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Modernisation of Agriculture through more efficient and effective Agricultural Knowledge and Innovation Systems

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HORIZON Coordination and Support Actions

Deliverable 3.1

3 online modules in 24 languages for Task 3.1 available on demand

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R	Document, report	☐	**PU**	Public	☒
DEM	Demonstrator, pilot, prototype	☐	**SEN**	Sensitive, only for members of the consortium (including the Commission Services)	☐
DEC	Websites, patent fillings, videos, etc.	☒			
OTHER		☐			

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1. Executive Summary

The overall objective of this work package is to build the capacity of AKIS Coordinating Bodies and other AKIS actors to understand, analyze, transform, monitor and evaluate their AKIS. Particular attention will be paid to building capacity for effective networking, enhancement of knowledge flows and AKIS governance activities.

Sub-objectives of this work package are:

- Create better-informed and engaged actors by facilitating, through capacity building, a thorough understanding of
- AKIS concepts among the AKIS coordination bodies and other AKIS actors (T3.1).
- Build capacities and enable innovative intervention, coordination and governance solutions to accelerate the transition to a more sustainable management and use of natural resources in farming and forestry (T3.2).
- Build understanding and competences to apply appropriate frameworks, methods and tools to improve knowledge flow and network governance as well as assessment and evaluation of MS's AKIS at national and/or regional level (T3.3).

WP3 is designed to enable AKIS actors in each MS to develop system thinking and equip them with the tools and capacities to collectively understand, analyse, benchmark and monitor & evaluate their AKIS, as well as their role(s) and agencies therein. This work package will also provide MSs with the tools and skills to develop implementation plans to transform and optimize their AKIS in terms of targeted coordination and governance. Over the lifetime of the project, and following the evolving trajectory and life-cycle of the AKIS networks, capacity building will be offered in a range of appropriate analogue and digital formats and in recursive loops between needs assessments, new knowledge identification and demand formulations (WP 2 and WP4).

We have developed a Capacity building framework which has been designed to achieve the learning objectives listed above.

- Development of 6 Online Modules (D3.1, D3.2)
- Development of an AKIS Toolkit and associated Learning Materials (D3.3. D3.4)
- Train the Trainer Capacity Building Events (D3.5, D3.6)
- Delivery of in-country workshops (D3.7, D3.8)

As part of this deliverable our team has developed three online modules that will be uploaded the akisconnect.eu online platform. Content development for these modules has been led by University of Hohenheim. A further three modules will be released as part of D3.2.

Annex 1 contains the contents for Modules 1-3 along with supporting notes.

2. Introduction

The objective of this deliverable is to enable AKIS actors across Europe to:

- Conceptualise valuable, relevant and credible AKIS models
- Understand how to organize, coordinate and govern AKIS actors and to align and connect infrastructures
- Conduct diagnosis on the strength and 'health' of the AKIS
- Develop systems thinking and systems level approaches to AKIS

A series of three modules have been developed to support the achievement of these objectives. The target audiences for these modules have been divided into two main categories.

- Key actors of change: National coordination body members, members of the modernAKIS Community of Practice as well as key actors in the AKIS
- Trainers: Trainers with already (good) training skills in interactive trainings, coming from different European countries

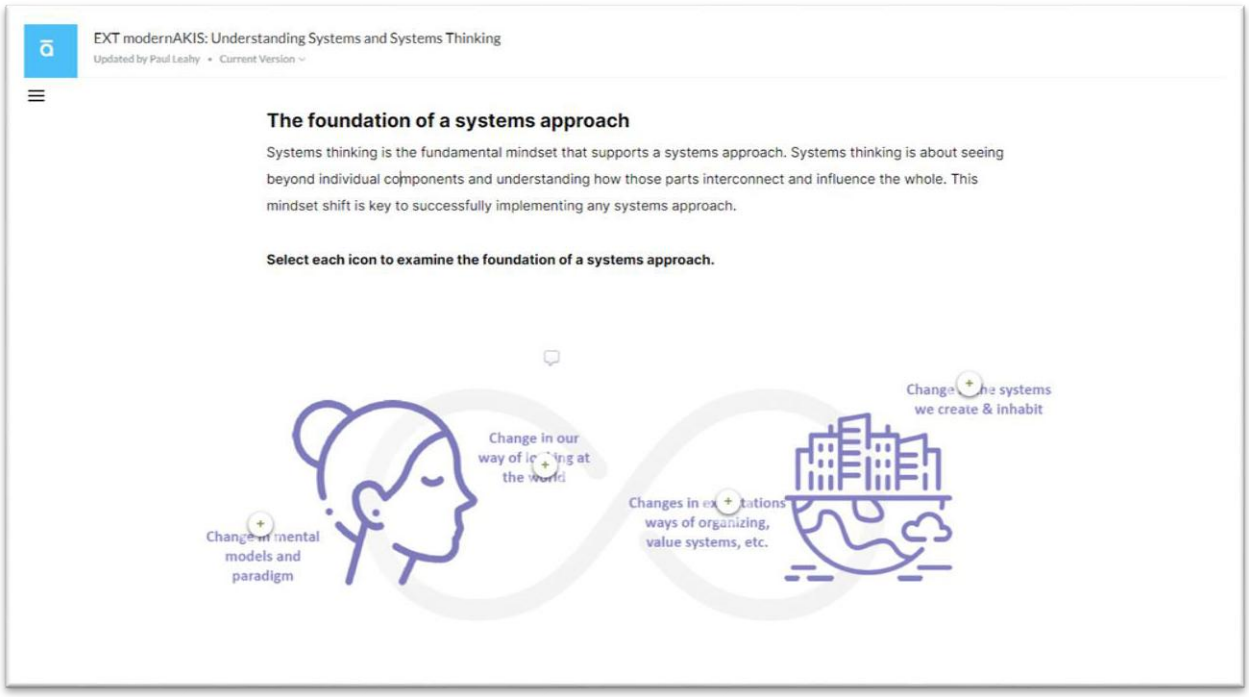

Figure 1: Screen Shot from Module 1 Understanding Systems Thinking

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3. Online Modules

Three detailed modules have been developed as part of D3.1. Each module has been co-created by our multidisciplinary team which consists of practitioners and researchers from a broad range of perspectives.

The project team have decided to further develop each module into a fully interactive online module.

3.1. The development process

WP3 has contracted a specialist Instructional Design company, The Learning Rooms, to develop each module into an interactive experience using Articulate Rise. The Learning Rooms is a digital learning services company that designs, develops and delivers technology-based training solutions to help organisations and their people improve performance. They are experienced in developing highly effective eLearning and performance support solutions to deliver valuable skills and awareness training through meaningful, engaging, and motivating learning experiences.

The Articulate Rise format ensures that each module is fully responsive (mobile friendly) which means that it can be consumed by learners on all mobile devices. Each module has been limited to a maximum 30 minutes to complete.

In this task we have adapted the ADDIE (Analyse, Design, Develop, Implement and Evaluate) instructional design model as a framework for building the AKIS Online Modules. The key stages are outlined below.

The next steps to developing the interactive online modules is to add animation, video and voiceover to create a much richer learning experience for learners. Each module will then be translated into 24 different languages. Both instructions for use of the modules and the content of the modules will be translated.

3.2. Instructional Design and Learning Experience

As part of the development of the online modules we adopted an instructional design approach to content development. Instructional design is the process of writing and designing learning content from an educational context that is far more engaging that traditional approaches.

As part of the development of the online modules we have also employed the use of Learning experience design, which is a human centred approach to designing simulations and interactive scenario based learning. The approach focuses on both content (instructional approach) and user experience (UX). We have followed principles and practices that ensure the learning journey is enjoyable, engaging, relevant, and informative for learners.

3.3. Module dissemination and hosting

All modules will be made freely available on the akisconnected.eu platform and will be translated into the 24 official EU languages. Each module contains knowledge checks (mini quizzes) throughout the learning journey.

The titles of the three modules are:

- Module 1: Understanding systems and systems thinking
- Module 2: Understanding the AKIS as a system
- Module 3: AKIS Diagnosis

A detailed draft of the online version of each of the modules is available at the following links:

- Module 1: Draft Online Interactive Version
- Module 2: Draft Online Interactive Version
- Module 3: Draft Online Interactive Version

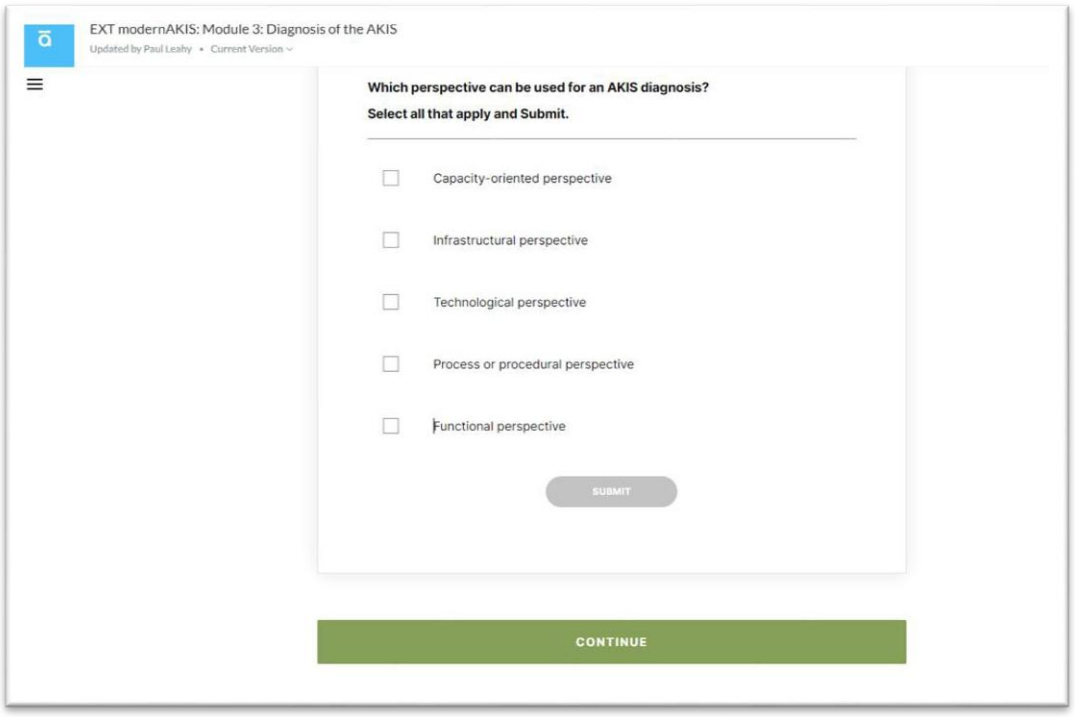

Figure 2: Screen shot from Module 1: Understanding systems and systems thinking

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4. Improved Capacity Development Framework

The WP3 team has reviewed the capacity development framework within the original grant agreement and believe that the revised framework below will generate savings within the project and increase the impact of all capacity building activities.

4.1. AKIS Toolkit and Learning Materials (D3.3. D3.4)

The next stage of the process will entail the development of an AKIS toolkit and learning materials (D3.3) based on the learning outcomes of online modules 1 to 3. As part of this deliverable a detailed curriculum will be developed for the in-country workshops which will be highly interactive. The toolkit and learning materials will underpin the in-country workshops that will be delivered in each Member State.

4.2. Train the trainer capacity building events (D3.5, D3.6)

A select group of trainers (c.10) from the core project team will receive intensive training and be immersed in the toolkit and learning materials developed as part of D3.3. Most of this team will have contributed to the development of the toolkit and learning materials as well as the development of the online modules. The train the trainer program will be delivered using blended learning.

4.3. In-Country AKIS Workshops (D3.7, D3.8)

Members of the training team will be assigned 2 to 3 Member States to deliver in-country workshops that will be attended by key AKIS actors and trainers. All attendees at the workshop will be expected to have complete all online modules in advance.

Round one of the In-country AKIS workshops will focus on using simulation exercises, practice selected core training elements and discussion to embed the concepts and approaches contained within the learning objectives of WP3.

The above process will be repeated for D3.8.

5. Conclusion

The content for modules 1-3 has been successfully developed and will now be transformed into a rich learning experience for learners across Europe. Modules will be promoted via WP5 across social media and within the modernAKIS network.

6. Annex

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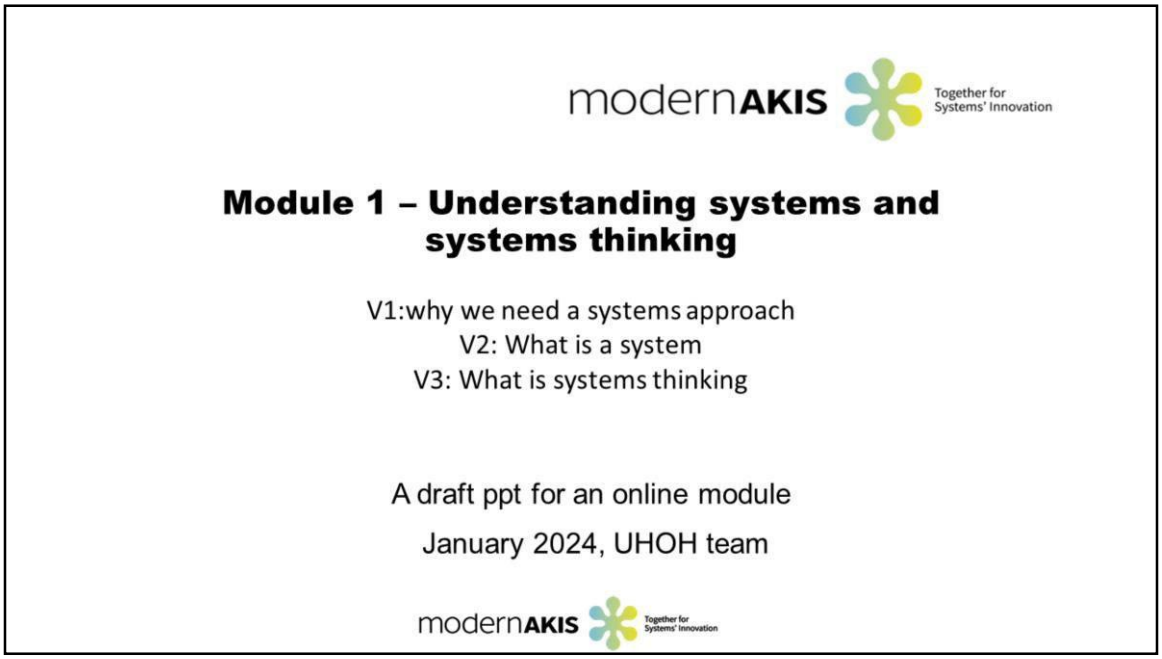
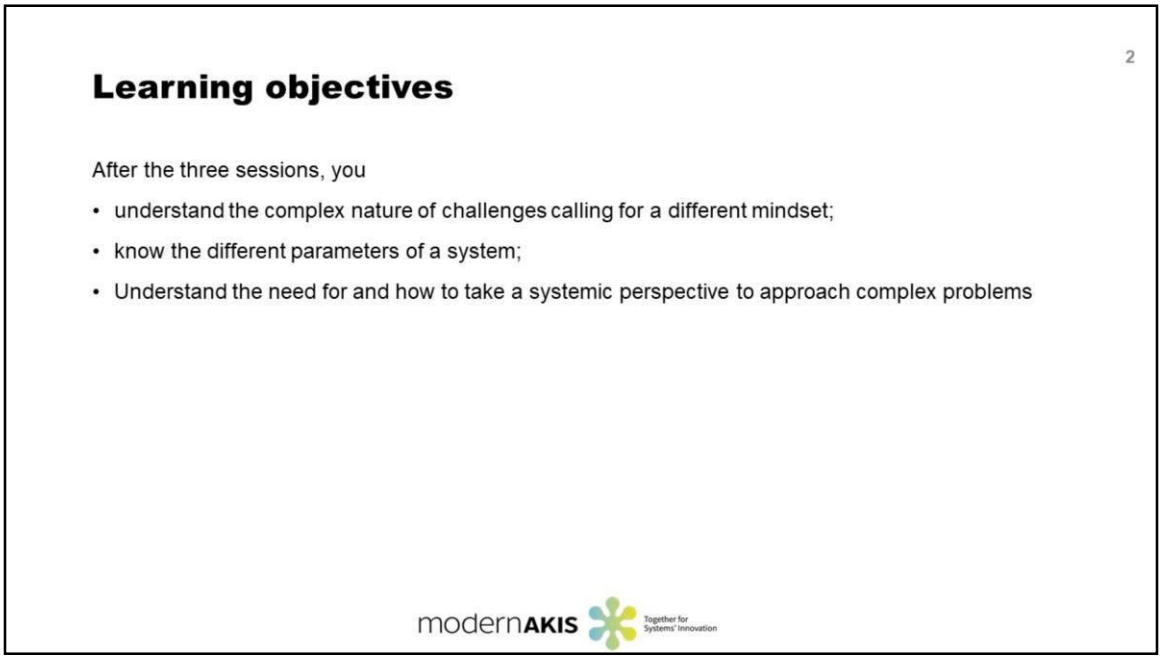


Welcome to the first module on the AKIS definition. The module dOverview:
This module ….
Justify why we start with systems approach and not directly with AKIS



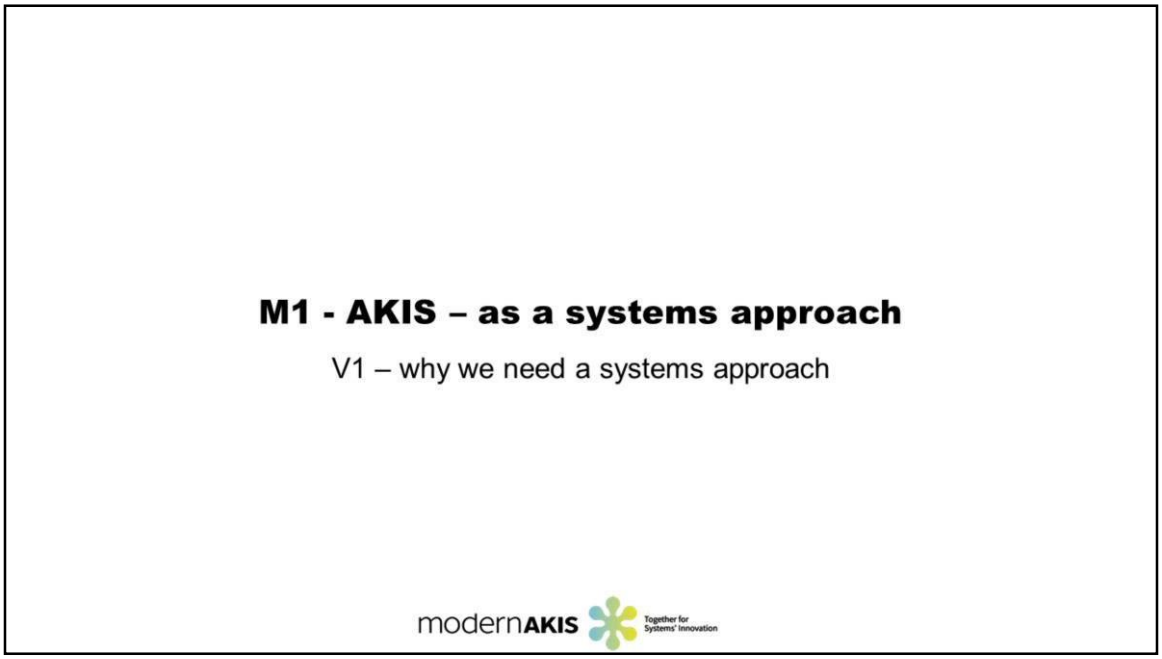
Overview: This module starts with a wider introduction to systems and systems thinking as this is the necessary foundation to well understand AKIS as a system approach.

We hope that at the end of this series of 3 videos

- You understand the complex nature of challenges calling for a different mindset;
- You know the different parameters of a system, and
- You understand the need for and how to take a systemic perspective to approach complex problems.

Specifically in the first video, you will be introduced to the mindset which is necessary to addressing complex problems that is: seeing challenges and opportunities from a systems perspective.

We will use concrete examples to make it lively and illustrative.



Let us start with inquiring why we need a systems approach at all. And we will begin with an example.

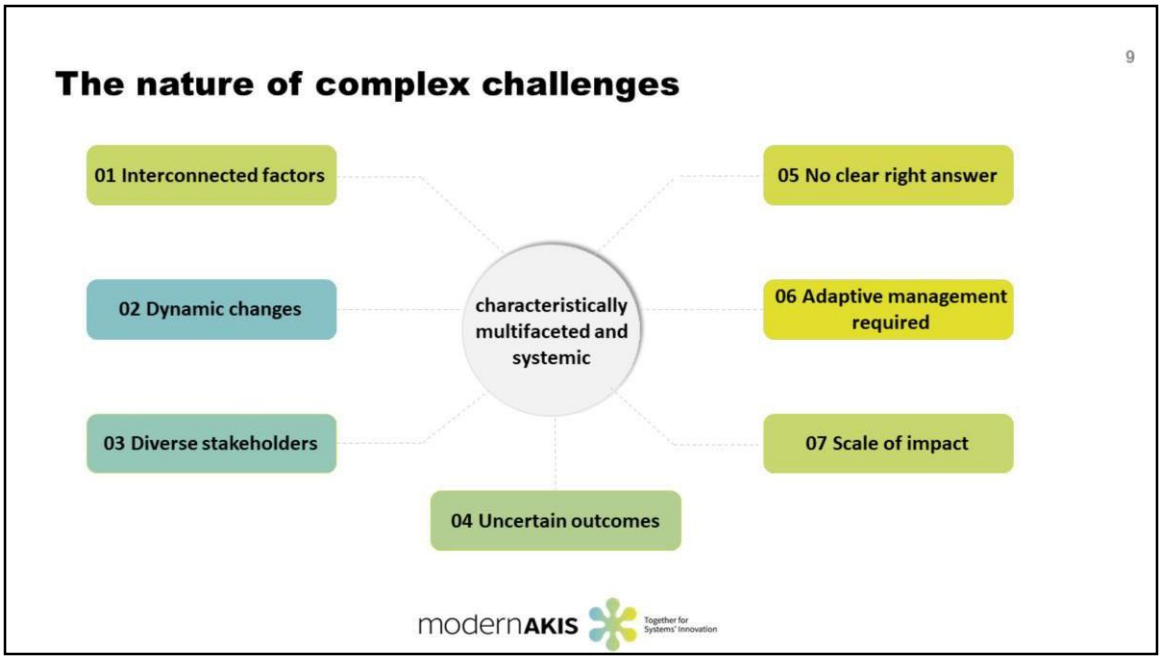
In the heart of Hessen, Germany, a new dawn brings with it not just light but a formidable challenge for those who till the land...

A new fertiliser regulation has been introduced that aims to reduce groundwater pollution from nitrogen fertilisers. According to this new mandate, the application of nitrogen in fertilisers must now be limited to 170 kg per hectare, a sharp decrease from the 200-260 kg that farmers like Gerhard have relied on. This has caused concern and worry among the wheat farmers in Hessen.

The new legislation has stirred unrest not just in the fields but also in the mills and bakeries. The millers and bakers are concerned because they know well that the strength of their bread begins with the protein in the grain. The fear is palpable – less nitrogen could mean less protein, risking the quality of their breads and the traditions they uphold.

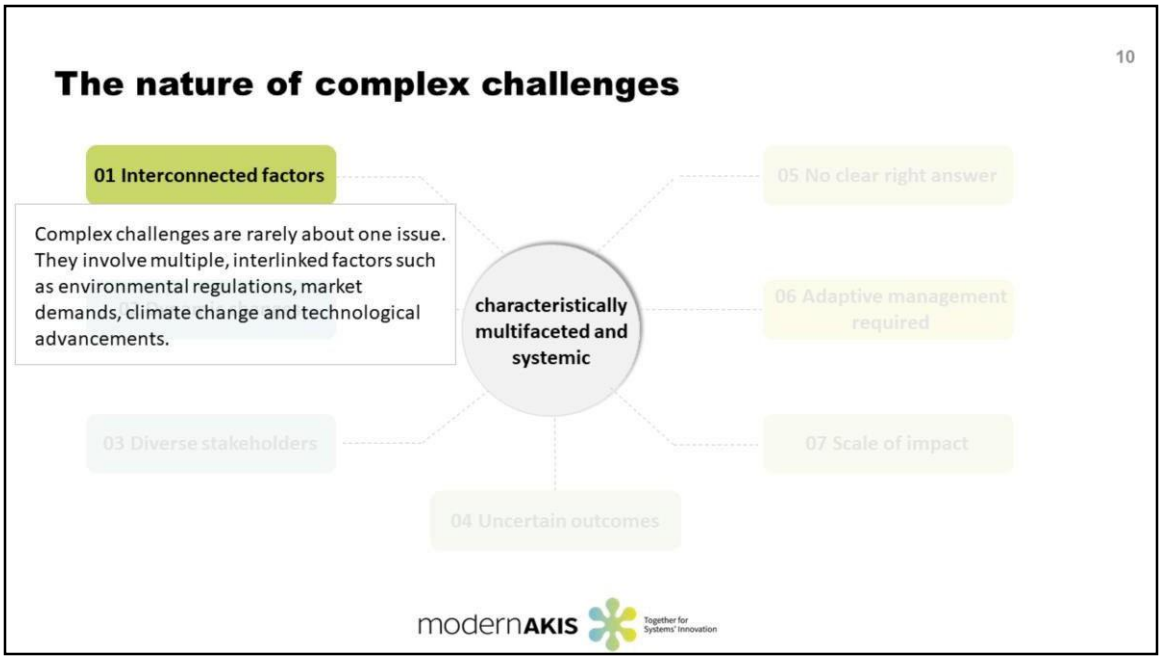
Farmers now find themselves in a difficult position. Their wheat is paid by the kernel protein content, the very metrics that define the quality of their yield. Now, the new regulation will cause a jeopardy to their earnings.

The farmers are now caught in a bind. Their hands, once firm on the plough, now tremble with uncertainty – how will they reconcile the high protein requirements from their customers with the strict new nitrogen restrictions?

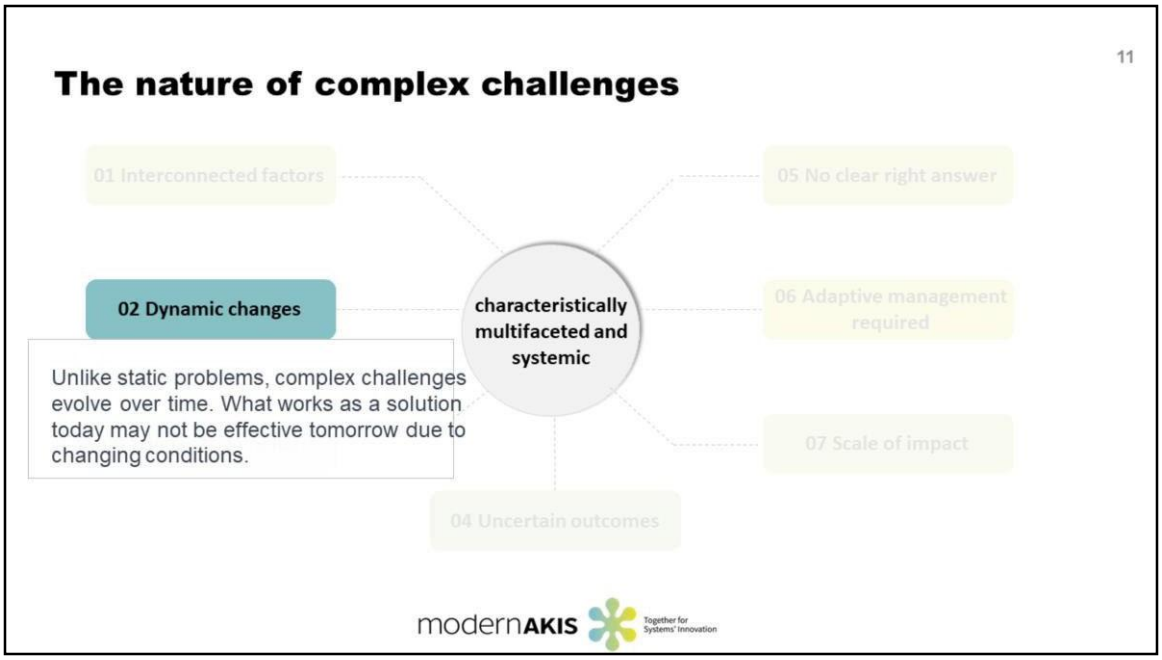


In the wake of our introduction to farmer Gerhard's situation, it's clear that today's farmers are navigating through a myriad of challenges. These are obviously not simple challenges with straightforward solutions; they are complex, multifaceted and systemic. But what exactly makes a challenge complex?

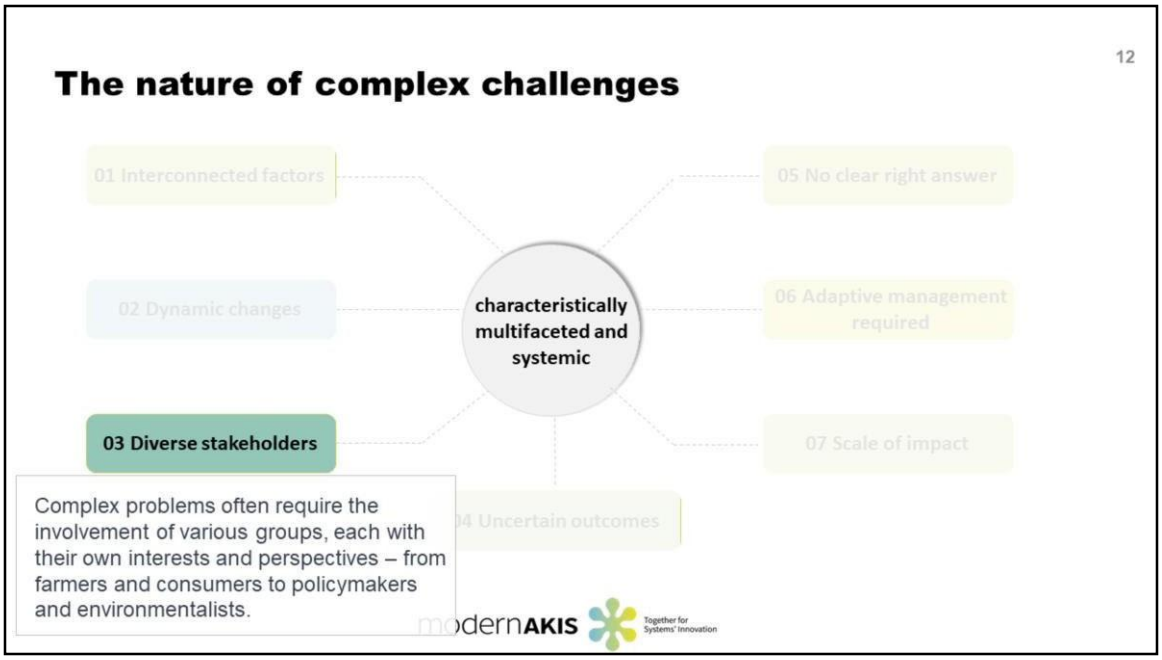
Click on each of these points to learn more.



