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V1

D1.1 - Guidelines for the creation of the networks

ADVISOR NETWORK FOR OPTIMAL FERTILISERS USE

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Glossary

AKIS Agricultural Knowledge and Innovation System
BBF Bio-based fertilizers
CAP Common Agricultural Policy
CoP Communities of Practice
EU27 MS European 27 Member States
FIN Fertilization Innovation Network

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Abstract

STRATUS aims to connect advisors from all over Europe for accelerating knowledge creation and sharing on integrated Fertilization Management, supporting farmers to bring this knowledge into practice aiming to reduce nutrient losses to the environment while maintaining soil fertility. A critical step to achieve this goal is the creation of an EU-wide advisory network. This document deploys a guide that describes the how-to to set up an innovative network using the STRATUS project as a case example. This will enable regional actors to adequately set up comparable networks.

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1. Aim of the deliverable

To deploy a guide that describes the how-to to set up an advisory network integrated in the EU27 AKIS using the STRATUS project as a case example.

2. Important concepts

AKIS. A combined organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields.

SubAKIS. The set of people and/or entities that create, transmit and use knowledge in a given geographical area, time scale, economic activity... Therefore, they present huge variability in their characteristics.

Advisory network. Advisory networks are multi-actor projects that connect advisors across all EU Member States in a European network. Advisory networks aim to help advisors stay up to date with cutting-edge knowledge and innovation, and to facilitate opportunities for them to exchange and share experiences on how to best tackle challenges or seize opportunities on farms, in forests and rural villages.

Community of Practice. A means of acquiring knowledge in which a newcomer learns from the group. It is a group of people in which people become members through shared practices, i.e. they are linked to each other through their involvement in certain common activities (Libro CoPs).

3. Relevancy of the topic/deliverable

3.1 Why advisory is necessary?

Agriculture has changed drastically over the last century, evolving from small mixed farming towards more intensified, large-scale farming. This has been crucial to face challenges with regards to the growing EU population and to secure food supply and self-sufficiency. At the same time this has caused environmental challenges (agriculture accounts for 10% of GHG emissions in the EU), concerns on decreasing soil quality and economical pressure, as we have become more dependent on import of primary nutrients and energy. These evolutions have led to more strict regulations such as stricter fertiliser and plant protection regulations, growing consumer concern for animal welfare and the entry of crop and livestock professionals in the value chain. At the same

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time this was not counterbalanced with better revenues, on the contrary the prices charged are often below production costs.

Recently, the undeniable impact of climate change once more demands resilience of the agricultural system. With increasing temperatures and seasonal variations, new pests and diseases can be expected to emerge, all with their associated problems. On the other hand, in Northern Europe, the growing season may increase opening opportunities for novel, while in Southern Europe extreme temperatures and periods of drought are expected to reduce production (European Environment Agency, 2020).

Another changing situation to which agriculture must adapt is rural depopulation. Urban areas are expected to account for 70 % of the world's population by 2050 (compared to 49% today) and the rural population, after peaking over the next decade, is expected to decline (FAO, 2009). This depopulation, together with the ageing of the rural population are leading to a lack of generational replacement in the agricultural and livestock sector. On the other hand, the ageing of the agricultural sector represents a handicap when it comes to adopting innovations (Ministry of Agriculture, Fisheries and Food, 2020b).

Despite all the hurdles outlined above agriculture has shown to be resilient and open for innovations that will lead to a more circular, more sustainable agro-food industry helping to adapt to challenges we are facing. In this respect, knowledge is a key resource to support the European agriculture in meeting all these new challenges (and the upcoming). The last decades a lot of scientific research has been performed, practice-oriented trials and projects have been executed and novel practices have reached maturity. However, it is critical that these innovations get truly adopted across the boundaries of institutions, regions or borders and precise and up-to-date information is available in easy and understandable language to the farmers.

Within this context, the central role that advisory services can play has gained wide attention.

In agriculture the Standard Committee for Agricultural Research in Agricultural Knowledge and Innovation Systems points out 2 criteria for being considered and advisor:

- The advisor should be impartial and not promoting a specific product or technology. That is because farmers may receive substantial and often valuable information from companies in the context of their commercial objectives. However, farmers need to be enabled to receive independent “advice” that is not part of a “product service” package.
- It is important that the advisor provides knowledge tuned to the specific farmer needs. The advisor must adapt their knowledge to the particularities of the farmer’s problem. Just as an orthopaedist creates and adapts a prosthesis to the morphology and needs of his patient (Adrien, G. ,2017, p.4)

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In conclusion we can say that advisory is the missing piece of a puzzle of problems and solutions (Figure 1)

Figure 1. Advisors role in innovating

To fulfil this second criterium it is crucial that the advisor has a broad knowledge in different areas apart from the high level of knowledge in the technical aspects of the subject and always considering the client's interest since all advice comes from a personal request for help. Furthermore, another important characteristic implicit above is since advisors manage and synthetize huge amounts of information at one time, they must have the ability to see the big picture of the problem they are solving, the broad, overall view or perspective of an issue. Also, they must have the ability to gather information of very different areas of knowledge.

When these 2 criteria are met advisors can become the brokerage platform that connects farmers and their specific problems with innovative solutions. However, in order to fulfil their crucial role, advisors need to have precise and up-to-date information on innovations and novel tools and services that have arisen and be willing to exchange information. In this the creation and the structure of a network is crucial for the management of knowledge and innovation exchange.

3.2 Networking as a driving force for innovation and problem solving

It is clear why advisory itself is necessary towards a more resilient agriculture. But it has been highlighted too that for a quality advisory to happen, advisors need to have certain skills and up to date knowledge. In a context of continuous change (also because of globalization) agriculture must implement innovative solutions quickly and correctly. To respond to the changing environment, it is crucial that organizations move away from the structures of the past which are based on hierarchies, discrete groups and teams and move towards those based on more fluid and emergent organisational forms such as networks and communities (Hildreth, P. M., & Kimble, C., 2004, p.ix). To de Man, A. P. (2008) "Innovation no longer takes place within individual firms, but within networks of organizations" (p.13) because an important requirement for such network-based innovation to come into practice is that knowledge must flow.

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De Man, A. P. (2008) argues that networks are the organization form of the knowledge economy for two reasons. First, competition in knowledge forces companies to gain more knowledge so they can maintain a competitive edge. Secondly because learning from other companies has become a necessity to upgrade existing competencies.

It is now clear that farmers working in a changing environment need advisory services, and these advisory services in turn need access to a huge amount of knowledge (new or existing), and the most favorable environment for accessing knowledge is a network.

3.3 When we talk about advisory in agricultural sector, we talk about AKIS

As argued before, a network is a good structure for innovation to happen and create impact. It is necessary to provide the exchange of knowledge and promotion of innovation with a structural framework. To create structured but flexible innovation ecosystems, where people meet, exchange ideas or problems and come up with common solutions (European Commission, 2019). In this respect the AKIS (Agricultural Knowledge and Innovation Systems) approach was created for agriculture to provide the enabling environment for faster innovation and better use of existing agricultural knowledge.

In simple terms Enfedaque (2020) defines AKIS as a theoretical concept used to describe how people and organisations are connected to foster mutual learning, to generate, share and use knowledge and information in the field of agriculture. This has also been acknowledged by the European Commission that stated that “The AKIS will make the process of innovation and knowledge sharing more efficient, as a well-structured innovation ecosystem will avoid duplication of efforts, save costs, increase the impact of innovation investments and accelerate the innovation process” (European Commission, 2019).

As AKIS encompasses a broad scala of actors among which farmers, researchers, policy makers, practice centers but certainly also advisors as they are one of the main sources of information for farmers' decision-making. In a functional AKIS:

- The innovations are scientifically understood, standardised and passed on to other actors.
- The scenario is set for people to meet and jointly solve problems with innovative solutions.
- The methodological framework, structure and tools necessary to support innovation and the exchange of knowledge and innovation are provided.

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- The innovation process is carried out efficiently. Saving costs and increasing the impact of investments.

To recap again, farmers working in a changing environment need advisory services, these advisory services in turn need access to a huge amount of knowledge (new or existing), the most favorable environment for accessing knowledge is a network and in agriculture AKIS are the networks where knowledge is shared (Figure 2). Even though advisors being already members of a network, agriculture must be embedded in the AKIS.

Figure 2. Key roles of an advisory network and AKIS in solving problems farmers

STRATUS project presents these guidelines to help practitioners to set up an advisory network with an example case in integrated fertilisation management.

4. Background and State of the Art in agricultural networking

In the new programming period for the Common Agricultural Policy the AKIS were identified as a tool to achieve the transversal objective of modernising the sector through the promotion and sharing of knowledge, innovation and digitisation in agricultural and rural areas, and promoting their uptake.

