users. Going beyond providing a digital resource to facilitate networking activities both online and in-person provides opportunities for cross-exchanges and collaborations and fosters a positive EU-wide agriculture and forestry community. This community can also include policy makers, helping to ensure that policy and practice work hand-in-hand to achieve the best outcomes in practice. This vision is

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<sup>3</sup> [https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en)

<sup>4</sup> <https://www.go-fair.org/fair-principles/>

extremely compatible with AKIS strategies<sup>5</sup> to strengthen links between research, practice, education and farm advisory services, enhance interactive innovation and support digital transition in agriculture and can also contribute to the United Nations Sustainable Development Goals<sup>6</sup>, particularly those seeking to end hunger and promote industry, innovation and infrastructure. A common KR platform be an interactive tool which enables a joined up approach to addressing common problems.

## 2.8. Acknowledgements

The Strategic Innovation Board (SIB) of EURAKNOS are gratefully acknowledged for their support, input and comments for the development of this Vision Paper especially at the meeting in Bruges, Belgium, January 31, 2020.

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Jannes Maes, CEJA

Inge Van Oost, EC DG AGRI

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<sup>5</sup> [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key\\_policies/documents/building-stronger-akis\\_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/building-stronger-akis_en.pdf)

<sup>6</sup> <https://sustainabledevelopment.un.org/?menu=1300>



### 3. Appendices

#### Appendix I: Input from the Vision Paper meeting with SIB January 31, 2020

The SIB participated in a meeting where they gave their input in response to questions that were presented to enable the construction of the vision paper. The discussion was structured in sessions, notes from which are outlined below.

SIB members present:

Nevena Alexandrova (FAO), Andre Laperrière (GODAN), Luc Peeters (Copa Cogeca), Tom Kelly (EUFRAS), Andrew Fielsend (NAIK)

SIB members not present, but gave written comments:

David Lamb (ERDN), Jannes Maes (CEJA), Inge Van Oost (EC DG AGRI)

#### Introduction

**Future of KRs:** developing high impact knowledge reservoirs (collections of best practices)

**Goal:** open-source system that connects all kinds of projects – what kind of content → consensus points

- Think how TNs can have more impact through a common open source data base, and what it can bring for farmers.
- Food and Agriculture Organization of the United Nations (FAO) has a particular interest in knowledge reservoirs; FAO launched the TECA Platform in 2002 for family farmers in Central Europe and Eastern European countries to access user-friendly information on practices, technologies, and innovations. Lessons could be learned from previous experiences/platforms, developers are often willing to share.
- The open source KR and its contents must be adapted to the specific needs of who it is for: farmers, foresters and advisors. It is a learning resource, it should connect to vocational training, using a problem-based learning approach for farmers and advisors.

#### What should an open source knowledge reservoir for agriculture and forestry look like and what do we need, want from it? What can it deliver/bring to farmers?

- All TNs were funded to address specific problems, so the KR should be based around specific challenges and options for solutions to those problems.
- The KR should be structured and “solution oriented” to allow a problem-based/problem-solving learning approach.
- The KR should target a specific audience. Farmers, foresters and advisors are a diverse group, so the KR should reflect their context-specific needs to help problem solving, and connect with education and vocational training.
- The KR should be tailored to Europe and the platform should be active, regularly updated and tailored to the end-user – a living tool.
- The system should be attractive for both end-users and content providers.
- A website manager/editor will be needed to moderate and maintain the platform, ensuring content is regularly updated and providing an element of quality control. To reduce the labour-intensiveness of this role, TNs should be expected to produce high-quality materials and upload in suitable formats. It may be necessary to consider requiring uploads to follow a standardised format/template. However, automation should be taken advantage of to the greatest degree possible.
- Translation is necessary but ambitious: would suboptimal translations be sufficient? there are relatively powerful translation tools available but these tools have limited accuracy, need contributions from native people

### Defining high impact

- What change does the platform bring? It should achieve high levels of interactions by creating good links with target audiences, providing content and structure which meets their needs.
- The platform should be inclusive and interactive and providing networking connections.
- It should be possible to engage national stakeholders (e.g. National Rural Networks (NRN)) and support national processes/targets.
- Knowledge can be added to by the combined expertise of people. The platform should provide a networking element where people can connect and form an engaged community.
- Link with existing networks/initiatives: EIP AGRI, NRNs, FAO, Industry, Sustainable Development Goals.

### Who is/are the target end-user(s) for the open source knowledge reservoir and what are their needs?

- **Farmers/Foresters/Primary producers** - 1<sup>st</sup> category users. Need information for a solution fast.
- **Advisors** = key users = facilitators who provide another avenue to reach and transfer knowledge to farmers. Often an essential link between farmers and researchers.
- **Teachers** similar needs to advisors, but their audience probably require more basic information. Need short training modules, training support e.g. digital materials on different topics and sustainable practices, and tools/information to build adult teaching programs for farmers. Linking with vocational schools and agricultural universities could help reach farmers, advisors, and researchers of the future to encourage a problem-solving approach.
- **Policy-makers and researchers** although not key users of this platform, it could be a useful resource to identify existing challenges and solutions for more applied research and policy.