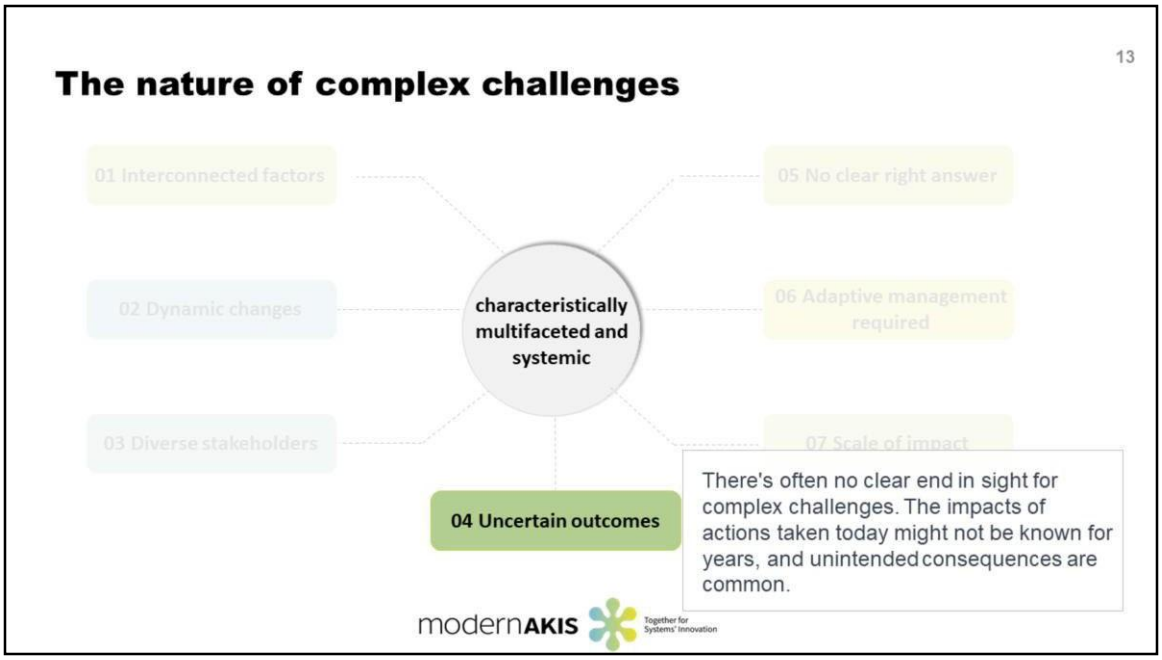
Complex challenges are rarely about one issue. They involve multiple, interlinked factors such as environmental regulations, market demands, climate change and technological advancements. In the introductory video we saw that Gerhard's challenge was not just about fertiliser use; it was also about groundwater health, crop quality, and market prices. Reducing nitrogen affects the wheat protein, which in turn impacts bread quality and price.



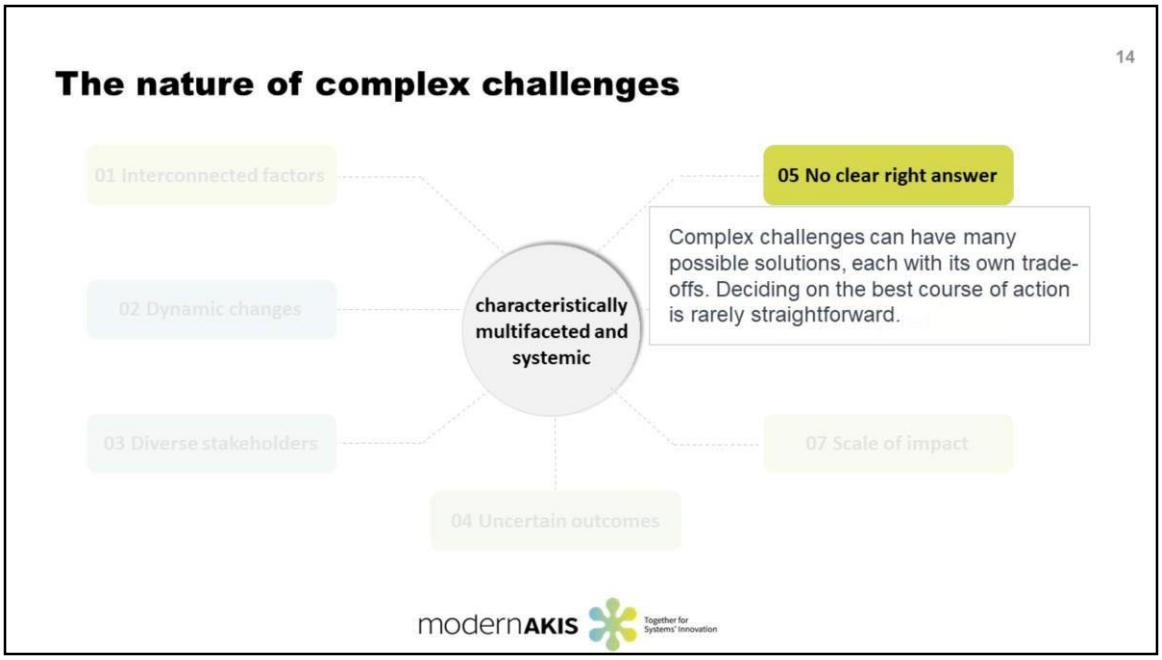
Unlike static problems, complex challenges evolve over time. What works as a solution today may not be effective tomorrow due to changing conditions. As we saw, the regulations changed from what Gerhard was used to. He must now change his practices and adapt to the evolving legal and environmental landscape.



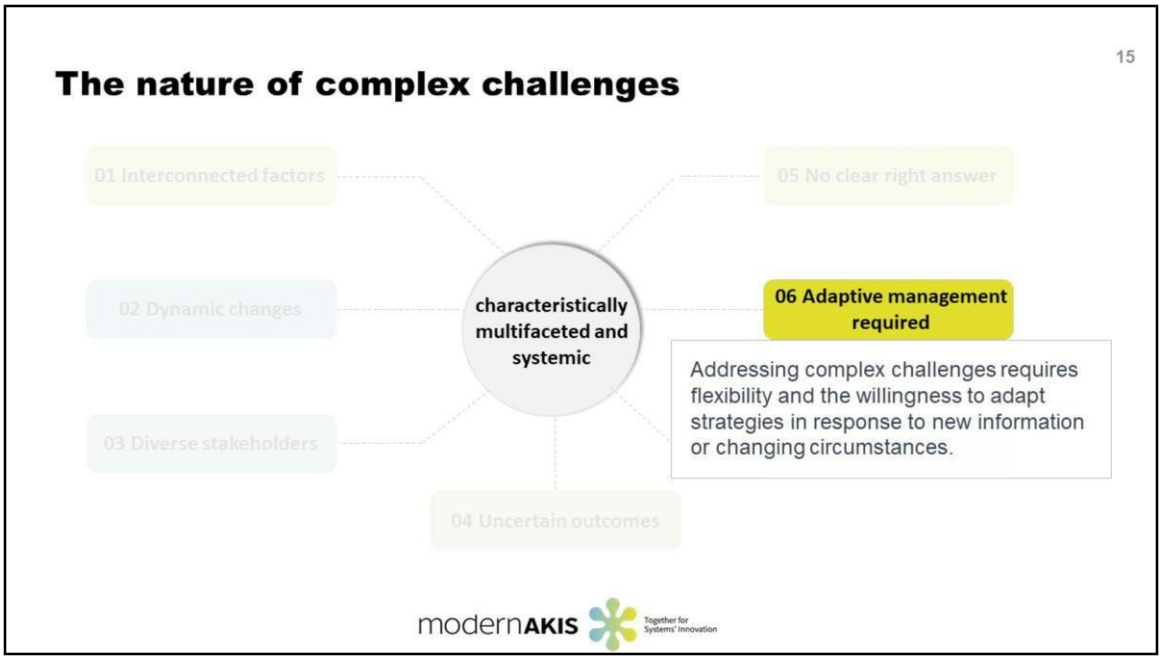
Complex problems often require the involvement of various groups, each with their own interests and perspectives. Gerhard's situation involved various stakeholder – policy makers setting the rules, consumers demanding quality produce, and environmental groups pushing for sustainability



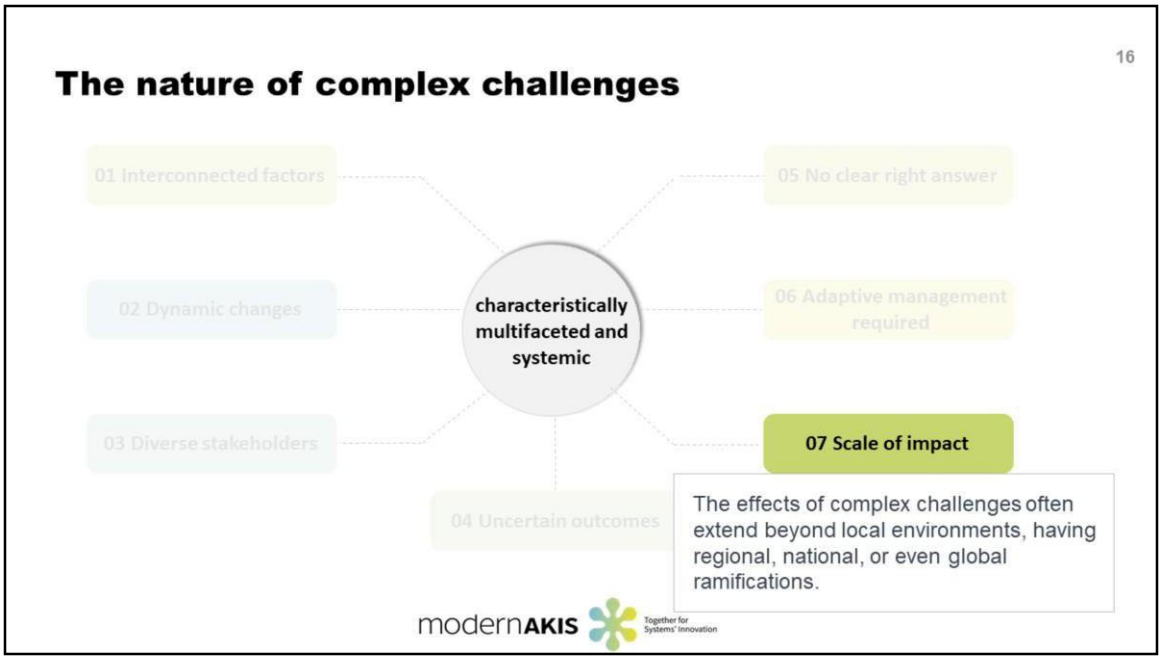
There's often no clear end in sight for complex challenges. The impacts of actions taken today might not be known for years, and unintended consequences are common. In a similar way, with the new regulation it's unclear how much Gerhard's wheat yield and quality will be affected in the long term, which makes planning and predictability difficult.



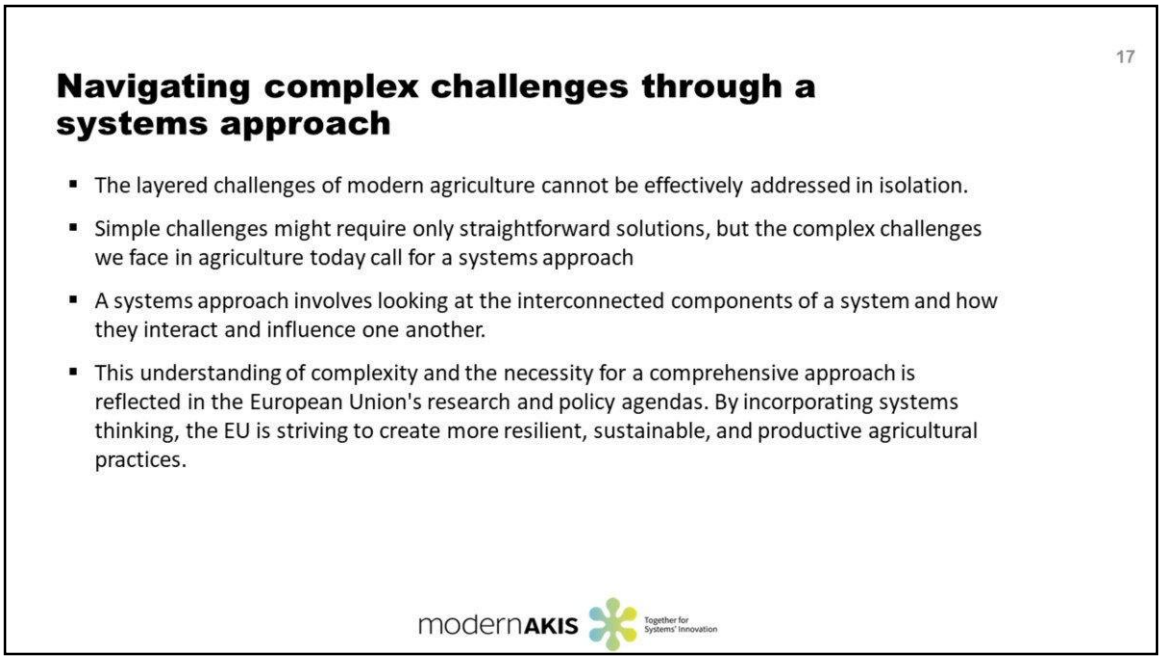
Complex challenges can have many possible solutions, each with its own trade-offs. Deciding on the best course of action is rarely straightforward. Likewise, there is no single solution for Gerhard. He must consider various strategies, like changing wheat varieties or adjusting his fertilization technique, each with different implications.



Addressing complex challenges requires flexibility and the willingness to adapt strategies in response to new information or changing circumstances. As the impact of the new fertilizer limits becomes clear, Gerhard may need to continuously adjust his farming practices in response to crop performance and regulatory updates.



The effects of complex challenges often extend beyond local environments, having regional, national, or even global ramifications. As we saw in the video, the challenge extends beyond Gerhard's farm. The regulation will affect farmers across Germany, influencing food supply chains and consumer prices.



As we've seen with Farmer Gerhard, the layered challenges of modern agriculture—affected by environmental, economic, social, and policy factors—cannot be effectively addressed in isolation. Simple challenges might require only straightforward solutions, but the complex challenges we face in agriculture today call for a systems approach.
A systems approach involves looking at the interconnected components of a system—be it a farm, a local economy, or a global food supply chain—and how they interact and influence one another. This method emphasizes holistic problem-solving that takes into account multiple perspectives and variables, and seeks to understand the system's behaviour as a whole.
This understanding of complexity and the necessity for a comprehensive approach is reflected in the European Union's research and policy agendas. By incorporating systems thinking, the EU is striving to create more resilient, sustainable, and productive agricultural practices.

In our next video, we'll delve deeper into the concept of a system and the principles of a systems approach, enhancing our understanding of these critical tools in meeting the challenges of today's farming landscape

Section quiz

Which of the following characteristics define a complex challenge in modern agriculture, such as the one faced by farmers under the new fertiliser regulations in Germany?

A. Challenges that have simple, one step solutions and are quick to resolve

B. Challenges that affect only one aspect of farming and do not require stakeholder collaboration

C. Challenges that involve uncertainty, require adaptability and have long-term implications

D. Challenges where the conditions remain consistent over time, allowing for a predictable, unchanging approach to problem solving

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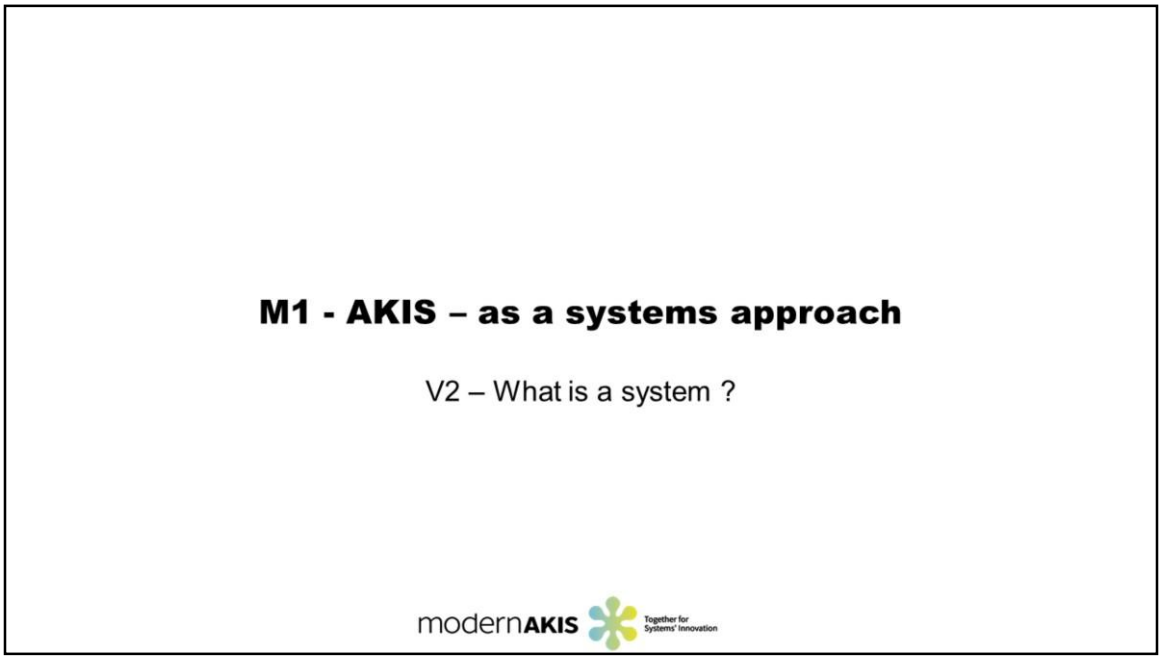
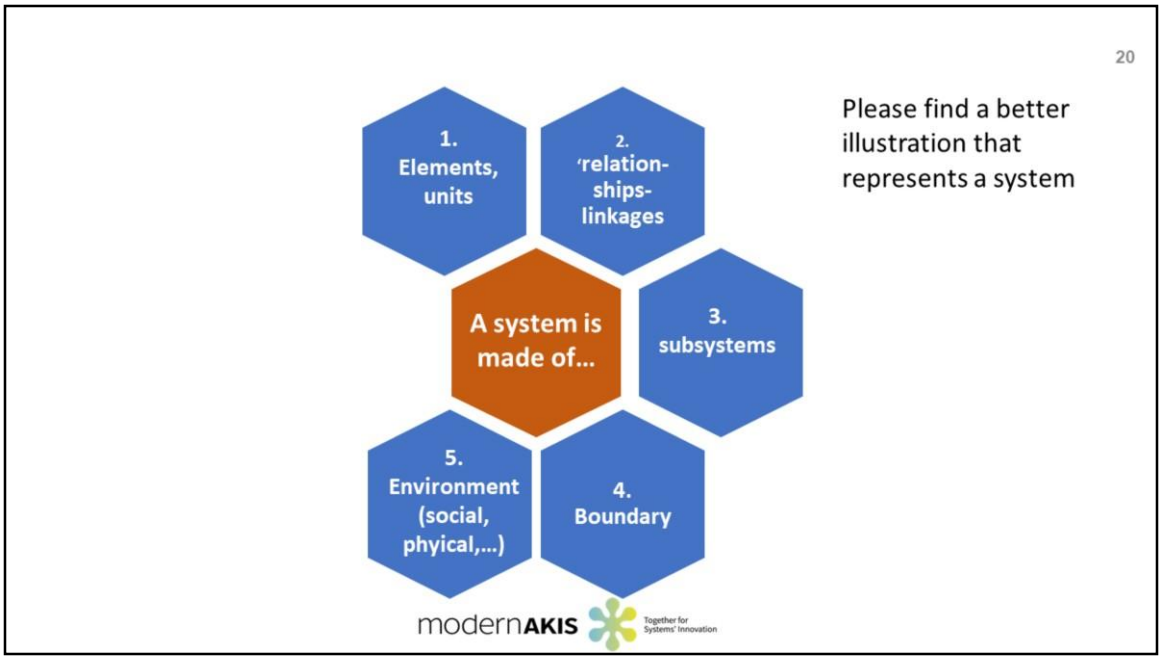


Welcome back!
So far, we have unfolded the different types of problems farmers or actors of value chains are facing. And increasingly they have to deal with **complex problems** that means problems that involve various factors and actors that interact in various ways and where different solutions are possible. This means the way to find solutions needs a different approach. Systems approaches, thinking in systems which means to see the different parts not isolated but in connection and in mutual influence, thus with a broader view, can help in this.
During the following minutes we will look deeper at the question: What makes a system? This will create the basis for the later explanation of the **AKIS** as a system. To illustrate and to be practical, we will use the example of a mixed farm as a system and hight light the respective components which will be presented.



As said earlier, we will now deepen the term and concept „system“ in general. Here, we will give you an overview of what we will cover: A system consists of 1. elements or units, and 2. relationships between these units; three there are subsystems which are located inside the system. Second last is the boundary i.e. the determinants of what the system includes and what not, and therefore subsequently belongs to five, the environment. In the following minutes we will explain them deeper.

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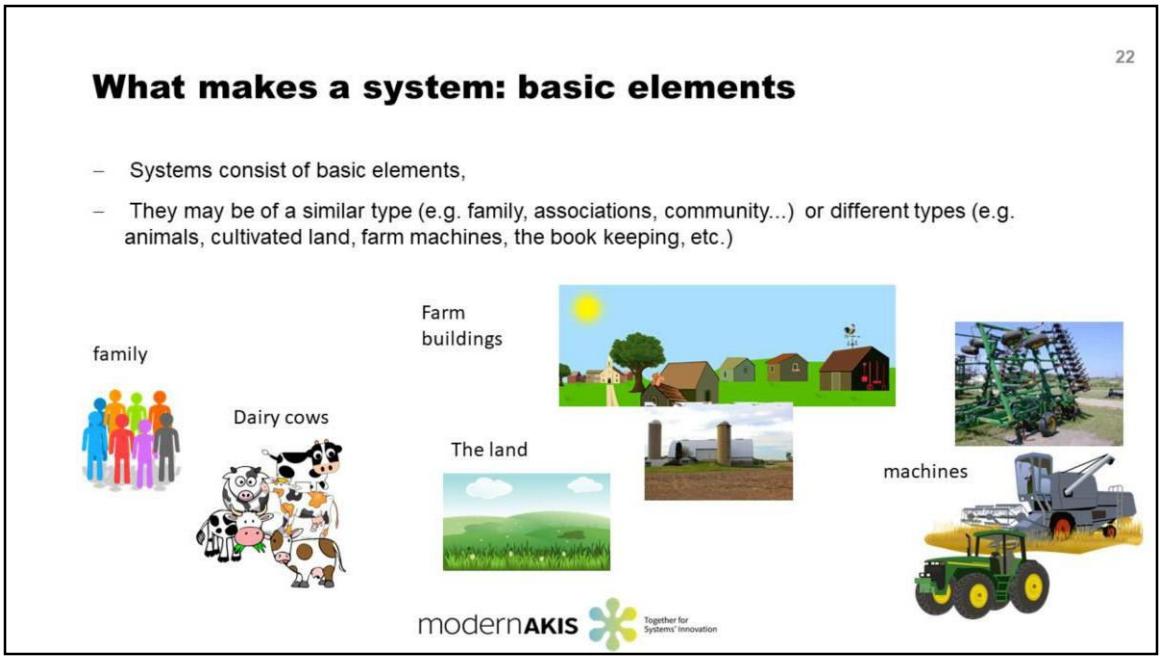
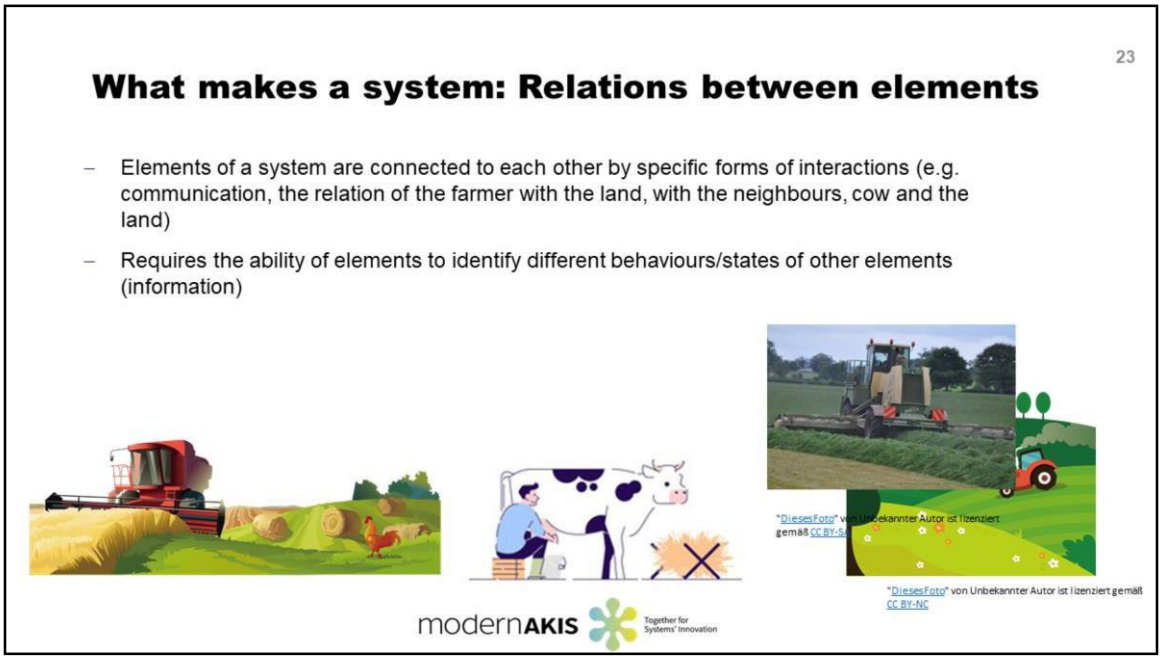
…and we will start with focussing on Gerhard‘s farm.
Imagine, he has a mixed farm. On his farm, you can find:
[for the instructional designer: each time, present the respective pictures for…]

- Farm area,
- Farm buildings
- Machines
- Animals (dairy cows),
- Biogas,
- Family and workers on the farm



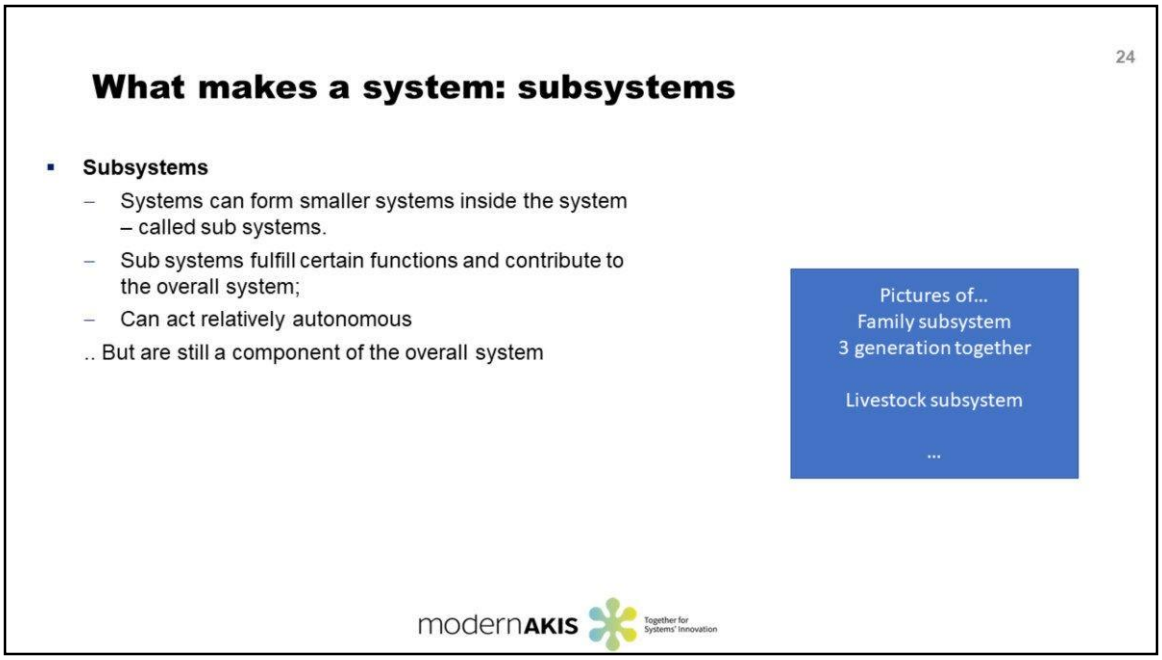
The first thing that we look into a system are basic elements or units. These elements can be of similar or different types. Similar types would be: humans in a community or human society, different plants of a meadow, the different vegetables in a garden. Different types of elements would be the vegetables, berries, herbs , and trees that are in the garden or: the plants, animals, water spots of a given ecosystem.
The elements are affected by being in the system and at the same time they influence how the element functions.

In our example of the mixed farm of Gerhard and his family we can distinguish also different elements:
The family members who live and work on the farm, but also the farm workers; other elements – and of course this depends on the farm type – can be the different animals, the buildings, the land, the equipment and machinery, the economy, etc .– to mention a few.

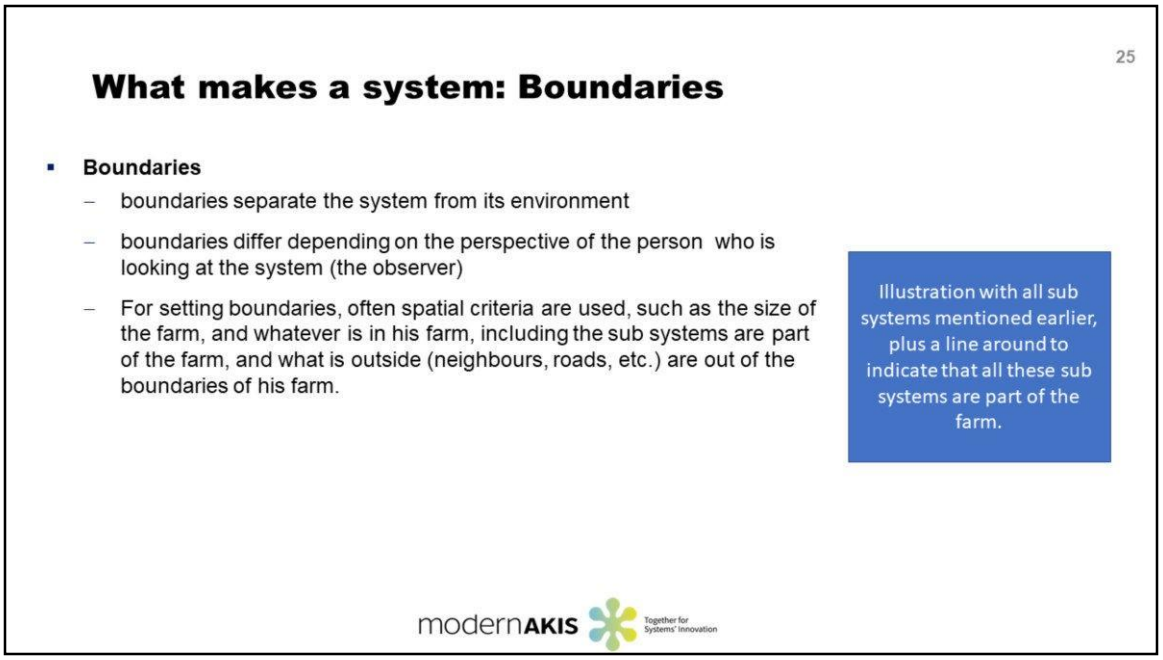


L1:
The elements of a system are not isolated but in relation and connected to each other by specific forms of interactions. Such interaction can be communication or the relation between a farmer and his land, the relation cow and land, and so forth. These relationships can be clearly shown again with Gerhard‘s farm: the family members agree on daily duties, animals need to be taken care of by somebody, maybe Gerhard himself and his eldest son, supported by Gerhard‘s father. Together they share the feeding, milking, clearning, caring if there is sickness, etc. Also, machines have to be operated by some or certain family members to cut the grass, to make hay, to transport straw, etc.; management decisions are taken based on the results of field observations, weather situation, etc. These are just a few examples.