The Article 50 of the Regulation (EU) 2021/2115 of the European Parliament and of the Council that establish rules on support for strategic plans to be drawn up by Member States under the CAP states “In order to enhance the quality and effectiveness of the advice, Member States should integrate all public and private advisors and advisory

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networks within the Agricultural Knowledge and Innovation Systems (AKIS), in order to be able to deliver up-to- date technological and scientific information developed by research and innovation."

As far as the characterization of AKIS is concerned, they differ greatly between countries, regions and sectors. This is because countries pursue different innovation strategies and agricultural policies. In fact, the level of specificity of an AKIS can be so high that within an AKIS we find so-called micro-AKIS. Just as within a natural ecosystem we find sub-ecosystems, the same situation applies to the innovation ecosystem that makes up the AKIS. A micro-AKIS would be the set of people and/or entities that create, transmit and use knowledge in a specific geographical area, time scale, economic activity... Therefore, the variability of a micro-AKIS is almost infinite. This implies that there is no AKIS that, due to its generic characteristics, is applicable to all regions or countries. Let us remember that it is a theoretical concept, useful for describing how knowledge generation and exchange works when it comes to innovation.

Giving the importance of AKIS networks, the next section will provide guidelines on how to set up a good network for agriculture in general. These will be exemplified by the approach of the STRATUS project that will focus on farm advisors as the one thing that all AKIS do have in common is that they all have farm advisors as key actors, and farm advisors are the main resource that farmers turn to when it comes to innovation.

In view of this context many initiatives under Horizon Europe Projects have been developed with the aim to contribute to this transversal objective of promoting sharing of knowledge and innovation by the creation of networks, studying the national AKIS and other aspects of the science of knowledge management in agriculture. With regard to the creation of an advisory network STRATUS will build on the work carried out in the following projects:

AGRILINK project

AgriLink was funded from June 2017 – November 2021 by the European Union's Horizon 2020 research and innovation programme. The project aimed to stimulate the transition

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towards more sustainable agriculture by improving understanding of the roles played by agricultural advisors in farmer decision-making and the adoption of innovation on the wide variety of different farm types that exist in Europe.

Among the results of the project AgriLink carried out 13 Synthesis Country Reports. These reports provide in-depth qualitative and quantitative insights on the micro-AKIS (Agricultural Knowledge and Innovation Systems at the farmer micro scale) supporting farmer's decision-making related to innovation uptake, with a focus on the role played by advisors. A total of 32 case studies were conducted in 13 European countries: Belgium, Czech Republic, France, Greece, Italy, Latvia, Netherlands, Norway, Romania, Poland, Portugal, Spain and the United Kingdom.

MODERN AKIS project

modernAKIS Together for Systems' Innovation

ModernAKIS, modernisation of Agriculture through more efficient and effective Agricultural Knowledge and Innovation Systems (AKIS). To this end the project will build and foster a European network of at least 1.000 key AKIS actors, including AKIS coordination bodies, from all EU MS. In addition, they will set up at least 1 Community of Practice in each Member State, enabling thus participants to act as vectors of change in their communities. modernAKIS will also provide a comprehensive digital catalogue with new know-how, and at least 80 tools and methods supporting key AKIS actors to improve the knowledge flow

NEFERTITI project

NEFERTITI F A R M D E M

The overall objective of NEFERTITI is to establish an EU-wide highly connected network of demonstration and pilot farms designed to enhance knowledge exchanges, cross fertilization among actors and efficient innovation uptake in the farming sector through peer-to-peer demonstration of techniques on 10 major agricultural challenges in Europe. It comprises a unique network (selected for 4 years under Horizon 2020, Societal

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Challenge 2, RUR 12-2017 call) comprising 32 partners from 17 countries and coordinated by ACTA, the head of Network of the French Agricultural Technical Institutes.

Nefertiti project based in literature review identified in its deliverable *D.1.1. Concepts and Key Factors for Successful Network Establishment* the key factors (Figure 3) for innovative network development:

- Clarifying network purpose, identity, and values
- Network recruitment and governance
- Knowledge exchange and learning activities for value creation
- Network infrastructure and resources
- Network monitoring and evaluation
- Network maintenance.

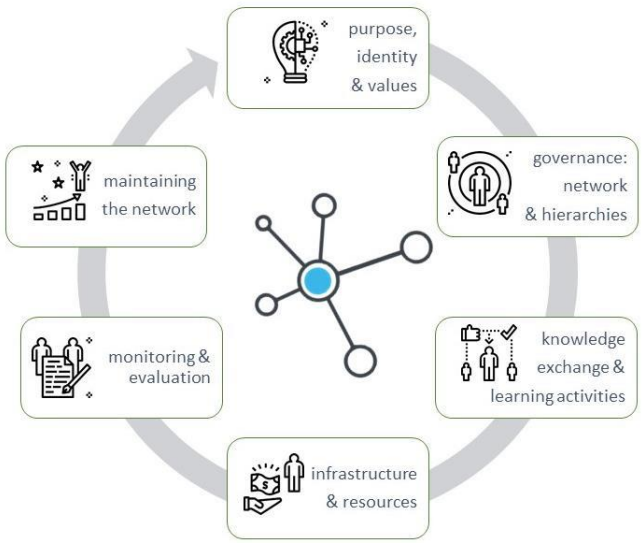

Figure 3. Key factors for innovative network development in Nefertitit project

By the end of the project (year 2022) NEFERTITI networks resulted in:

- 45 regional hubs
- 793 overall demo events
- 45000 participants in Nefertiti Events. Farmers were their first target and represented 50% of the total number of participants (6.000). With 3.400 participants, agricultural adviser and students represent 28% of the total number of participants.
- 45 % of the events took place on a commercial farm. The project supported different kind of events with a good balance between their size: from little groups of farmers with a high degree of peer-to-peer learning to bigger events with a lots of innovations presentation.

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I2connect project

i2connect project aims to fuel the competencies of advisors who will support and facilitate interactive innovation processes. The strategy in i2connect is to use the existing advisor networks and the experiences of success to create a broader network and momentum of change enabling a new culture of bottom-up led innovation support. This resource of over 40,000 advisors is critical to support agriculture and forestry on the ground and must be influenced in this project to support innovation with emphasis on EIP-Agri 2020.

The project hosts a Toolbox on moodle platform where the project offers classes for advisors, trainers and managers of advisory services. They developed several tools for co-creation. In the Network Analysis Tool (Figure 4), they identified every factor and every element when creating a network.

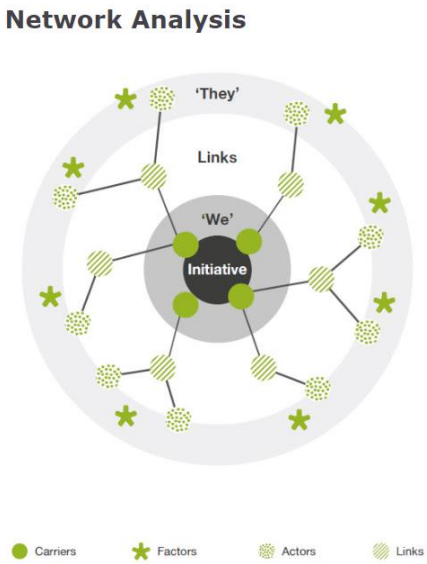

Figure 4. Network analysis tool of I2Connect

In addition, i2conncet developed an Advisory Service database. The database is an EU-wide directory of professional organisations and individual actors that provide knowledge services to actors in agriculture, forestry, horticulture and related fields along the agro-food value chain, as well as to other related actors in rural areas.

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5. Setting up an advisory network. Practical example: STRATUS

This is a user-friendly guide to help you stablishing a network: its thematic, scope, governance...

STEPS 1-4 help you define the purpose of the network, who is the network for, the problem it addresses and the kind of activities to be carried out. Besides to find out if there are existing networks to have synergies with.

STEPS 5-7 once the purpose of the network is well defined, steps 5-7 guide you to define the characteristics of your networks such as: people involved within it, geographic scope, governance methods...

STEPS 1-2-3-4–> PURPOSE OF THE NETWORK
Definition of the needs, current situation, constraints...

The vison of a network may be summarised as a shared roadmap to which network members can subscribe to reach the goal. Three questions can guide the drafting of a network vision:

- Who is the network for?
- What problem is the network working on?
- What type of collaborative activities will the network undertake?

STEP 1. What are the needs to be covered by the network and who will the networks serve to?