### What should the user interface be like?

- Access should be possible without setting up a profile and setting a password.
- Lessons should be learnt from what other systems, search engines, TNs, etc. have done.
- Interoperability is essential to be able to connect online services, Internet of Things, sensors etc.
- Options should allow users to contribute to the management and updating of the platform, contributing to user analytics.
- Access should be possible from web and mobile app platforms.
- It should be visual and tell a story
- It should link to physical interactions/data e.g. weather forecast to foster multi actor approach and data ecosystem. The platform could act as a digital facilitator/advisor for practical solutions

### What type of content should be contained within an open source knowledge reservoir to be an effective, user-friendly tool to find quality materials?

- Content should target and be tailored for three main groups of end-users: farmers/foresters/primary producers, advisors, and teachers/educators.
- Content should provide practical knowledge, organised by sector and problems with simple messages.
- Content might include: tutorials, training programmes, instruments/tools, infographics to answer key questions, mind mapping, storyboards, cartoons, videos, podcasts, etc.
- Content should relate to EIP-AGRI policy and support national processes in member states. It should be relevant to the Common Agricultural Policy (CAP) and other standards e.g. organic
- Ranking by proven effectiveness is not possible when every farm is different.



### **How can we best incorporate the multi-actor/TN approach to demonstrate added value to agricultural society**

- Inclusiveness is an illusion – some individuals will not be digitally savvy etc. Produce print materials to reach more farmers and link with agricultural press for more effective communication.
- Involve actors (including TN and their networks) in the different stages of planning, implementation and development.
- Focus first on farmers/other stakeholders already involved in TNs, let it grow from there.
- It is important that the platform can link with physical interactions.

### **What do policy makers need to know/consider/change/aim for? How can they facilitate this type of system?**

- Consider what policymakers want from farmers and connect with local policy organisations, and perhaps even DG AGRI (EU Commission's Directorate-General for Agriculture and Rural Development).
- Consider regulatory frameworks farmers have to follow and see if it is possible to crosslink different systems/challenges e.g. climate challenges
- Policymaker improvement should *not* be paid for by CAP. Platform organisers must be aware of changes in policy and consider the longevity of the HIKR if this happens.
- Sustainability of KR needs to be considered if it is publicly owned. At some point it must be self-sustaining. This could come from the dissemination budget from new research projects (this could become standard policy). Alternatively, government programmes (short term) or royalties/advertisements could be considered. A business model for sustainability must be established.
- Commission should perhaps play a role, and/or different member states should be encouraged so that different countries have ownership over the platform to facilitate (national) network to help manage the platform.
- This common KR should link with local websites from policy-makers.
- Policy could help with language: it might be unrealistic to translate to every language (although automated translations may improve drastically over the course of 5 years). Policy could state e.g. that TN should prioritise 5 languages, then further translations could be produced if demand is apparent. Alternatively, the funding body could make translations of the content of TN project outcomes mandatory.
- The platform could help farmers to make decisions to integrate existing policy on-farm by applying the regulatory framework and access to information for their own context. This could improve compliance with regulation.



## Appendix 2: Relevant entries from the 20 recommendations from the EURAKNOS workshop

20 recommendations were distilled from the various parallel workshops that were organized during the EURAKNOS TN expert meeting in Budapest, September 2019. The most relevant recommendations which helped to inform the Vision Paper are listed below.

### 8. TN Digital Platform:

The **digital platform** that houses the TNs knowledge outputs should function so that the content shown to each user is **profile user led i.e. tailored to their profile, level of expertise and in their preferred language and format** (automatic profiling and translation). This should be organised using common easy language with well-defined concepts and focus (instead of using over-generalised buzz-words). Having a digital platform which responds to each user creates trust and validity in the platform, which can amplify the number of users it reaches and the impact it gains.

### 9. TN User Interaction:

In addition, the digital platform should **use user analytics** to further optimize its usability, including **evaluation and feedback forms** on the solutions and outputs it generates. For example, via user reviews of content, content suggestions (e.g. Amazon function: '*user that were interested in this were also interested in these alternatives*') or a 'bot' that flags up other information that is relevant for you in an interactive virtual conversation (Q&A). This would facilitate a live, interactive experience for the user and enable the TN **to improve the outputs and adapt them**, so they stay relevant.