L2:
Also, the elements need to be able to identify the state or behaviour of the different elements in order to react.



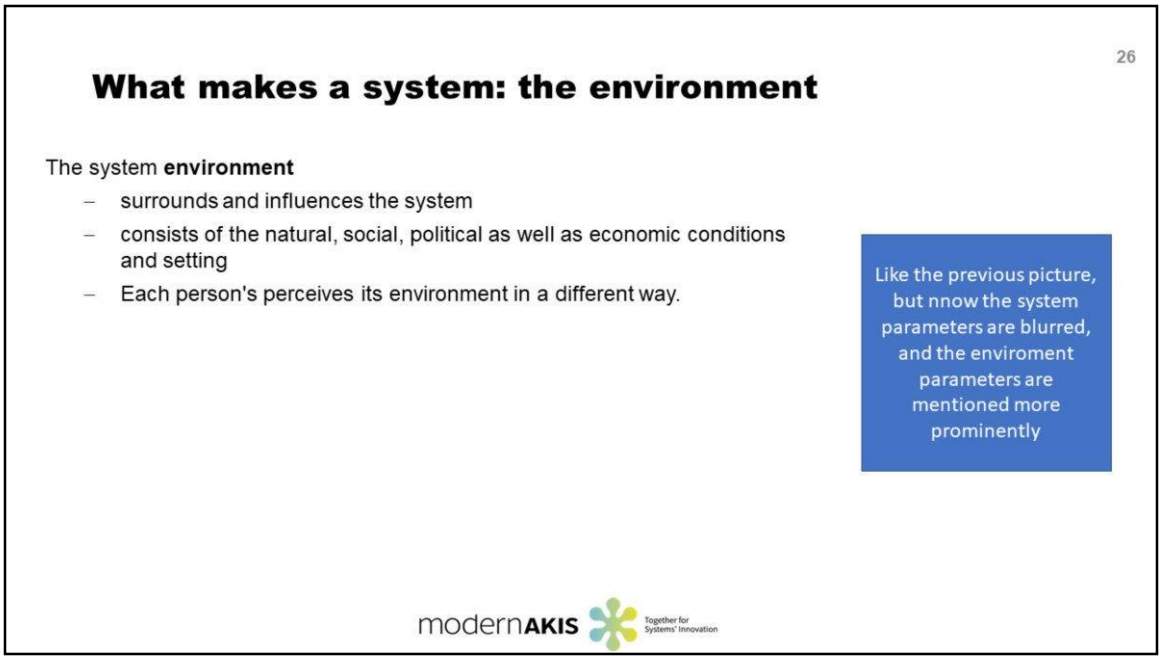
Some elements of the system can form a smaller system – which we then call sub systems. These subsystems are located inside the system and they fulfil a certain function. This function contributes to the functioning of the overall system.
A subsystem can show all or some of the characteristics of a system. And to a certain extent it can act independently from other subsystems or elements. However, it contributes to the functioning (performance?) of the system in which it is embedded – even if they act relatively autonomous.
Coming back to our family farm: the family itself constitutes a subsystem: the number and composition of members varies and can include one, two or three generations living and working together with different values and perceptions of the future of the farm, but also common values and objectives for continue farming and to ensure a good generation transition.
The livestock with the dairy cows can be another subsystem: Feeding cows, mucking out, milking, caring for calves, handling the milk, cleaning the tools, etc. All these activities have to take place independent from all other activities of the farm but contribute to the overall output of the farm.



The boundaries separate the system from its environment that means here is the line that determines which parameters are inside and which ones are outside the system. This is important to have in mind as the boundaries differ depending on the perspective of the actors of the system.

Setting and defining the boundary is not easy. We can use spatial criteria e.g. the geographic location of a farm in a certain district.

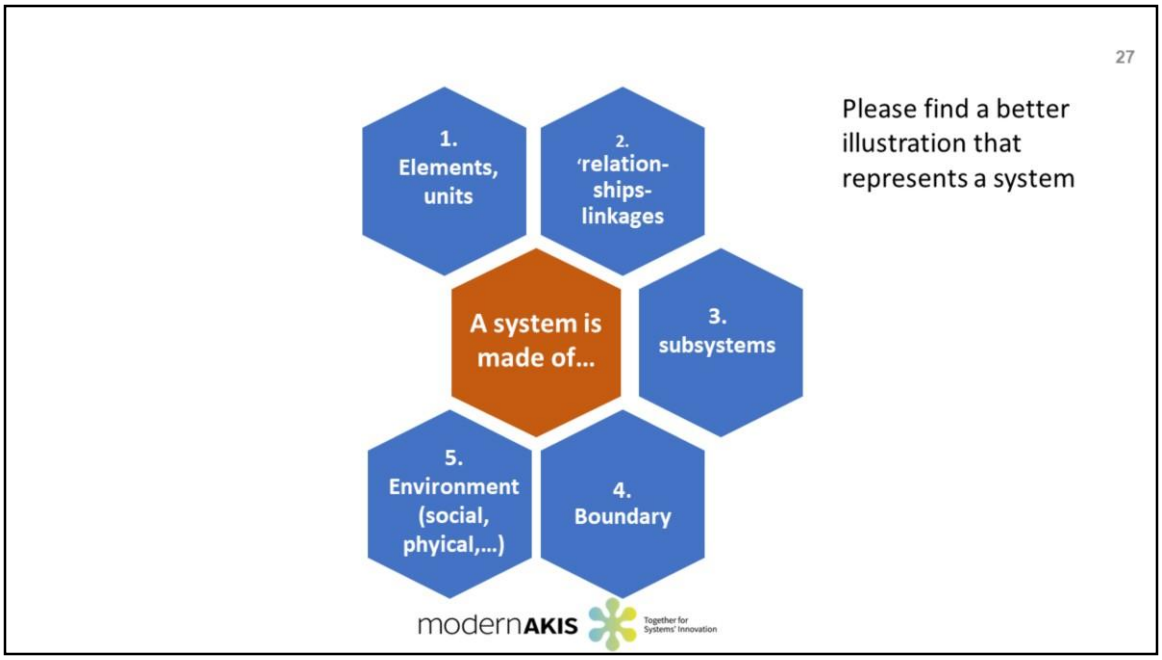
Coming back to Gerhard. Here we see all the different sub systems of his farm and the circle indicates the boundary of his farm.



And last: A system is surrounded and influenced by its environment. This requires that we can clearly define what is part of a system and what not. Everything which is not part of the system belongs to its environment – also other systems. Therefore the determination of boundaries is important.

The environment of a farm system consists of the natural, social, political as well as economic conditions and setting which influence farmers. This can be other actors and institutions which for example provide services, such as accounting, farm advisory or tax advisory services provided by different organisations. Other environment-related actors can be input suppliers (seed, feed, …) and other business partners; or banks (credits), insurance companies. Local governments, national and EU-wide policies influence farmers' decision making on a daily basis, but also their medium and long-term decisions through specific local but also national and EU regulations.
Neighbours, consumers , peers may exert social pressure.
How the environment is perceived differs from the various actors of the system.

Therefore, for the analysis of a given system, it is necessary to have a clear objective in order to take into account the relevant environment parameters.



The parameters of a system are now explained. It becomes obvious that looking at problems from a systems perspective, calls for a different mind set. And this is what we will address in the next video.

Section quiz

- What are the different parameters of a system?
  - ✓ Actors
  - ✓ Relationships
  - ○ Resources
  - ✓ Subsystems
  - ✓ Boundaries
  - ✓ Environment
- Subsystems are…
  - ✓ smaller systems inside a given system
  - ○ Always out the boundary of the system

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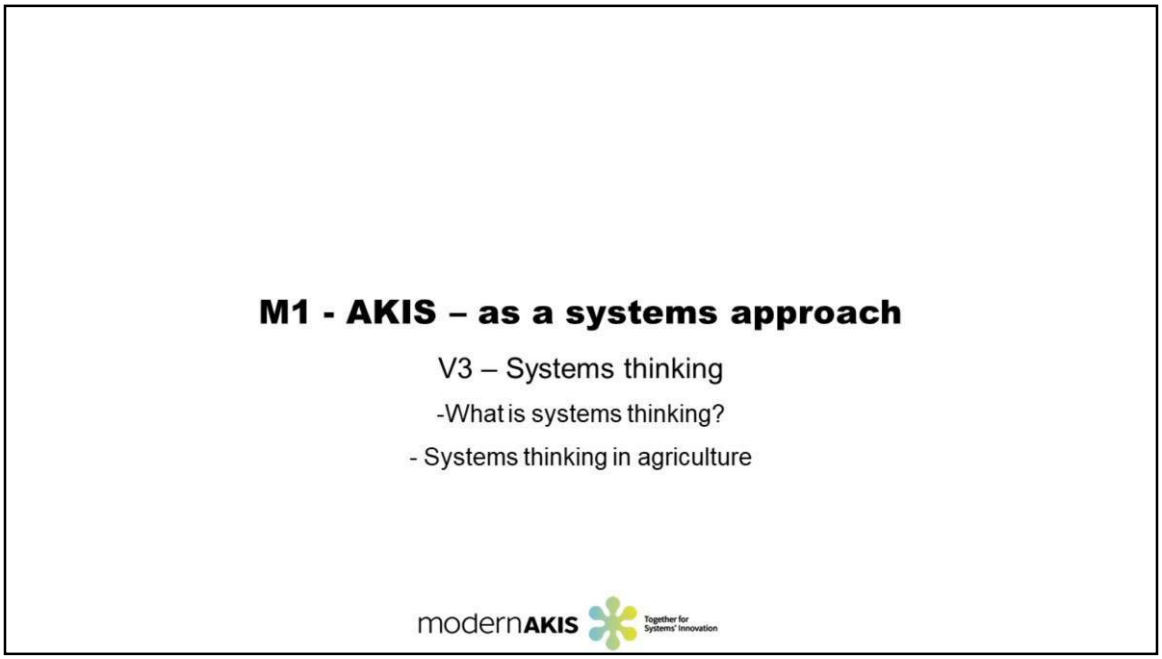
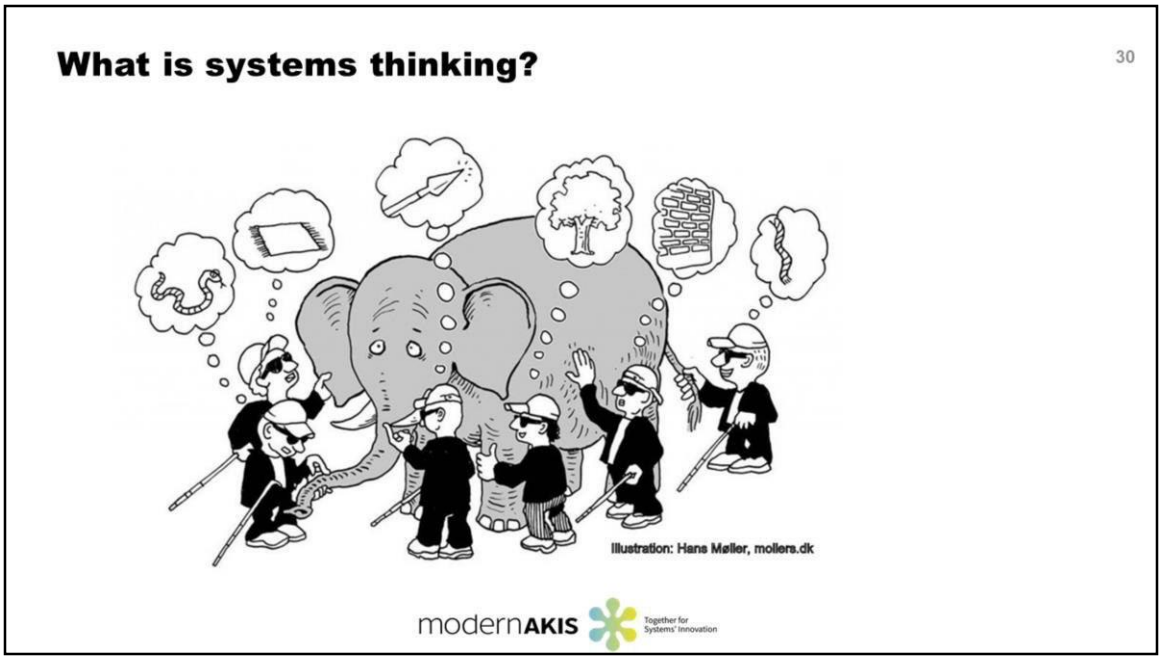


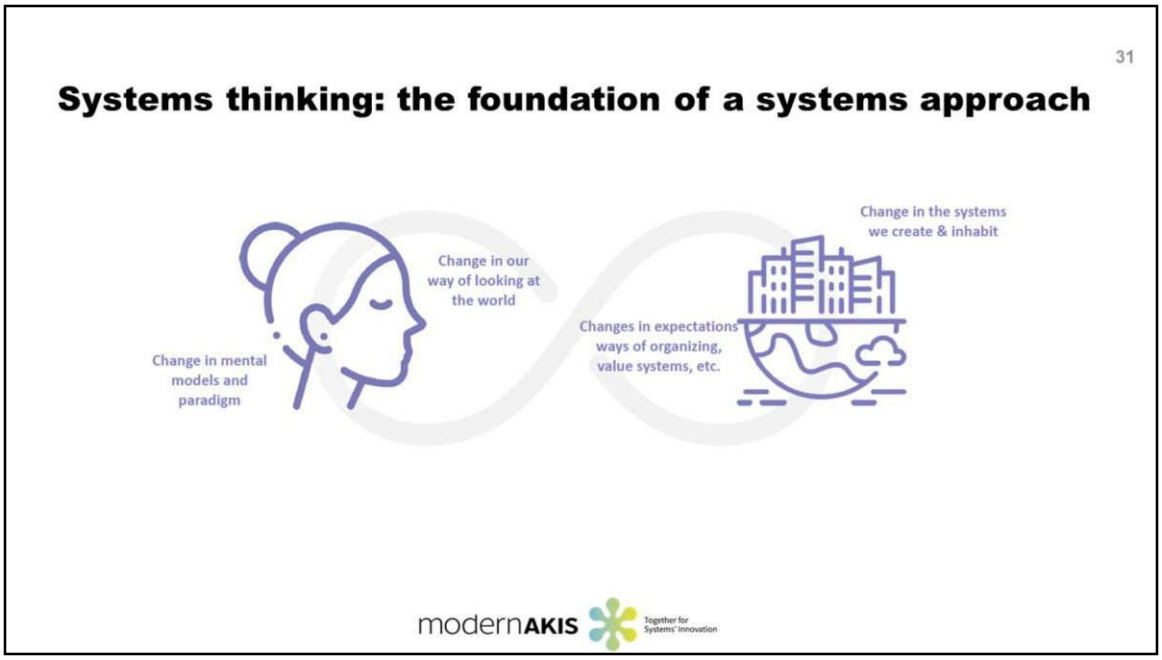
Welcome (back) to this video.

In the previous unit, we introduced you to systems and to AKIS as a system. Building on this, here, we want to explain, why systems **thinking** in agriculture is relevant, and specifically for AKIS.



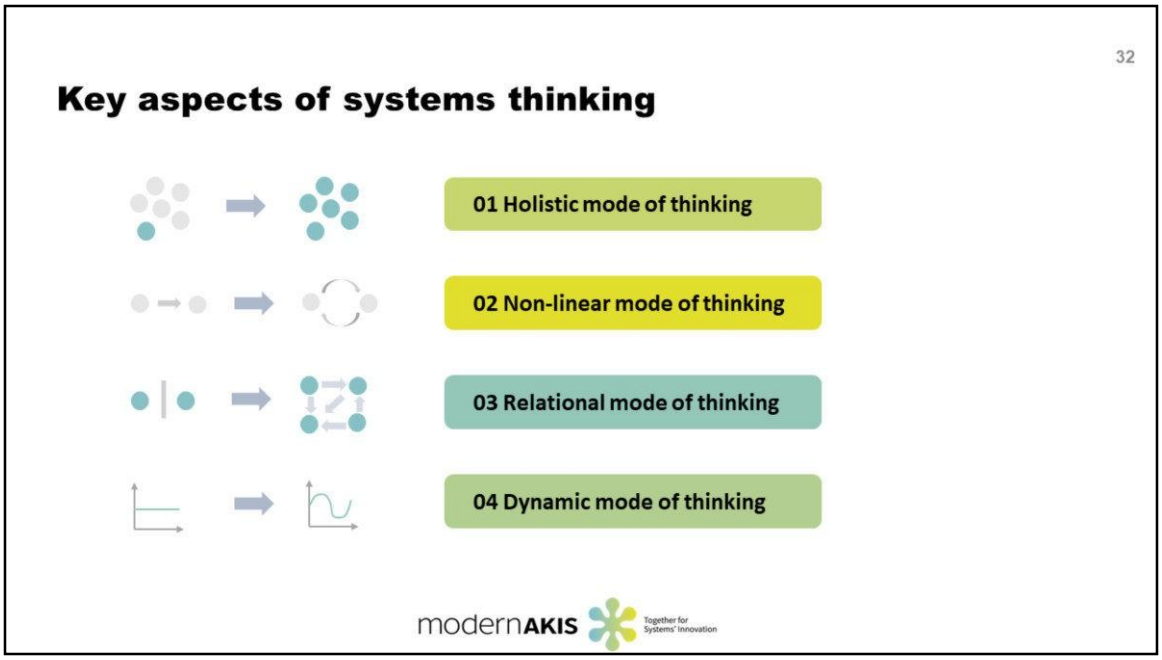
This section begins with the classic story of ”The blind men and the elephant”, which you might be familiar with. The story goes that one day, a group of blindmen happen to come across an elephant. Each man touched one part of the elephant: one held the tail, another touched the trunk, and yet another felt the ears. They were asked to describe the elephant based on their perspective. The man holding the tail said, “An elephant is like a rope”. The man who touched the trunk disagreed and said, “No, it’s more like a snake”. Meanwhile, the man who felt the ears chimed, “You’re both wrong, an elephant is like a large carpet”. As they argue, it became clear that each blind man perceived the elephant differently, based solely on the part they were touching. None of them could fully understand the true nature of the elephant from their limited viewpoint.

This story, although simple, illustrates the essence of systems thinking. Just as the blind men could not grasp the entire elephant by fixating on its parts, we too will fail to understand and address the complex challenges in agriculture if we focus only on individual components or aspects in isolation.

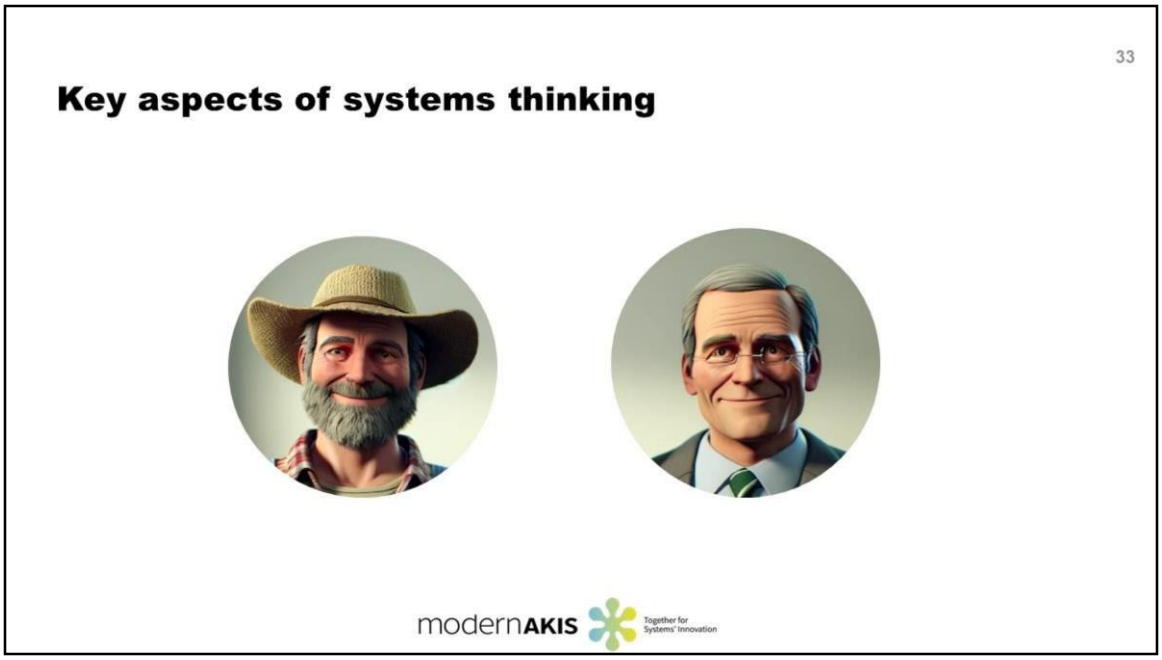


Before diving into the concept of AKIS as a systems approach, it's crucial to explore the fundamental mindset that underpins it: systems thinking. This mindset shift is key to successfully implementing any systems approach. Systems thinking is about seeing beyond individual components and understanding how those parts interconnect and influence the whole.

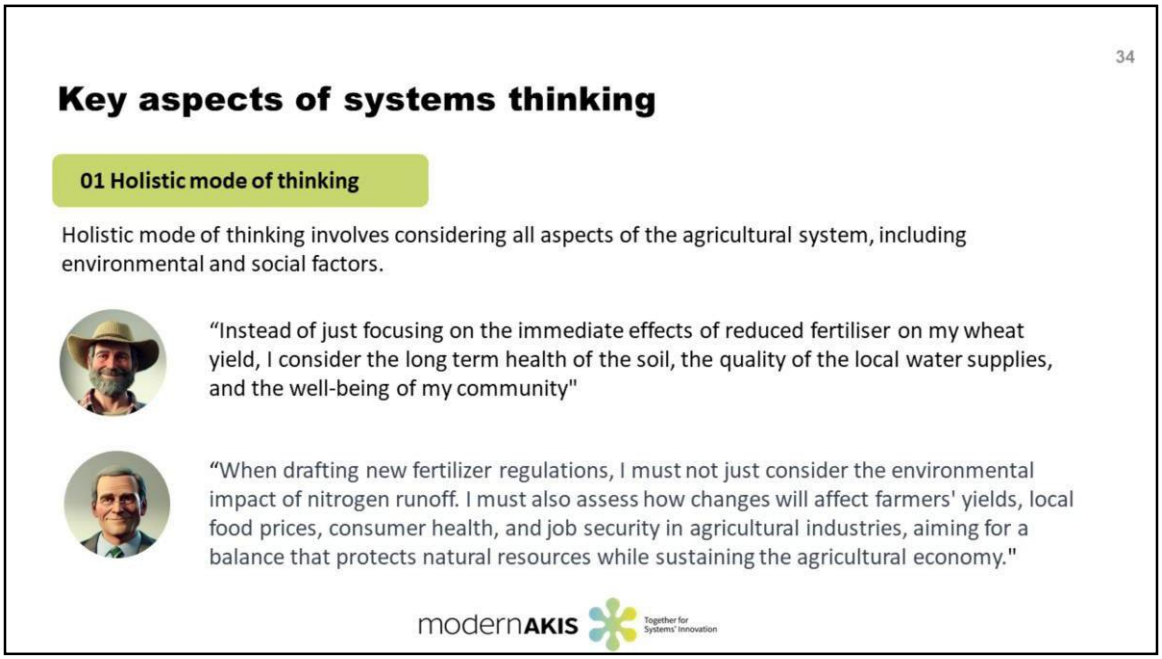
Let’s explore further what systems thinking entails.



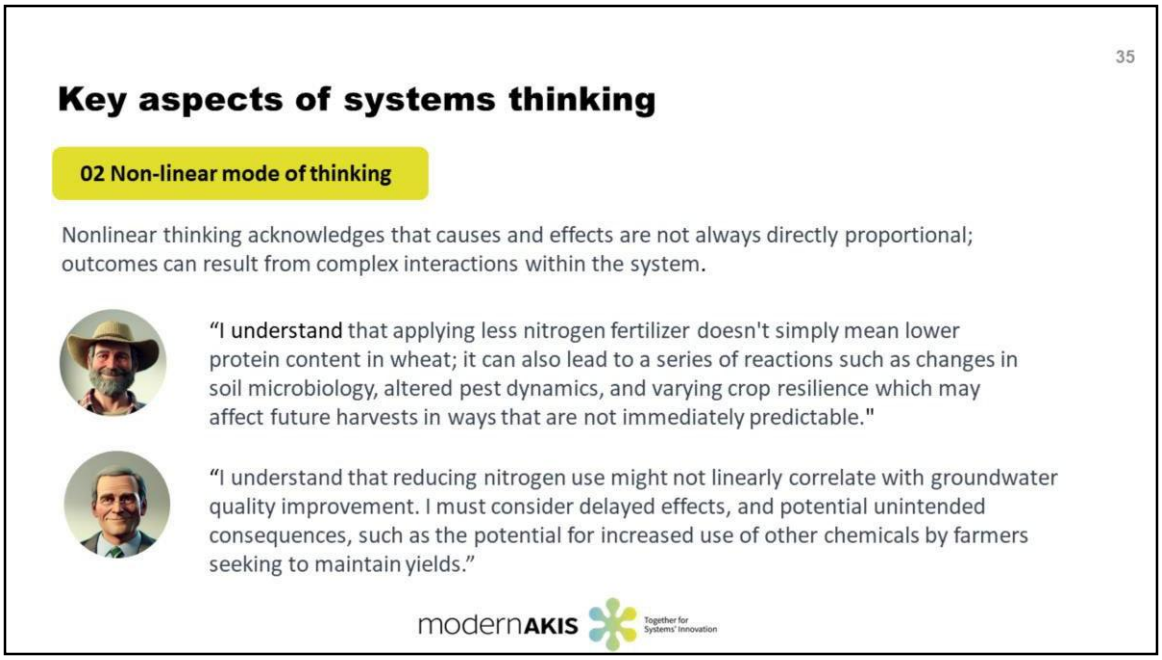
Systems thinking encompasses four main modes of thinking: holistic, non-linear, relational and dynamic. In the upcoming slides, we will delve into each of these modes in detail. We'll explore how taking a holistic view helps us see the big picture, why recognizing nonlinearity in cause and effect is crucial, the importance of understanding relationships within systems, and how embracing change and dynamics leads to more resilient strategies



To better understand the essence of systems thinking, farmer Gerhard whose story we followed in the first video as he navigated the complexities of new fertiliser regulations, will offer this perspectives. We will also be joined by policy maker Christian Walter who has the difficult task to balance multiple interests in shaping farming practices.
By exploring each mode of systems thinking through the eyes of both farmer Gerhard and policy maker Christian, we will see how systems thinking can guide anyone in the AKIS



First, systems thinking is a holistic mode of thinking. This means that one considers all aspects of the agricultural system, including environmental and social factors.
(Voice of farmer Gerhard) "Instead of just focusing on the immediate effects of reduced fertiliser on my wheat yield, I consider the long term health of the soil, the quality of the local water supplies, and the well-being of my community"
(Voice of policy maker Christian) "When drafting new fertilizer regulations, I must not just consider the environmental impact of nitrogen runoff. I must also assess how changes will affect farmers' yields, local food prices, consumer health, and job security in agricultural industries, aiming for a balance that protects natural resources while sustaining the agricultural economy."



Second, systems thinking is a non-linear mode of thinking. Nonlinear thinking acknowledges that causes and effects are not always directly proportional; outcomes can result from complex interactions within the system.

(Voice of farmer Gerhard) "I understand that applying less nitrogen fertilizer doesn't simply mean lower protein content in wheat; it can also lead to a series of reactions such as changes in soil microbiology, altered pest dynamics, and varying crop resilience which may affect future harvests in ways that are not immediately predictable."
(Voice of policy maker Gerhard) "I understand that reducing nitrogen use might not linearly correlate with groundwater quality improvement. I must consider delayed effects, and potential unintended consequences, such as the potential for increased use of other chemicals by farmers seeking to maintain yields."

Key aspects of systems thinking

03 Relational mode of thinking

Relational thinking focuses on the relationships between different stakeholders and parts of the system

"Working with the millers showed me how my farming practices are directly tied to their flour quality. We're in this together, and our success is interdependent."

"I strive to foster a dialogue among farmers, consumers, and environmental groups. Understanding each other's priorities helps us find common ground and more effective solutions

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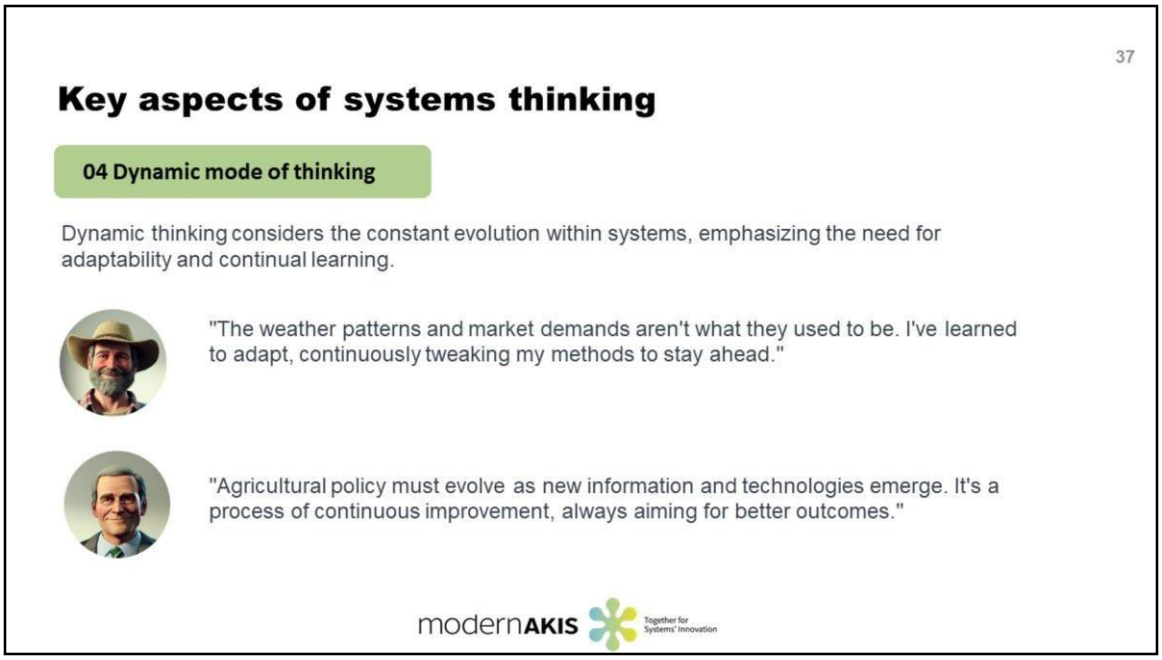
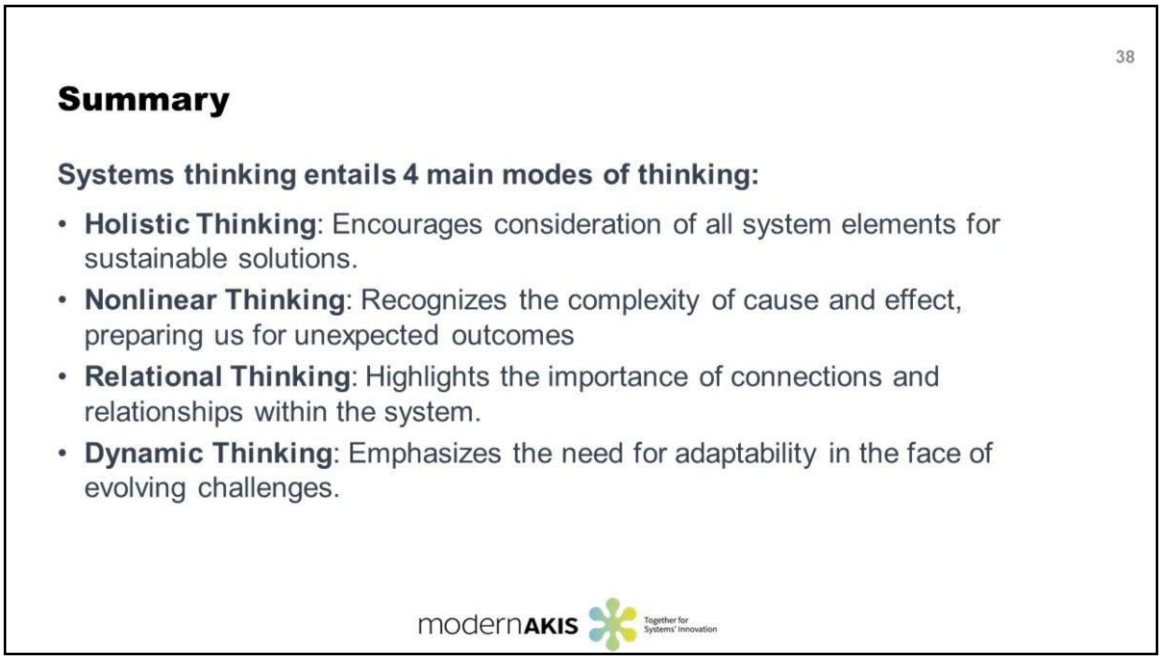
Third, systems thinking is a relational mode of thinking. This means focusing on the relationships between different stakeholders and parts of the system

(Voice of farmer Gerhard) “Working with the millers showed me how my farming practices are directly tied to their flour quality. We're in this together, and our success is interdependent."
(Voice of policy maker Christian) "I strive to foster a dialogue among farmers, consumers, and environmental groups. Understanding each other's priorities helps us find common ground and more effective solutions”



Lastly, systems thinking is a dynamic mode of thinking. Dynamic thinking considers the constant evolution within systems, emphasizing the need for adaptability and continual learning.