Have you identified an issue affecting a specific group of people which needs to be addressed? This step helps you to determine the problem or needs to be handled by your network, defining thus the topic and thematic area of the network. This will be pivotal in determining the characteristics of your network such as the number and composition of participants, geographical area, goal, vision and governance... Very importantly, in this first stage you will also have a first idea of the critical risks of implementation you will face.

STRATUS case
Why an advisory network on optimal fertilization use?

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Fertilisation management is a key aspect in agricultural production, both from an economic, environmental as productivity perspective as farmers encounter challenges while managing the fertilization of their crops due to strict regulations, rising prices and environmental management.

Nitrogen, Phosphorus and Potassium are essential natural resources for agriculture, playing a key role in food security (European Environment Agency, 2022). However, the excess use of these nutrients and the fact that not all the amount applied is effectively taken up by plants results in pollution of air, soil and water, loss of biodiversity and climate impact across Europe.

The European Green Deal envisions how to make Europe the first climate-neutral continent by 2050. At the heart of the Green Deal, the Farm to Fork Strategy (European Commission, 2021) sets a target of at least halving nutrient losses by 2030 without deteriorating soil fertility, resulting in a reduction of fertiliser use by at least 20%. In turn, the EU Soil Strategy (Act, S. M. , 2021a) under the EU Biodiversity Strategy stresses the importance of stepping up efforts to protect soil fertility, reduce soil erosion and increase soil organic matter through adopting sustainable soil management practices. Similarly, the Zero Pollution Action Plan (Act, S. M. , 2021b) calls for action on Member States (MS) to reduce ammonia emissions from agriculture, which are a major source of air pollution.

Notwithstanding the above, the agricultural sector is key for reaching a climate neutral economy, as stated in the Sustainable Carbon Cycles Communication (Act, S. M. 2021c). Carbon removals in terrestrial ecosystems could be achieved by carbon farming, which could be a new source of income for land managers, while contributing to land fertility, also providing benefits on biodiversity, enhancing ecosystem services and helping land managers being more resilient to climate change.

To foster a more efficient use of nutrients, thus reaching the Farm to Fork 2030 reduction targets for nutrient losses, the Commission will adopt an Integrated Nutrient Management Action Plan. The Plan will aim to maximise synergies with the Common Agriculture Policy (CAP) new green architecture, reinforcing the measures included in the MS CAP Strategic Plans, such as Nutrient Management Plans (NMP) or the use of IT tools such as the Farm Sustainability Tool (FaST) (European Commission et al., 2022). Also, precision Farming practices can also play an important role in reducing nutrient losses, as they can reduce the use of inputs by site-specific applications (Balafoutis, A. et al., 2017).

Mineral fertilizers are still widely used in Europe, but they are prone to price vulnerability and geopolitical pressure. For example, the war in Ukraine has resulted in an increase of 149% in fertilisers price in September 2022 compared with 2021 (Ensuring availability and affordability of fertilisers - European Commission, 22/04/2024). Bio-based fertilisers

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can also provide farmers an alternative to mineral fertilisers, following circular economy principles that make use of post-harvest and livestock residues as well as waste streams (Chojnacka, K. et al., 2020). The relevance of BBF has increased over the past years, following increasing mineral fertiliser prices, EU regulation, such as the EU Fertilizing Product Regulation, widespread research, as well as the transition to a circular economy, for which the use of residue and waste streams is necessary, especially for limiting resources (i.e. phosphorus).

Finally, farming techniques, such as alternative crops, cover crops or timing of input applications can also contribute to a more sustainable nutrient management, reducing nutrient losses while ensuring soil fertility and quality.

In the previous section it was substantiated that advisors represent one of the main information sources for farmers' decision making and are key drivers to speed up innovation adoption by farmers (van Oost, I., & Geerling-Eiff, F., 2019). Within the new CAP, advisors must be embedded within the MS' Agricultural Knowledge and Innovation Systems (AKIS), also having a broader action scope that encompasses economic, environmental and social domains. All these demands put a strain on advisors, that not only must be up to-date on research results and innovations, but also need to deploy a wide set of soft skills to adapt this knowledge to the local context.
For all the above reasons, we believe it is necessary to establish a fertilisation advisory network that:

- Studies the best solutions for an efficient fertilisation of the soil
- Is embedded in the local context (AKIS) so that the advice is adapted to the different scenarios in the agricultural sector throughout Europe.
- Involves all actors involved in the context of agricultural fertilisation, including political actors.
- Includes advisors as the key actors in information transfer between the origin of the information and the farmers.
- Serves the farmers and seeks to preserve their interests

STEP 2. What means do you have at your disposal to establish the network?

In this step it is necessary to reflect on the financial and practical aspects of your network. What are your means to set up the network? How do you communicate with members and people outside the network? What assets do you have? What do you need to keep the network going (funding, roles, time)? Will you meet in a digital or a physical setting, how often...?

It can be infrastructure, internet connection, digital tools, funding from various sources, volunteering... This step will affect the goal and the scope of your network and vice versa.

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You can come back to previous steps to re-define the characteristics of your network once you have identified your constraints to stablish the network.

STRATUS case

The spatial scope for STRATUS is Europe, hence digital tools will be the standard for setting up online meetings, information sharing and so on. Microsoft Software Teams and apps will be used as project intranet. The e-meetings will be organised through Teams too. In addition, STRATUS will have fundings thanks to Horizon Europe call under grant agreement 101134711. This will allow the participants of the project to also physically meet internationally yearly, produce materials for dissemination and cover other expenses needed for the deployment of the network and its activities.

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STEP 3. The goal of the network

In this step define the specific purpose of the network or the tasks or services that it must provide. It must be aligned with the demands and necessities you have identified in the previous steps. Once the network's purpose is clear, it is useful to think about why people might want to join, or their motivations for engaging in the network. Knowing the motivation of members is useful to better design and plan your network, because it provides information on commonalities between network members.

STRATUS case

The objectives of the network that will be created within STRATUS project will be:

- To collect solutions on optimal fertiliser, use in the areas of precision farming, bio-based fertilisers and soil quality.
- To analyse those solutions according to their feasibility that includes farm-economic effects, on-farm applicability, effects on the value chain, legal aspects and environmental and social aspects to obtain a collection of the best solutions ready to use. To consider the realities, demands and necessities of all stakeholders involved in fertilization: farmers, researchers, industry partners and advisors across Europe.
- To support advisors in the exchange of knowledge, experiences and key challenges for practice around effective and novel approaches for optimal fertiliser use, also supporting farmers to bring this knowledge into practice through the development of activities and materials covering EU27 MS.

STEP 4. Are there any existent networks like the one you want to set up working on the same topic?

Finally, it is important to scan the market to avoid or duplicate efforts already done. Potentially there are already well stablished networks that could solve the problem you have identified, in which to reflect connect with them or even better, find synergies.

STRATUS case

Below are some of the entities anybody can come up during a brief search in internet with key words "fertilizers" "association". Many have things such as structure, means of governance, type of members... useful to replicate in STRATUS case. However, they don't have the exact same purpose as STRATUS intended one. For example, at first glance none of them have as members policymakers, industry partners, farmers, researchers, advisors...all together in a unique network European wide. Nevertheless, these partnerships resulting from a first search will be interesting to consider for future synergies.

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FERTCON, Fertilizers Consultants Network

The Fertiliser Consultants Network (FCN) is a team of consultants working in the fertiliser sector. It is a group of regulatory experts at the European level designed to face the changes, first the EU Regulation 2019/1009 on fertiliser products that entered in force in July 2022, followed by the Reg. (UE) 2019/515 on mutual recognition. The FCN's mission is to operate with competence and reliability in the support of fertiliser manufacturers, importers, traders, agricultural consortia, cooperatives and suppliers from all around the world establishing their presence on the European market in compliance with all current regulations.

IFA, International Fertilization Association

The International Fertilizer Association (IFA) was founded in 1927 and is the only global fertilizer association, with 450+ members in some 80 countries and a mission to promote the efficient and responsible production, distribution and use of plant nutrients. IFA provides a framework for exchanges and collaboration among its members and a structure for agreeing common positions and joint actions.
Members include fertilizer producers, traders and distributors, as well as their associations, service providers to the industry, research organizations, agtech start-ups and non-governmental organizations.

FERTILIZERS EUROPE

The association's membership comprises 15 fertilizer manufacturers from countries across the Union and 9 national fertilizer associations. The association communicates with a wide variety of stakeholders, institutions, European and national policymakers and members of the general public who seek information on fertilizer products and application technology, and topics relating to today's agricultural, environmental and economic challenges.

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STEPS 5-6-7-> DEFINITION OF THE CHARACTERISTICS OF THE NETWORK
In this stage of the process, you must define the characteristics of your network in line with the identified needs and constraints above but more important considering the means that are at your disposal.