*E.g. [4D4F](#), measured outreach with user analytics in a learning community*

*E.g. [FarmDemo](#) hub set up by AgriDemo-F2F, PLAID and Nefertiti uses questions, instead of keywords or categories to guide the users to the results that are most relevant for them.*

### 10. Access to TN Output:

The **digital platform** that houses the TN outputs should provide **easy access** to content through an **optimised search engine** with highly configurable, state-of-the-art search engine technology. In addition, a cross-platform with cross-device applications, such as a user-friendly mobile application for daily use, should be explored. All **content need to be relevant, to the point, and instantly provide value to the user**. Therefore, the content should be easily searchable and findable.

As such, digital platforms of TNs should at least adopt the following **features to filter information** (high signal to noise ratio within a max of 5 clicks):

A good categorization with keywords or "Search Zones" i.e. the existence of specific "areas" on a webpage allowing for guided content search through use of predefined options (geography, sectors, themes, needs, expertise, solutions, content type, origin, date, etc.) when you want to browse and be inspired.

Intuitive and efficient search tools (similar to those that most people use everyday provided by major tech firms) when you want to find specifically what you are looking for.

### 11. TN Output Standardisation:

The outputs of a TN have a **degree of standardisation**, including descriptors and metadata provided by well-established and acknowledged vocabulary, going from tailor-made solutions to highly standardised content depending on who the output is for.

### 17. TN Output Format:

In terms of the format, materials, and tools used for dissemination purposes, **the less text and more visual and interactive the better**. So, there should be a focus on creating **engaging videos of best practices or case examples** with co-created content and international showcases of new information.



## Appendix 3: Background based on Deliverables D2.1, D2.2, D2.3, D2.4 and D4.1 and outcome of Working Group 3.1

### Excerpts from D2.1 relevant for the Vision Paper

The outputs that the ideal TN produces should be based on practical expertise that can inspire farmers to apply or further innovate to tackle technological, economic and ecological problems. The solutions should have clear targets and user profiles (+ expertise level) for the problems they are trying to solve and they should be embedded in everyday farming practice. The role of a TN is twofold: (I) to create and share timely practice solutions to technological, economic and ecological problems; and (II) to inspire other 'end users' and actors to mobilise new TNs to trial, innovate and apply their own practical solutions to context specific problems.

In order to expand specific sector knowledge towards those less represented countries or sectors (Eastern & Southern Europe, crops: Permanent grassland & crops; Forestry), based on their own needs, more links with OGs and NRNs should be created, relevant actors, such as policy makers, representatives of the agricultural sector, researchers, stakeholders and farmer associations should be engaged, the knowledge transfer should be improved, and communication should be more effective. 25 % of links in TNs did not work - how will it be possible to create permanent links?

Table 1: Main type of Outputs.

Communication	
<b>Press release</b>	Official statement delivered to members of the news media for the purpose of providing information, an official statement or making an announcement. To maximize the impact it could be linked to the provision of a solution of a huge society problem. Target: General Public
<b>Brochure, booklets</b>	A type of small magazine that contains pictures and information on the project. Target: General Public
<b>Podcast</b>	Audio that is stored in a digital form that you can download from the internet and play on a computer. Target: General Public
<b>Infographics</b>	A representation of information in a graphic format designed to make the data easily understandable at a glance. Target: General Public
<b>Newsletter</b>	A bulletin issued periodically to the members of the project. Target: General Public
<b>New: Short presentations at events, Policy briefs Technical infographics</b>	

### Excerpts from D2.2 relevant for the Vision Paper

A digital KR is organised around:

- A back-end where the data (knowledge) is stored and organized in order to be mobilized in applications and operations. This part can be seen as a library of different types of content with shelves and with an order able to locate information and use it. Data is understood here as information provided in different forms (e.g. digital data, metadata, as well as urls, pictures, videos, articles, practice abstracts, newsletters, fact sheets, leaflets, press releases and articles, scientific papers, tools). This data can be classified according to their format and their usefulness for a given type of user.
- The user interface is the visible part of the KR. This interface is therefore a showcase for the information contained in the back-end and makes the contents visible in an organized way.

The open source KR has two main objectives: provide access to information (related to the project: project status, partners involved...) and technical content (all types of knowledge produced by the TN and intended to be disseminated). Other objectives could be to act as an archive of the project results, promoting innovations and fostering dialogue with end users.

Table 2: Main type of Outputs.