(Voice of farmer Gerhard) "The weather patterns and market demands aren't what they used to be. I've learned to adapt, continuously tweaking my methods to stay ahead."
(Voice of policy maker Christian) "Agricultural policy must evolve as new information and technologies emerge. It's a process of continuous improvement, always aiming for better outcomes."



We have so far looked at the different aspects of systems thinking: holistic, nonlinear, relational and dynamics. Through the insights of farmer Gerhard and policy maker Christian, we have seen how these modes of thinking serve as a practical tools that can guide decision making at the farm abut also policy formulation.

In summary;

- **Holistic Thinking**: Encourages consideration of all system elements for sustainable solutions.
- **Nonlinear Thinking**: Recognizes the complexity of cause and effect, preparing us for unexpected outcomes.
- **Relational Thinking**: Highlights the importance of connections and relationships within the system.
- **Dynamic Thinking**: Emphasizes the need for adaptability in the face of evolving challenges.

Together, these modes of thinking form the foundation of a systems approach, enabling us to navigate the intricacies of modern agriculture with insight and foresight. As we apply systems thinking, we can develop strategies that are

robust, adaptable, and aligned with the ever-changing tapestry of environmental, economic, and social factors that define our world.

Section quiz

Which statement best reflects the principles of systems thinking as applied to agriculture?

A. Farming decisions should be made based on the most immediate and visible outcomes.

B. Agricultural policies should be static, providing consistency and predictability over time.

C. Each part of the agricultural system operates independently and does not affect the other parts.

D. Farmers and policymakers need to consider environmental, economic, and social factors as interconnected when making decisions.

E. Changes in agricultural practices have predictable effects, making long-term planning unnecessary.

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Module 2: Understanding the AKIS as a system

A draft ppt for an online module

Dec. 2023, UHOH team

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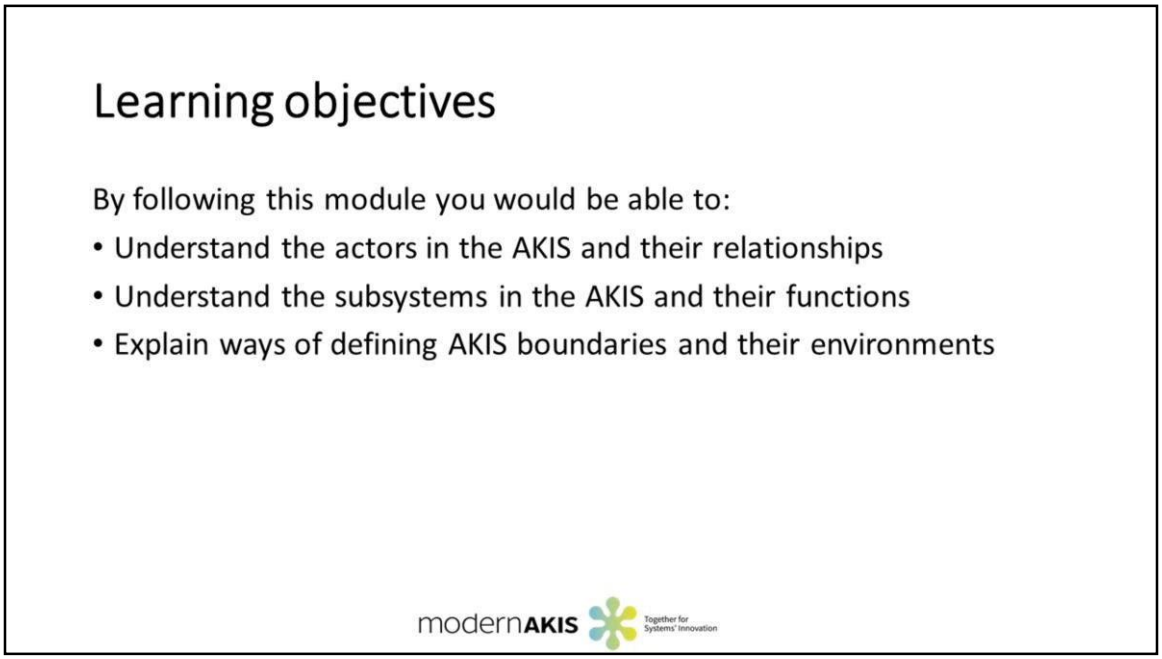
Welcome to the 2nd module. On this module you will gain deeper insights about what AKIS is and its parameters. We will explore the system parameters to provide you with a comprehensive understanding of the AKIS concept and its practical application.

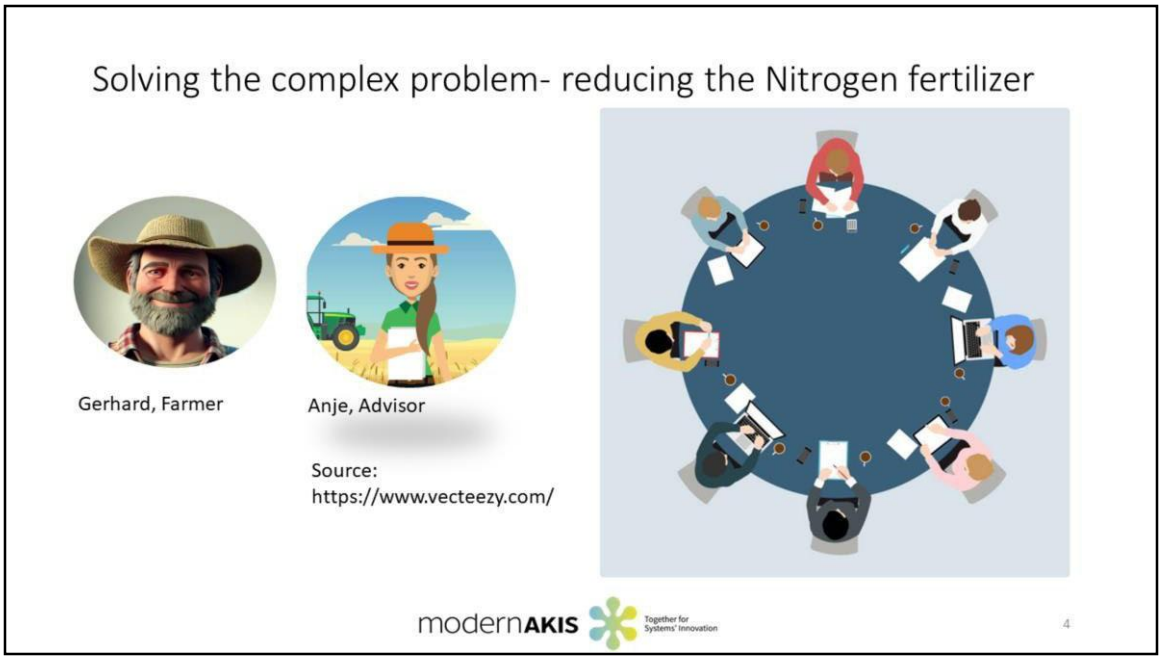


By following this session: you should be able to:

1. have improved understanding of the key actors in the AKIS and their relationships .
2. differentiate and describe the AKIS parameters as part of the whole system and the sub systems within
3. explain ways of defining AKIS boundaries and environment surrounding the AKIS

Module 2

V1: Defining the AKIS

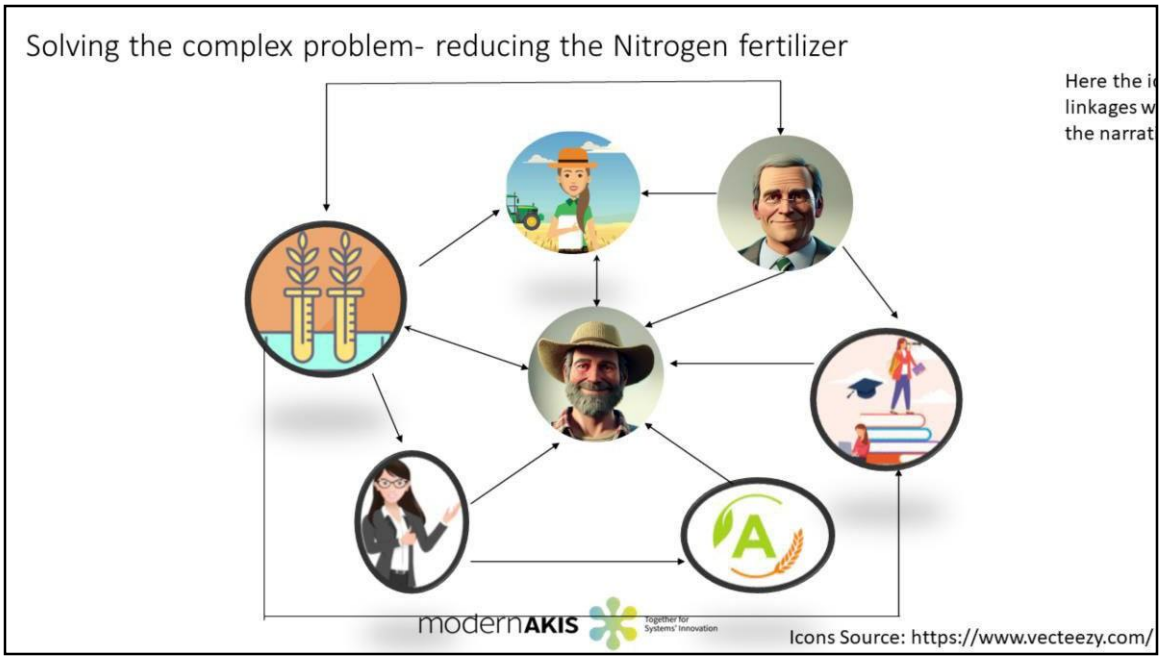


Before talking about what AKIS is and how it is defined, lets bring back the story of Gerhard, the farmer who is faced with the challenging situation of needing to follow the new fertilizer regulation and keeping the market happy.

Realizing that he needed to tackle the challenge posed by the new fertilizer regulation, Gerhard set out to ensure the production of high-quality wheat. Simultaneously, he aimed to adhere to the new regulations, reducing Nitrogen fertilizer usage strategically to maintain the crucial subsidy for his farm.

Recognizing the need for expertise beyond his own, Gerhard turned to Anje, an agricultural advisor, who is well experienced in facilitating communication between farmers, policy makers, researchers, and private business owners

After understanding Gerhard's situation, Anje facilitates communication with other actors, who are engaging in local policy making to discuss the-ground implications of the new regulation for farmers like Gerhard. Anje organizes a round table discussion.



During the round table discussion, the participants agreed to conduct a collaborative project, where Gerhard will be closely working with the Wheat breading research institute and other actors. They agreed to set up a joint project on nitrogen management and implement precision farming technologies and run trials on living labs. Sylva will be the principal researcher from the wheat breading research institute and will be set up field trials to experiment on wheat varieties that allow to reduce fertilizer use and maintain protein content

Emily, a private business owner volunteered to co-develop new technologies and processes to optimise fertilizer use

Christian, the policy maker, agreed to fund the project for a period of three years. He also took the initiative to create a knowledge exchange platform that allows the involved individuals and organizations to exchange knowledge and collaborate in an optimal manner. The platform and the project will be coordinated by the advisory service provider, Anje's organization

Recognizing the importance of wider knowledge dissemination, representative from the university and vocational education took the responsibility to design new

educational programs, that would allow for sharing insights with the wider farming community.

By jointly working together, these individuals and organizations solved the challenge by:
- Identifying an alternative wheat variety, introducing new precision farming technologies that are affordable, promoting the use of nitrogen fixing crops and creating market for them; introducing crop rotation as a new farming practice, and designing and implementing new training courses on nitrogen management practices.

Solving the complex problem- reducing the Nitrogen fertilizer

- Gerhard's story illustrates how diverse actors organize, interact and exchange knowledge and experience to solve a complex problem and to harness an opportunity in agriculture.
- This story illustrates AKIS in practice
- But how do we define AKIS? What is AKIS?

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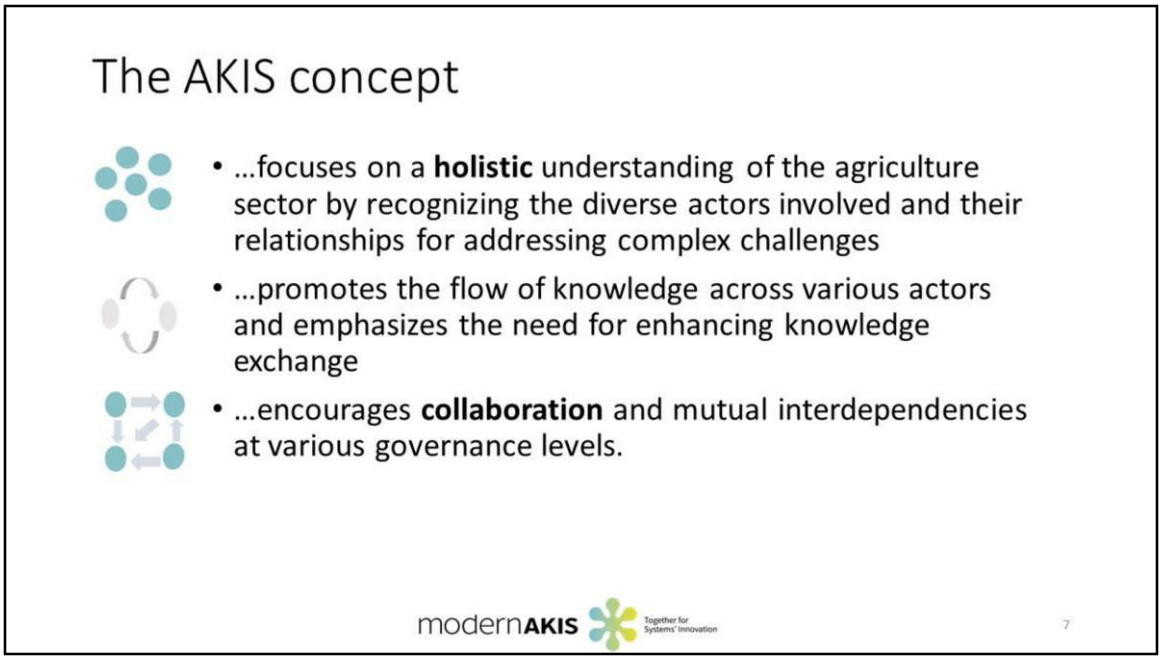
As you have observed, the collaborative efforts transformed the nitrogen crisis into an opportunity for positive change, showcasing the power of a systems approach. The story also illustrates how diverse actors interact and exchange to solve a complex problem or to harness an opportunity in agriculture.

The story you just heard illustrates what an AKIS means in practice: diverse actors organize, interact and exchange knowledge and experience to solve a complex problem and to harness an opportunity in agriculture. That is AKIS in practice.

But how do we define AKIS? What is AKIS?



The AKIS concept is all about embracing a holistic understanding of the agriculture sector. It recognizes that farming isn't a solo act—it's a complex, interconnected web involving various actors. AKIS acknowledges these diverse actors and their relationships, forming the foundation to tackle the complex challenges in agriculture.

In AKIS, It's not just about what happens on individual farms; it's about the exchange of ideas, innovations, and expertise among different players in the agricultural scene. AKIS places a spotlight on the need to enhance this knowledge exchange for the greater good.

AKIS encourages **collaboration** and mutual interdependencies at various governance levels. In other words, whether it's farmers working hand-in-hand with policymakers and advisors or researchers collaborating with private sectors, AKIS recognizes that the magic happens when everyone joins forces .

AKIS – quick definition

The Acronym

A – Agricultural
K – Knowledge
I – Innovation
S – System

EU Regulation (EU) No 2021/2115, Art 3 (9)

"An AKIS is the combined organisation and knowledge flows between individuals, organisations, and institutions who use and produce knowledge for agriculture and interrelated fields".

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8

L1: The AKIS concept has developed over decades and if you are interested in its development you can see the articles in the bibliography list at the end of this module.

L2: Relevant in our context is the definition of the EU in the CAP 2023-2027. The respective Regulation (EU) No 2021/2115 – provides a simplified and a more comprehensive definition of an AKIS.

"An AKIS is the combined organisation and knowledge flows between individuals, organisations, and institutions who use and produce knowledge for agriculture and interrelated fields".

L3:The organizations and institutions include actors such as farmers, foresters, farmers' and foresters' organisations and cooperatives, advisors, researchers, trainers, rural entrepreneurs, non-governmental organisations (NGO), public authorities, etc.) that generate, share and use knowledge and innovation for agriculture and interrelated fields: rural areas, value chains, landscape, environment, climate, biodiversity, consumers and citizens, food and non-food systems including transformation and distribution chains, etc.

The AKIS concept

- …can be used in multiple and varying contexts: acknowledging the complexity of the agricultural sector

- …is useful to assess the strength and weaknesses of a given agricultural knowledge and innovation system

- …is useful for planning and implementing actions with the potential to contribute to more functional agricultural knowledge system

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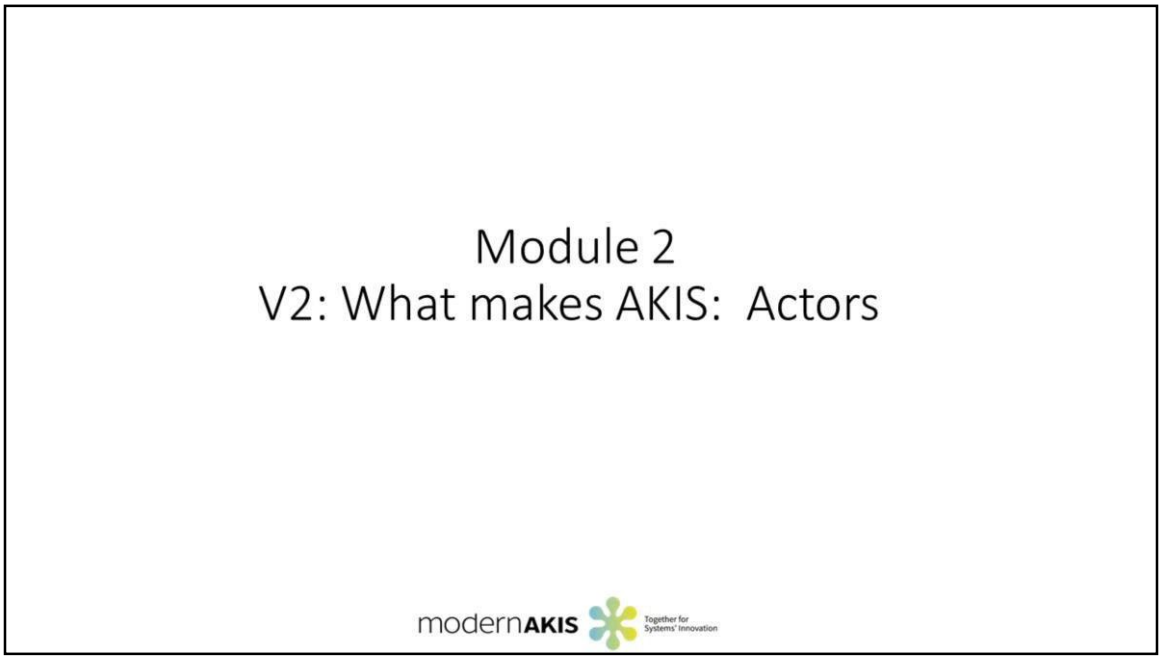
The AKIS concept proves its versatility by fitting into multiple and diverse contexts, acknowledging the complexity of the agricultural sector.

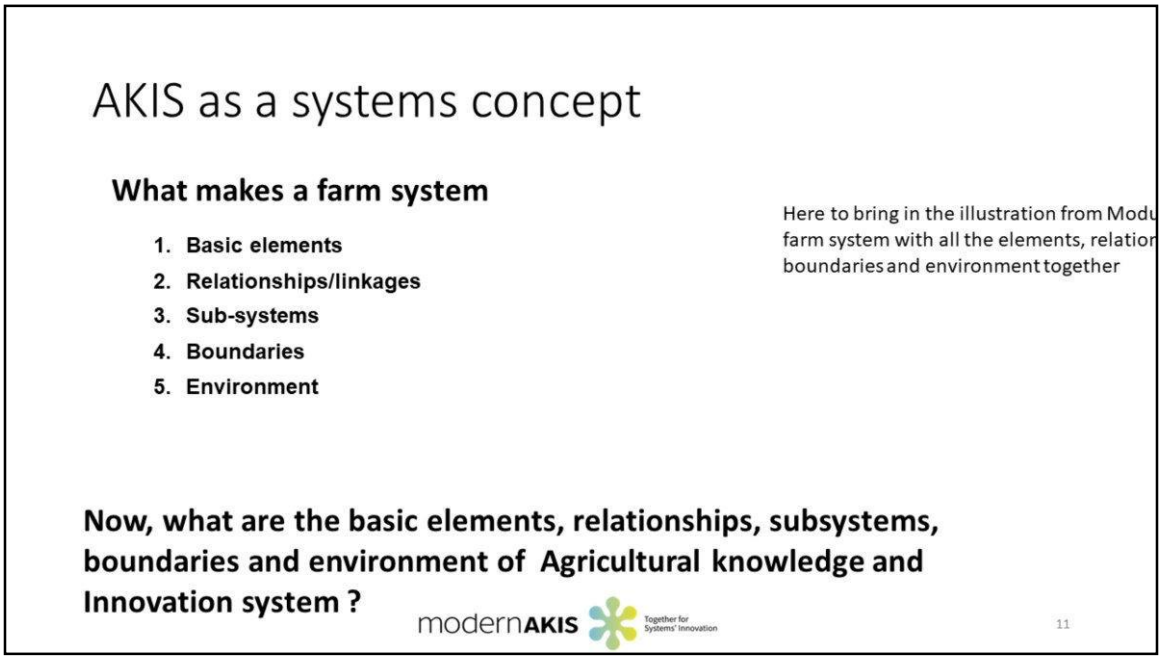
It serves as a valuable tool, allowing us to evaluate the strengths and weaknesses of a specific agricultural knowledge and innovation system.

Furthermore, it becomes an essential guide for planning and executing actions that have the potential to enhance the functionality of the agricultural knowledge system.

For us to use the AKIS concept in our day to day practices, we need to recognize what makes an AKIS? And this is explained in the next videos



So lets start with the first component: AKIS actors and their roles



In module one, you were introduced with systems approach and what makes a system. And there were five parameters, namely Basic elements, Relationships/linkages, Sub-systems, Boundaries AND Environment

Now on this video we will unpack the basic elements, relationships, subsystems, boundaries and environment of Agricultural knowledge and Innovation system

Basic elements in AKIS= Actors

Those bodies within AKIS, which play distinctive roles and shape how the AKIS functions.

AKIS actors can be:
- Individuals
- Organizations (corporate actors) and their institutions

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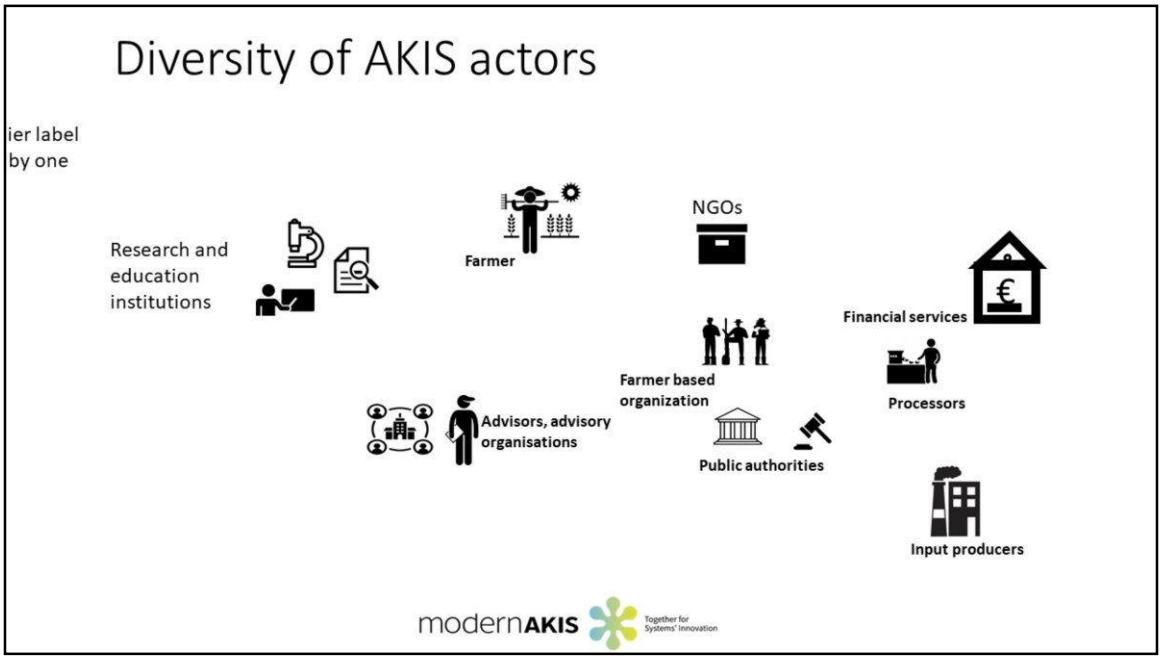
L1: In AKIS, the basic elements are those bodies within AKIS that play distinctive roles

L2: A simplified definition would be all those actors, both individuals and organizations who play distinctive roles and activities that put them in a position to shape the AKIS.

- They can come from private, public or non-profit bodies along the value chain related to agriculture.
- Each actor contributes specific and unique knowledge, based on skills and experience on production, research, teaching, processing and informing about agricultural issues.
- Consequently, these actors collectively contribute to the generation, dissemination, and application of knowledge and innovation within the agricultural domain.



In our previous example, some actors were mentioned. Farmers perspective)

If we look at a braoder perspective, an AKIS, we could find the following actors.

Farmers, Research and education institutions, NGOs, Financial service providers, Farmer based organizations, processors, public authorites, input producers advsors and and advory organizations

Diversity of actors and their tasks in AKIS

Farmers

Tasks

- Apply knowledge to create, test and adapt new technologies, practices and processes
- Apply and suggest innovative products and practices to increase agricultural productivity and market access

Mission

- Sustainable and improved agricultural productivity

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As you can see here on this illustration, each actor category contributes specific and unique knowledge, based on their skills and experience and missions
The tasks of farmers include:

- Applying knowledge to create, test and adapt new technologies, practices and processes
- Applying and suggesting innovative products and practices to increase agricultural productivity and market access

Diversity of actors and their tasks in AKIS

Farmer based organisations

Tasks

- Represent farmer interests, opportunities in value chains, community and policy arenas
- Facilitate access to agricultural inputs, credits and markets
- Promote specific innovation through collaborative research and organizing logistic support

Mission

- Farmer empowerment

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As for farmer based organizations, their role in AKIS include:

- Representing farmer interests, opportunities in value chains, community and policy arenas
- Facilitating access to agricultural inputs, credits and markets
- Promoting specific innovation through collaborative research and organizing logistic support

The overall mission of the farmer based oranizations is to empower farmers through their services

Diversity of actors and their tasks in AKIS

Research organizations and researchers

Tasks

- (joint) testing of locally developed technologies and processes
- Develop and improve technologies, practices and processes relevant to local/regional/national context
- Documenting the ways new practices and technologies are adapted

Mission

Advancing science and knowledge through knowledge generation

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Research institutions and organizations' tasks include:

- joint) testing of locally developed technologies and processes
- Develop and improve technologies, practices and processes relevant to local/regional/national context
- Documenting the ways new practices and technologies are adapted

The mission of research organizations is

Advancing science and knowledge through knowledge generation

Diversity of actors and their tasks in AKIS

Advisory service and Innovation Service providers

Tasks
- Brokerage of knowledge between farmers and other actors
- Making new technology and practice available to farmers and other actors
- Provide training and guidance to farmers
- Play intermediary role between farmers and other actors

Mission
- Dissemination of knowledge and develop capacity
- Facilitate innovation

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Actors in the advisory service or innovation service providers have multiple tasks which include:

- Brokerage of knowledge between farmers and other actors
- Making new technology and practice available to farmers and other actors
- Provide training and guidance to farmers
- Play intermediary role between farmers and other actors

In general the mission of advisory service providers is to dissiminate knowledge, develop capacity and facilitate innovation and knowledge generation and use

For each actor a new slide

Diversity of actors and their tasks in AKIS

Education and training service providers

Tasks

- Provide agriculture education and training to professional in the agriculture sector
- Develop better knowledge and associated skills for farmers and other actors
- Facilitate investment in human resources for process and product development
- Develop approaches and methods of experiential and multi-actor learning

Mission

-improving education level of all actors

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Actors in education institutions and training service provision have the tasks that include:

- Provide agriculture education and training to professional in the agriculture sector
- Develop better knowledge and associated skills for farmers and other actors
- Facilitate investment in human resources for process and product development
- Develop approaches and methods of experiential and multi-actor learning

The mission of these actors is to improve education level of all actors in the agriculture and related sectors.