STEP 5. The scope of the network

What do you want the scope of your network to be? Do you want the role of your network to be local, regional, national or international? How will the network achieve its intended reach?

Diversity is key to the innovation process so a network that involves key actors from many places, different backgrounds and different skills will be a rich scenario for innovation to succeed. Collaborating between countries or regions will help to have a greater understanding to a common problem, at the end having the big picture of a problem in a globalized world. However, it may also encounter some difficulties:

- Greater need for actors involved to have greater reach. There have to be actors with outreach to each of the countries where the network wants to be established. This implies greater recruitment of people.
- Greater consumption of coordination resources.
- When actors of different nationalities are involved, communication difficulties may arise due to language or culture.
- To keep members engaged in the network, they must all feel represented in the common interest of the network. Finding a common interest becomes more complicated as the number of actors involved increases and conflicts of interest may arise between the individual and the common interest.
- Risk of not reaching the network's objective appropriate to the context in which it is implemented, tending to provide generalist solutions.

Sometimes you will have identified a local problem which will require solutions tailored to a certain context. In this case a smaller network will be preferred large network as:

- You will make sure that solutions are adapted to the problem with their own casuistry.
- It will be easier to involve all actors, and everyone will find their place to participate in knowledge sharing.
- The coordination and monitoring requirements of the network will be lower.

But on the contrary, you risk creating a scenario that is poor in opportunities for knowledge exchange and innovation.

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Therefore, critical assessment of the scope of your network is a crucial step for future success.

STRATUS case

The STRATUS network has chosen to opt for an outreach and/or presence in all European Member States:

- Involving advisors and specialists in different areas of fertilisation from all over Europe will allow complementing the weaknesses of one member state with the strengths in the same area of expertise of another member state.
- The solutions collected on optimal fertilizer use must be tailored and assessed to national specificities, hence the network must have participants from all Member States or reach stakeholders from all Member States.
- Not only the technical approach must be regional tailored but also the intricacies of each MS Akis. Thus, the network advisors (then the network) ideally must be embedded into the regional/national AKIS.

Hence, STRATUS will cover all EU27 MS, while considering all European pedo-climatic conditions and complying with the topic requirements. This will be done with 3 different approaches:

A. 11 MS are covered directly by project partners to at least one the project´s activities:

Table 1. List of partners in STRATUS project from 11 different Member States

	Participant organisation name	Organisation type	Country
1	**INTIA -** INSTITUTO NAVARRO DE TECNOLOGIAS E INFRAESTRUCTURAS AGROALIMENTARIAS SA	Advisory	ES
2	**CDR** - AGRICULTURAL ADVISORY CENTREIN BRWINOW	Advisory	PL
3	**AUA -** AGRICULTURAL UNIVERSITY OF ATHENS	University	EL
4	**CAFS -** CHAMBER OF AGRICULTURE AND FORESTRY OF SLOVENIA	Advisory	SL
5	**INI -** INICIATIVAS INNOVADORAS SAL	SME	ES
6	**ZLTO** - SOUTHERN AGRICULTURE AND HORTICULTURE ORGANIZATION	Advisory	NL
7	**VEGEPOLYS** VALLEY	Cluster	FR
8	***AC3A*** *- ASSOCIATION DES CHAMBRES D'AGRICULTURE DE L'ARC ATLANTIQUE*	*Advisory*	*FR*
9	**EUFRAS -** EIROPAS LAUKSAIMNIECIBAS UN LAUKU KONSULTANTU ASOCIACIJA	Advisory	LV

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10	**SEASN-** SOUTH EASTERN EUROPE ADVISORY SERVICE NETWORK	Advisory	HR
11	**RT-REGIONE TOSCANA**	Public Authority	IT
12	**EV ILVO -** EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK	Research & Advisory	BE
13	**WR -** WAGENINGEN UNIVERSITY & RESEARCH	University	NL
14	**HS-F -** HS HUSHALLNINGSSALLSKAPENS SERVICE AKTIEBOLAG	Advisory	SE
15	*HS-7- HUSHALLNINGSSALLSKAPET SJUHARAD*	*Advisory*	*SE*
16	*HS-S- HIR SKANE AB*	*Advisory*	*SE*
17	*HS-J- HUSHÅLLNINGSSÄLLSKAPET JÖNKÖPING*	*Advisory*	*SE*
18	**UGENT**- UNIVERSITY OF GHENT	University	BE

B. **12 MS are covered through being members of EUFRAS and SEASN networks**. Advisory organisations in the 12 MS have been pre-identified by EUFRAS and SEASN and their participation will be ensured through a dedicated budget in these advisory networks, for different project activities such as trainings and cross Visits.

EUFRAS, founded in 2013, is a Europe-wide network supporting agricultural and rural advisory services in promoting innovation and knowledge transfer. Its aim is to enhance the quality, effectiveness, and efficiency of advisors' work in agriculture and rural development. They address current challenges through collaboration and innovation, fostering knowledge exchange and co-learning through workshops, seminars, and conferences. EUFRAS represents advisory services and facilitates cooperation with stakeholders such as policymakers, farmers' organizations, and training institutions. Having their own platform provides opportunities for engagement beyond our membership, amplifying their impact in the agricultural knowledge and innovation system. The EUFRAS advisory organisation that will participate in STRATUS network activities are:

a. **Portugal: Consulai.** Founded in March 2001, CONSULAI has become Portugal's largest consulting firm in the agribusiness, farming and forestry sectors. CONSULAI bases its operations on long-term relationships with customers, responding to their needs, promoting their competitiveness in the market, the quality of their products and economic results
b. **Ireland: Agricultural Consultants Association of Ireland.** ACA was established in 1979 to represent Independent Agricultural Consultants in Ireland. They represent private agricultural consultants and advisors in Ireland. Members

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of ACA advise in the region of 55,000 Irish farmers, confirming the private advisory service as the largest in Ireland.

c. **Ireland: TEAGASC – the Irish Agriculture and Food Development Authority.** Teagasc – the Agriculture and Food Development Authority – is the national body providing integrated research, advisory and training services to the agriculture and food industry and rural communities. Research, Development, and Innovation (RD&I) are at the core of our work in Teagasc. They offer state-of-the-art scientific expertise and research services for industry, using world-class facilities and equipment.
d. **Germany: Bavarian State Advisory Service for farmers**. The Bavarian State Research Center for Agriculture (LfL) is the knowledge and service center for agriculture in Bavaria. The applied research of the LfL takes up issues of agricultural practice and provides applicable solutions for agricultural enterprises in various ways.
e. **Germany: FiBL Projekte GmbH.** The Research Institute of Organic Agriculture (FiBL) is one of the world's leading institutes in the field of organic agriculture. Its locations are situated in Switzerland, Germany, Austria, France and a representation in Brussels (Belgium) through FiBL Europe.
f. **Germany: German Association of Chambers of Agriculture, Verband der Landwirtschaftskammern.** The Chambers of Agriculture and the German Agricultural Society as well as the Bavarian Farmers' Association are combined in the Association of Chambers of Agriculture (VLK).
g. **Germany: International Academy of Rural Advisors (IALB)**. The International Academy for Rural Counseling (IALB) has existed since 1961 and started as an association of counsellors from German-speaking countries. Advisors from more than ten European countries now belong to the IALB.
h. **Germany: University of Hohenheim**. The University of Hohenheim (German: Universität Hohenheim) is a public university located in Stuttgart, Germany. It has its roots in a School of Agronomy, founded in 1818, making it the oldest university in Stuttgart.1 Its studies in economics and agronomy have a long tradition.
i. **Denmark: SEGES Innovation P/S**. SEGES Innovation is a private, independent, non-profit research and development organization and is the leading agricultural knowledge and innovation centre in Denmark. They offer sustainable solutions for the agriculture and food sector.
j. **Finland: Association of ProAgria Centres**. With nine regional centres and the Association of ProAgria Centres, they form the Finnish-speaking rural advisory organisation. ProAgria Lantbrukssallskapet guarantees advisory services in Swedish in Uusimaa, Turku and the surrounding region, Swedish-speaking Ostrobothnia and Åland.
k. **Estonia: Centre of Estonian Rural Research and Knowledge METK**. METK areas of activity include research, monitoring, evaluation, and analysis in the field of agriculture, rural life, and rural economy, including laboratory analysis; breeding and field trials of agricultural crops; knowledge transfer, advisory, and

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innovation services in the field of agriculture and rural life; activities necessary for the implementation of the common agricultural policy of the European Union.