Dissemination	
<b>Practice abstracts</b>	A short document that highlights a practice and useful innovation. Target: Farmers and researchers
<b>Factsheets</b>	One single printed sheet with a concise presentation of information in a format which emphasizes key points concisely, usually using tables, bullet points and/or headings and printed on a single printed page. They are sometimes a summary of a longer document. <i>Target: Farmers and researchers</i>
<b>Research papers, Reviews</b>	Papers published in scientific journals indexed in the WoS or any other scientific database as a direct result (Research papers) or as a compilation of results from other papers. Target: Researchers
<b>Report</b>	A document coming from the project that highlights the most important results from a specific project Target: Researchers
<b>Technical articles</b>	A document that describes the nature, state of the art, progress, or results of a technical process. Therefore usually associated to best practices. Target: Farmers
<b>Guides</b>	A document that describes a process or the know-how of an innovation. Target: Farmers
<b>Videos</b>	A film detailing an innovation in images. Target: Farmers
<b>Handbook</b>	A book giving information such as facts on a particular subject or instructions for operating a machine. Target: All type of stakeholders
<b>New: training &amp; online courses (MOOC) policy reviews podcasts</b>	New: advisors should be added as target to all materials

Content and information are provided for people already involved in agriculture and forestry and able to understand and use delivered recommendations, but it should be considered whether a distinction should be made between farmers and advisors due to their different use of innovation practices. Advisors and innovation brokers are seen as an important target for KR managers. The content delivered in KRs is supposed to inform on new practices.

The translation of content is a very time consuming and tedious task to implement, but is the only solution to facilitate understanding of content by all end-users.

Validation is mainly concerned with the technical content of provided data, the practice applicability and the scientific content. Language and layout attract less attention with regard to validation.

The CMS is the code language. It determines the associated content management functionalities. Different CMS have been used mainly open source. The CMS choice must also be compatible with the open access character. Open access means that research results are made freely accessible in digital form, which promotes the dissemination of research results both within the scientific community and to the public at large. The reader can read free of charge, use, copy, print, and link to the open access publications.

The KR can be linked to OpenAire, the scientific platform to exchange knowledge on agriculture, either directly from the KR or via Zenodo (a repository linked to OpenAire). This solution gives some opportunities in storage data and information.

The most common content search options are: the subjects covered, the country providing the content (which is strongly correlated with the language in which the content is written) and the field with which the content refers. But not only that, because it is also clear that the type of content and the year of conception are also elements that are much emphasized in the availability of available content.

The KR's exploitation plan is a document which summarizes the practices that will be implemented and retained to be able to develop an open source KR and guarantee its sustainability in terms of longevity and updating of the content. The KR updating is fully correlated to the lifetime of the project. During the project, the content is regularly updated. However, after the end of the project the content of the open source KR remains static and no longer evolves due to lack of time, budget and person in charge. The question in relation to the maintenance cost is who will have to support them once the project is completed, which raises the question of the sustainability of the content deposited in the KRs.

It should be noted that the attendance rate of the KR is strongly correlated with the frequency with which content is updated. To retain the loyalty of a KR user, it is necessary to regularly provide the KR with new content adapted to the expectations of this user.

The general observation that can be made on the KRs is as follows: different designs for different KRs. KRs are based on:

- End-users requests and needs
- Type of contents which can be scientific or not so scientific, very « hands-on » with lots of tips and forums
- Input from partners and users (videos, etc...)

#### Types of KRs:

- KR as a catalogue: supports the user in his choices oriented in the search for practical solutions. So, these KRs reference some innovative technical solutions. The key steps for consulting content are in the first place through the use of a search engine; in the second place search criteria are defined to filter solutions.
- KR as a library: The main functionalities identified are a classification of contents by theme or type of content. The key steps for consulting content area guidance on the site according to a proposed thematic classification.
- KR as a practical digital guide book: The main functionalities identified are a presentation of tricks and
- tips and very practical solutions. The key steps for consulting content are first, through the use of a search engine, second search criteria defined to filter solutions or defined on the subject on which it is focused.
- KR as a market place to exchange good practices: The main functionalities identified are a KR which does not host any knowledge content but which lists references accessible through URL links.
- KR can also be a mix of the above.

Current TNs have different websites with different IT structures, formats and contents, depending on the actors involved in the project, the theme, the sector, the targeted audience and countries and the outputs of the project. To be of high impact the results should not only be of high relevance to the end-user but also easily accessible and understandable, and this should be better facilitated.

The sustainability of the website is a key issue in terms of long term impact. Therefore, a generic website or platform may be created with short descriptions and links to the individual project websites, which are built in a common format.

### Some recommendations for a High Impact Knowledge Reservoir

When designing a KR, it is absolutely essential and fundamental to take into account the need and to satisfy the expectations of end-users. We must be able to know what type of content end-users expect and to define the functionalities offered by the KR in order to direct end-users as much as possible and as well as possible towards suitable and interesting content.

To this end, it seems important to plan to develop a prototype that can be presented to a panel of end-users, with different profiles, who will then be able to give their opinions and share their perceptions. It is also essential to support end-users in their navigation in the KR and it is also important to think about finding a way to make the most appropriate content as easily accessible as possible.

A few comments collected during the surveys summarize quite well the points of vigilance that must be kept in mind when developing a KR:

“Communication is the main issue: we need to know our targets!”