Diversity of actors and their tasks in AKIS

Agribusiness (private companies) and support services: banks, credits, …

Tasks

- Produce and provide (new) agricultural inputs and output markets
- Identify, pilot and mainstream new market opportunities
- Manufacture agriculture equipment
- Define quality standards of agricultural products
- Linking agricultural actors to the rest of the market

Mission

- Profit making, competition

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The

Diversity of actors and their tasks in AKIS

Public authorities/ Government agents

Tasks

- Formulate, implement and enforce strategies, policies and regulations
- Provide strategic orientation for the AKIS
- Allocate resources for research and human resource development
- Provide incentives to innovate and collaborate, to set up networks and partnerships

Mission

E.g., The new AKIS coordination bodies assigned in EU MS have the tasks specified here

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Actors in the public authorities and government bodies have the tasks including:

- Formulate, implement and enforce strategies, policies and regulations
- Provide strategic orientation for the AKIS
- Allocate resources for research and human resource development
- Provide incentives to innovate and collaborate, to set up networks and partnerships

For each actor a new slide

Diversity of actors and their tasks in AKIS

NGOs and civil society (third sector)

Tasks

- Involve in and advocate sustainable development programs
- Foster actor engagement and inclusion
- Represent farmers in policy discussions

Mission

Bringing social and environmental justice.

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As you can see here on this illustration, each actor category contributes specific and unique knowledge, based on their skills and experience and missions

The multiple roles of AKIS actors

- AKIS actors make best use of the complementary types of knowledge (scientific, practical, organisational …) to disseminate solutions or implement practices
  - -could engage in multiple activities based on own capacities/abilities
  - Could engage in various activities in reaction to the specific political, socio-economic and cultural contexts
- Actor composition evolves with the AKIS context:

  e.g the new CAP introduced new AKIS actors- AKIS coordination bodies, experts in digitalisation

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L1: Although the actor categories in the previous slides help us make sense of the type of actors in AKIS, nowadays, AKIS actors could/do engage in multiple type of activities depending on the innovation processes or the system, regardless of the "category" in which they are categoirzed .

L2: Another important aspect in AKIS is that composition of actors evolves in relation to the social, political and economical environment of a country, or a region. For example the new Common agriuclture Policy introduced new AKIS actors- The AKIS coordiantion bodies, and other actors from the technology sector, which were not present in the AKIS in earlier times.

Section quiz

Which actor does not play a role in the AKIS
○ Advisor
○ Researcher
○ NGO representative
○ Pilot
○ Financial advisor
○ Vocational school teacher
○ Media

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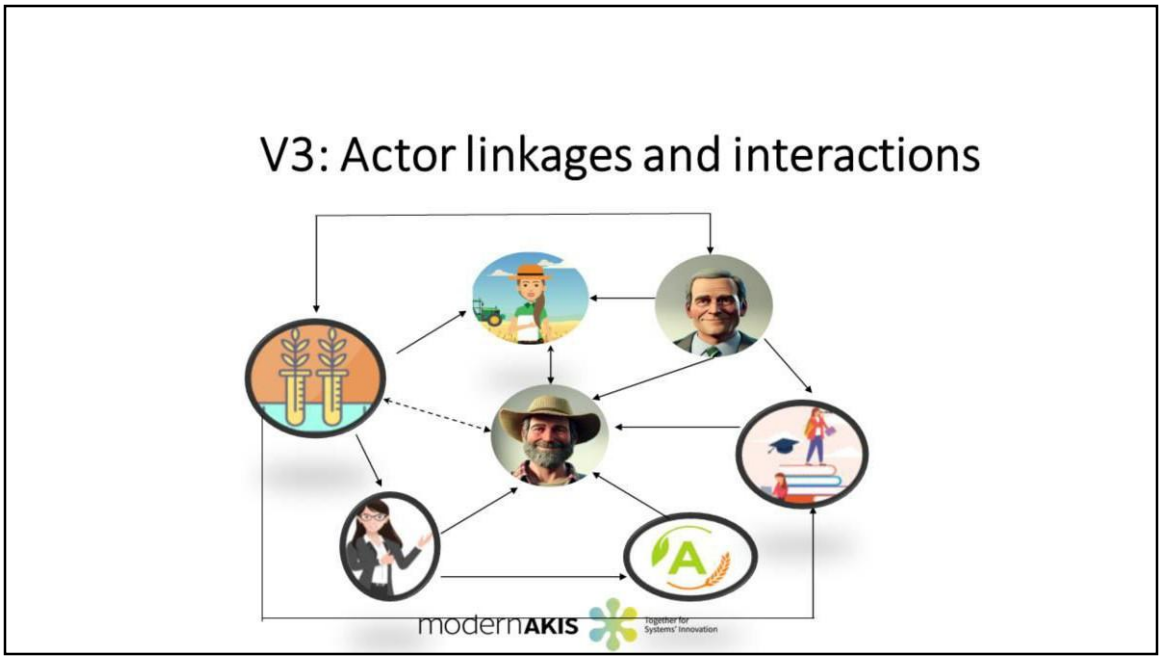
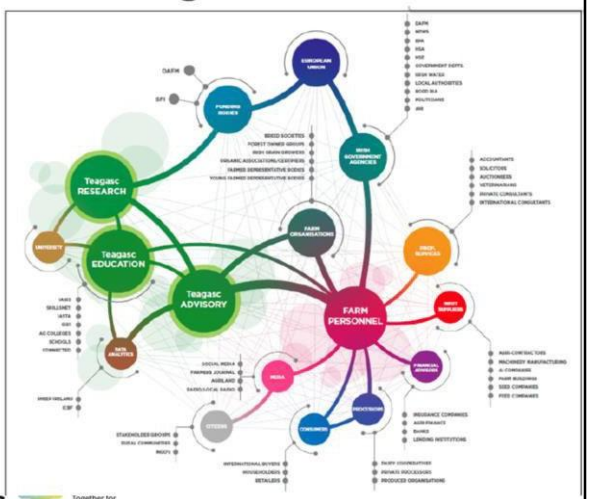


Now we know about the actors and their tasks in AKIS, the next session will be about actors Linkages/relationships and their pattern of interactions. In this session you will be introduced about the differences and similarities of actor linkages and interactions and how they are
used to understand knowledge exchange

What do we mean by Actor linkage?

Actor linkage

- Focuses on links, connections, relationships between actors.
- Purpose is to understand how everything is build and connected in the AKIS



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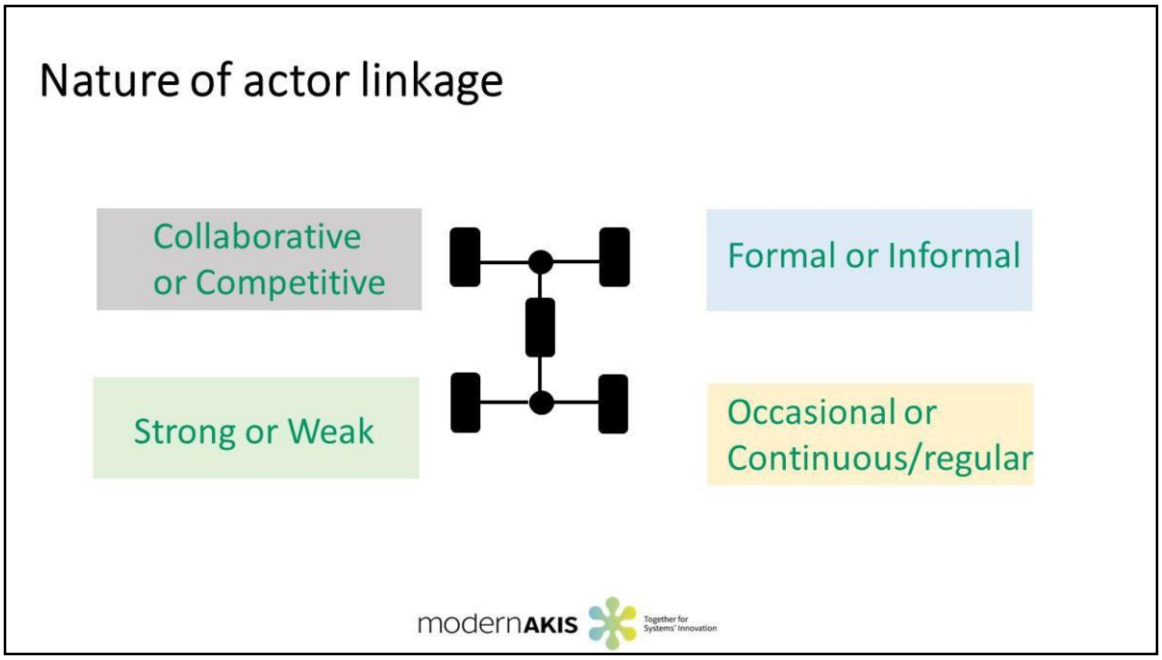
Actor linkage focus on links, relationships between actors and organizations. Coming back to the story of Gerhard had a strong relationship with Anja, the advisor with whom he discussed his concerns and problems. Through Anja, he was then in a linkage with the research organization and the policy maker with whom he had no linkage before.

Another practical example about actor linkage we can look is the linkages between the actors in the Irish AKIS. As you can see in the figure:

- Teagasc is a prominent actors within the Irish AKIS maintaining direct and strong linkage with farmers.

- As an agency of the Irish government with three main wings (research, education and research), Teagasc collaborates closely with relevant government bodies and regulatory agencies. This collaboration ensures alignment with national agricultural policies, facilitates compliance with regulations, and enables coordinated efforts for sustainable rural development. CT and strong connection with farmers serving as a vital link between research and practice.

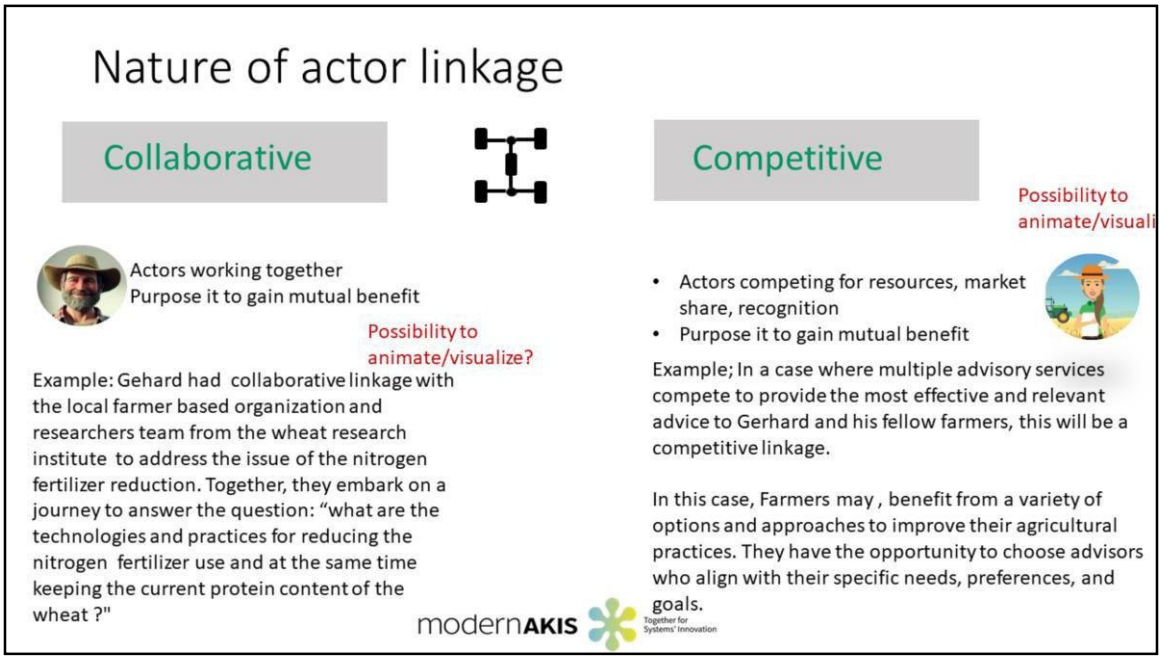
- Teagasc is linked to educational institutions to support agricultural education and training programs.



L1: When examining the nature of actor linkages and actor interactions within AKIS, it's crucial to understand that these linkages can take various forms.

L2: They can be either collaborative competitive . Additionally, they can manifest in formal or informal ways, or may exhibit strong or weak linkages.
L3: Finally, the linkages can also be occasional- happening every now and then sporadically; or regular where there is a continuous linkage between actors

Let's see some examples to clarify these types of linkages.



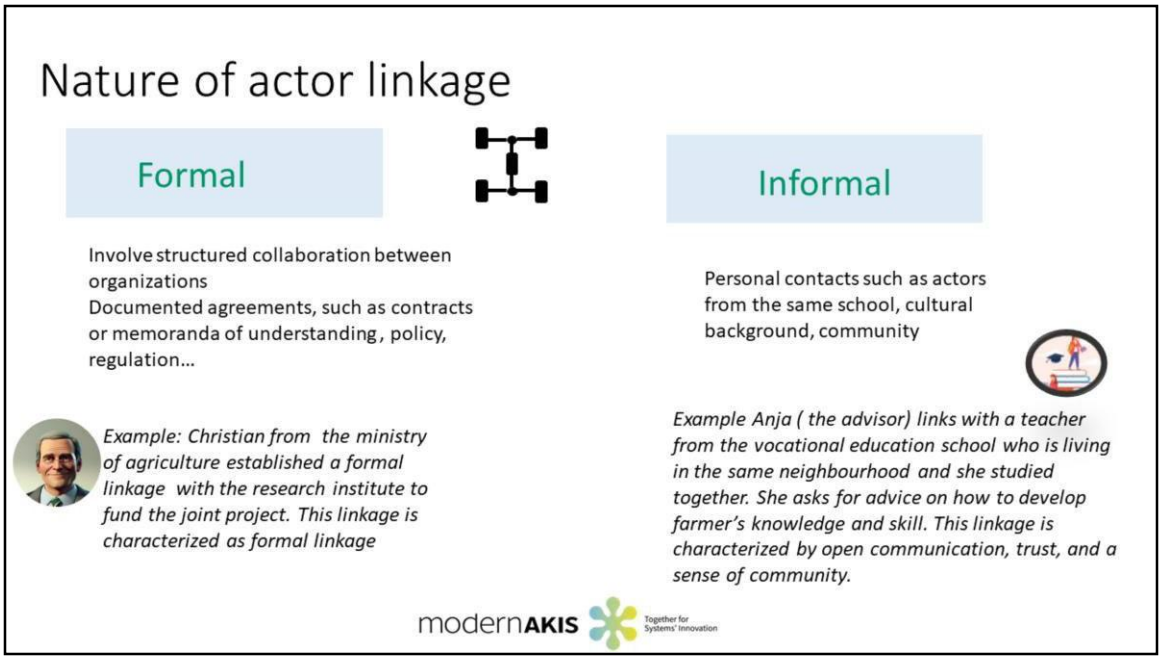
To explain the nature of actor linkage, we once again come back to Gerhard's story.

To solve the challenge of reducing use of nitrogen fertilizer and at the same time keeping the wheat protein high, Gerhard formed a linkage with the local farmer organization and the researchers team. The type of linkage was collaborative that aimed at solving the challenge and gaining mutual benefit

L2: Collaborative or complementary linkages typically involve actors who are working together for example on joint research activities, information sharing, facilitation of networks. These interactions are

aimed at mutual benefit, fostering innovation and knowledge exchange within the AKIS.

L2: On the flip side, competitive actor linkages may involve situations where actors within the system are in competition with each other. This can occur when they are competing for resources, market share, or recognition. It's a critical aspect to consider when assessing the dynamics of AKIS.



L1: Moving on to the formality of linkages, we can distinguish between formal and informal arrangements. Formal linkages might involve documented agreements, such as contracts or memoranda of understanding. These serve as legal or official commitments to collaboration or cooperation.

L2: Lets take another practical example of formal linkages through regulations and policies

L3: Within the European Union (EU), one significant approach taken to

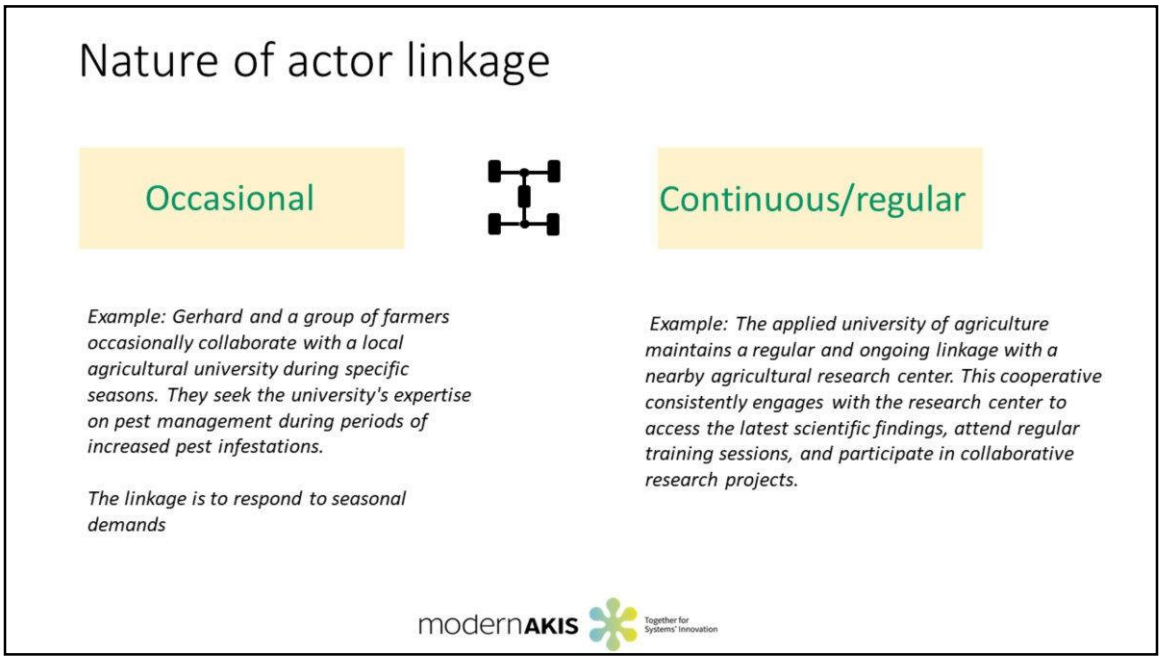
enhance the AKIS situation in Member States is the formulation of AKIS-supporting policies and resource allocation. This is achieved through the agricultural and rural development policies, regulations, and financial support provided by the EU to strengthen AKIS. These policies serve as instruments for creating favourable conditions for various actors to engage effectively.
L4: For instance, these policies encourage favourable conditions for researchers to seek partnerships with farmers and agribusinesses. This promotes collaborative efforts in developing and applying innovative solutions.

L5: The policy also foster an increased readiness to collaborate with various AKIS actors, enabling a more dynamic and cooperative ecosystem.

L6: Furthermore the policy supports advisors to enhance their knowledge, improve their competencies and expand their influence in the AKIS

L7: In contrast, informal linkages are often more flexible and may include partnering on a task or linking via personal contacts such as actors

from the same school, cultural background, community…. These are not bound by legal documentation and often rely on trust and shared goals between the actors.



L1:, when considering the strength and regularity of linkages, it's important to assess whether the degree of linkages are occasional or regular. If we once again take the example of Gerhard. When Gerhard and a group of farmers occasionally collaborate with a local agricultural university during specific seasons. They seek the university's expertise on pest management during periods of increased pest infestations. *The linkage is to respond to seasonal demands*

L2: In contrast when, the applied university of agriculture maintains a regular and ongoing linkage with a nearby agricultural research center. This cooperative consistently engages with the research center to access the latest scientific findings, attend regular training sessions, and participate in collaborative research projects.

Nature of actor linkage

Strong

Weak

Example: Anja maintains a consistent presence in the community where Gerhard lives. She is regularly organising farmer discussion groups, training sessions, and providing hands-on assistance. Gerhard and other farmers actively participate in these activities, implement recommended practices, and regularly communicate their challenges and successes. This strong linkage between farmers and between farmers and advisor ensures a continuous exchange of knowledge, feedback, and support.

Example: Researchers from the wheat research institute produces advanced agricultural technologies and products. However there is minimal effort to engage directly with the farmers or understand their specific needs. Research findings and technical documentation are not easily accessible or tailored to the local context, making it challenging for farmers to fully comprehend the benefits and applications of the offered products.
In this weak linkage, the disconnect between the researchers and the farmers results in a lack of meaningful interaction, hindering the translation of valuable research into practice

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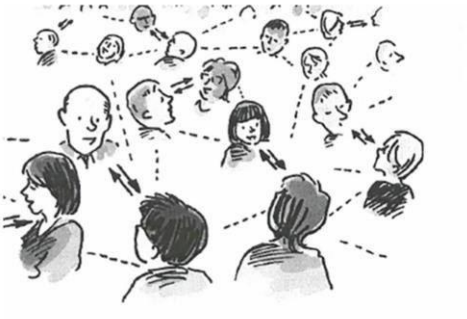
L1: Lastly, when considering the strength and regularity of linkages, it's important to assess whether the degree of linkages are strong or weak . Lets get back to Anja and Gerhard once again. Anja maintains a consistent presence in the

community where Gerhard lives. She is regularly organising farmer discussion groups, training sessions, and providing hands-on assistance. Gerhard and other farmers actively participate in these activities, implement recommended practices, and regularly communicate their challenges and successes. This strong linkage between farmers and between farmers and advisor ensures a continuous exchange of knowledge, feedback, and support.

L2: In contrast, Researchers from the wheat research institute produce advanced agricultural technologies and products. However there is minimal effort to engage directly with the farmers or understand their specific needs. Research findings and technical documentation are not easily accessible or tailored to the local context, making it challenging for farmers to fully comprehend the benefits and applications of the offered products.
In this weak linkage, the disconnect between the researchers and the farmers results in a lack of meaningful interaction, hindering the translation of valuable research into

practice

What do we mean by actor interaction?



Actor interaction:

- Involves the dynamic exchanges and ongoing relationships between actors within a system
- Crucial for the creation, dissemination, and application of knowledge and innovations

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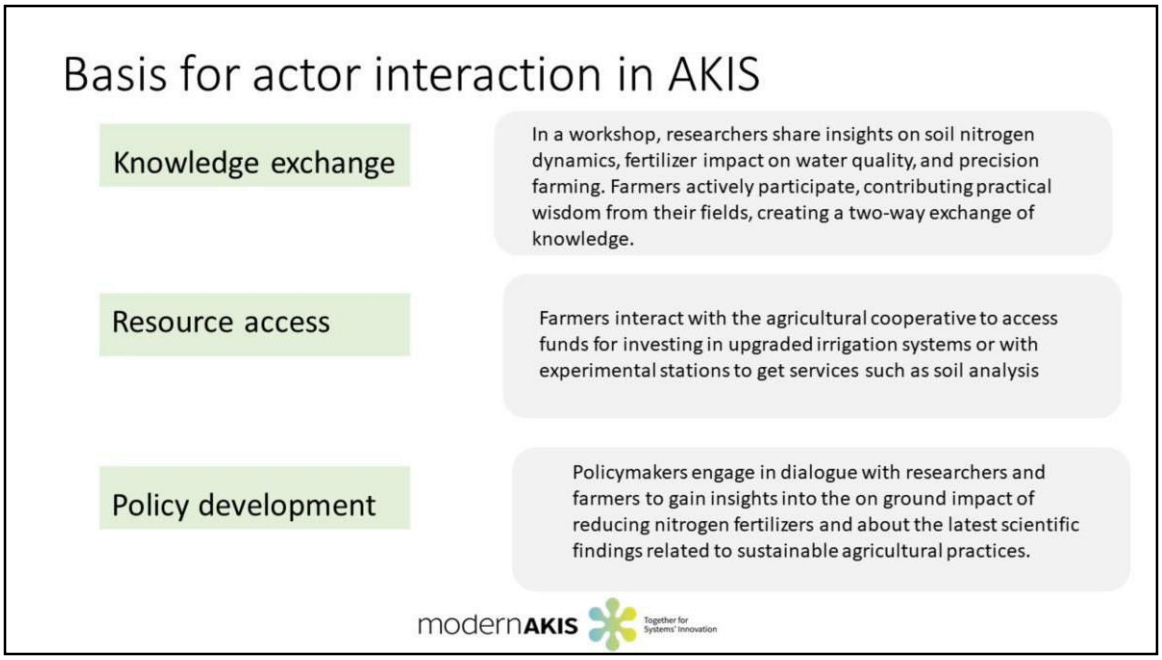
L1: So we know now that actors may form different types of linkages between them. Now lets briefly discuss what we mean by actor interaction

L2. Actor interaction in AKIS refers to the dynamic relationships, collaborations, and exchanges of information among various actors within the agricultural sector.

L3: The interaction among these actors is crucial for the creation, dissemination, and application of knowledge and innovations to address challenges and improve agricultural practices.

L4: It is important to grasp that when we talk about interactions, we are not referring to straightforward, one-directional relationships. Instead, we are referring to dynamic and complex relationships that are continuously evolving between actors allowing for the exchange of feedback and insights.



L1: Actors interact to exchange knowledge, which is all about sharing and combining existing knowledge. Actors come together to share their insights and experiences, leading to a richer, more comprehensive understanding. This sharing can happen through collaborative projects, communities of practices, or informal discussions among actors

L2: The other purpose actors interact is to ensure access to necessary resources at their disposal to carry out their work effectively. Actors interact to have access to for instance laboratory equipment's and other services as well as funds that are essential for research or piloting best practices.

L6: The last purpose of interaction is to implement policy and regulations. Implementation involves putting the policies into practice, which involves interaction of policy makers with other actors.

Now, lets see some real world examples of actor interactions within AKIS

L7: In a workshop, researchers share insights on soil nitrogen dynamics, fertilizer impact on water quality, and precision farming. Farmers actively participate, contributing practical wisdom from their fields, creating a two-way exchange of

knowledge.

L8: Next, Farmers interact with the agricultural cooperative to access funds for investing in upgraded irrigation systems or with experimental stations to get services such as soil analysis

L9: Policymakers engage in dialogue with researchers and farmers to gain insights into the on ground impact of reducing nitrogen fertilizers and about the latest scientific findings related to sustainable agricultural practices.

Section quiz

Combination of formal and informal actor linkages offer better chances for the AKIS actors to collaborate well
○ True
○ False

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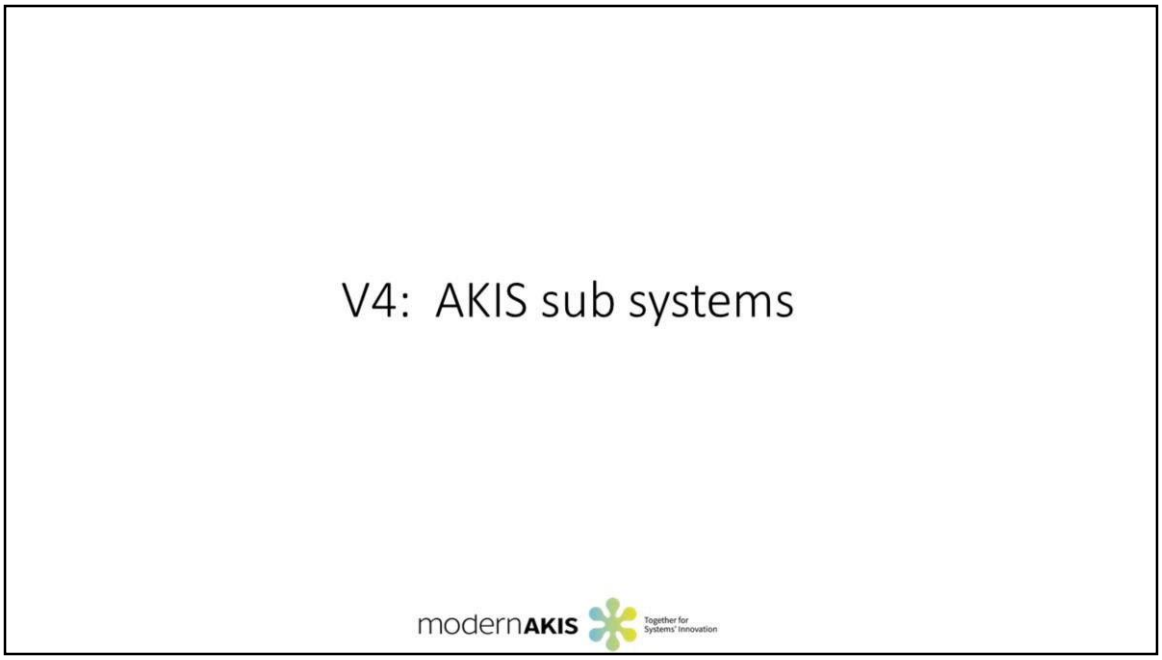
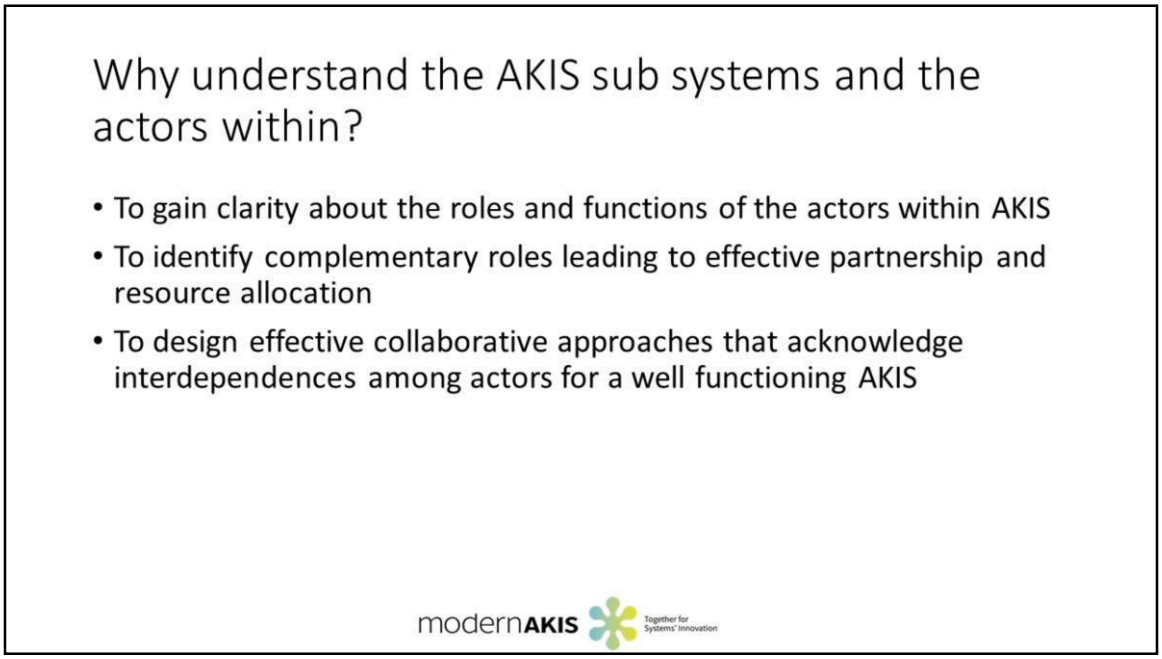


In this section of module 2, we will discuss the AKIS sub systems, which are distinct components within the broader AKIS. We will explore sub systems that focus on specific aspect of the agricultural knowledge and innovation.



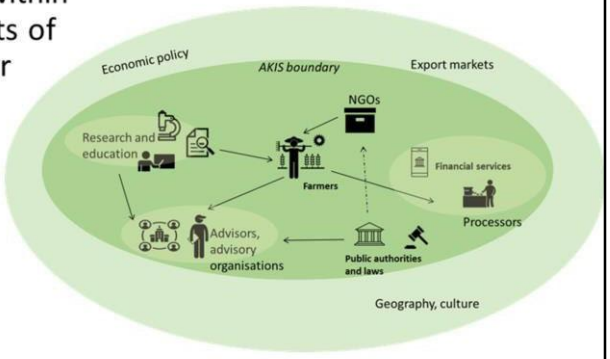
L1: Harmonious collaboration between subsystems is an indication to the AKIS strength, efficiency, and capacity for positive change in the agricultural sector. The strength of AKIS becomes apparent when we examine how its subsystems cohesively bring together their functions and talents into a productive whole. To appreciate this strength, it's crucial to first understand the subsystems and subsequently examine how the actors interact with one another.