l. **Estonia: Estonian Rural Development Foundation**. Estonian Rural Development Foundation (the Foundation) was founded by the Government of the Republic of Estonia in 1993. The foundation issued guarantees to banks for credits granted to farmers and other entrepreneurs in Estonian rural areas. Today the purpose of the Foundation is to support economic development in Estonian rural areas via specific programs implemented for promoting business activities in those areas.

m. **Lithuania: Chamber of Agriculture of the Republic of Lithuania**. The Chamber of Agriculture today brings together 41 organisations. Over the last thirty years it has implemented rural development programmes, protected and renewed the living environment of the county's population. All the most active organisations live under the umbrella of the Chamber of Agriculture.

n. **Lithuania: Lithuanian Agricultural Advisory Service**. PI Lithuanian Agricultural Advisory Service, founded on 1 June, 1993, has been developing a nationwide agricultural advisory system for the third decade. The headquarters of the Lithuanian Agricultural Advisory Service are in the township of Akademija (Kėdainiai District). Currently, more than 400 employees work in 46 district and municipal offices.**Hungary: Hungarian Chamber of Agriculture**. The task of the Hungarian Chamber of Agriculture, Food Economics and Rural Development (NAK), established on March 28, 2013, is to strengthen the Hungarian agricultural and food sector, to enforce its interests, to support the competitiveness of Hungarian food, and to provide expert advice and providing reliable information to farmers.

o. **Hungary: Széchenyi István University.** The university faculty of Agricultural and Food Sciences carries out research on food process engineering and environmental techniques, animal and plant biotechnology, improvement of nutrition supply for productive livestock, environmental protection, maintaining of ecological systems during agricultural production and precision agriculture. A major goal of the faculty is to ensure the proper function of agricultural production, based on an efficient and integrated education-research-development system.

p. **Romania: Fundația ADEPT Transylvania**. Fundația ADEPT, founded in 2004, is a biodiversity conservation and rural development NGO based in Saschiz, Romania. ADEPT has been working for the last 14 years to protect the nature-rich, farmed landscapes of Transylvania and to support the traditional farming communities that have created them over centuries and who maintain them today.

q. **Luxembourg: Luxembourg Ministry of Agriculture, Viticulture and Rural Development**. The areas of competence of the Ministry of Agriculture, Viticulture and Rural Development are food production at the level of agriculture, viticulture, and horticulture, the aspects of food safety linked to primary production, rural development, and consumer protection.

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On the other hand, **the South Eastern Advisory Service Network (SEASN)** is an association of agricultural advisory services, agricultural chambers, agricultural research institutes, universities, and nongovernmental organizations founded in Bulgaria on 22nd October 2015. SEASN has 19 members from 14 countries in the Balkan region. Their scope of work is transferring knowledge from EU projects to all EU and non-EU members. They provide workshops and training in the field of understanding and promoting interactive innovation. The SEASN advisory organisations that will participate in STRATUS network activities are:

a. **Bulgaria: The National Agricultural Advisory Service of Bulgaria (NAAS)**. NAAS provides free specialized consultations and training to farmers in the field of crop production, animal husbandry, agricultural economics and RDP. They also perform agrochemical analyses and provide recommendations for fertilization. The mission of NAAS is to support the implementation of state policy in the agricultural sector and the achievement of priorities and goals set by MAFWE for efficient and competitive agriculture in the Republic of Bulgaria, assisting in the development of the national system of knowledge and innovation in agriculture and offering farmers quality consulting services, up-to-date and useful information, training and technical assistance.
b. **Austria: Chamber of Agriculture and Forestry in Carinthia, Austria.** This organisation offers assistance to farming family businesses in solving their specific economic and social problems, information, advice and training for all persons involved in the field of agriculture and forestry, provision of information, preparation of position statements and expert opinions for public authorities etc. as part of administrative assistance, performance of duties within the framework of agricultural subsidies (EU, national) and governmental administration.
   C. The **remaining 4 MS** are being reached through four project's advisory organisations in charge of "mirroring" IFM knowledge exchange in those countries. Likewise, the advisory organisations in charge of "**mirroring" have** been already identified in the drafting phase of the project proposal and will be invited to participate in the project with a dedicated budget:

      a. **Czech Republic: Agrarian Chamber of Czech Republic (AGRO CR).** AGRO CR is a public-law body dedicated to representing and defending interests of agriculture and related sectors. It associates most entrepreneurs in agriculture, forestry and food processing industry. It provides advisory, consultation and legal services for its members. Apart from domestic activities, they are involved in major organizations which represent European farmers and other fora of international cooperation. They consider that it is vital in contemporary united Europe for farmers to work together, share experiences and exchange opinions.

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b. **Slovakia: Slovak Academy of Sciences in Slovakia (SAS).** SAS, along with the academies of other central-European countries, has historically played an important leadership role in the research organisations of the country. Today, SAS carry out three missions: carry out top-level basic research at the frontiers of knowledge that leads to new discoveries and concepts, make the scientific infrastructure for technically demanding research available to all interested parties (be it universities or other organisations of research and development), and long-term strategic and applied research and development, whereby SAS intensively and effectively co-operates with the business sector, the public sector, and civil society to transfer knowledge into practice.
c. **Cyprus: Extension Section of the Department of Agriculture of the Government of Cyprus.** The Agricultural Extension Section informs, advises, instructs and trains the rural population. Furthermore, they plan and carry out in-service training courses
d. **Malta: AgriConnect.** AgriConnect is registered to operate as a Farm Advisory Service, with the primary objective of ensuring farmers achieve and maintain compliance with regulations. They offer a range of complimentary services designed to assist farmers and livestock breeders in overcoming operational obstacles and technical issues they may encounter. This is accomplished by assistance with tailored information and consultative guidance, aimed at fostering diversification within their agricultural practices, enhancing product quality, and stimulating innovation within the sector. Furthermore, AgriConnect seeks to establish a robust collaborative framework connecting farmers with relevant stakeholders in the rural sector.

Additionally, STRATUS will cooperate with different project proposals on the advisory network projects funded under Horizon Europe 2023-2024 programme to cover all EU27 MS through common actions.

STEP 6. Type of actors that will be in your network.

In this step the profile of the actors or entities you want to be in your network should be determined, according to the theme of the network and the functions you want them to perform. Some non-limitative examples:

-Policy makers
-Scientists
-Advisors/consultants
-Educational entities: universities, formal and non-formal training centres...
-Industry partners
-Farmers
-Consumers
-Non-governmental organisations

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Here you may also use the mapping of the already existing networks carried out in **STEP 3.**

Besides, in section **2.3** it has been stated that an advisory network must be embedded in the AKIS. So, it is recommended to include your agricultural advisory network in the appropriate AKIS in some way, taking in account the constraints of your local/regional/national AKIS. In this respect the I2connect report "AKIS in European countries: Cross analysis of AKIS country reports from the i2connect project" can be of assistance. In this report the AKIS in Europe are characterized and described according to (i) organization and governance of the AKIS, (ii) type and diversity of the AKIS actors, (iii) AKIS supporting policy and dedicated resources, (iv) AKIS coordination mechanisms, (v) linkages among AKIS actors, and (vi) Advisory organizations reaching farmers. The objective of the deliverable is to provide an insight and outlook about AKIS in the i2connect partner countries by presenting comparative results. Besides, I2connect consortium developed a comprehensive overview of the AKIS infrastructures and of the predominant agricultural and forestry advisory services on national and (if applicable) on regional levels for each of I2conncet partner countries for the year 2020. Each one of the country reports can be found here https://i2connect-h2020.eu/resources/akis-country-reports/

Some of the conclusions found by I2connect regarding the cross-country analysis to facilitate the integration of an advisory network with its national and or regional AKIS are described below. The full report can be found here https://i2connect-h2020.eu/wp-content/uploads/2022/05/2022-04-29-AKIS-cross-analysis_final_compressed.pdf

Type and diversity of AKIS actors

I2connect distinguished between 5 actor categories:

1. Public authorities
2. Research and Education
3. Farmer based organizations
4. Third sector NGOs
5. Private companies/entrepreneur

The results show across the board a clear diversity of actors across the European countries but with predominance of public authorities, public research and education actors and farmer-based organizations (Figure 5). On the contrary, private companies and non-governmental organizations are way less present (Birke, F., et al., 2022, p.15).