“Keep in mind the end-users’ needs: main criteria to reach them: easy to use, be visual, different languages available”

“Share with all the stakeholders on the design of the KR”.

To be able to connect all KRs in a common open source infrastructure, a standardized framework should be developed. It should be a dynamic system with a self-improving feedback loop, with well overthought search options for specific farmers’ needs, actions and different sectors.

Indicators such as the number of hits for specific information or profile of the end-user, can be used for continuous monitoring, evaluation and adaptation of the system.

### Excerpts from D2.3 relevant for the Vision Paper

The **targeted end users** include farmers, researchers, advisors, policy makers, industries, consumers and media. On the other hand, NGOs, local authorities, investors, and specific actors according to the topic are defined as minor target groups.

The main barrier identified was how to deal with translations. **Language issues** concern local languages as well as technical/scientific language.

- One of the solutions used by TNs is the automatic translations provided by social networks or online tools: translation isn’t perfect, but it saves time and budget.
- Once it comes to dissemination to practice, end-users can provide some help to translate the technical knowledge into easily understandable communication.

The second barrier, **is how to reach end users**, especially farmers, through channels, materials and activities: *“farmers get a lot of information from everywhere, so it is challenging to catch their interest”*. Besides, reaching people isn’t enough; *“the point isn’t to have the numbers, but to engage people”*.

Monitoring tools must be developed to estimate end users really engaged by TN outputs.

Facilitation of the further use of the results is more oriented towards active stakeholder user engagement and innovation management focused on exchanging existing knowledge, best practices, methodologies and innovative solutions. Making use of these results will most probably lead to making use of a product, new service and influence societal activity and policy changes through speeding up agricultural innovation.

Digital channels are considered having an essential value for the TN, however, their importance is lower compared to the face to face and group meetings.

The success of these channels depends on the countries and habits in local regions, TNs must have some practitioners who know the most used and accepted channels by end users. OGs, for example, are already proactive in dissemination activities by using their own usual channels (websites, mailing of e.g. newsletters) and networks to make the project results available.

The EIP-AGRI channel and its practice abstracts offer dissemination material towards end users in a standardized format, to reach the managing authorities, the regions, multi-actor projects, TNs, and OGs. Being mandatory by the EC for TNs, the EIP-AGRI practice abstracts are now well known as a dedicated material (format) and tool to disseminate knowledge, best practices and methodologies, into understandable language for farmers and foresters. The reason for their existence and their potential value is largely accepted by the AKIS community, but there are some issues as **the format and design of EIP-AGRI practice abstracts are not satisfactory for the majority of TNs.**

**Educational programs, or training courses**, directed towards students, farmers/foresters or advisors. Following the EU regulations, they are all published in open access. These types of programs are part of a key solution for the sustainability of the TNs as it can be accessible in the long term and re-used by stakeholders to disseminate the knowledge and increase impact.

The best material to communicate and disseminate to the maximum amount of end users is a **graphic** one: picture, video, infographic... The less time you need to understand your material, the more efficient your C&D. That's why videos and images are more impactful to capture interest than only texts. In fact, videos and YouTube are becoming more and more important for dissemination because movies attract attention more easily and farmers can compare themselves to their peers on a video for example.

Some material needs to have a lot of content to disseminate knowledge, so in that case it should be accompanied with infographics, abstracts, and fact sheets to sum-up and not discourage people to read it, especially farmers who don't have a lot of time dedicated to that and need practical inputs. Paper or hard copy (like factsheets) are still considered to be important material next to digital output.

Message must be adapted to target the audience foreseen, but to be able to do that, some time and knowledge should be dedicated to define the profile of each targeted end-user group to understand end user's need, but also their cultural and socio-economic background, what they're looking for, when/where are they searching for information, what equipment and/or infrastructure they have and the language they speak. The core objective of a TN is to enhance agricultural innovation by the uptake of innovative knowledge and best practices by farmers and foresters. Delivering the right message to the right target groups for this purpose is an important challenge. There is not such a big difference between type of actors. But the content should be different for the same material as target groups do not have the same expectations and do not speak the same language (different kind of format, language, technical details, etc).

The main issue remains the measurement of number and type of people reached by TNs communication and dissemination: *What do we understand with "reach"? People that are using the results? How can we know if the content is used, and by which kind of actors?*

The idea would be to focus more on the end user uptake than on figures and Key Performance Indicators (KPIs) which are not so significant in terms of engagement and application of results in practice.

Recommendations for TNs:

- **The identification of the audience may not be restricted to the type of actors, but also to their common practices, age and preference in term of channel** – for example a young farmer



belonging to a digital community (twitter group etc) in comparison to an old farmer who doesn't have any computer or smartphone, but is proactive in farmer associations.