L2: Subsystems offer a valuable lens through which we can study the diverse components of the AKIS. The actors serve different functions within the system, including the generation of knowledge and innovation, the operationalization and dissemination of information, and the facilitation of learning and knowledge exchange. Understanding how these functions interplay within and outside the subsystems is central to understanding the dynamics of AKIS.

L3: Furthermore, there is a need to have profound understanding of what the AKIS sub systems are and the actors within to formulate sound policies that support effective collaborative approaches that acknowledge interdependence among actors.

What are AKIS subsystems?

- Subsystems are specialized units within AKIS, focusing on particular aspects of the knowledge and innovation: For example:
  - Agricultural research,
  - Agricultural education,
  - Agricultural advisory services,
  - Agro-dealers



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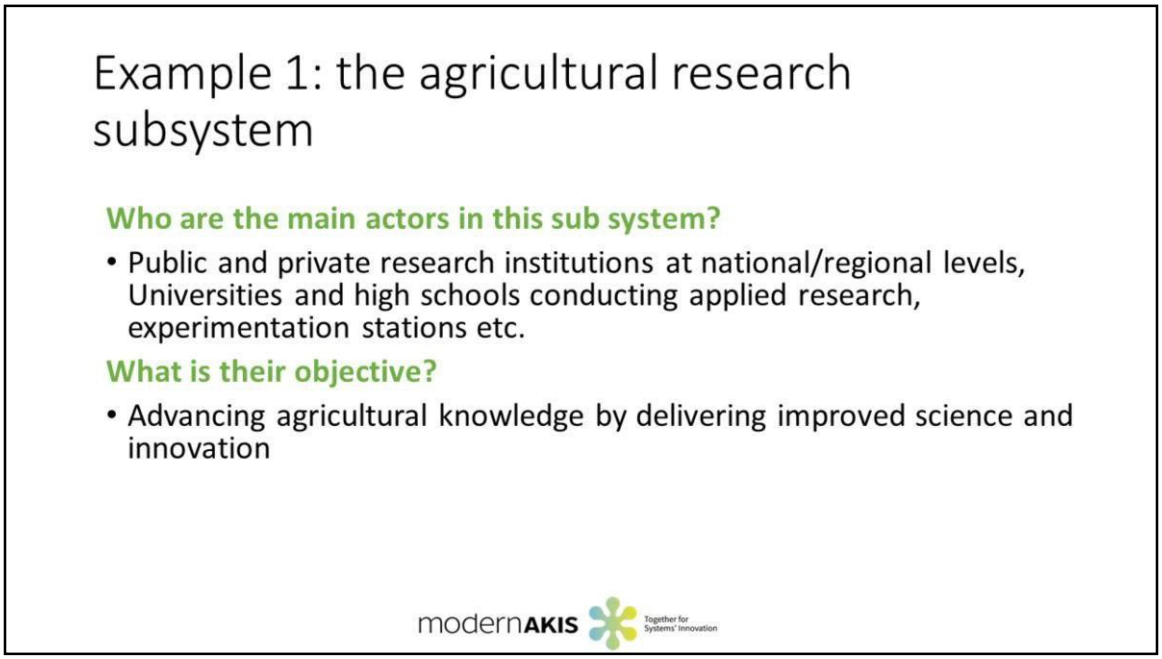
Subsystems are specialized units within AKIS, focusing on particular aspects of the knowledge and innovation: For example:

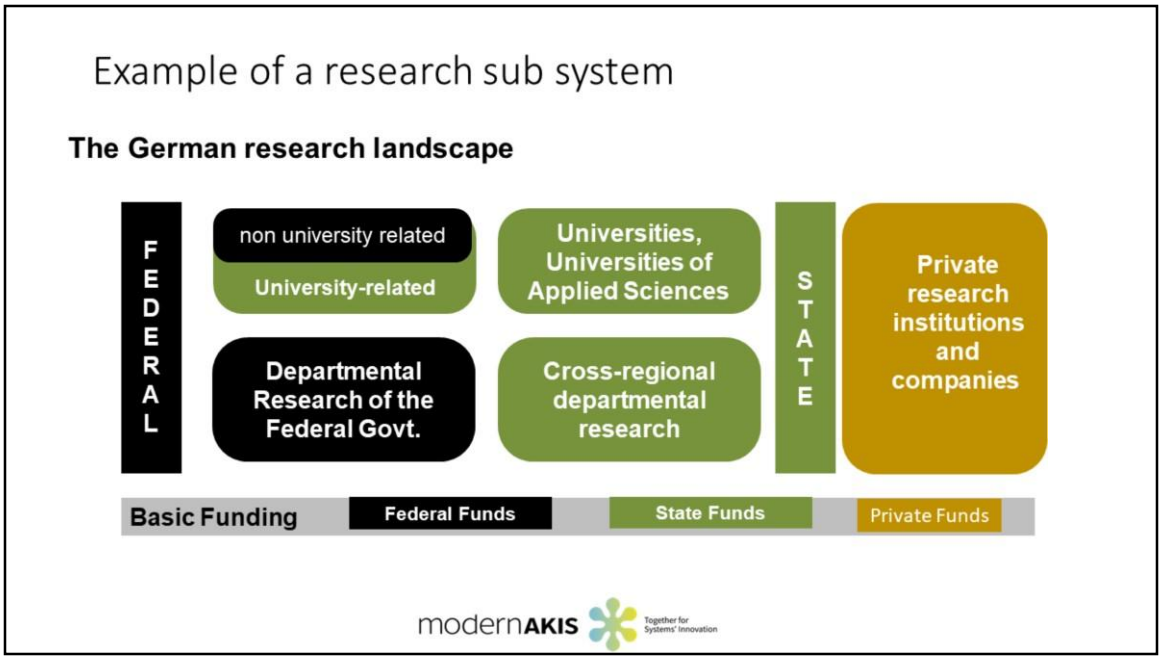
Agricultural research,
Agricultural education,
Agricultural advisory services,
Agro-dealers

As you can see on the diagram, actors belonging to a sub system have a light green background.



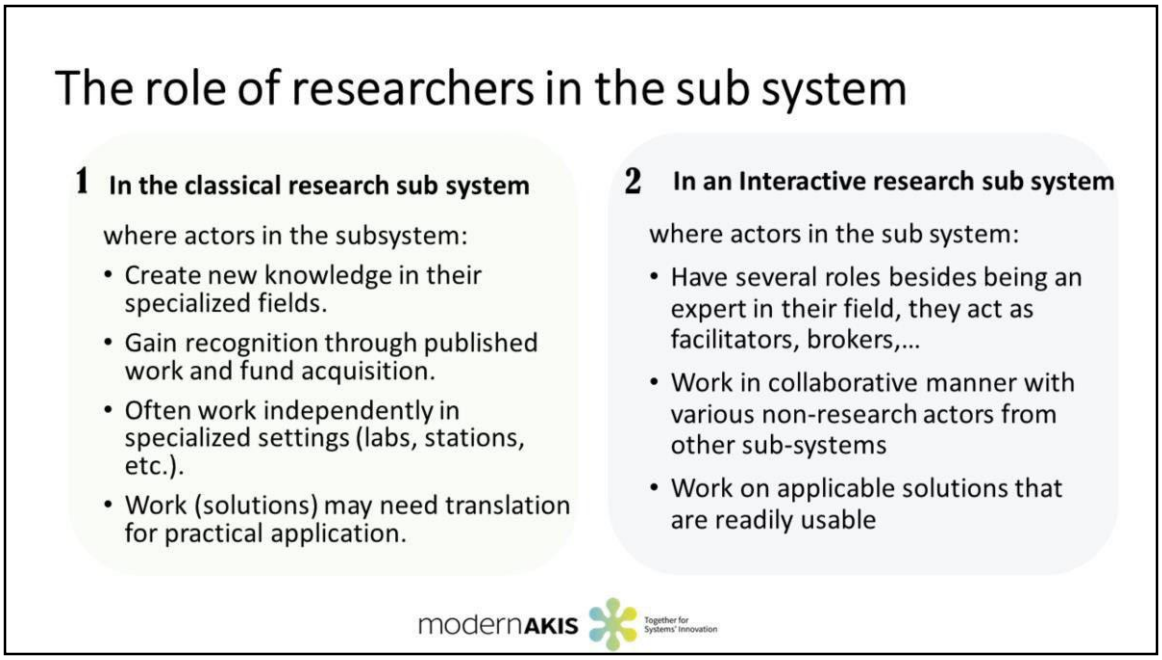
L1: Lets begin by exploring the agricultural research sub system:
L2: In this sub system, we are referring to a diverse community of actors and organizations. These entities are dedicated to identifying challenges, formulating innovative solutions, and evaluating policies, all aimed at contributing to the sustainable development of the agriculture sector.

L3: What unites these actors engaged in research is a common mission - the advancement of agricultural knowledge. Their shared objective is to bring the sector forward by deliver improved agricultural science and innovation.



L1: let's explore the visual representation, which illustrates the actors involved in Germany's Agricultural Research Subsystem:

L2: Within this figure, you can discern the diverse actors comprising Germany's agricultural research subsystem. Notably, research organizations operate on both the Federal and regional levels, creating a multi-layered landscape of research institutions.
L3: t's worth noting that the funding sources for these research organizations vary. They primarily receive financial support either from the federal government or from the state government. The source of funding depends on the organizational structure and the primary functions of these research entities within the agricultural research landscape.



L1: When w explore the research sub system and the role of the researchers in this sub system, we can broadly group researchers into two: Those operating within a classical research sub system and those operating within an interactive research sub system.

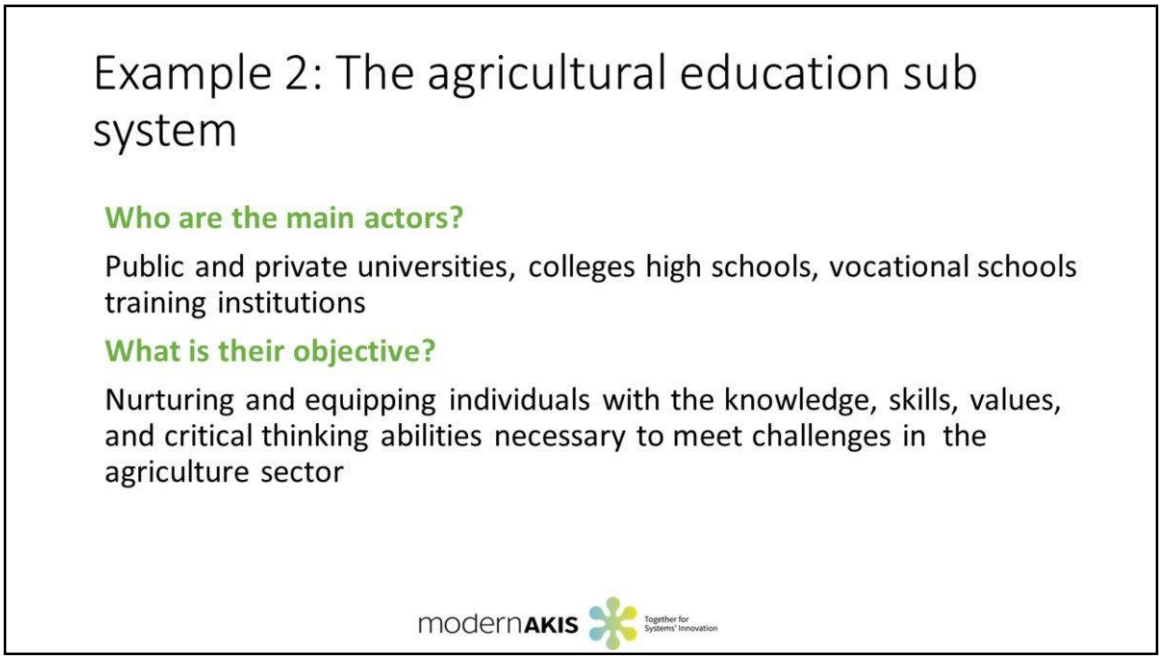
In the classical research sub system:

1. researchers are renowned for their academic expertise. They specialize in generating new knowledge within their respective fields of expertise.
2. Their work is characterized by the recognition they receive for their published research findings and the third-party funds they mobilize to support their projects.
3. Researchers in the classical research sub system often work independently, frequently focusing on specific research questions. Their work environments are highly specialized, which might include laboratories, experimental stations, and computational facilities. However, the solutions they produce often necessitate further translation or operationalization to become relevant and applicable in practical contexts.

L2: The second type of research sub system is one that embraces the interactiv innovation conept. Interactive innovation‘ concept is a **fundamental challenge** to the

classical world view of scientists on the production of knowledge

1. Researchers in the interactive innovation sub system have multifaceted roles. In addition to their expertise within their fields, they also serve as knowledge brokers, facilitators, advisors, and more.
2. To excel in this interactive research sub system, researchers need to cultivate additional communication and cooperation skills. These skills are essential for effective collaboration and knowledge exchange in a multi-actor contexts. Furthermore, it's crucial to consider and allocate resources, including time, for these interactive process. Reflection on resource allocation implies an understanding of power dynamics within these collaborations.
3. Within the interactive research subsystem, researchers collaborate closely with various stakeholders to address real-world challenges with practical and implementable outcomes that are readily applicable

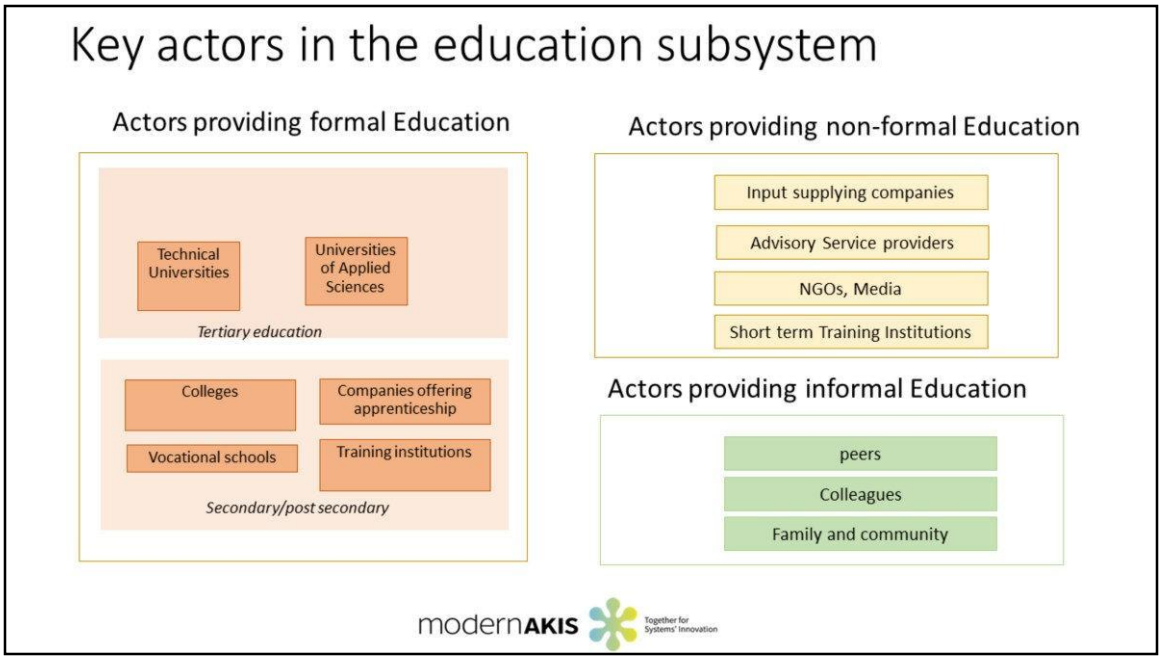


Now lets move on to the next sub system- the agricultural education sub system.

L1: This sub system includes all those actors whose main function is to provide education and training opportunities in wide varieties and levels of agriculture topic. Actors in the education sub system may play different but commentary roles. For instance universities may focus on theoretical and analytical knowledge while vocational schools emphasize on practical training and skills development.

L2: The overarching goal of the education sub system tis to nurture and equip individuals with the knowledge, skills, values, and critical thinking abilities necessary for enhancing agriculture and rural development.
- Studies have shown that a good educational level enhances the effectiveness of agricultural knowledge exchange.

L3: The organizing principle of actors in the education sub system is there is a need to equip students and practitioners with new knowledge and skills help them better contribute to agriculture and rural development.



L1: More than the research sub system, the Education sub system is a colourful system with diverse actors. The following scheme provides an overview of the various types of actors providing education services:

L2: Lets start with actors in the Formal education . By formal education we mean the structured, systematic, and organized form of learning typically provided by institutions like schools, colleges, and universities. Actors in formal education institutions follow a standardized curriculum and is guided by established rules and regulations.
L3: Earlier studies already in the 1990s have shown the importance of basic and vocational agriculture schools as important components in the agricultural knowledge system (Blum 1991)

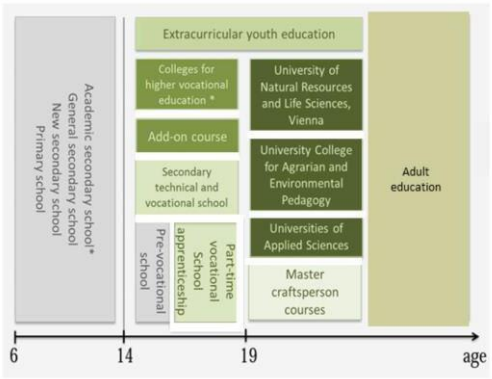
L4: The next category is actors that provide non-formal education. The settings in a non-formal education is more flexible and does not follow traditional classroom structures and grading systems.

L5: The last category refers to actors that provide informal education. Informal education refers to learning that occurs through daily interactions and life

experiences. It is not typically structured, planned, or institutionally guided. Actors include peer groups, colleagues, family,

Example of an education sub system

The Austrian Agriculture education system



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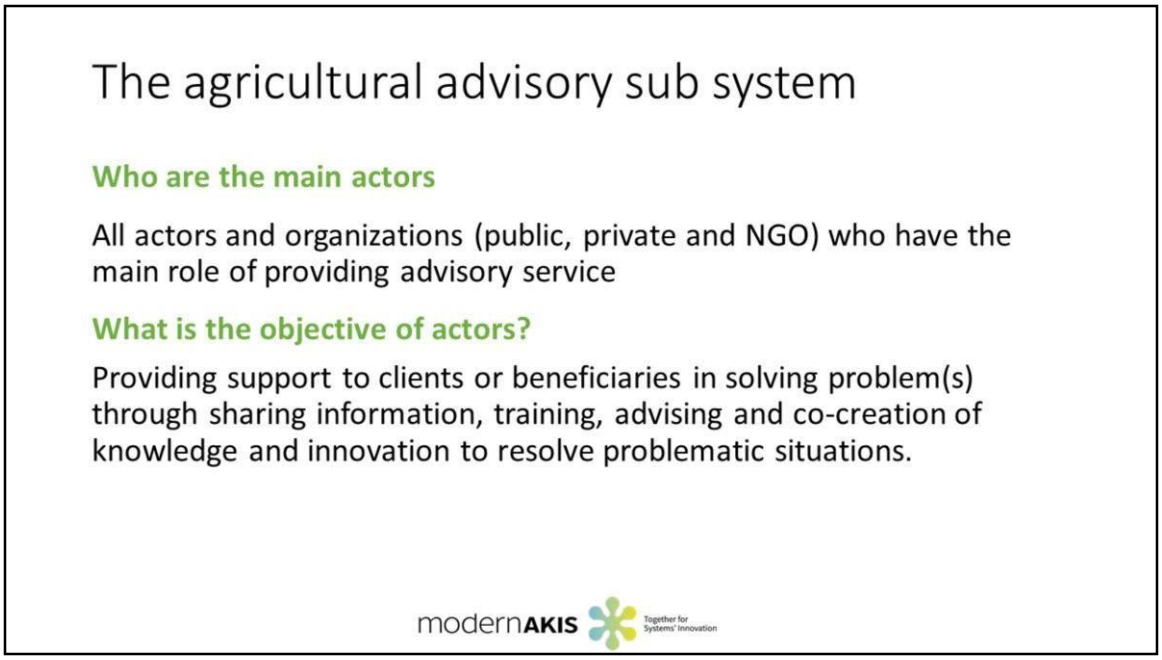
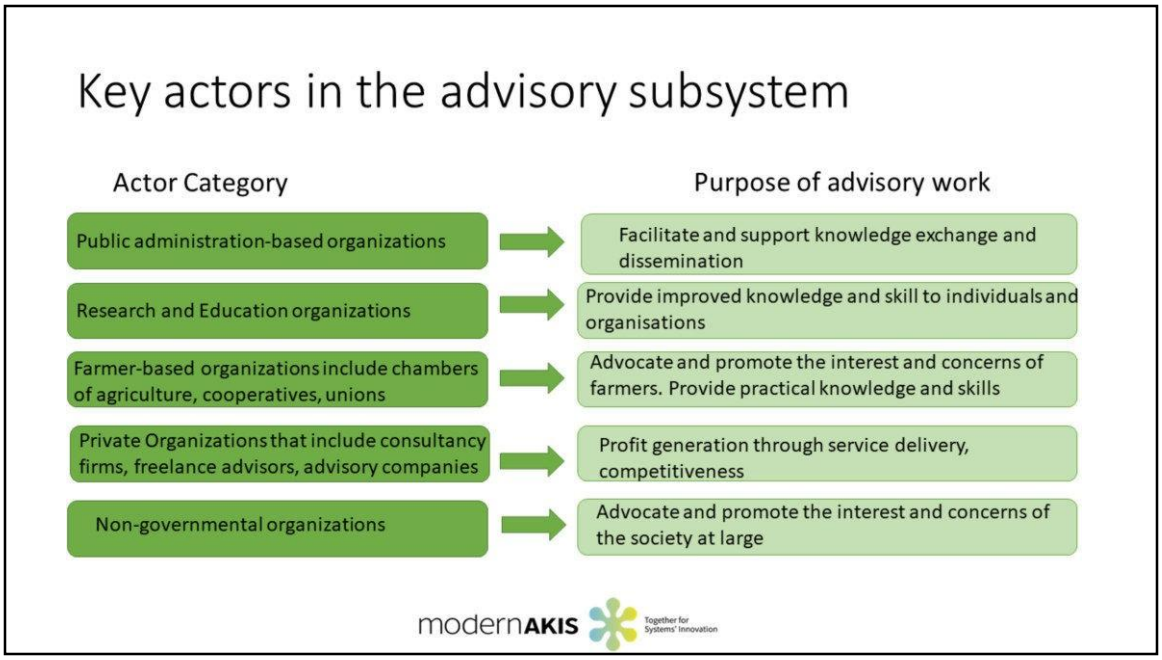
L1: Studies have shown that the abundance of educational institutions specializing in agriculture implies greater access to a wide array of educational opportunities, which, in turn, enhances the availability of agricultural knowledge and expertise within a region or community.

L2, as it can be observed in the figure, Austria has a well-developed agricultural education system that includes a variety of educational institutions. Ranging from universities offering advanced degrees in agricultural sciences to vocational schools providing hands-on training and skill development in agriculture-related fields. This accessibility ensures that individuals are equipped with the knowledge, skills, and critical thinking abilities necessary to enhance agriculture and rural development in Austria.

Source: https://seerural.org/wp-content/uploads/2017/12/Annex-3_Agricultural-Education-System_Ochsenhofer_final.pdf



L1: Now lets look at the third and last sub system in this video, the agricultural advisory sub system:
L2: When we consider the Advisory Subsystem, it's crucial to first identify the diverse actors engaged in the advisory service provision. All those actors playing a fundamental role in facilitating and supporting knowledge exchange in the AKIS. We will come back to the diverse actor types and their mission again
L3:The primary objective of these actors within the advisory sub system is to offer crucial support to their clients or beneficiaries. This support is delivered through various means, including sharing information, counseling, advising, and even co-creating knowledge.
L4: The organizing principles that guide the actions of actors in the advisory sub system revolve around communicative interventions. These interventions are designed to foster the development and induction of innovations. These innovations, in turn, aim to resolve problematic situations encountered in the realm of agriculture.



L1: Understanding the actor categories in the advisory sub subsystem along with their mission provides us a deeper understanding about the actors and their role in the sub system

L2: The first category is government or public administration based organisation providing advisory services. The mission of such organisation is to bridge science practice gap by disseminating latest knowledge, information and technology.

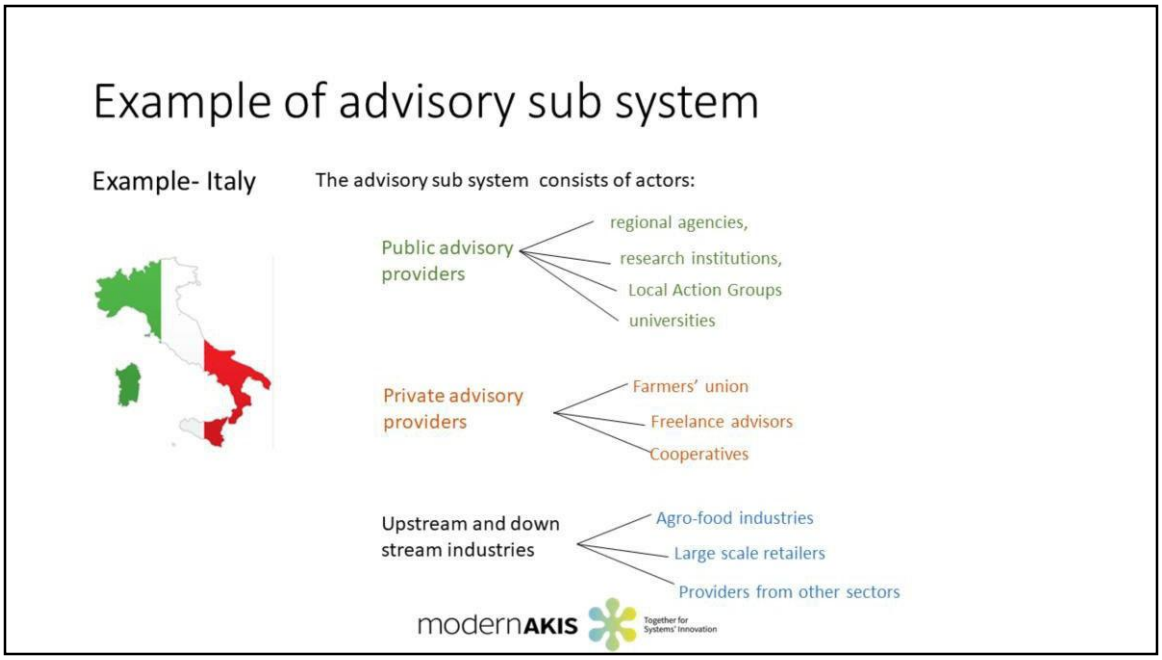
L3: Research and education organizations have the mission to provide access to improved knowledge and skill to individuals and organization by generating

L4: Farmer based organizations such as chamber of agriculture, cooperatives and unions aim at advocating and promoting the interests and concerns of famers either in the policy or the market domain. Their advisory work directly supports this mission by offering guidance and support that empowers farmers and safeguards their interests.

L5 : Private organizations including consultancy firms, freelance advisors and companies have the mission to make profit through delivering information and knowledge

L6: Lastly, non-governmental organizations have the mission to advocate and promote the interest and concern of the society at large.

L7: In summary, each category of actor within the Advisory Subsystem has a distinct mission. Their advisory work serves as a direct means of achieving these missions, whether it's bridging the science-practice gap, disseminating knowledge, advocating for farmers, generating profit, or advancing societal interests.



L1: To give a real example of the advisory sub system. Lets take the case of the Italian advisory sub system

L2: The Italian advisory sub system is marked by a diverse array of service providers with varied objectives and organizational structures.
L3: Following the EU innovation policy, significant changes have occurred, including the emergence of new players supporting innovation and a restructuring of existing entities to facilitate multi-actor innovation processes. Notably, the entry of ICT sector players specializing in digital tools for farming has expanded the landscape of service providers.

L4: The current scenario features greater participation and proactivity from various service providers, some of whom engage in international research projects, fostering knowledge exchange and professional development.

L5: Public providers include regional agencies, research institutions, universities, and Local Action Groups (LAGs).
L6Private providers encompass farmers' unions, freelance advisors (agronomists, veterinarians, and agrotechnicians), cooperatives, and other farmers-based

organizations.

L7: Freelance advisors, numbering around 63,000, offer a range of services, often organized in associations or networks.

L8: Cooperatives and farmers-based organizations contribute to overcoming agricultural supply fragmentation, providing services such as business advice, technical guidance, and support for innovation projects.

L9: Upstream and downstream industries, agro-food industries, and GDO (large-scale retailers) may offer advice through their networks, while providers from other sectors enter the market to support innovation projects.

Section quiz

If you want to identify key actors in an AKIS sub system, you would

- ○ Draw a boundary
- ○ Identify their roles
- ○ Identify their scope and objectives
- ○ All of these answers

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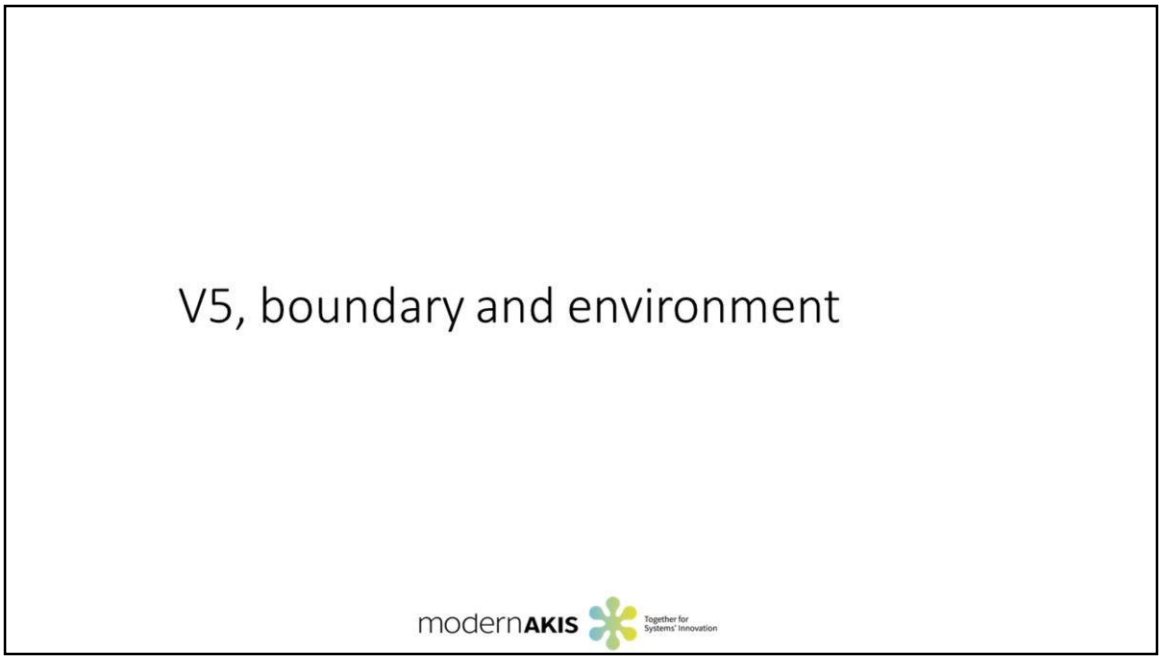

In this section, of module 2, we will discuss the AKIS boundary and the environment surrounding the AKIS

AKIS boundary- What is it?