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Figure 5. Frequency of mentions of the AKIS actor categories in each country. Source: i2Connect "cross analysis of AKIS country reports from i2Connect project" report

Advisory organizations interacting with farmers

This communication channel refers to those actors in AKIS focusing on providing support to clients or beneficiaries for problem-solving through sharing information, advising and co-creation of knowledge. In this communication channel the key actors are farmers and advisors. However, the typology of advisors can differ depending on the country. The country reports showed that in 21 out of 28 countries there is only 1 actor category providing directly solutions to farmers (Table 2):

Table 2. Who gives direct advice to farmers in each of the MS

Who interacts with farmers	Countries
Public organisation	Bulgaria, Cyprus, Ireland, Latvia, Lithuania, Croatia, Serbia, Montenegro, Switzerland
Farmer-based organisation (FBO*)	Austria, Denmark, Finland, France, Portugal, Sweden, Poland, Slovenia, Belgium-Flanders
Private advisory organisations	The Netherlands, Greece
Public and FBO	Luxembourg, Malta, Hungary

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Public and private advisory org.	Belgium-Wallonia, Czech Republic, Estonia
Public, FBO and private advisory org.	Germany, Italy, Spain, Slovakia

Adapted from Birke, F., et al., 2022, p.25)

STRATUS case

STRATUS will create an EU advisory network that will gather, evaluate and disseminate existing innovative solutions and effective and novel approaches for optimal fertiliser use around three key areas that cover all aspects mentioned on the topic: Precision farming, Bio-based fertilisers and Soil quality. This will be done by the creation of **3 transnational sub-networks** (Fertilization Innovation Networks - FIN) and **10 Communities of Practice**.

Translational sub-networks: Fertilization Innovation Networks

The choice of these three sub-networks has been made following STRATUS partners' expertise to ensure a systemic approach to the identification of practices, approaches and innovations:

- Precision farming (PF): will deal with the use of technology and digitalisation for an optimal fertiliser use
- Bio-based fertilisers (BBF): will deal with the substitution of mineral fertilisers with sustainable, affordable high-quality bio-based alternatives from different residue and waste streams
- Soil quality (SQ): will deal with the use of different farming techniques, such as alternative crops, cover crops, carbon farming or timing of input applications for a more sustainable nutrient management, reducing nutrient losses while ensuring soil fertility and quality.

The FINs have been developed adapting the methodology of the Thematic Networks successfully applied in Nefertiti project. Each FIN is composed of a mix of the partners organization of the project (Figure 5). The participation of the partners in the FINs is organised to ensure the coverage of all agricultural sub-sector and climatic areas as can be seen in Table 3. All partners of the project have different levels of expertise to cover the goal of STRATUS network:

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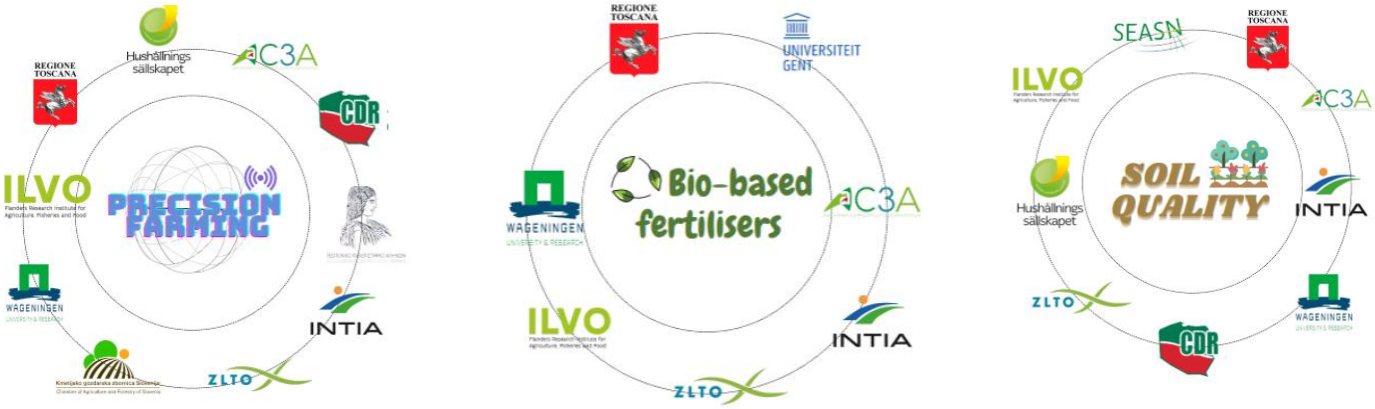

Figure 6. Fertilization Innovation Networks in STRATUS project

Table 3. Partners, sub-sectors and climatic areas covered in each FIN.

Topics	FIN Partner	SUB-SECTORS	CLIMATIC AREAS
PRECISION FARMING	AUA	Hort, Fruit	Mediterranean
	ILVO	Arable, hort, fruit	Atlantic
	INTIA	Arable, hort, fruit	Atlantic
	CAFS	Arable, fruit	Mediterranean
	WR	Arable, hort	Atlantic
	RT	Arable, fruit	Mediterranean
	HS-F	Arable	Nordic
	AC3A	Arable, hort, fruit	Mediterranean
	ZLTO	Arable	Atlantic
	CDR	Arable, hort, fruit	Continental
	WR	Arable, hort	Atlantic
BIO-BASED FERTILISERS	AC3A	Arable, hort, fruit	Atlantic
	INTIA	Arable, hort, fruit	Atlantic
	ILVO	Arable, hort	Atlantic
	RT	Arable, hort, fruit	Mediterranean
	UGENT	Arable, hort, fruit	Atlantic
	ZLTO	Arable	Atlantic
SOIL QUALITY	INTIA	Arable, hort, fruit	Atlantic
	HS-F	Arable	Nordic
	ILVO	Arable, hort	Atlantic
	WR	Arable, hort	Atlantic

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	SEASN	Arable, fruit	Mediterranean
	RT	Arable, fruit	Mediterranean
	ZLTO	Arable	Atlantic
	AC3A	Arable, hort, fruit	Atlantic
	CDR	Arable, hort, fruit	Continental

All partners of the project and members of the network have at least one of the following characteristics which are key to the achievement of STRATUS objectives:

- Expertise in research on precision farming, bio-based fertilizers and/or soil quality
- Expertise giving advisory services
- Are a network itself
- Are public authorities

INSTITUTO NAVARRO DE TECNOLOGIAS E INFRAESTRUCTURAS AGROALIMENTARIAS SA

INTIA is a public corporation under the Ministry of Rural Development and Environment. INTIA's core mission is to provide services for the transfer of knowledge, technologies and the innovation of the regional agri-food system. A pioneer in Spain in combining applied research with technology transfer, INTIA has been working rigorously and technically independently throughout the value chain since 1980.

AGRICULTURAL ADVISORY CENTREIN BRWINOW

Centrum Doradztwa Rolniczego w Brwinowie together with its Branches in Cracow, Poznan, Radom and Warsaw, is a state organizational unit reporting directly to the Minister of Agriculture and Rural Development.

The Center cooperates with agricultural advisory services, government and local governmental institutions, industry organizations, scientific and research institutes and other organizations and institutions working for the development of rural areas and agriculture. The purpose of the activities carried out is to improve the knowledge and skills of the advisors and to raise and standardize the standards of services provided by advisors to farmers.

AGRICULTURAL UNIVERSITY OF ATHENS

The Agricultural University of Athens (AUA) is a major Agricultural University in Greece and the third oldest in the country, offering research and extension in agri-food for the public and private sectors. AUA research addresses a wide range of issues related to food safety and environmental protection, including the areas of precision agriculture, imaging, AI & robotics, web applications and databases.

CHAMBER OF AGRICULTURE AND FORESTRY OF SLOVENIA

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The Chamber of Agriculture and Forestry of Slovenia is the umbrella interest organization of natural and legal persons in the Republic of Slovenia engaged in agriculture, forestry and fishery. Its central task is to protect and represent their interests, to consult them and accelerate economical and environment friendly activities. They offer specialist services which operate in eight regional agricultural forestry institutions: agricultural advisory service, selection and monitoring production in stockbreeding, forestry advisory service, centers for fruit-growing and nursery.

SOUTHERN AGRICULTURE AND HORTICULTURE ORGANIZATION

ZLTO is the Southern Netherlands organisation of 13.000 farmers with 9.000 farms. ZLTO is one of the three organizations that work in the federation LTO Nederland. Together they represent 45.000 Dutch Farmers.

VEGEPOLYS VALLEY

VEGEPOLYS VALLEY is a French competitiveness cluster which brings together 600 stakeholders of the plant ecosystem to strengthen their competitiveness. The cluster mobilizes 40 FTE employees for more than 600 members: companies, research and training centers, professional unions, development organizations and consular chambers. It covers the entire plant value chain from genetics to use (Plant breeding, Plant and soil health, Farming equipment, Digital & AgTech, Seeds and young plants, Aromatic and medicinal plants, Crops (cereals), Vegetables and fruits, Ornamental plants, Cider and wine production, Feed and food, Nutrition, prevention, health, well-being and cosmetics, Agri-Supply, Urban farming). The organization mobilizes its members around 7 innovation axes and offers services related to innovation, business growth, internationalization, networking and communication.