- Some channels are not used (or practically not) even if they are potential good ways to reach farmers/foresters, such as **WhatsApp, radio media, podcasts** and **local press**.
- In order to maximize impact of communication and dissemination, a solution can be to **connect the TNs to other H2020 projects**, national and local projects or OGs, to launch shared events and common reflections to identify innovative practices.
- In continuation, and in order to assure the sustainability and long-term application of TNs results, **links with long term local initiatives and education programs** are recommended.
- There is a need for **decision making support tools** on how to select a blend of multiple channels and a portfolio of tools/materials that will lead to high impact dissemination to the specific audiences (including end-users of project results).
- To conclude, future TNs need more effective and appropriate/relevant measures and tools to evaluate the result of their (co-production) and dissemination of results. An ideal TN should definitely have better means to evidence its outcome and impact on end-users.

### Excerpts from D2.4 relevant for the Vision Paper

According to a recent report<sup>7</sup> of the SCAR SWG AKIS projects<sup>8</sup>, being multi-actor should ensure:

- Demand-driven innovation as a sort of guarantee for impact of research, if the project succeeds in developing practical solutions
- Result-based inclusion of tacit and practical knowledge in a balanced and focused way, beyond purely scientific inputs from various scientific disciplines
- Resulting applications which are fit for the local levels, thanks to the inclusion of the local practitioner and contexts
- Real added value for the practice by avoiding overlap during proposal drafting with existing best practices and research done already
- An efficient and effective dissemination practice, both at EU level as at local/regional/national level, with a view to spread knowledge ready for application
- A quicker uptake of research and innovation results, thanks to the co-creation and co-ownership of end-users of project results

According to the EC<sup>9</sup> the most important end-users of TN results are the farmer and the forester.

However, intermediaries can also be an important target group as they are key not only in capturing the needs but also in the dissemination process towards the farmer and forester.

### Methodology to keep farmers and foresters engaged:

- Interesting topics and facilitation.
- Free access.
- Combine 'more boring topics' with 'catchy topics' for farmers.

One of the main challenges is linked to the sustainability of the network and the updating and effective use of the outputs and the results in the long term. The Multi Actor Approach helps to make the TN sustainable beyond the life of the project funding due to the connection with the EIP-AGRI, links with end-users and the dissemination of best practices.

<sup>7</sup> [https://ec.europa.eu/info/system/files/food-farming-fisheries/key\\_policies/documents/report-preparing-for-future-akis-in-europe\\_en.pdf](https://ec.europa.eu/info/system/files/food-farming-fisheries/key_policies/documents/report-preparing-for-future-akis-in-europe_en.pdf)

<sup>8</sup> [https://ec.europa.eu/info/system/files/food-farming-fisheries/key\\_policies/documents/report-preparing-for-future-akis-in-europe\\_en.pdf](https://ec.europa.eu/info/system/files/food-farming-fisheries/key_policies/documents/report-preparing-for-future-akis-in-europe_en.pdf)

<sup>9</sup> [https://ec.europa.eu/info/system/files/food-farming-fisheries/key\\_policies/documents/report-preparing-for-future-akis-in-europe\\_en.pdf](https://ec.europa.eu/info/system/files/food-farming-fisheries/key_policies/documents/report-preparing-for-future-akis-in-europe_en.pdf)





Creating more synergies with other projects, related initiatives, or other parties to continue using the outputs and results after the project:

1. 'Linking more everywhere (Focus groups, OGs) about methods etc. Increase synergies between ongoing projects at an European scale'
2. 'Be aware that most end-users will never visit the EIP AGRI website but Google. Make results searchable and findable through Google'
3. 'Projects should be included in a bigger picture as for example communities of practice, outputs easily accessible for practitioners, continue to work giving service to farmers beyond the project.'
4. 'A shared vision and parties we can genuinely work with are needed. Explore other relationships. Use TNs beyond the project duration.'

### Excerpts from Working Group 3.1 (Paris) notes relevant for the Vision Paper

- **Each person has different needs** – no need to put everyone in boxes.
- One big repository for all with good filters.
- Focus on **the most common types of questions and needs**. Too much irrelevant content makes you lose interest. The more you include the more complex it becomes. How many filters. Criteria are all filters.
- Comes back to how to present it. Click through what comes up instead of using filters. **Easier to browse through pictures or words**. Like in google search – see pics, videos etc. Possible to ask a question e.g. "how do I get more bees" .
- IT wants to come up with something new –but it is important to look at what is working already (EIP-AGRI, OpenAire).
- The **search engine** is **the meeting point between input & demand**. Media key. Expression of what is the aim of the EURAKNOS e-KRP prototype. If we want to help farmers we need to put the benefits in the key.

A coordinator point of view

"Personae mapping creating priorities and getting better to know what the needs are the journey what do you want to know, when, why. Redesign how to build it."