- Delineates the limit that distinguishes what belongs to the AKIS in focus and what belongs to the environment in which it operates.
- The threshold between what is part of **a specific AKIS** and what is outside

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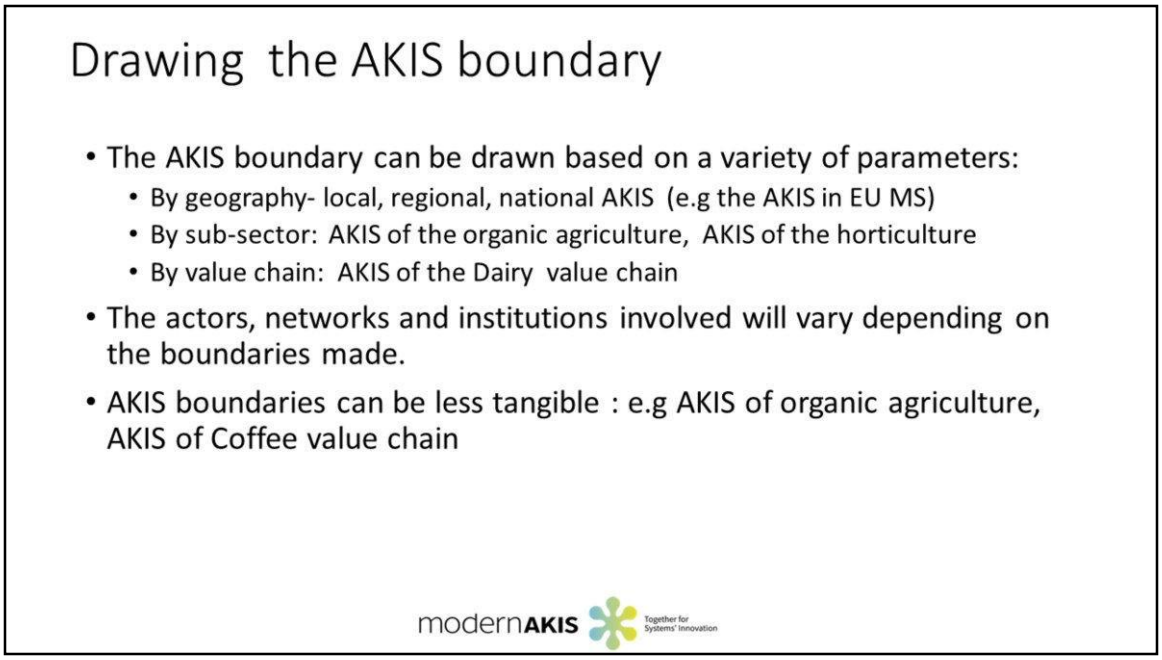
L1: Lets start with describing what we mean by an AKIS boundary
L2: The boundary is a fundamental component in understanding the type of AKIS we are talking about. Boundary essentially delineates the limit that distinguishes what belongs to the system and what belongs to the environment in which it operates.

L3: In systems thinking the boarders of the system, which are determined by the observer define where control of action can take place or a particular area of responsibility to achieve a system purpose (Ison, 2008) DOI: 10.4135/9781848607934.d15

L4: To put it simply, the AKIS boundary serves as the threshold between what is under the control and influence of actors within the system and what lies outside. It is where actors can direct their efforts, collaborate, and exercise their responsibilities to advance the goals and functions

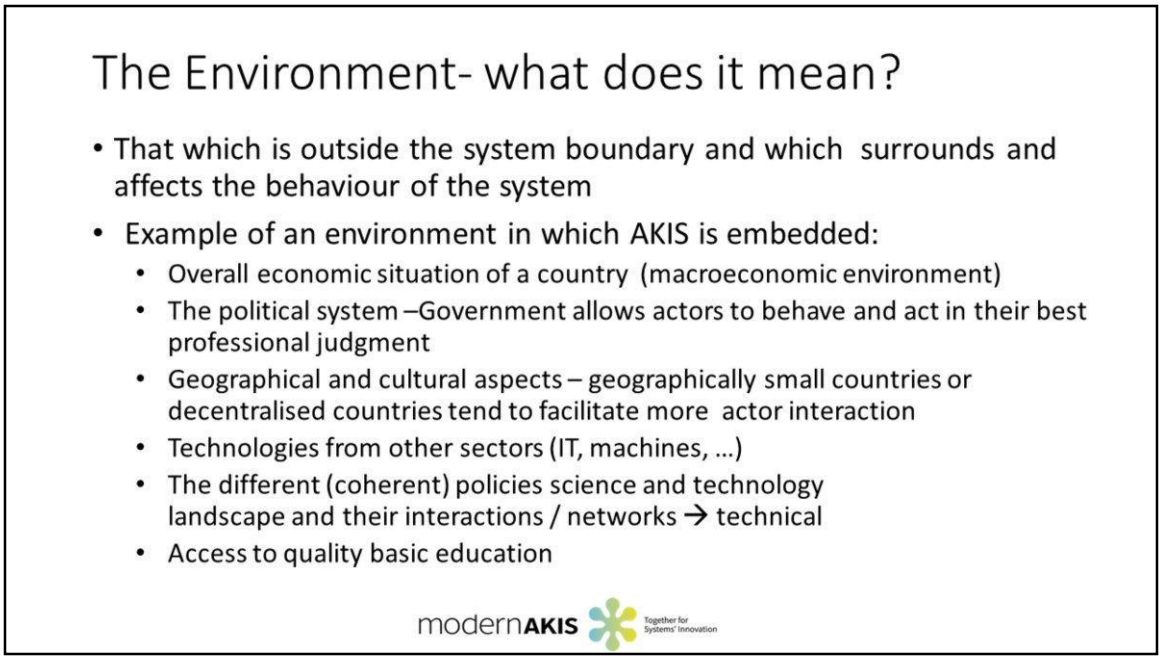


L1: The AKIS boundary can be drawn by using various parameters, and these identifiers play a crucial role in shaping the scope of the system:

1. The AKIS boundary can be drawn based on geography, encompassing local, regional, or national AKIS. For instance, a local AKIS might focus on specific agricultural practices within a specific location, while a national AKIS would have a broader reach. In the context o the EU CAP, the boundaries for AKIS are determined by the geographical boundaries meaning by the actors' affiliation to the state in consideration.
2. It's also possible to delineate the boundary by sub sector. This means that different sub sectors of agriculture, such as organic farming or horticulture, can have their own distinct AKIS.
3. Another way to identify the AKIS boundary is by considering specific value chains within agriculture. For example, the Dairy value chain or the Coffee value chain each have their own AKIS boundaries, tailored to the actors, networks, and institutions involved in these particular chains.

L2: When talking about AKIS boundaries, it is important to note that the choice of the boundary, whether geographical, sector-specific, or value chain-oriented, will determine who participates in the system

L3. Additionally boundaries can sometimes be less tangible. For instance, defining the AKIS of organic agriculture or the AKIS of the Coffee value chain might not be as rigid as other boundaries. These AKISs encompass actors from multiple value chains and sub-sectors . In such cases, the AKIS boundary takes on a more fluid and dynamic nature, adapting to the unique characteristics of these domains.



L1: By the environment surrounding the AKIS we refer to the broader context that encompasses various social, geographical, and cultural aspects of a country or region. These elements are external to the AKIS system but are fundamentally important for its effective functioning. In essence, we can view the AKIS as the foreground, while the environment serves as the background that influences its operations.

L2: Let's explore some examples to gain a better understanding of the AKIS environment:

1. The overall economic situation of a country, often referred to as the macroeconomic environment, is an AKIS environment as it affects the resources available for research, innovation, and knowledge exchange within the AKIS.
2. The government's policies and regulations can either encourage or hinder the actions of actors within the AKIS. They play a pivotal role in allowing actors to behave and act in their best professional judgment.
3. The physical geography and cultural characteristics of a region can shape the dynamics of actor interactions. For example, geographically smaller

or decentralized countries often facilitate more interaction among AKIS actors.

4. Availability of technologies from other sectors, such as information technology and machinery, can enhance the efficiency of knowledge transfer and innovation within the AKIS.
5. the presence of coherent policies in the science and technology landscape, along with their interactions and networks, provide a technical framework for how knowledge is generated, disseminated, and applied within the AKIS
6. Availability of good basic education plays a vital role as a well-educated workforce with a strong foundation in relevant fields contributes to the overall efficiency of the AKIS.

The environment and its influence to the AKIS

Example: The case of Germany

- The strong economy allows for substantial investmen in agricultural research and innovation,
- The political system allows scientific research and innovation, allows actors to operate with autonomy
- Decentralised system allows for efficient actor interaction within states/regions
- Emphasis on strong basic education system provides a well educated work force

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L1: Lets look at a practical example of how the external environment influence the AKIS by taking the example of the German AKIS environment
L2: The overall economic situation in Germany, as part of the macroeconomic environment, plays a significant role. The country's strong economy allows for substantial investments in agricultural research and innovation, contributing to a strong AKIS.
L3: Germany's political system supports scientific research and innovation and allows actors within the AKIS to operate with autonomy and in their best professional judgment. Government policies encourage collaboration between researchers, farmers, and agribusinesses.
L4: The decentralised AKIS governance in Germany allows for efficient actor interaction within the states or regions.
L5: Germany's emphasis on a strong basic education system provides a well-educated workforce, particularly in fields related to agriculture, further strengthening its AKIS.
L6: So these examples illustrate how the external environment influences the AKIS of a country.

Section quiz

In EU member states, the AKIS boundaries are delineated by value chain

1. TRUE
2. FALSE

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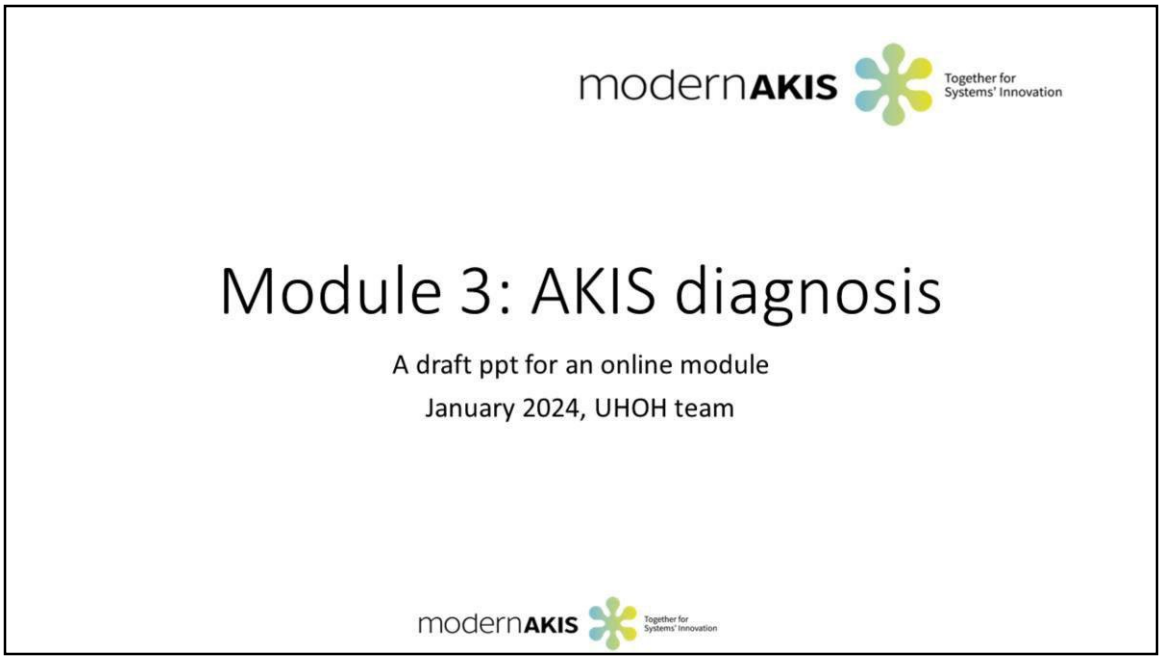
Literature sources



Narration: This module is on the diagnosis of an AKIS. We already learned in module 1 and 2 what the characteristics of a system are and what elements it consists of (*Picture from module 1 with all the system elements*) thus you have understood what a system is. We also saw how system thinking can be applied in an agricultural context. In this module you will learn how to make a diagnosis of AKIS that is similar to a medical "health check". The diagnosis is a process with "check ups" to understand the state of an AKIS.

Learning outcomes

Participants …

- understand the importance of an AKIS diagnosis
- know the different steps and tools applied in an AKIS diagnosis
- Can analyse and draw conclusions from an AKIS diagnosis

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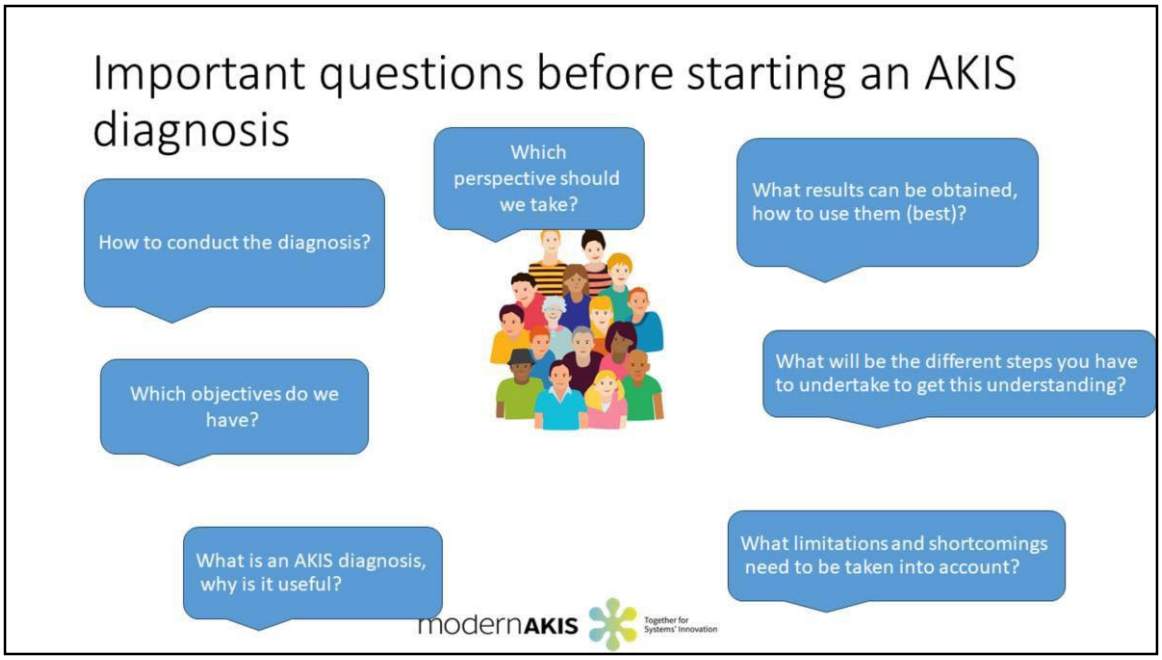
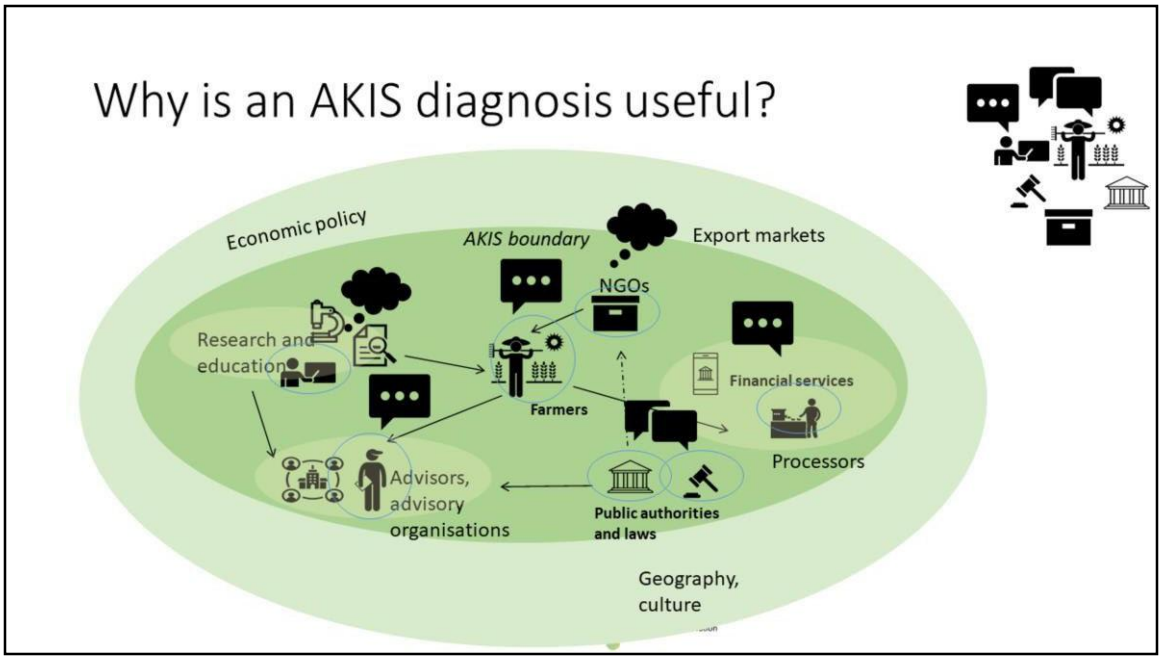
Narration: At the end of this module, you will understand the importance of an AKIS diagnosis and the four steps and various tools of an AKIS diagnosis. You will further know how to visualise the results of an AKIS and draw conclusions from the analysis.



Imagine, you are a nominated CB, and you want to know the AKIS of your region together with the leader of the chamber of agriculture.
Now you are wondering how you would conduct an AKIS diagnosis? How would you go about? What will be the different steps you have to undertake to get this understanding? Which results are you aiming for and how will you get them? And what are the limitations and shortcomings that have to be taken into account?
In this module we will introduce you to the AKIS diagnosis tool and clarify these questions.



Why is an AKIS diagnosis useful? First of all a diagnosis serves as means to give an overview off all the actors in your AKIS (*actors pop up*). At first it is needed to obtain divers perspectives on knowledge exchange and innovation processes (*thinking and speaking bubbles pop up*) and to reveal the degree of linkages among actors and coordination mechanisms such as networks and programs that bring actors together (*arrows pop up*). You can also identify the strengths, weaknesses and gaps of knowledge and innovation infrastructures such as the number of lecturing institutions or exchange possibilities (*several persons in research and education pop up and advisor fades away*). The output of this AKIS diagnosis is a means for stimulating discussions among the diverse AKIS actors (*actors move out of the diagram to the side and discuss with speech bubbles*) and for identifying capacity development needs (*in the green visualisation the advisor is circled red and the scatter arrow from public authorities to NGO*). As you could see step by step an overview of an AKIS can be created and concret results are obtained on what to improve.

What results can be obtained?

- **Outstanding** AKIS actors
- The **diversity of actors** within the AKIS
- **Linkages** and their characteristics among actors,
- Description of **AKIS related policy instruments**
- **AKIS strengths** and **weaknesses** based on the empirical findings and actors' observations
- But: Mention gaps, lack of links and coordination, insufficient empirical evidence and potential biases

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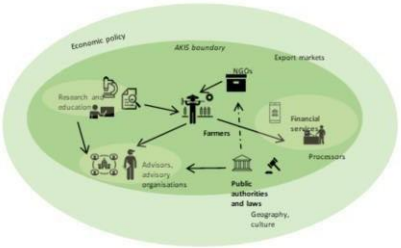
Now as you know why an AKIS diagnosis would be useful let's look into concret results that can be obtained.

- Since actors are identified you can find **outstanding** AKIS actors that e.g. have a strong influence or central role in the public sector and farmer-based organisations
- Further the **diversity of actors** within the AKIS can be determined. E.g. are there many actors that could possibly exchange and infuence each other.
- Assess the **linkages** among actors and the characteristics of these linkages. E.g How do the linkages look like? Do the actors engage with each other unregularly, or are there stable pathways?
- Connected to the linkages are policy instruments that are related to AKIS. You will get clarity on their role in he AKIS.
- The diagnosis also highlights strengths and weaknesses based on the empirical findings and actors' observations. E.g. Where is a diversity of actors not used or exchange not happening?
- But likewise it is important to mention gaps, lack of links and coordination that couldn't be covered by the diagnosis and also insufficient empirical evidence as well as potential biases

Objectives and boundaries for the AKIS diagnosis

- Decide upon your objectives
- Analyse your AKIS boundaries (e.g. Country/region/thematic AKIS)



- Formulation of questions to be answered with the AKIS study

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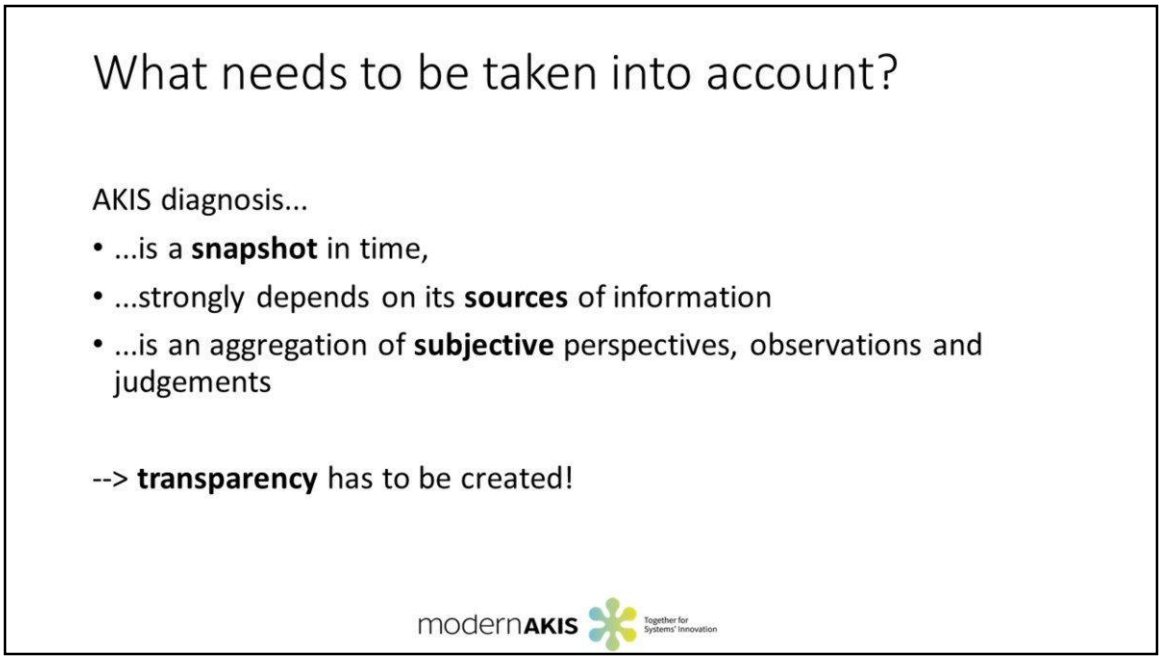
Now as you know why an AKIS diagnosis could be useful it is necessary to think about the objectives. What is intended to be achieved with the AKIS diagnosis. Is it the actors you are interested in or how they interact? A focus can help here.
What are the boundaries of the AKIS you want to look at? Is it on a national or local level? Or is it on a specific topic such as the nitrogen reduction that farmer Gerhard within his AKIS has to deal with from the earlier module?
Formulate the questions to be answered with the AKIS study considering the objectives and boundaries. They will guide you through the AKIS diagnosis.



- First of all: an AKIS diagnosis is a **snapshot** in time, it allows for relevant judgments however bound to the particular frame of the study;
- Secondly: an AKIS diagnosis strongly depends on its **sources** of information in terms of diversity and typicality of information sources
- Finally: an AKIS diagnosis remains an aggregation of **subjective** perspectives, observations and judgements

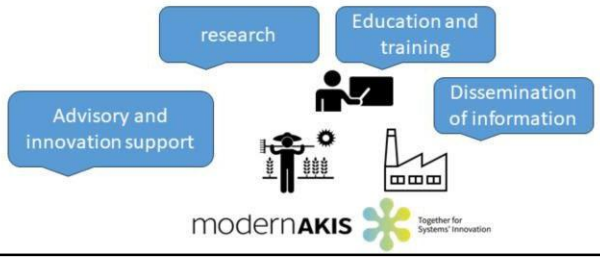
Thus, transparency has to be created about the frame, the bases and the aggregation approach of the diagnosis study.

What is an AKIS diagnosis and who does it in short?

An AKIS diagnosis….

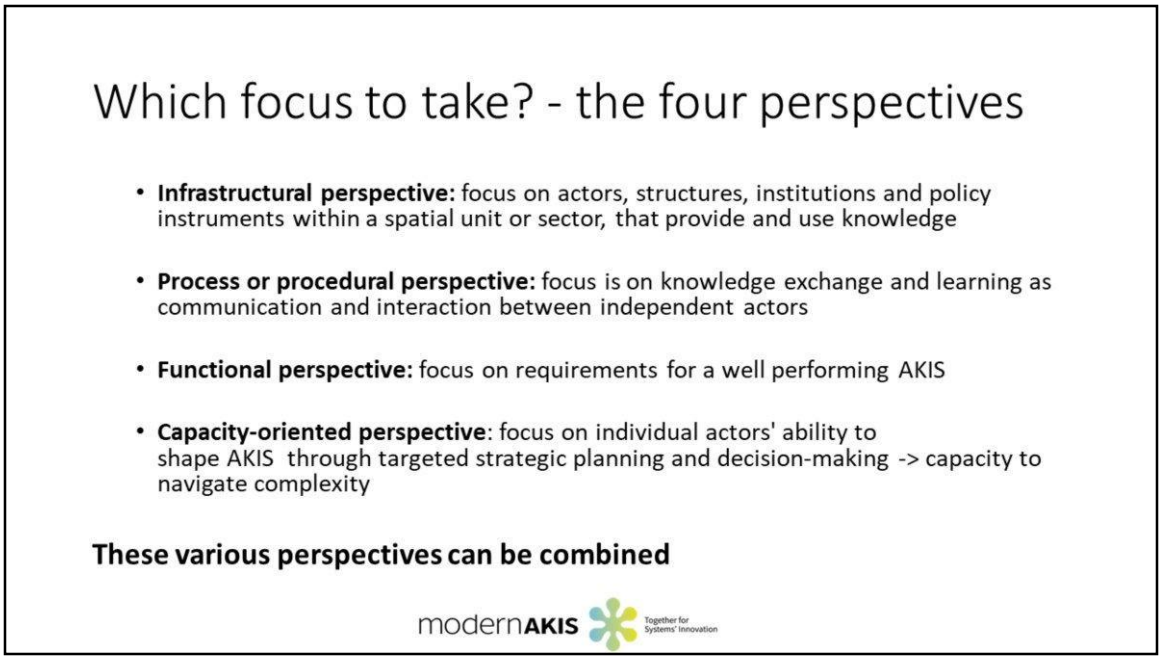
- Is the process
- Using tools and methods

→ Can be conducted by key actors



..whatever perspective you decide to take, methods, tools and a process are needed that bring the objectives and perspectives together to conduct the analysis. This two parts make the main body of an AKIS diagnosis and guide the AKIS analysis towards answering the objectives. The analysis can be done by key AKIS actors from public bodies, private enterprises or farmer based organisations that deal with research, education and training, advisory and innovation support and dissemination of information. For example the CB from the beginning is a perfect key actor, as they have contacts to divers actors, support innovation

and aim for disseminating the results. Therefore they would profit from the diagnosis.



If you want to do an effective AKIS diagnosis it is important to decide on the perspective or focus under which you want to analyse it. Depending on your perspective, you could focus you diagnosis on…

If your objective is to know the actors and their interlinkages at a national level, you would choose the first (infrastructural perspective). The infrastructural perspective is also partly used by the following perspectives.
If you want to deepen the interactions, relations among the different actors, you take the process perspective – which however, is based on the infrastructural perspective, but you may chose different boundaries since this perspective investigates exchange and interaction among individual actors. This perspective reveals how knowledge exchange and innovation processes are done.
If you want to focus the requirements that are needed for a well performing AKIS you choose the functional perspective, to get an understanding of what needs to be done.
If you want to focus on targeted strategic planning and decision-making to shape AKIS the ability of individual actors might be of interest and thus the capacity-oriented perspective.
When you will take the focus on either the functional, procedural or CD perspective, you usually set smaller boundaries and look rather at parts of the AKIS than on the

AKIS as a whole.
Important at this stage is to make already clear what the objective of an AKIS diagnosis in your case would be and which boundaries it has: e.g. is it a national or local AKIS and what are you aiming at with this diagnosis?
A combination of perspectives is possible if needed for the objective.
In the next video we will focus on how to do the AKIS diagnosis from an infrastructural perspective.

(*Examples if possible with the simplified AKIS system from slide 4 -> highlighting differneces for the different perspectives*)

Quiz

Which perspective of the AKIS diagnosis is not existing?