ASSOCIATION DES CHAMBRES D'AGRICULTURE DE L'ARC ATLANTIQUE

AC3A – Association of the Chambers of Agriculture of the Atlantic Area – is an association which was set up in 1993. Its members are the Chambers of Agriculture from the Atlantic area (currently 28 Chambers). Its main role is to: Provide the opportunity to the Chambers of Agriculture of the Atlantic Area to experiment and exchange on a European level about agricultural issues to ensure that the sector remains dynamic, innovative and sustainable. European cooperation is central to most AC3A's activities, through its network they work directly with farmers, agricultural advisers, researchers, policymakers and entrepreneurs.

EIROPAS LAUKSAIMNIECIBAS UN LAUKU KONSULTANTU ASOCIACIJA

EUFRAS, founded in 2013, is a Europe-wide network supporting agricultural and rural advisory services in promoting innovation and knowledge transfer. Its aim is to enhance the quality, effectiveness, and efficiency of advisors' work in agriculture and rural development. They address current challenges through collaboration and innovation, fostering knowledge exchange and co-learning through workshops, seminars, and conferences. EUFRAS represents advisory services and facilitates cooperation with

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stakeholders such as policymakers, farmers' organizations, and training institutions. Having their own platform provides opportunities for engagement beyond our membership, amplifying their impact in the agricultural knowledge and innovation system.

SOUTH EASTERN EUROPE ADVISORY SERVICE NETWORK

South Eastern Advisory Service Network (SEASN) is an association of agricultural advisory services, agricultural chambers, agricultural research institutes, universities, and nongovernmental organizations founded in Bulgaria on 22nd October 2015. SEASN has 19 members from 14 countries in the Balkan region. Their scope of work is transferring knowledge from EU projects to all EU and non-EU members. They provide workshops and training in the field of understanding and promoting interactive innovation.

REGIONE TOSCANA

Tuscany Region is an Italian Regional Government located in the Center of Italy. It has direct legislative competences in forest management and forestry. It is Regional Managing Authority of EARDF and ERDF. By acting as Managing Authority, Tuscany Region has a direct competence in allocating resources, fostering innovation and selecting innovative projects and initiatives related with agriculture, forest and food resources. Since September 2012, Tuscany Region has been coordinating an informal European Network called ERIAFF (European Regions for Innovation in Agriculture, Food and Forestry). Tuscany Region is also committed as lead Region in the development of a S3 AGROFOOD Platform Thematic Partnership focusing on High Tech Farming (Precision Farming).

EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK

Flanders Research Institute for Agriculture, Fisheries and Food (ILVO) is an independent scientific research institute of Flanders' Government. ILVO's task is to generate knowledge for more sustainability in the agriculture, fisheries and agri-food sectors. Starting from a strong anchor in Flanders, their work extends throughout Belgium, Europe and the rest of the world.

WAGENINGEN UNIVERSITY & RESEARCH

The experts of Field crops Wageningen Research contribute to innovation and knowledge development in arable farming, field production of vegetables, green space, nursery stock and fruit growing, at both the national and international level. As their work on developing practical innovations is commissioned by the private and the public sectors, they ensure that our independent position and academic integrity are always at the forefront. They have test facilities equipped to carry out accurate and efficient tests and demos, both in the field and under controlled conditions.

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HS HUSHALLNINGSSALLSKAPENS SERVICE AKTIEBOLAG / HUSHALLNINGSSALLSKAPET SJUHARAD / HIR SKANE AB / HUSHÅLLNINGSSÄLLSKAPET JÖNKÖPING

Hushållningssällskapet and its associated sub-entities: Hushallningssallskapet Sjuharad, Hir Skane AB and Hushållningssällskapet Jönköping are focused on advisory services as well as the development of better farming practices.Their activities are broad and independent, free from commercial and political interests. All the independent knowledge is spread to the Swedish farmers via their nine natural farming high schools, innovative research and innovative power, and via their field trials, the results of which are spread across the country.

UNIVERSITY OF GHENT

Ghent University is one of the largest universities in Belgium and is a frontrunner in scientific research. The department Re-Source has built up a strong expertise in agro-industrial environmental technology through active participation and/or coordination in various European and Flemish projects. Ghent University is a coordinator of the Flemish nutrient platform: Nutricycle Vlaanderen and is therefore in close contact with various stakeholders. This Flemish nutrient platform examines, among other things, the extent to which the transition can be made effectively from nutrient removal to more nutrient recovery. Ghent University also coordinates the Biorefine Cluster Europe (www.biorefine.eu), a freely accessible partnership between circular economy projects and Re-Source (www.re-source.bio), a network that brings together researchers and their initiatives.

Regarding the composition of each FIN, each on will have:

- 1 member representative of each of the partners organization member of the FIN.
- 1 scientific leader with expertise in the topic in question (precision farming, bio-based fertilizers or soil quality)
- 1 advisory leader with many years of experience in providing advice to farmers

The scientific and an advisory leader role will work together to readily translate existing knowledge into opportunities for optimal fertilisers use.

Precision Farming FIN

Advisory leader: Eigen Vermogen Van Het Instituut Voor Landbouw - En Visserijonderzoek (ILVO). EV ILVO has 4 living labs supported by online knowledge platforms. The most relevant for this proposal is the Living Lab Agrifood Technology (https://agrifoodtechnology.be/en), working on topics like fertilisation in our own fields and at the farmers. Precision farming, mechanization and digitalization are often the key. ILVO is one of the EU testing and experimentation facilities for Agrifood Innovation (https://www.agrifoodtef.eu/). ILVO is leading or participating in different national and

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European projects dealing with precision agriculture, data, fertilisation and soil like Soilwise (https://soilwise-he.eu/), Agridataspace (https://agridataspace-csa.eu/), Empyrean (https://empyrean-horizon.eu/), OpenAgri (https://horizon-openagri.eu/), etc .

Scientific leader: Agricultural University of Athens. AUA's involvement in numerous notable EU and national projects for precision agriculture, particularly those related to IFM, including ICARUS, Smart Droplets, and econutri, showcases their expertise. Additionally, their experience in DEMOs and training cooperatives and farmers through various projects, such as ICTAgri (ERASMUS program), Cracksense, and Robs4Crops, further demonstrates their proficiency. This extensive background underscores their capability to lead as the scientific leader for the Precision Farming FIN initiative.

Members list:

Table 4. Precision Farming FIN members

ENTITY	ROLE	MEMBER NAME
AUA	**Scientific Leader**	**Georgia Nikolakopoulou**
EV ILVO	**Advisory Leader**	**Donald Dekeyser**
HS	**Member**	**Mattias Hammarstedt**
AC3A	**Member**	**Agathe Lemoine**
CDR	**Member**	**Andrzej Szymański**
INTIA	**Member**	**Pablo Echarte**
ZLTO	**Member**	**Peter Paree**
CAFS	**Member**	**Igor Hrovatič**
RT	**Member**	**Alessandra Gemmiti**

Bio-based FIN

Advisory leader: Association Des Chambres D'agriculture De L'arc Atlantique. AC3A extends throughout France as a network proving their expertise as advisory leaders. On the field daily, they form a unique local network in France, providing advice, support and formation to farmers on various topics. For example, having worked for many years on plant cover, the Chamber provides research and technical elements for better implementation and other use such as green manure (project ADOPTAE).The MERCI tool (https://methode-merci.fr/) allows you to calculate the contribution of a plant cover and therefore adjust the fertilization of the following crop.

Scientific leader: Wageningen University & Research. WUR as a leading research organization in agricultural topics the Netherlands is working on several projects related

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to biobased fertilizers. This ranges from projects such as “betere stal, betere mest, betere oogst” (=”better stable, better manure, better yield”), where nutrients from the dairy sector are optimally utilized and applied to arable fields, to the creation of a manual on the ideal application of fertilizers to achieve a good soil health. In addition, the KNAP project aims at closing the nutrient cycle by recovering nutrients from sewage sludges and applying them to arable fields.