A farmer point of view

"EU commission wants to help farmers – but this may not be the best platform directly to farmers – position it for advisors & researchers first who will connect to farmers in a second time."

An expert point of view

"About the ranking system – information put out should have the possibility to rank whether it was good or useful to show other people when they find it."

"Use existing knowledge."

### Excerpts from D4.1 relevant for the Vision Paper

Studying the feasibility of an electronic knowledge reservoir platform (e-KRP), and thereby taking into account useful findings from various TNs requires identifying relevant end users and their needs to then match them to the design of the e-KRP.

#### End user descriptions

The focus is on farmers (including foresters) as the main target group of the e-KRP. Three more end-user types, namely advisors, teachers and policymakers, were selected based on their function as information sources for farmers or otherwise close relation to farmers, e.g. through their decision-making power. Farmers associations are essentially composed of individual farmers and farm advisors so will not be considered as a separate end user unit.



### End user needs

Farmers need knowledge that is up to date and tailor-made, i.e. adapted to their context and specific needs (e.g. practice abstracts, videos, factsheets and newsletters). Information provided should be understandable and actionable (i.e. concrete and practical/applicable) in order to address the demand for technological, context-specific knowledge. The flexibility of tailor-made solutions allows the translation of knowledge to a very specific context. The success of solutions should have been proven/demonstrated in the field. As a lack of time is a major barrier for farmers to the acquisition of knowledge, the e-KRP should be easily accessible (i.e. easy to find, available in different languages, providing open access documents) to reduce the amount of time spent on searching for the right information.

Farm advisors need comprehensive, up-to-date knowledge about recent policy and sector developments that can be transferred to farmers. Advisors for organic farmers for instance need information about the new regulation governing organic production and trade, and the implications for practice. Adjusted formats that are also relevant for farmers themselves include practice abstracts, newsletters, factsheets, press releases, and videos.

For agriculture teachers/trainers, the e-KRP should provide transferable knowledge and information. Besides practice abstracts and factsheets, impactful examples include training modules, courses, teacher's guides and resource packs<sup>10</sup> to prepare and equip students in their role as farmers or to become future farmers.

Advice for agricultural policymakers should be on time (up to date), on topic (broad range of knowledge covered), and in the right format in order to be relevant for and best serve policymakers. Relevant formats suited to policymakers' needs include press releases, videos, newsletters and factsheets.

Table 3: Needs of the selected end-user groups

Usergroup Needs	Farmers	Farm advisors	Agriculture teachers	Agricultural policymakers
<b>Type of knowledge</b>	Easily accessible Understandable Useful, actionable · New	Rather tailor-made Comprehensive Transferable Up to date	Up to date · Transferable	Standardised/ generalised Evidence-based Up to date · Implementable
<b>Content</b>	Tailored advice Specific technological knowledge necessary for the farm · Adapted to their context and needs	Recent policy and sector developments · Specific, local solutions for specific business and technical problems	Scientific results & practice · Adapted to the target group and practitioners' needs	Relevant to their respective policy area · Knowledge to design new policies
<b>Types of content/formats</b>	Online information, e.g. practice abstracts, videos, factsheets and newsletters · Interactive, e.g. agricultural training, individual advice and farmers' journals	Practice abstracts Newsletters Factsheets Press releases · Videos	Practice abstracts Factsheets Training modules Courses Teacher's guides · Resource packs	Press releases Videos Newsletters Factsheets · Peer-reviewed meta-analyses translated into policy reports with recommendations

<sup>10</sup> Example: [https://ec.europa.eu/agriculture/sites/agriculture/files/teachers-pack/material/1-1-teachers-guide\\_en.pdf](https://ec.europa.eu/agriculture/sites/agriculture/files/teachers-pack/material/1-1-teachers-guide_en.pdf)

Agriculture and forestry are increasingly becoming data and knowledge intensive. Technology in the form of electronic platforms or databases can assist in facilitating the dissemination of expert knowledge. A KR serving to communicate on multiple projects like EURAKNOS can ensure continuity of communication even after the project ended (Chourot & Pascal, 2018). It collects all available information material and provides an easy-to-use search function that enables users to find what is of interest for them. In contrast, a successful information system is much more than this; it checks, validates, and selects the most useful contents, and also processes them, creates news, summaries, analyses, etc.

Besides farmers themselves accessing platforms and tools provided, advice/extension and education/training are means by which science can become practice (EU SCAR, 2016). Bodin (2019) found that more than 90% of the TNs surveyed within the frame of WP2 consider farmers as potential end users, followed by advisors and farmers' associations. Besides these three main end-user groups that were further investigated in this report in terms of their knowledge needs and how they are currently met by the offers of different national and international e-KRPs, policymakers are considered as another potential end-user group. As the group least targeted by the analysed initiatives, they are promising as a target group for the e-KRP – as are teachers/trainers whose needs are currently likewise not sufficiently met by the platform offers. Education/training plays an important role in the acquisition of knowledge by farmers, and teachers/trainers are in direct contact with and thus a crucial information source of farmers.