- Capacity-oriented perspective
- Infrastructural perspective
- Functional perspective
- Process or procedural perspective
- Technological perspective

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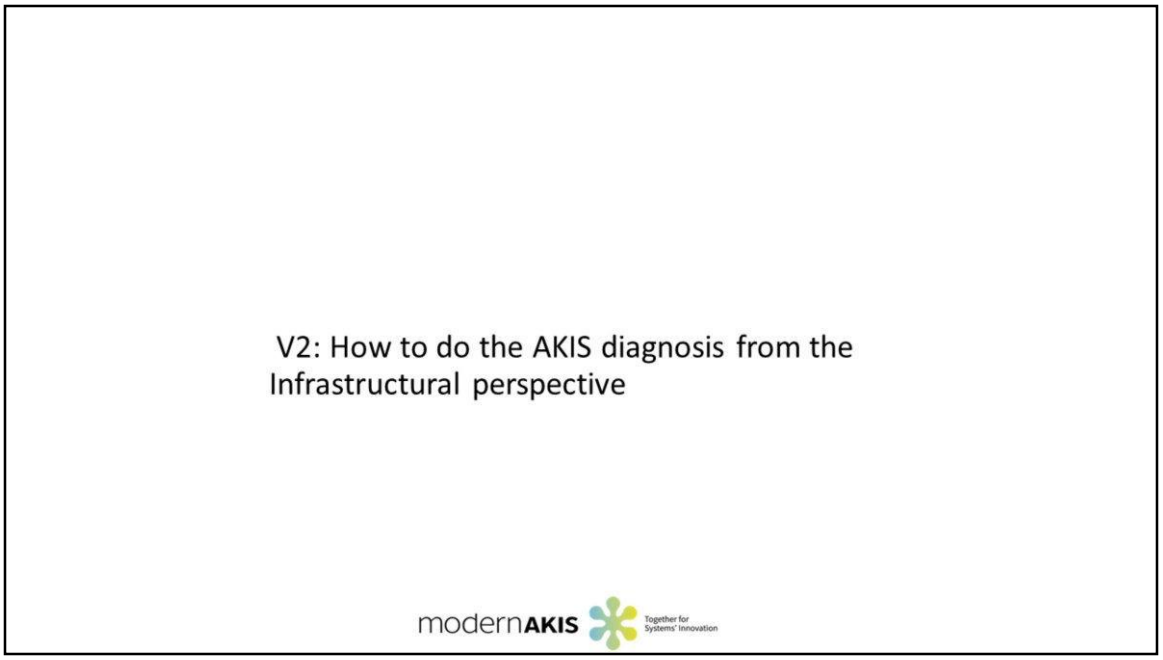
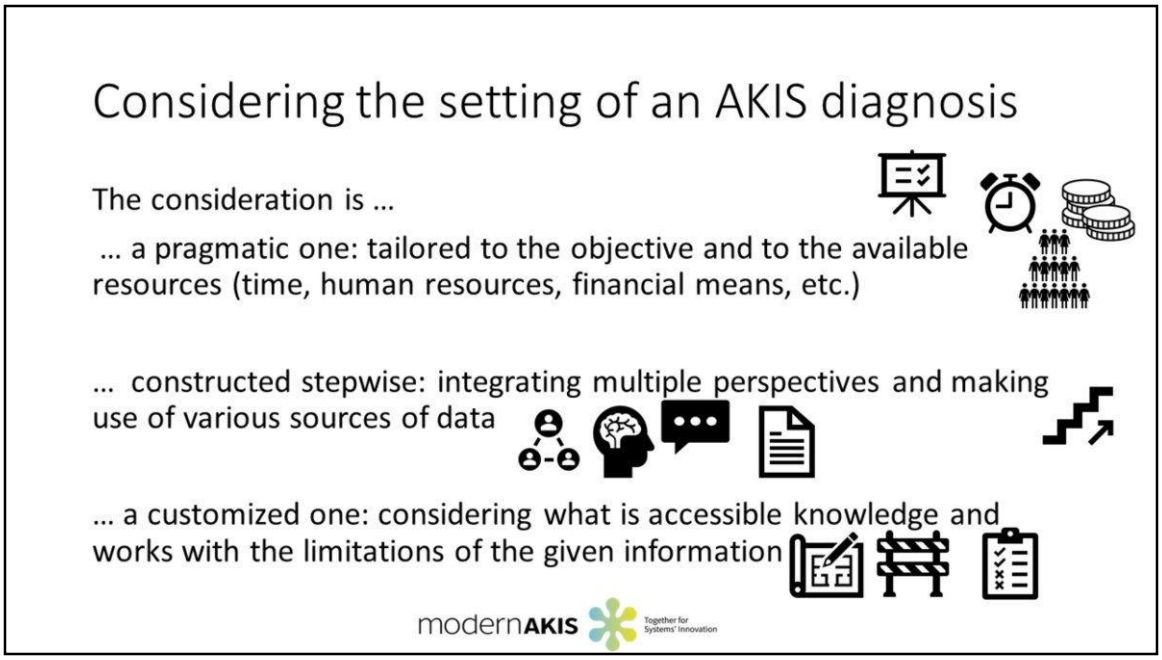


Narration: In this video it will be clarified how the process of an AKIS diagnosis from the infrastructural perspective looks like. You may have come across the analysis of AKIS from the infrastructural perspective when you have read your country report produced by the i2connect project or the PRO AKIS project. The infrastructural perspective is a widely used one and therefore the steps are proven. The perspective is also partly included in the Capacity oriented, the Functional and Process perspectives. More details on the other perspectives will follow in module 5 and 6.

Maybe the GFRAS 5 aspects --> https://www.ifpri.org/publication/building-knowledge-systems-agriculture-five-key-areas-mobilising-potential-extension-and
Specificall modernAKIS is developing tools for the capacity development perspectives



Before going into the steps of the AKIS diagnosis we highlight the general setting that needs to be considered. First the setting consideration is a pragmatic one. The diagnosis should be tailored to the objectives and the availability of resources such as time frame with in the diagnosis has to be conducted, the human resources available or financial means. Further, the diagnosis is constructed stepwise through integrating the various findings from different sources of data such as interviewed actors or document search. Lastly it very much depends on the AKIS frame. Therefore the diagnosis is customizable depending on the accessibility of knowledge – for instance actors might not be reachable or answering surveys and therefore the AKIS diagnosis has to deal with the limitations and conditionalities of every individual AKIS.

Use ***material from Annexes in the document*** on "Evaluating the AKIS Strategic Approach in CAP Strategic Plans"
Make simpler sentences, shorter
Iterative, situational,

How to do the AKIS diagnosis?

Objectives...
Setting... ...are clear! 
Perspective...

The infrastructural perspective diagnosis is composed of four steps:

- Identify the state of knowledge
- Collect empirical evidence
- analysis and integration of the information
- Interpretation and conclusions

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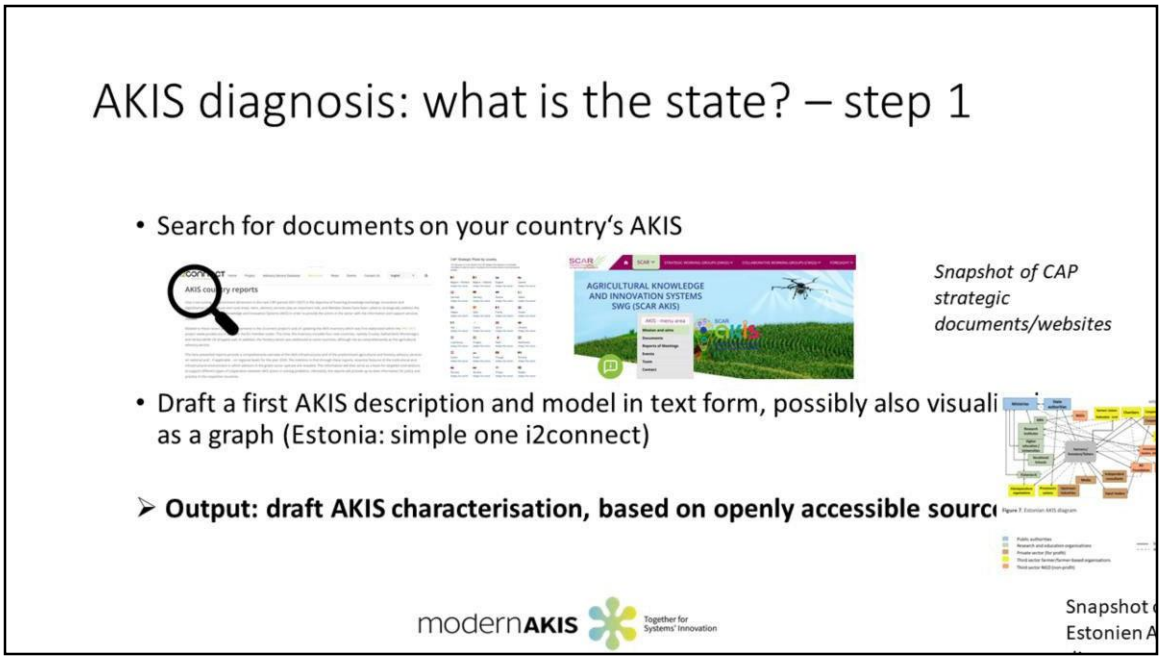
Before starting with the diagnosis the formulation of objectives, setting and perspectives should be made clear. Especially the system boundaries and scale such as country or regional level or a thematic AKIS need to be clarified. When the objectives of your AKIS diagnosis are set, the perspectives you want to focus on are clear and the setting of your AKIS is taken into consideration you can start with the actual diagnosis. A diagnosis in a medical sense refers to a kind of "health check", which is also the case for the AKIS diagnosis, which checks the state of the AKIS. It consists of four steps – remember these steps refer to a diagnosis with an infrastructural perspective. First the current state of knowledge needs to be identified. This is backed in the second step by a collection of empirical data to ensure and bring more evidence. The third step consist of the integration of all information and their analysis. The fourth step is finally the interpretation and conclusion.

We will present a proven procedure using the visualized AKIS map diagnosis. Maybe some of you have been already involved in conducting a diagnosis for your countries AKIS. There are different methods and tools already propose in the CAP AKIS evaluation Guideline which also could be used to do an AKIS diagnosis and to see how “healthy” the AKIS is.

In this module we will unfold the steps of the infrastructural AKIS diagnosis.



The first step of the diagnosis is on gathering all the material discussing and describing the current state of the AKIS. You start with searching for documents on your country`s AKIS. You can get the information from the national CAP strategic plan (https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans_en?prefLang=de#assessment) or from the AKIS country reports of the i2connect project. You may also get into contact with members of the SCAR AKIS CW group (https://scar-europe.org/index.php/akis-mission-and-aims) or use sources like publications, grey literature, websites and other sources. All the information you gathered here from should be used for a first draft AKIS description which can possibly visualised as graph. Here you can see an example from the Estonien AKIS (*Show AKIS diagram*) schematic represeantion. How to visualise such a diagram will be discussed in the next video. Your output from this first step is a draft AKIS characterisation based on all the openly accessible sources.

AKIS diagnosis: collecting evidence – step 2

- Conduct semi-structural interviews with experts / **key informants**

- Conduct survey with AKIS **key actors** (= targeted members of subsystems)

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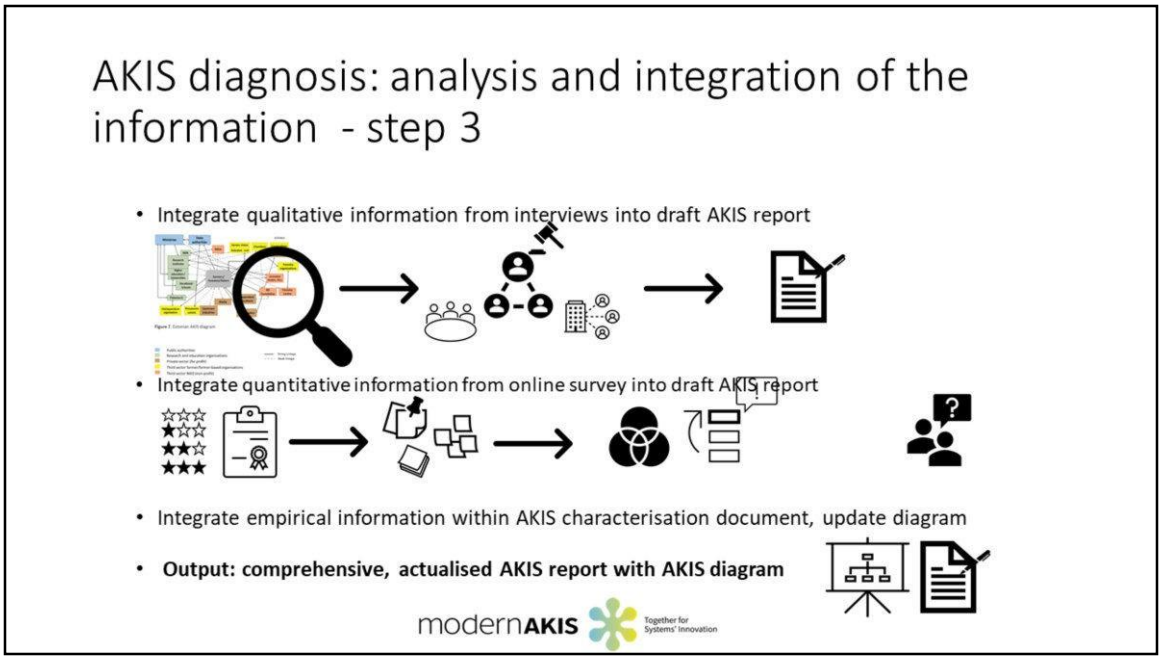
In the next step we have to collect evidence from practice and complement or confirm the findings from step 1. Two forms of data collection are conducted in this step: semi-structured interviews and surveys. For the Interviews the development of a guideline helps the flow of collecting data such as which questions are relevant. Key informants for semi structural interviews can be experts who have broad overview of the agriculture sector. For comprehensively, experts from different actor categories need to be invited. Selection may be on the basis of:

- their knowledge/insight in the AKIS under investigation (National/regional AKIS, Organic agricultures/ horticulture AKIS)
- their ability to articulate their opinion; their influence/power within their organisation and in the wider AKIS (opinion leaders), e.g representative of the farmers association/ chambers
- and the position of their organisation in the AKIS as recognized by other key informants

If you have found key informants, contact depending on you resources a selection for an interview. For conducting the interviews, the AKIS diagram that was drafted in the 1. step can be a supporting resource. Semi-structured interviews are recommended

as the questions are structured and in a potential order, but allow to be flexible in the course of the interview. After the interviews data needs to be processed and findings from it brought together.

If you afterwards see a need for a survey it is conducted with AKIS key actors which are targeted members of the subsystems. Before starting the survey clarify if it is necessary to conduct it (***why ?***). Develop the survey in an online format and identify potential respondents that need to be invited. After collecting the data aggregate the findings.
At the end of this step you have new findings from the interviews and the survey that complement the findings from step 1.



Step 3 of the AKIS diagnosis is all about the analysis and integration of the informations collected from literature, interviews and surveys to create the overall picture
From the interviews start with adding new actors to the diagram and complement positions of already identified actors. This is followed by characterising and complementing differing forms of formal linkages, policy instruments an coordination mechanisms (***how?***). The gatherd information need to be incorporated into the report.

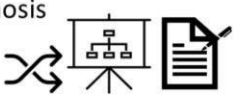
The survey data should also complement the diagram and report. At first the quality of data collected in the survey should be assessed. Depending on the research question of the conducted AKIS and the focus process and aggregate the survey data accordingly. From this data you can identify very specific and cross cutting information (example??) but keep an eye on their relevance and importance.

After this step you should have an actualised AKIS report and diagram with data from literature and practical actors

AKIS diagnosis: What judgements and conclusions? - step 4

- Cross-check and refine the AKIS diagnosis within an interactive event

- Create an updated, consolidated AKIS diagnosis



➢ **Output: comprehensive, consolidated AKIS report with AKIS diagram**

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In the last step the accumulated data is cross-checked and finalised into a draft report where all key actors are identified and their roles in the AKIS and their linkages with other actors are described. Sharing and discussing the results of the AKIS diagnosis in interactive events such as group discussions, workshops and meetings will enrich the diagnosis. To draw final conclusions and assessments it is beneficial to collect the reactions, comments and complementary information from other key AKIS actors.

At the end of this step you have a comprehensive, consolidated AKIS report and an AKIS diagram!

Illustrate again with examples:

Quiz

1. Before starting an AKIS diagnosis – what should be clear in advance?
   - The persective
   - The actors
   - The objectives
   - The setting
2. Can you give the order of the AKIS diagnosis steps?
   - Cross-check findings and update report (4)
   - Search for documents (1)
   - Analyse data and integrate information (3)
   - Collect evidence from interviews/survey (2)

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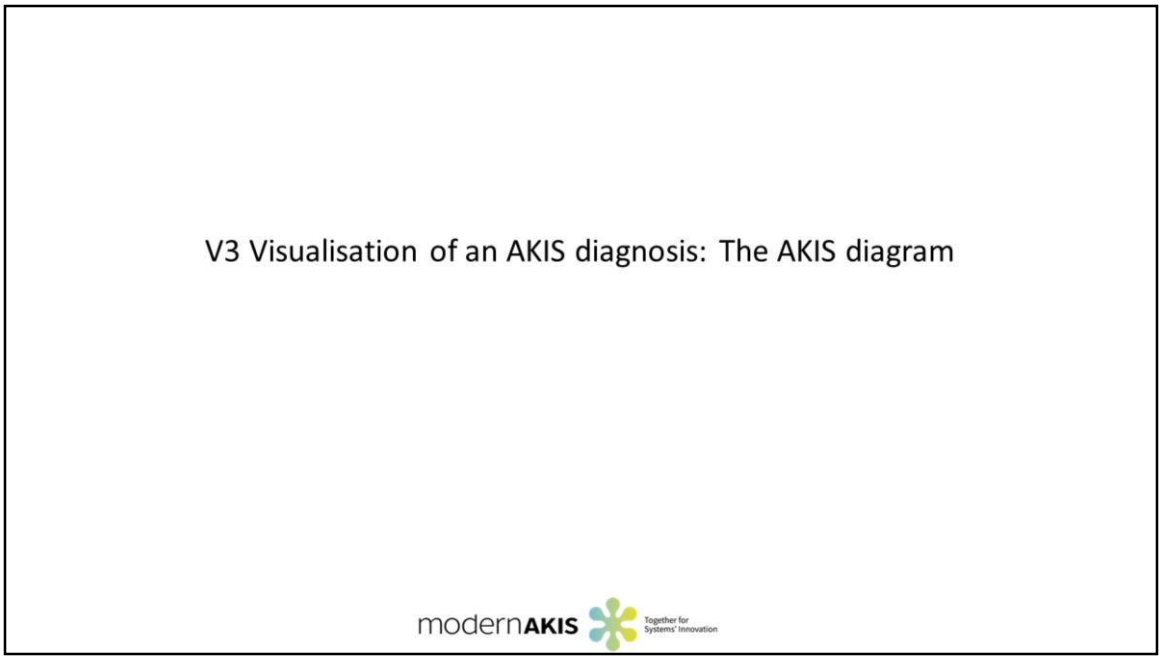
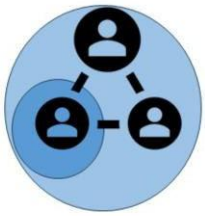


In the last video you got an overview of the steps an AKIS diagnosis consists of. There are two central outputs from the diagnosis: the report and the AKIS diagram. The diagram is a visualisation of the investigted AKIS and supports the understanding of an AKIS. In this video we will go into this visualisation practice of an AKIS diagram.

AKIS diagnosis: Visualisation

Why?
AKIS is an abstract concept
--> visualisation supports its understanding

What?
Visualisation of:
- Actors
- Linkages
- possible levels (national, local,…)



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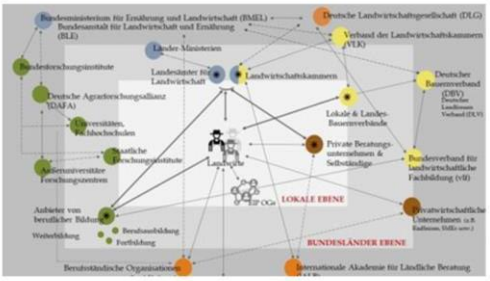
Why is a visualisation needed? As you could see in the first two modules AKIS is an abstract concept based on system thinking. In the report the methods and results are explained but visualisation simplifies the complexity through an overview and supports understanding.
What can be visualisied? In an AKIS diagram diverse actors, the linkages among them and the level of action such as national or local level can be visualised. Actors include single key actors with a central stake, institutions and organisations. Linkages represent among others, policies, regulations and coordinating mechanisms in an infrastructural perspective, and in contrast, stand for communicative interaction, information sharing and knowledge exchange in a procedural networking view.
(*show first actors, second linkages, third levels (blue circles)*).
How can the visualisation be conducted?

How to visualise?

1. Representation of AKIS actors and infrastructure: grouping actors by organisational characteristics through
   - colours and
   - grouped positioning
2. Linkages within an AKIS:
   - Degree of connection through bold or fragmented lines
   - Directionality is differentiated between uni- or bi-lateral relationships through one- or two-sided arrows
3. Levels can be incorporated if needed:
   - in the background with light colours
   - in a nested way



AKIS Germany

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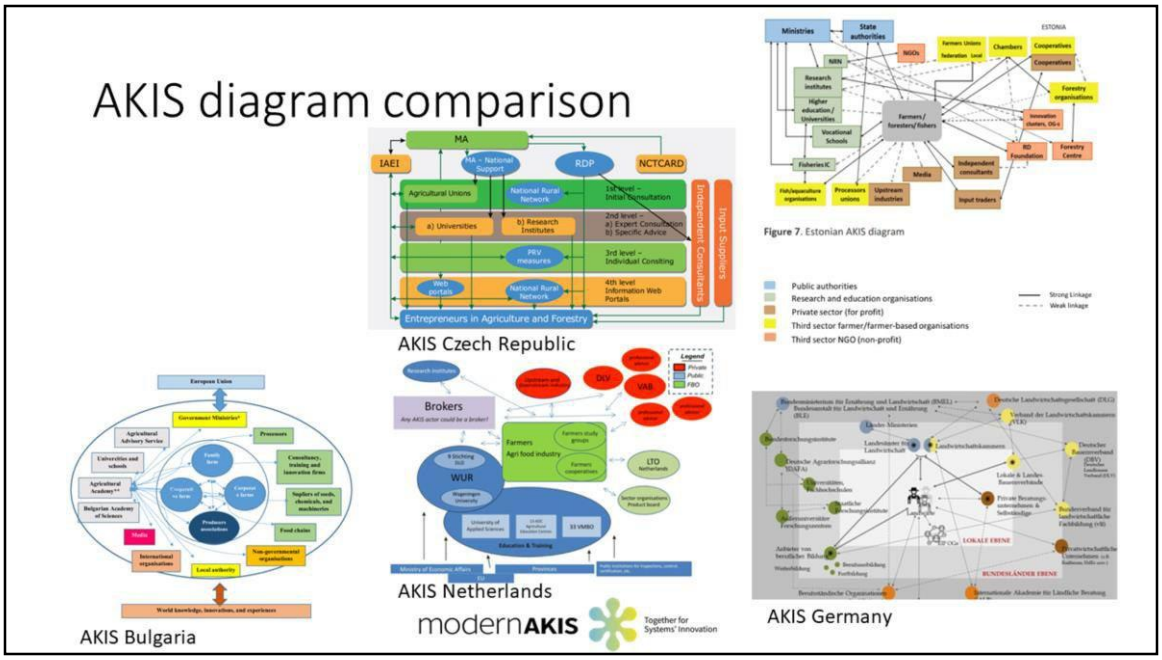
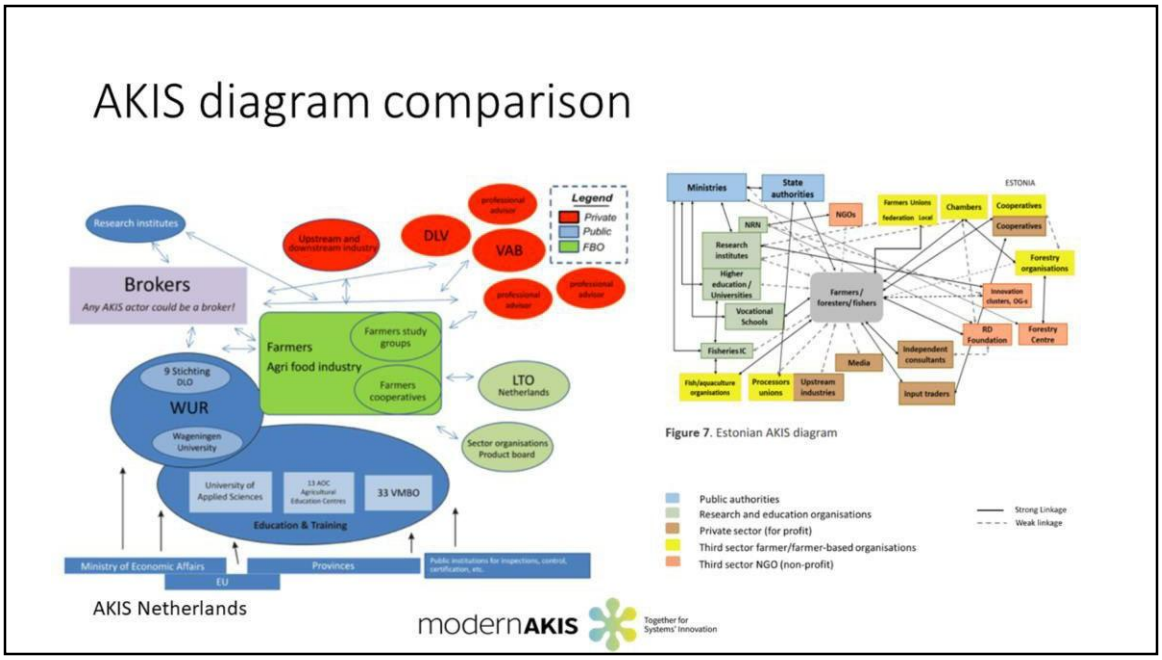
(*Singel points mentioned here are successively added to the picture -> full picture should look like the picture*)
Start with the actors you found and group them by there organisational characteristics. Which of the actors are part of the public sector, the academic institutions, private sector, farmer led organisations or NGOs? Position actors of one group close together and give them the same colour. If you have all the actors you can start with the linkages. As you just learned the linkages can be manigfold which we can't visualise in the AKIS diagram. But what can be visualised is the degree of the connection, is it strong or weak? Than draw it as bold or fragmented arrow. Moreover, is the direction uni-directional? e.g. is information always going from one actor to the other but not the other way round than visualise it through a one-sided arrow or is there an exchange, than you would draw a two-sided arrow. If your AKIS is organised on different organisational levels such as national and local, it can be visualised in the background with light colours inidcating the levels in a nested way, where the highest level e.g. national level inculdes the smaller levels such as the local level.



Now you know the general rules for visualising an AKIS. Since AKISs are incorporating the individuality of the systems frame and the person conducting the visualisation task they also differ a lot from each other (*Show different diagrams – not all at once! Maybe two at a time*). Therefore we will now compare different diagrams.



Let's compare how the actors were visualised in these two examples. What differences do you see? (*short break*)
The left example shows the Dutch AKIS. The actors are distiguished in three colours. On the right side you can see the Estonien case using five colours to visualse the different actor groups. Within some of the actor groups at the Dutch case such as the Farmers and Agri food industry wasn't made a distinction whereas in the Estonien diagram looks more into detail. The Dutch diagram makes it therfore easy to get an rough overview but for getting into the details of actors connections the Estonien diagram might be of better choice.

AKIS diagram comparison

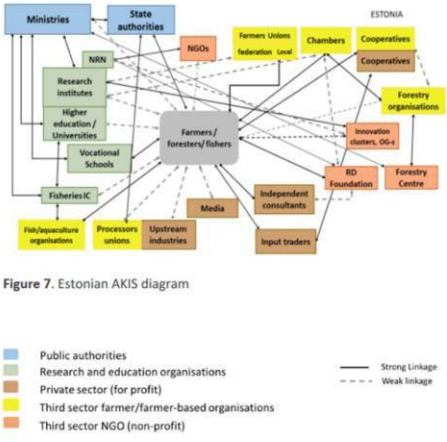
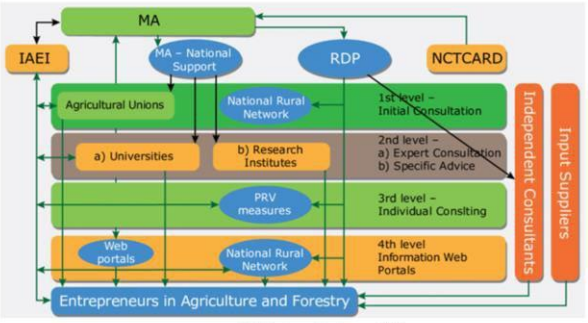


Figure 7. Estonian AKIS diagram

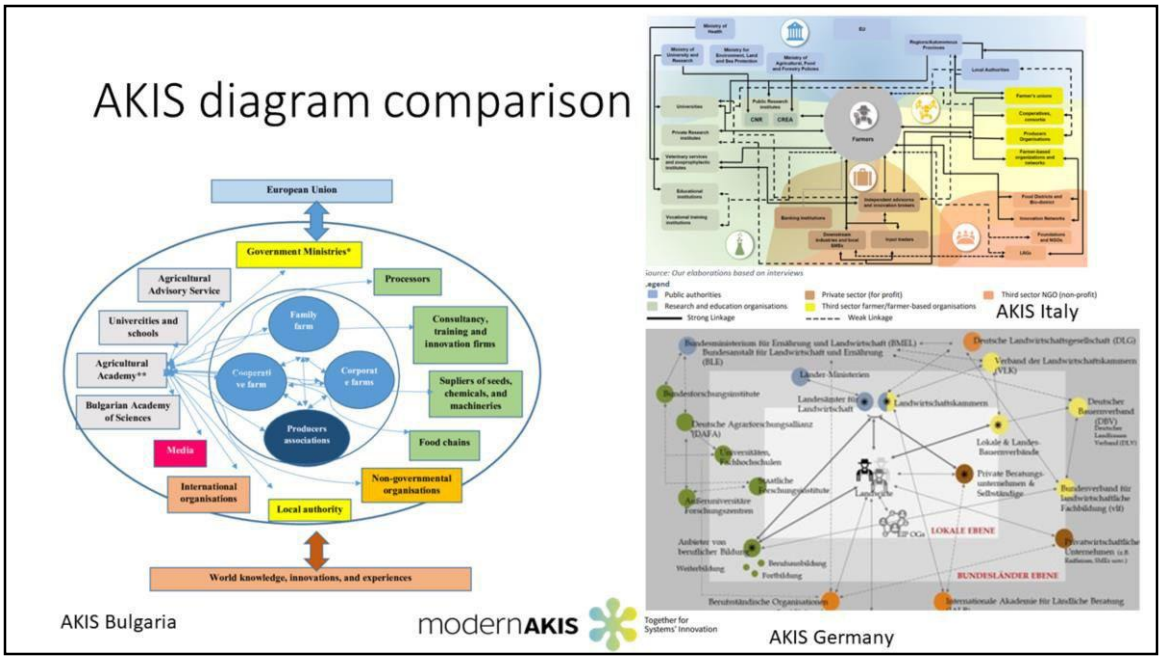


AKIS Czech Republic

Have a look at these three diagrams from Estonia and Czech Republic in terms of linkages which are the arrows. Which differences can you see between the examples? (*Zoom into every diagram*)

Look at the Estonien diagram (zoom in). It has different bold and segmented arrows, whereas the other examples don't differ in that regard (*show the other two diagrams for three seconds*). But the Czech Republic (*highlight*) diagram at the right differs the arrows by colour.

The Estonien example further connected single actors directly with each other, which led to a high number of arrows compared to the Czech AKIS.



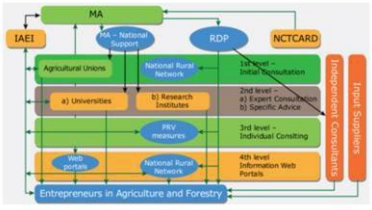
Let's compare how the different levels of national, regional or local were visualised in diagrams. How were the different levels visualised? (*short break, zoom into diagrams*)

The most striking difference is the visualisation of the German AKIS, where different levels are visualised in nested grey colours since Germany has a decentralised system. Italy (*highlight*) is also more decentralised organised but visualised it differently. There the regional and local authorities are mentioned as actors and linked with other actors but it is more vivid to wht degree which actor acts at which level. In the Bulgarien AKIS diagram local authorities and national autorities are mentioned but also the linkages to the EU and so called "World knowledge, innovations and experiences".

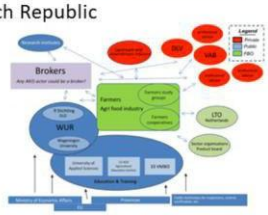
AKIS diagram comparison

Differences:

- Depth of categories: broad categories or actors within the categories (summary or detail)
- Usage of colours and shape
- Visualisation of linkages
- Visualisation of intervention levels (national, regional, local)



AKIS Czech Republic



AKIS Netherlands

AKIS Bulgaria

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As you could see there were differences in the depth of categories with some of the diagrams going into depth of actors giving more information about the AKIS but and some summarising them. Big differences could be seen in the usage of colours in number and variation and the shape of actors and actor groups. Linkages were in some diagrams more differentiated compared to others having more or les variety in colours, boldness and fragmentedness. Some countries that have more decentraliced AKISs visualised the differing intervention levels in a nested way with light colours or circles or highlighted actors active on other levels in brighter colours. There is a risk that some diagrams are presented in a rather summarised manner showing actors per category, a way that allows for an easier overview but is less effective in conveying how AKIS components are understood and addressed by the authors.

Quiz

Which of the following points should be taken into account for visualising an AKIS?

- The degree of linkage between actors
- Close actor groups should be grouped together
- Actors of the same group of actors should have the same colour
- The directionality of linkages

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Literature

- ….

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