Members list:

Table 5. Bio-based fertilizers FIN members

ENTITY	ROLE	MEMBER NAME
WR	**Scientific Leader**	**Ardy Saarloos**
AC3A	**Advisory Leader**	**Mélisande Nardy / Sandra Gabard**
RT	**Member**	**Alessandra Gemmiti**
UGENT	**Member**	**Evi Michels / Erik Meers**
INTIA	**Member**	**Pablo Echarte**
ZLTO	**Member**	**Julia Krijnen**
EV ILVO	**Member**	**Saartje Degelin**

Soil Quality FIN

Advisory leader: HS Hushallningssallskapens Service Aktiebolag. Hushållningssällskapet have a 200 year long history of excellence in regard to advising the farming community on best practices. On the topic of soil quality, we stand out by leading projects about biochar and its characteristics as a soil amendment. Hushållningssällskapet is also running several field stations where research on new practices and products are developed in practice. The results are smoothly disseminated through our advisors to farmers and other interested parties, thereby creating knowledge for the future.

Scientific leader: Instituto Navarro De Tecnologias E Infraestructuras Agroalimentarias SA. INTIA is a public applied research and advisory organization with over 40 years in the sector, developing field trials and transferring results to more than 12.500 farmers as part of its core work. INTIA has its own experimental farms both at organic and conventional farming where there are currently more than 200 field trials. Regarding fertilizers, INTIA carries out long-term trials on the three main nutrients: nitrogen, phosphorus and potassium. Some of them are more than 35 years old and are in different locations in Navarra. These trials allow adjusting the fertilization of crops, as we know their needs in each of the different agro-climatic zones of Navarre.

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Members list:

Table 6. Soil Quality FIN members

ENTITY	ROLE	MEMBER NAME
INTIA	Scientific Leader	Pablo Echarte
HS	Advisory Leader	Cecilia Hermansson
SEASN	Member	Domagoj Gorup
RT	Member	Alessandra Gemmiti
AC3A	Member	Jean-Philippe Bernard
WR	Member	Ardy Saarloos
CDR	Member	Marek Krysztoforski
ZLTO	Member	Djessie Donkers
EV ILVO	Member	Saartje Degelin

Communities of practice

In addition to the transnational exchange covered by the FINs, STRATUS will also ensure the integration of the advisors in the MS AKIS as well as the adaptation of the project work to the local conditions through the creation of **10 Communities of Practices (CoPs)**, following the methodologies developed in the Bovine and Climate Farm Demo. The CoPs will be established with local AKIS actors in **10 countries: Spain, Poland, Greece, Slovenia, Netherlands, France, Croatia, Italy, Belgium and Sweden.**

Each CoP is specialized in the most relevant and representative topics of their country. The following Table 7 shows the relevant topics that will be covered in each pedoclimatic area through the CoPs. All types of crops are covered in each pedoclimatic area.

Table 7. FIN topics, sub-sectors and climatic areas covered in each FIN.

Pedoclimatic area	CoPs	Relevant topics	Sub-sector
ATLANTIC CLIMATE	France	BBF/PF/SQ	Arable, hort, fruit
	Netherlands	BBF/PF/SQ	Arable, hort
	Belgium	BBF/PF/SQ	Arable, hort, fruit
	Spain	BBF/PF/SQ	Arable, hort, fruit
MEDITERRANEAN CLIMATE	Greece	PF	Hort, fruit
	Slovenia	PF	Arable, fruit
	Italy	BBF/PF/SQ	Arable, hort, fruit
	Croatia	SQ	Arable, fruit

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CONTINENTAL CLIMATE	Poland	PF/SQ	Arable, hort, fruit
NORDIC CLIMATE	Sweden	PF/SQ	Arable

Atlantic and Mediterranean area CoPs will address the 3 themes (PF, BBF and SQ) since these are the challenges that these countries will have to face in the coming years. Continental and Nordic area CoPs have prioritized their resources on PF and SQ, as they are the ones more important nowadays. In fact, these zones have a large surface area to apply waste streams and unprocessed residue, so BBF is not considered a major topic to cover.

However, countries of continental and Nordic areas, will have all the material related to BB created during the 5 years of the project which will be released and disseminated: GPs, RIs and BPs, demos, etc. This material will help them to stay up to date on all these techniques.

Regarding the composition of the CoPs, the CoPs will follow the multi-actor approach (Figure 7) to boost peer to peer learning among regional and national policy makers and education organizations in addition to the usual AKIS actors such as farmers, industry, and researchers also ensuring the link with the EIP OGs. Each CoP will be composed of:

- 2 policy makers partner of the project
- 5 advisors
- 3 farmers
- 2 researchers
- 2 industry partners

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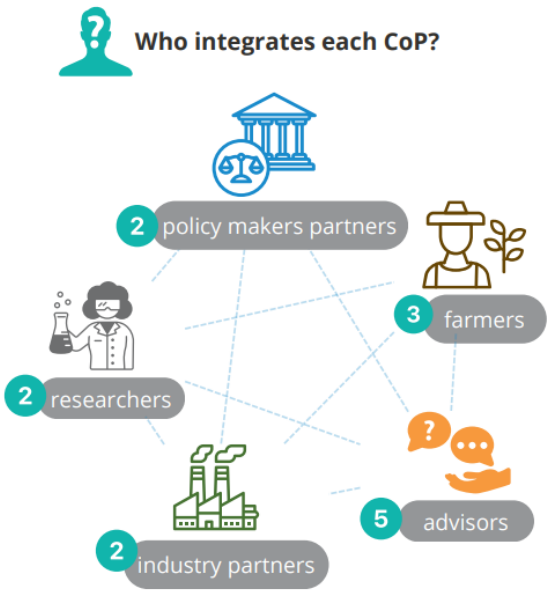

Figure 7. CoP actors in STRATUS

These participants will be identified by the local STRATUS advisory partners building the CoPs, thus adapting project activities to the specific context of the different countries. The CoPs will be a key part of the knowledge exchange, ensuring the capture of the bottom-up needs and knowledge as well as multiplying the knowledge exchange. The CoPs will be managed by the advisors involved in the FINs that act as Innovation Brokers in their local Integrated Fertilization Management AKIS being also in charge of organizing the CoP related activities and of maintaining an active network (Table 8).

Table 8. CoP leaders in each country.

CoP Country	Leader
SPAIN	INTIA
POLAND	CDR
GREECE	AUA
SLOVENIA	CAFS
NETHERLANDS	ZLTO
FRANCE	AC3A
CROATIA	SEASN
ITALY	RT
BELGIUM	ILVO
SWEDEN	HS-7 / HS-J

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These advisors being also part of the FINs will ensure a smooth integration of project activities at the EU and national/regional levels. The FINs and the CoPs created and monitored will be the core of the project for STRATUS

Since the interaction with policymakers at different levels is key for STRATUS, advisory partners will pay specific attention to their active involvement in the CoPs, thus ensuring the relevance of the policy recommendations developed by the project. A specific task will explore how the activities of the STRATUS network can be successfully maintained after the end of the project.

STEP 7. Governance methodology

Which methods will you use to governance the network?

Stratus case

Once created, the deployment and management of FINs and CoPs will be monitored and supported through the development of Dynamic Action Plans (DAPs) and regular meetings.

Membership management

For the recruiting of the members that will represent the organizations in the FINs an excel list was shared in the project intranet with an e-mail reaching all the partners of the project. After becoming part of a FIN, each member received a welcome e-mail with information about the tasks and duties to be done as member of a FIN.
On the other hand, it will be possible to participate in activities and meetings as a guest in cases of common interest. Guests may participate but have no decision-making power as they are not assigned to the FIN.

Dynamic Action Plans

A DAP is a document that identifies the key challenges of a project or network for a certain range of time. It helps to direct the efforts of a network's work towards its most important objectives:

- Dynamic: because they are live documents that are updated in regular basis as the time goes by and the work is executed. They are not a fixed to-do list.
- Action: because at the end they contain the specific work or actions to be done according to the objectives stated and the challenges identified.
- Plans: Because it highlights the work to be done, expected results, responsibilities and timing.

In STRATUS project the DAPs will identify practical plans for network establishment and facilitation, being able to adapt to the needs throughout the project and ensuring continuous learning and improvement:

- 1 DAP per each FIN will be developed on an annual basis.

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- 2 DAPs per each COP will be developed during the whole project

Meetings

To ensure enough exchange flow in the networks and as a method of governance and coordinator the different network bodies will meet trough the project on a regular basis.

FINs meetings

FINs will meet on-line individually at least 2 times the first year of the project and 4 times per year the following years:

- Each FIN will meet individually online
- The leaders of the FIN will be in charge of scheduling the meetings
- After each meeting the leaders should take minutes and proof of the activites carried out during the meetings.

CoPs meetings

Each of the 10 COPs will organize a face-to-face meeting with all their members on year 1, year 3 and year 5 of the project.

- The advisors on the FIN who are members of the COP will be in charge of scheduling the meetings.
- After each meeting the leaders should take minutes and proof of the activites carried out during the meetings.

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