The platforms analysed in this report see their added value in their function as a KR and/or network, providing information and engaging the user community. Hereto related strong points include the **quantity and quality of the content/data**, an **efficient search function** that makes it easy to find content, and **availability in different languages**. All TNs studied in WP2 attribute website success to unique content. Also similar to the findings presented in this report, language is a main barrier of C&D, influencing access to the website and KR as well as to the contents (Bodin, 2019). Most of the excluded international platforms are not available in and/or do not offer contents in different (more than four) languages. Likewise, 8-11 of the 22 national platforms mapped are not available in the national language and English. From the national initiatives analysed in more depth, BIOEAST, though focused on Central and Eastern Europe, is only available in English. This makes it difficult for practitioners to access and understand the content, and technical agricultural terms in particular.

The barrier of too many sources encountered by farmers will be tackled since the e-KRP will gather the knowledge and material from all TNs in one place. For the TNs, the added value will consist in enhancing their own impacts and the uptake of their results by end users, multiplying the channels of C&D, and increasing the visibility (Bodin, 2019).

After reviewing the chosen national and international platforms, one comes to the conclusion that they vary greatly in every aspect – from very simple ones to platforms with a huge number of content in various types and formats, with geographical coverage from national to global, from platforms and contents available in a single language to a high variety of available languages, from a simplistically structured standalone webpage to a complex platform which can transfer contents from different sources, supported by different social media and other channels. Some platforms only provide a single email address for contact whereas others offer a wide variety of specialised contact persons or even an online chat function. There are moreover differences in the target group. While some platforms focus on governmental bodies, others directly target end users. Further differences concern the complexity of the structure, the maintenance, metadata, search function and other available tools.

For the data to be of use, it must be available and accessible, of good quality and easy to exchange. Search and analysis tools are necessary to quickly find the right information, which is crucial for practitioners. Interoperability of data and information systems (i.e. the translation of data from one technology to another) requires common standards and an agri-business collaboration and data exchange facility. Next to cooperation between content providers and technical partners, specific

vocabularies (e.g. to suggest suitable search term) are necessary to tailor the platform to the different needs of different target groups (e.g. tagging certain documents as being useful to practitioners or annotating documents with terms to make them more findable, and sharing them further via social media; EU SCAR, 2016).

The most important feature concerns the usability and effectiveness of the platform: A KR cannot be really user friendly if the contents related to a specific topic are in too many different types and forms. For users, it is much easier to overview materials if they are in a standardised form. The system should not be too complex, and the number of functions should be limited. The system architecture should be tailored to the content and user needs.

The EURAKNOS e-KRP should be based on a user-friendly search function that enables end users to access the relevant information out of a broad range of knowledge and a variety of tools intuitively and quickly. The content of the e-KRP should be filled with metadata to ensure the possibility for fine searching that provides content that is really needed. The categorisation is important, as is a rating system on a scale (e.g. easy to understand, useful, etc.), based on the judgement of the authors/administrator or feedback of users. The platform should be structured in a clear way, guiding the user (e.g. problem, solution, description in the case of Organic Farm Knowledge) and providing information regarding the applicability of tools (e.g. theme, language, keywords, year of release, country of origin, issuing organisation, more information about the tool in the case of Organic Farm Knowledge). Moreover, the platform design should be interactive, e.g. providing a user rating system, the possibility to leave comments or engage in discussion, a feedback form to suggest tools and/or templates to contribute own solutions. Further options include a forum/intranet for the user community to network and exchange knowledge as well as social media channels.

The system should be self-supporting. A minimum budget should be dedicated to communication during and after the projects (Chourot & Pascal, 2018).

Specific recommendations for the e-KRP are listed below:

1. A clear objective is required.
2. The target group must be specified – their profile, information habits, and needs.
3. It must be clear what kind of contents will be stored in order to design an effective and content-friendly KR.
4. Special attention must be paid to metadata and its completeness/correctness as a base of an effective and user-friendly search function.
5. Focus should be on those channels that are the most frequently used by the target group(s).
6. Collecting feedback from users is indispensable, and this information must be used for further development.
7. It must be ensured that the new contents should be added to the system in a determined structure and form, as much as possible in an automatic way.
8. Quality review and assurance must be solved.
9. Resources should be ensured for maintenance of the system regarding both the updating and further development.

The FAIR Data Principles, a set of guiding principles to make data findable, accessible, interoperable and reusable provide guidance for scientific data management and stewardship to promote maximum use of research data (Association of European Research Libraries, 2017). Strengthening the development of infrastructures and services that enable a systemic change of science practices to Open Science, they should be taken into account when designing the EURAKNOS e-KRP.